H&H

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Proposal for

Pointe-A-La-Hache Ferry Landing Replacement

CONTRACT No.
4400026585

STATE PROJECT No.
H.006226.5

FEDERAL AID PROJECT No.
H006226

SUBMITTED BY:
Hardesty & Hanover, LLC

May 17th, 2023

3850 N. Causeway Boulevard
Suite 1625
Metairie, LA 70002
T: 504.962.9212
www.hardestyhanover.com

May 12, 2023

Louisiana Department of Transportation and Development
Consultant Contracts Services
Electronic Submission to: DOTDConsultantAds80@la.gov

RE: Contract No. 4400026585 POINTE-A-LA-HACHE FERRY LANDING REPLACEMENT, PLAQUEMINES PARISH

Dear Selection Committee Members:

Hardesty & Hanover (H&H) is pleased to submit our qualifications to LADOTD to provide Engineering Design services for the Replacement of the Pointe-A-La-Hache Ferry Landing in Plaquemines Parish. We are proud of our long history working in Louisiana, dating back to 1896 with the historic Waddell A-Truss Bridge over Cross Bayou in Shreveport, and our continued partnership on a variety of challenging projects. As leader in bridge engineering, our firm brings a legacy of providing engineering excellence for over 136 years for marine infrastructure such as ferries, piers, seawalls, and docks as well as bridges of all types. Ranked as one of **ENR's Top 10 Bridge Firms** in the country, H&H has the full capability, available capacity, and extensive bridge engineering experience to perform all contract services required. We have identified a large pool of qualified bridge engineers within our company that have relevant experience to meet your schedule and achieve your goals that will result in a safe, dependable, and sustainable infrastructure for our fellow Louisiana residents and stakeholders.

Our Staff: H&H's Project Manager, Babak Naghavi, PE, Ph.D., brings extensive experience successfully managing cross-discipline, multi-year engineering project contracts. His knowledge of design and construction, combined with his dedication, project management capabilities, and reputation with LADOTD make him an ideal candidate for this position. H&H's team of Technical Discipline Leads includes Ray Mankbadi, PE (Geotechnical Engineering), Steve Mikucki, PE (Mechanical Engineering), Andrew Barthle, PE (Electrical Engineering), Rob Viciedo, PE (Structural Engineering), Robb Hideck, PE (Roadway Design), and Fred Wetekamm, PE (Constructability).

Our Project Team: Hardesty & Hanover has strong working relationships with our subconsultants Moffatt & Nichol, APS Engineering and Testing, Ardaman & Associates, Chustz Surveying, and Urban Systems working on similar previous projects. To round out our capabilities we have added Pelican Marine Design, LLC who is well-qualified to perform marine design of the pontoon barges. Together, we bring proven engineering design and pre-construction services; successful delivery of numerous other LADOTD projects on time and on budget; resources that meet and exceed your Minimum Personnel Requirements; and a roster of qualified professionals in all required disciplines with availability to begin work immediately.

Firm	Role
Hardesty & Hanover, LLC	Project Management; Geotechnical, Structural, Mechanical, Electrical, and Roadway Design; Constructability
Ardaman & Associates, Inc.	Geotechnical Investigations
APS Engineering & Testing, LLC	Geotechnical Investigations
Chustz Surveying, Inc.	Land and Hydrographic Surveys
Moffatt & Nichol, Inc.	Coastal Design and Scour Analysis
Pelican Marine Design, Inc.	Design of Pontoon Barges
Urban Systems, Inc.	Traffic Services including TCPs, and TMPs

DBE Participation: We will meet the 4% DBE participation goal of this contract with the inclusion of APS Engineering & Testing for geotechnical investigations and Urban Systems for traffic Services. We have worked with both firms successfully in the past.

LADOTD Experience: Our team assigned to these projects have comprehensive experience using LADOTD standards and specifications featuring staff that has previously worked at LADOTD for over 25 years and/or working on prior LADOTD projects. Because we are thoroughly familiar with LADOTD procedures and design standards, we will be able to work at accurately and swiftly from the beginning of the contract. Our staff from H&H meet and exceed all the MPRs required under this contract.

We appreciate your consideration and would sincerely appreciate the opportunity to work with LADOTD on this important project. Do not hesitate to contact me at 504-962-9212 or BNaghavi@hardestyhanover.com if you need clarification or additional information about our qualifications.

Sincerely,
Hardesty & Hanover

Babak Naghavi, PE, PhD, PH – H&H Regional Manager
Project Manager and Point of Contact

DOTD FORM: 24-102

(Revised January 1, 2023)

PROPOSAL TO PROVIDE CONSULTANT SERVICES

Prime consultant shall complete the DOTD Form 24-102 without altering the Form's text; however, the instruction and/or guidance for Sections 12 through 23 can be removed but do not remove Section title and number.

ANY CONSULTANT FAILING TO SUBMIT ANY OF THE INFORMATION REQUIRED ON THE DOTD FORM 24-102, OR PROVIDING INACCURATE INFORMATION ON THE DOTD FORM 24-102, MAY BE CONSIDERED NON-RESPONSIVE.

1. Contract Name as shown in the advertisement	Pointe-A-La-Hache Ferry Landing Replacement Plaquemines Parish
2. Contract Number(s) as shown in the advertisement	Contract No. 4400026585 Federal Aid Project No. H006226
3. State Project Number(s), if shown in the advertisement	State Project No. H.006226.5
4. Prime consultant name **(name must match as registered with the Louisiana Secretary of State where such registration is required by law**)	Hardesty & Hanover, LLC
5. Prime consultant license number (as registered with the Louisiana Professional Engineering and Land Surveying Board (LAPELS) if registration is required under Louisiana law)	E.F. 0005124
6. Prime consultant mailing address	3850 N. Causeway Boulevard, Ste. 1625 Metairie, LA 70002
7. Prime consultant physical address (existing or to be established, if location is used as an evaluation criteria)	3850 N. Causeway Boulevard, Ste. 1625 Metairie, LA 70002
8. Name, title, phone number, and email address of prime consultant's contract point of contact	Babak "Bobby" Naghavi, PhD, PE, PH, Regional Manager 504.605.7940 bnaghavi@hardestyhanover.com
9. Name, title, phone number, and email address of the official with signing authority for this proposal	Babak "Bobby" Naghavi, PhD, PE, PH, Regional Manager 504.605.7940 bnaghavi@hardestyhanover.com

Prime consultant should enter the firm name in the footer at the bottom of this page. (It will carry over to subsequent pages.)

10. This is to certify that all information contained herein is accurate and true, and that the team presently has sufficient staff to perform these services within the designated time frame. By submitting this proposal, proposer certifies that it is not engaged in a boycott of Israel and it will, for the duration of its contract obligations, refrain from a boycott of Israel. Proposer also certifies and agrees that the following information is correct: In preparing its response, the proposer has considered all proposals submitted from qualified, potential subcontractors and suppliers, and has not, in the solicitation, selection, or commercial treatment of any subcontractor or supplier, refused to transact or terminated business activities, or taken other actions intended to limit commercial relations, with a person or entity that is engaging in commercial transactions in Israel or Israeli-controlled territories, with the specific intent to accomplish a boycott or divestment of Israel. The proposer also has not retaliated against any person or other entity for reporting such refusal, termination, or commercially limiting actions. DOTD reserves the right to reject the response of the bidder or proposer if this certification is subsequently determined to be false, and to terminate any contract awarded based on such a false response.	 Signature above shall be the same person listed in Section 9: Date: 5/17/2023
11. If a Disadvantaged Business Enterprise (DBE) goal has been set for this advertisement, indicate which firm(s) will be used to meet the DBE goal and each firm(s)' percentage.	Firm(s): APS Engineering and Testing, LLC 3.5% Urban Systems, Inc. 0.5%

12. Past Performance Evaluation Discipline Table:

As indicated in the advertisement, insert the completed table here. The percentages for the prime and sub-consultants must total 100% for each past performance evaluation discipline, as well as the overall total percent of the contract.

The **only** past performance evaluation disciplines to be used are: Road, Bridge, Traffic, CE&I/OV, Geotech, Survey, Environmental, Data Collection, Planning, Right-of-Way, CPM, ITS, Appraiser and Other (please specify).

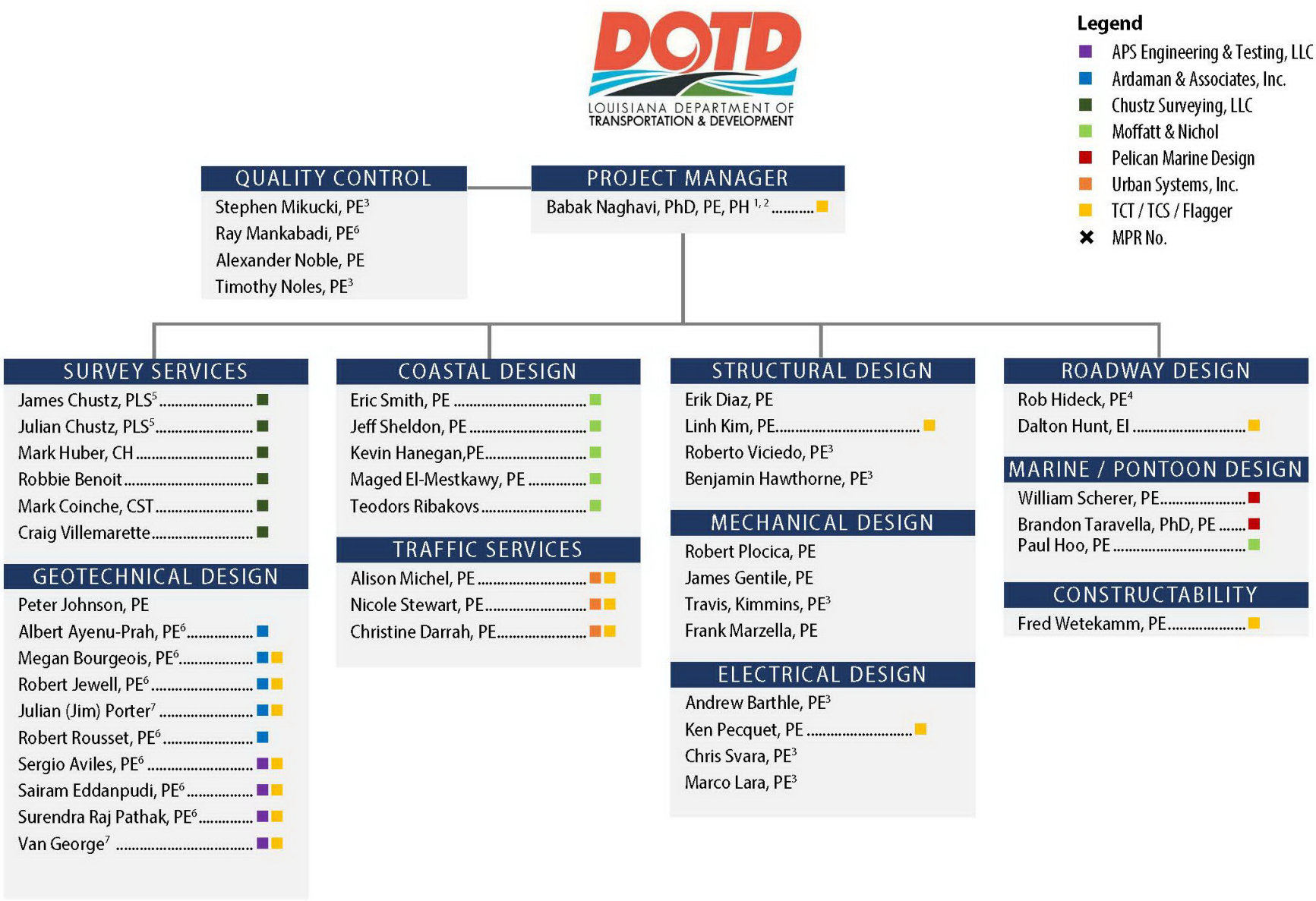
Past Performance Evaluation Discipline(s)	% of Overall Contract	Prime Hardesty & Hanover, LLC	Ardaman & Associates Inc.	APS Engineering and Testing, LLC	Chustz Surveying Inc.	Moffatt & Nichol, Inc.	Pelican Marine Design, Inc.	Urban Systems, Inc.	Each Discipline must total to 100%
Bridge	86%	88.5%				7.5%	4%		**100%**
Road	2%	100%							**100%**
Geotech	8%		56%	44%					**100%**
Survey	3.5%				100%				**100%**
Traffic	0.5%							100%	**100%**
	Identify the percentage of work for the **overall contract** to be performed by the prime consultant and each sub-consultant.								
Percent of Contract	**100%**	**78%**	**4.5%**	**3.5%**	**3.5%**	**6.5%**	**3.5%**	**0.5%**	**100%**

13. Firm Size:

Firm name	DOTD Job Classification	Number of personnel committed to this contract	Total number of personnel available in this DOTD Job Classification (if needed)
Hardesty & Hanover, LLC	Principal	2	4
	Supervisor – Eng	5	12
	Engineer	10	24
	Engineer - Other	4	32
	Engineer Intern	1	24
	Administrative	1	2
Ardaman & Associates, Inc.	Administrative	1	1
	Clerical	1	1
	Engineer	2	4
	Engineer Intern	3	6
	Principal	2	2
	Senior Technician	7	9
	Supervisor – Eng	3	3
	Supervisor – Other	3	3
	Technician	10	14
APS Engineering & Testing	Engineer	3	3
	Driller	8	8
	Technician	12	12
Chustz Surveying, LLC	Administrative	1	2
	CADD Operator	1	3
	GIS Analyst	1	3
	Instrument Man	2	5
	Party Chief	2	5
	Principal	1	1
	Rodman	2	5
	Supervisor - Other	3	4
	Surveyor	2	3
Moffatt & Nichol	Supervisor- Eng	2	10
	Engineer- Other	2	10
	Professional	1	6
	Principal	1	2
Pelican Marine Design, LLC	Supervisor- Eng	2	2

Urban Systems, Inc.	Supervisor- Eng	2	2
	Engineer	2	2
	Engineer Intern	1	1
	Senior Technician	1	1
	CADD Technician	1	1
	Engineering - Aide	2	3

14. Organizational Chart:



15. Minimum Personnel Requirements:

MPR No. Do not insert wording from ad	Personnel being used to meet the MPR (Individual(s) may not satisfy more than one MPR unless specifically allowed by Attachment B of the advertisement)	Firm employed by	Type of license and discipline meeting MPR/ certification & number (Ex. PE # - Civil)	State of license	License / certification expiration date
1	Babak Naghavi	Hardesty & Hanover	PE# 20745 - Civil	LA	9/30/2024
2	Babak Naghavi	Hardesty & Hanover	PE# 20745 - Civil	LA	9/30/2024
3	Timothy Noles	Hardesty & Hanover	PE# 31675 – Civil	LA	9/30/2023
3	Robert Viciedo	Hardesty & Hanover	PE# 36533 – Civil	LA	3/31/2024
3	James Newberry	Hardesty & Hanover	PE# 45742 – Civil	LA	9/30/2023
3	Benjamin Hawthorne	Hardesty & Hanover	PE# 44620 – Civil	LA	9/30/2024
3	Steve Mikucki	Hardesty & Hanover	PE# 44849 – Mechanical	LA	3/31/2025
3	Travis Kimmins	Hardesty & Hanover	PE# 43676 – Mechanical	LA	3/31/2024
3	Andrew Barthle	Hardesty & Hanover	PE# 34062 – Electrical	LA	3/31/2025
3	Christopher Svara	Hardesty & Hanover	PE# 44080 – Electrical	LA	3/31/2024
3	Marco Lara	Hardesty & Hanover	PE# 44115 - Electrical	LA	3/31/2024
4	Robert Hideck	Hardesty & Hanover	PE# 41953 – Civil	LA	3/31/2024
5	James H. Chustz, Jr.	Chustz Surveying, LLC	PLS #4657 - Survey	LA	3/31/2024
5	Julian Chustz	Chustz Surveying, LLC	PLS # 5251 - Survey	LA	9/30/2023
6	Ray Mankabadi	Hardesty & Hanover	PE# 41609 – Civil	LA	9/30/2023
6	Robert Jewell	Ardaman & Associates, Inc.	PE# 38579 - Civil	LA	9/30/2024
6	Albert Ayenu-Prah, Jr	Ardaman & Associates, Inc.	PE# 37402 – Civil	LA	3/31/2025
6	Megan Bourgeois	Ardaman & Associates, Inc.	PE# 36725 - Civil	LA	3/31/2024
6	Robert Jewell	Ardaman & Associates, Inc.	PE# 38579 - Civil	LA	9/30/2024
6	Robert Rousset	Ardaman & Associates, Inc.	PE# 38637 - Civil	LA	9/30/2024
6	Sergio Aviles	APS Engineering and Testing	PE# 33571 – Civil	LA	3/31/2024
6	Sairam Eddanapudi	APS Engineering and Testing	PE #35129 – Civil	LA	3/31/2024
6	Surendra Raj Pathak	APS Engineering and Testing	PE #43487 – Civil	LA	9/30/2023
7	Jim Porter	Ardaman & Associates, Inc.	N/A		
7	Van George	APS Engineering and Testing	N/A		

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Babak Naghavi, PhD, PE, PH**	Years of relevant experience with this employer	5
Title	Regional Manager	Years of relevant experience with other employer(s)	35

Degree(s) / Years / Specialization			PhD / 1993 / Civil Engineering / Louisiana State University MS / 1982 / Civil Engineering / Louisiana State University BS / 1979 / Civil Engineering / Louisiana State University
Active registration number / state / expiration date			Professional Engineer: 20745 / LA / 9/30/2024 NEPA Transportation Decision Making Workshop ATSSA Traffic Control Supervisor Refresher – ATSSA Flagger Highway Safety Manual Workshop
Year registered	1983	Discipline	Civil and Environmental Engineering
Contract role(s) / brief description of responsibilities			**Project Manager Meets - MPR 1, 2**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
01/17 – Present	**Bayou Teche Movable Bridge at Oaklawn | St. Mary Parish, LA | LADOTD** **Project Manager** responsible for the design, calculations, and plan preparation of the bridge power distribution and relay-based control system for this movable bridge located in St. Mary Parish, LA. The new through girder swing-span rotates with hydraulically-actuated slewing (push-pull) cylinders. The project was on hold; now presently in the design phase.
01/11 - 12/12	**S.P. 700-38-0110: Belle Chasse Tunnel-Electrical, Mechanical & Structural Rehab. Design | Plaquemenines Parish, LA | LADOTD** **Project Manager** provided design support and construction engineering & inspection services for the repair/rehabilitation of the Belle Chasse Tunnel. Scope of work included leak sealing by injection of grout/resin materials with associated sealing of joints; repair of existing gratings and supporting concrete; replacement of the existing lighting system; installation of tunnel height detection system at tunnel entrances; repair or refurbishment of all discharge piping; installation of the generator and automatic transfer switch; replacement of louvers for ventilation rooms; replacement of ventilation fan motors; and the repair/replacement of pumps and motors.
08/20 – Present	**L H.001498.6; LA 24 and LA 16 Company Canal Vertical Lift Bridge | Bourge, LA | LADOTD** **Project Manager** delivering construction engineering and inspection services for a new vertical lift bridge and operator's house. Services include daily monitoring of all construction activities; maintaining all construction field records; coordinating with DOTD, contractor, parish government, and utilities; performing field testing; maintaining records of contractual operations, pay estimates and progress reports; preparing final estimate packages; conducting construction progress meetings; and construction close-out.

01/19 – Present	**Lapalco Boulevard Movable Bridge over Harvey Canal | Jefferson Parish, LA | Jefferson Parish DPW** **Project Manager** for the pre-design inspection and design of a new three-lane double bascule movable bridge crossing of Harvey Canal and the widening of the existing four-lane Lapalco Boulevard to provide a facility carrying three lanes of traffic in each direction. The new bridge is constructed as an independent structure immediately adjacent and north of the existing bridge with a new operator house. The project includes rehabilitation to the existing four-lane bridge with three lanes of traffic and a new pedestrian/bike lane. The scope of services also includes improvements to bridge and roadway approaches for eastbound and westbound traffic as well as the development of a Traffic Control Plan. The project is designed in accordance to LADOTD Standards and Specifications.
01/20 – Present	**Almonaster Avenue Railroad Bridge of the Industrial Canal Rehabilitation | New Orleans, LA | Port of New Orleans** **Project Manager** for the bridge assessment, rehabilitative engineering design, and construction inspection services required for the partial replacement of the Almonaster Avenue Bridge, a movable Strauss-heel trunnion bridge. H&H's 2019 assessment of the circa-1920, National Register of Historic Places eligible bridge revealed that improvements to the electrical and mechanical systems, superstructure, and counterweight were required to return this bridge to its full operating capability. Although the existing substructure could remain, modifications to other bridge elements were deemed necessary to accommodate the rehabilitated superstructure. H&H developed necessary design plans to replace the span drive and span lock machinery, operating strut, guide assembly, live load bearings, counterweight trunnion pin, and bushing. The main trunnion bearings were rehabilitated and repositioned. The project is designed in accordance to LADOTD Standards and Specifications.
06/18 - 06/21	**SR-605 Movable Bascule Bridge over Industrial Waterway | Harrison County, MS | MDOT** **Project Manager** responsible for design, plan review, and quality control for full rehabilitation design of the SR-605 bascule bridge as a task-order to the IDIQ Master Bridge Contract. The scope included engineering assessment; mechanical, electrical and structural designs; and preparation of Traffic Control Plans. All designs were completed in accordance with AASHTO, FHWA, and MDOT guidelines and specifications.
03/18 - 06/20	**SR-609 Movable Bascule Bridge over Old Fort Bayou IDIQ Master Bridge Design Contract | Ocean Springs, MS | MDOT** **Project Manager** responsible for full rehabilitation of SR 609 bascule bridge as a task-order to the IDIQ Master Bridge Contract which includes developing standard and special bridge services statewide for MDOT. The scope of work included inspection and rehabilitation of structural, mechanical, and electrical bridge components, roadway approaches, and development of maintenance and repair plans. All designs are in accordance with AASHTO, FHWA, and MDOT guidelines and specifications.
06/11 - 06/16	**S.P. No. 064-05-0085 (CE&I), Bayou Lafourche Bridge at Larose | Lafourche Parish, LA | LADOTD** **Project Manager** responsible for construction engineering and inspection services for an on-system **vertical lift bridge**. This new bridge replaces the former LA 310 pontoon bridge at LA 657 extension to LA 308. This is the largest span lift bridge in the State of Louisiana. Scope of work included concrete piers, installation of structural steel members, welding, bolted connections, anchor bolts, field painting, and concrete approaches. Work involved the structural steel paint inspection of all bolted connections. This $30 million project is the 3rd largest ARAA funded transportation project in the state. Responsibilities included overall supervision; coordination with LADOTD, Parish, and Coast Guard; and QA/QC of project documentation.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Stephen Mikucki, PE**	Years of relevant experience with this employer	27
Title	Principal Associate/Chief Mechanical Engineer	Years of relevant experience with other employer(s)	1

Degree(s) / Years / Specialization			B.E. / 1990 / Mech. Engineering / Manhattan College
Active registration number / state / expiration date			Professional Engineer: 44849 / LA / 3/31/2025
Year registered	2020	Discipline	Mechanical Engineering
Contract role(s) / brief description of responsibilities			**Quality Control – Mechanical - Meets MPR 3**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
02/14 – Present	**2011 Ferry Engineering Service Agreement Project | New York, NY | New York City DOT** **Project Manager** for Hardesty & Hanover's (H&H) work on this project, which is on a task order basis. H&H is a subconsultant to Halcrow Engineers, PC. Currently there are three tasks which H&H has performed work on. The tasks are: 1. Emergency Inspection and Engineering Support for Whitehall Slip 1, Lower Bridge Dead Load Rope Replacement., 2. Structural, Mechanical & Electrical Biennial Inspection of four St George, three Whitehall, one City Island & one Hart Island Ferry Slips., and 3. The St George Wire Rope & Elevation Study, with Engineering Support.
01/11 – 06/12	**2010 NYC Ferry Ops-Transfer Bridge Inspection at Staten Island Ferry Term | Staten Island & Manhattan, NY | New York DOT** **Lead Mechanical Engineer** for the mechanical & electrical inspections and reports for 7 transfer slips (3 on the Manhattan Side / Whitehall Terminal, and 4 on the Staten Island Side / St. George Terminal). Each slip has two upper pedestrian bridges, and one lower vehicular bridge. The lower bridge is used to moor the Ferry into position during docking operations.
08/18 – 12/19	**Keller Ferry Landings Replacement | Keller, WA | Washington State DOT Ferries** **Lead Mechanical Engineer** for electrical and mechanical system design implementation. This project involved developing electrical and mechanical plans, specifications, and cost estimates to relocate the operating equipment for two existing floating ferry landings onto two newly fabricated floating ferry landing. Designed improvements to the winch operating systems and developed a new vessel roller support cradle system. Construction support services were also provided.
10/21 – Present	**Fisher Island Ferry Landing Ramps Replacement | Miami-Dade County, FL | Fisher Island Community Association, Inc.** **Lead Mechanical Engineer** responsible for the mechanical design of two ferry landing ramps on Fisher Island. Following an in-depth structural, mechanical, and electrical inspection of the ramps, H&H recommended a course of action for rehabilitation and replacement of the older, cable pulley ramps. The new ramps will operate hydraulically and be rated for AASHTO HS20. H&H is designing the mechanical and electrical systems for these ramps as well as providing construction support services including shop drawing review, RFI response, field visits, shop inspections, and tests.

06/18 – 12/18	**Almonaster Avenue Railroad Bridge over the Industrial Canal | New Orleans, LA | Port of New Orleans** **Mechanical Systems Expert** contributed to the bridge assessment, complete rehabilitative engineering design, and construction inspection services required for the partial replacement of the Almonaster Avenue Bridge, a movable Strauss-heel trunnion bridge. H&H's 2019 assessment revealed that improvements to the electrical and mechanical systems, superstructure, and counterweight were required to return this bridge to its full operating capability. Modifications were deemed necessary to accommodate the rehabilitated superstructure. H&H developed necessary design plans to replace the span drive and span lock machinery, operating strut, guide assembly, live load bearings, counterweight trunnion pin, and bushing. The main trunnion bearings were rehabilitated and repositioned.
12/94 – 08/00	**St. George Station Slip Bridge Rehab at Ferry Terminal | Staten Island, NY | New York City DOT** **Project Manager** for the development of contract plans and specifications for the machinery systems that operate three movable bridges per ferry slip. Also managed shop and field inspection of work related to emergency reconstruction of one slip damaged by a ferry accident. $90 million mechanical and electrical rehabilitation design for slip bridges 3, 5, 4 and 6. Also provided emergency inspection, report, and construction support services for slip 4, which suffered damage during a ferry accident on April 17, 1995. Developed contract plans and specifications.
06/00 – 08/08	**Ferry Street Bascule Bridge | New Haven, CT | City of New Haven** **Project Mechanical Engineer** responsible for mechanical work items included in bridge rehabilitation for this $11 million deck replacement design for double leaf bascule bridge which involves replacement of a purlin-stringer-floor beam-girder span that opens to a 101-foot-wide channel clearance with center-to-center trunnion spacing at 124 feet. Mechanical work included the replacement of the span center locks and machinery, as well as a rehabilitation of the trunnion and span drive machinery
01/13 – 08/13	**Lea Joyner/Ouachita River Bridge Rehabilitation | Monroe, LA | LADOTD** **Mechanical Systems Expert** responsible for the design, calculations, development of contract plans, cost estimate, construction support services, review of shop drawings, project submittals and installation procedures, and responding to RFI's submitted by the contractor for a counterweight trunnion replacement and rehabilitation at the Louisville Bascule Bridge. The Ouachita River Bridge is a double-leaf Strauss Bascule bridge constructed in the early 1930s. H&H provided structural and mechanical support in the replacement of the counterweight trunnion and hanger plates, developed a jacking procedure and specifications for the project. Coordinated with contractor to determine field conditions and construction limitations. Reviewed all structural steel shop drawings.
12/12 – 07/14	**Ouachita Bascule Bridge | Monroe, LA | LADOTD** **Movable Bridge Lead** for this emergency repair to the hanger plates and counterweight trunnion bearings for this underdeck Straus double leaf bascule bridge. As part of a commissioning task including strain gaging of equipment for contractor PCL, H&H discovered a significant operational resistance in the counterweight bearings. This lead to the replacement of the bearings, and structural hanger plate located between the tail end of the bascule leaf, and articulated counterweight frame.
01/97 – 11/06	**Third Avenue Swing Over the Harlem River | New York, NY | New York City DOT** **Movable Bridge Lead** responsible for Quality and Construction Review of Machinery Design for this $118.8 million on-line bridge replacement which includes a temporary bridge and float-in of fully-assembled, 350-ft through truss swing span. Total project length is 3500 feet. Included in-depth inspection, complete substructure and superstructure replacement of ramps, 18 approach spans, swing span's mechanical and electrical systems, control house, seismic analysis and design, traffic studies, and complex staged construction.

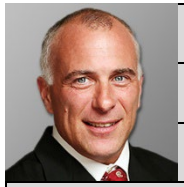
16. Staff Experience:

Firm Employed by	Hardesty & Hanover			
Name	**Alexander Noble, PE**		Years of relevant experience with this employer	26
Title	Lead Electrical Engineer		Years of relevant experience with other employer(s)	7
Degree(s) / Years / Specialization			B.E. / 1989 / Electrical Engineering / Manhattan College	
Active registration number / state / expiration date			Professional Engineer: 80143 / FL / 08/28/2023	
Year registered	2015	Discipline	Electrical Engineering	
Contract role(s) / brief description of responsibilities			**Quality Control - Electrical**	

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s) .
01/11 – 06/12	**2010 NYC Ferry Ops-Transfer Bridge Inspection at Staten Island Ferry Term | Staten Island & Manhattan, NY | New York DOT** **Lead Electrical Engineer** for the mechanical & electrical inspections and reports for 7 transfer slips (3 on the Manhattan Side / Whitehall Terminal, and 4 on the Staten Island Side / St. George Terminal). Each slip has two upper pedestrian bridges, and one lower vehicular bridge. The lower bridge is used to moor the Ferry into position during docking operations.
05/18 – 10/19	**Keller Ferry Landings Replacement | Keller, WA | Washington State DOT Ferries** **Lead Electrical Engineer** for electrical and mechanical system design implementation. This project involved developing electrical and mechanical plans, specifications, and cost estimates to relocate the operating equipment for two existing floating ferry landings onto two newly fabricated floating ferry landing. Designed improvements to the winch operating systems and developed a new vessel roller support cradle system. Construction support services were also provided.
11/21 – Present	**Fisher Island Ferry Landing Ramps Replacement | Miami-Dade County, FL | Fisher Island Community Association, Inc.** **Lead Electrical Engineer** responsible for the electrical design of two ferry landing ramps on Fisher Island. Following an in-depth structural, mechanical, and electrical inspection of the ramps, H&H recommended a course of action for rehabilitation and replacement of the older, cable pulley ramps. The new ramps will operate hydraulically and be rated for AASHTO HS20. H&H is designing the mechanical and electrical systems for these ramps as well as providing construction support services including shop drawing review, RFI response, field visits, shop inspections, and tests.
08/13 – 06/14	**Hatteras Ferry Ramp Rehabilitation | Dare County, NC | North Carolina Division of Highways** **Lead Electrical Engineer** provided a rehabilitation design that included a new control system, a new distributed power distribution system, motor controllers, control stations, receptacles, lights, and hydraulic controls for the ramp. Provided the electrical design, including calculations, design drawings, and specifications. Following the completion of the Design Phase, during the Construction Phase provided construction support services, including shop drawing review, and Requests for Information.

01/18 – 08/19	**Southport and Fort Fisher Ferry Ramp Rehabilitation | Fort Fisher, NC | North Carolina DOT** **Electrical Engineer** for the rehabilitation design of the of the Southport and Fort Fisher Ferry Ramps. The design focused on simplified and streamlined structural, mechanical, and electrical details that would provide reliable operation while decreasing the Ferry Division's annual maintenance costs. Innovative cylinder and float mechanism details allowed the elimination of the high maintenance existing counterweight system. A new lift bent crossbeam and structural modifications to the lift bent improved the structural integrity while enabling the bent to behave as a structural frame. Access platform modifications allowed for safe access by maintenance personnel to the new mechanical and electrical equipment.
04/04 – 02/09	**State Street Bridge | Milwaukee, WI | City of Milwaukee** **Electrical Engineer** responsible for design of the new electrical system for the bascule span of a historic, 120-foot, double-leaf bascule span excluding bascule girders. Performed inspection and rehabilitation of trunnion assemblies. Replaced span drive and span lock machinery and electrical system. Complete electrical system replacement included power system, DC drives, relay logic and PLC remote control and CCTV via fiber-optic communications.
04/11 – Present	**Bridge Inspection Task Order Contract | Statewide, CT | Connecticut DOT** **Lead Electrical Engineer** responsible for annual inspection and reporting for the movable bridge electrical systems for ConnDOT owned movable bridges on the Metro-North Railroad line, including the Cos Cob, Saugatuck, Peck and Devon Bridges. Inspections included data acquisition and analysis of motor currents, verification of relay and PLC based logic systems, insulation resistance testing of motors and submarine cables and testing of limit switches and encoders/resolvers.
2019 – Present	**Welland Canal Bridge #6 Major Rehabilitation Design | St. Catherines, Ontario | St. Lawrence Seaway Corporation** **Electrical Engineer** for major rehabilitation of Bridge #6. Work includes complete drive machinery rehabilitation, span brake replacement, span lock replacement (per the SLSMCs Bridge Lock Strategy Report), toe bearing de-icing system, replacement of power distribution & electrical equipment, replacement of interior and exterior lighting, replacement of movable span festoon cable systems that provide power to the moving span, replacement of bridge span lock starters and brake timing delay to wind up machinery, rebalance the spans using dynamic strain gaging, and all span brake testing work.
05/05 – 04/14	**On-Call Movable (BCS 2008-10B; 2005-01A) | Statewide, MD | Maryland State Highway Administration (MDSHA)** **Lead Electrical Engineer** for the multiple cycles of this on-call contract. Work included performing inspection of the electrical systems on all 18 MDSHA-owned movable bridges including data acquisition and analysis of span and auxiliary motor currents, analyzing parameters for inverter type AC drives, insulation resistance testing of motors and submarine cables, and verification and adjustment of span, lock and gate limit switches. Also, led the engineering for the replacement of an electrical control system including the design of relay logic and the implementation of inverter drives, and the replacement of the entire electrical system including power distribution, motor controls, span control logic and auxiliary devices on another movable bridge. Comprehensive reports were generated identifying any deficiencies and provide repair details and cost estimates.

16. Staff Experience:



Firm Employed by	Hardesty & Hanover		
Name	**Timothy Noles, PE**	Years of relevant experience with this employer	38
Title	Principal	Years of relevant experience with other employer(s)	0

Degree(s) / Years / Specialization			B.S. / 1984 / Civil Engineering / University of Tennessee
Active registration number / state / expiration date			Professional Engineer: 31675 / LA / 9/30/2023
Year registered	2005	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities			**Quality Control – Structural - Meets MPR 3**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s) .
07/21 – Present	**Fisher Island Ferry Landing Ramps Replacement | Miami-Dade County, FL | Fisher Island Community Association, Inc.** **Quality Control Engineer** responsible for the electrical design of two ferry landing ramps on Fisher Island. Following an in-depth structural, mechanical, and electrical inspection of the ramps, H&H recommended a course of action for rehabilitation and replacement of the older, cable pulley ramps. The new ramps will operate hydraulically and be rated for AASHTO HS20. H&H is designing the mechanical and electrical systems for these ramps as well as providing construction support services including shop drawing review, RFI response, field visits, shop inspections, and tests.
01/18 – 07/19	**Southport and Fort Fisher Ferry Ramp Rehabilitation | Fort Fisher, NC | North Carolina DOT** **Quality Control Engineer** for the rehabilitation design of the of the Southport and Fort Fisher Ferry Ramps. The design focused on simplified and streamlined structural, mechanical, and electrical details that would provide reliable operation while decreasing the Ferry Division's annual maintenance costs. Innovative cylinder and float mechanism details allowed the elimination of the high maintenance existing counterweight system. A new lift bent crossbeam and structural modifications to the lift bent improved the structural integrity while enabling the bent to behave as a structural frame. Access platform modifications allowed for safe access by maintenance personnel to the new mechanical and electrical equipment.
06/18 – Present	**Almonaster Avenue Railroad Bridge Over the Industrial Canal | New Orleans, LA | Port of New Orleans** **Technical Lead** for the bridge assessment, rehabilitative engineering design, and construction inspection services required for the partial replacement of the Almonaster Avenue Bridge, a movable Strauss-heel trunnion bridge. H&H's 2019 assessment of the circa-1920, National Register of Historic Places eligible bridge revealed that improvements to the electrical and mechanical systems, superstructure, and counterweight were required to return this bridge to its full operating capability. Although the existing substructure could remain, modifications to other bridge elements were deemed necessary to accommodate the rehabilitated superstructure. H&H developed necessary design plans to replace the span drive and span lock machinery, operating strut, guide assembly, live load bearings, counterweight trunnion pin, and bushing. The main trunnion bearings were rehabilitated and repositioned. The project is designed in accordance to LADOTD Standards and Specifications.

10/07 – Present	**Oaklawn Swing Bridge Over Bayou Teche | Oaklawn, LA | LADOTD** **Principal-in-Charge** responsible for engineering design and post-design services for the new Bayou Teche Bridge at Oaklawn project. Built in 1941 to carry LA Route 323 over Bayou Teche, the original bridge is being replaced with a new hydraulically-operated swing bridge. H&H provided the electrical design for the bascule bridge in line with LADOTD's design requirements and standard design details and coordinated closely with the other design disciplines to assure success. All design deliverables were made in accordance with project schedule. Due to permitting issues, design activities were placed on hold for several years extending the schedule, now in design phase.
08/08 – 08/13	**Judge Seeber Vertical Lift Bridge | New Orleans, LA | LADOTD** **Principal-in-Charge** overseeing the task order involving the replacement of the vertical life bridge's entire electrical system, counterweight ropes, counterweight guides, and span locks in addition to miscellaneous structural repairs. The design contract required the completion of the design in three months to meet the FEMA funding deadline. The electrical system was replaced in-kind using secondary resistance control operated with a drum switch in accordance with LADOTD preference.
10/12 – 03/14	**SR-A1A / Hillsboro Inlet Bridge Over ICWW | Pompano Beach, FL | Florida DOT** **Principal-in-Charge / Lead Design Engineer** for the structural, electrical and mechanical rehabilitation, aesthetic enhancements and control house 2nd story addition of a single-leaf bascule span The new, two level tender house consisted of two levels to be cooled and heated by means of a split-type AC system. The span locks were replaced and relocated to the rest pier. Structural rehabilitation included grating replacement, bridge and pedestrian railing replacement, and marine mattress scour mitigation of the substructure located in a severe scour environment. Electrical work included modification of the electrical system including new control desk, multiplexor to prevent subcable replacement and pedestrian gate. Mechanical rehabilitation included new secondary reducer and span locks. The need for an additional submarine cable originally included in the scope was eliminated and replaced with the first use of a multiplexor on a Florida movable bridge. The project was also funded with a $1 million JPA with the City of Pompano Beach that included sidewalk improvements and control house renovation.
01/00 – 04/02	**Broward County Bridges over New River | Ft. Lauderdale, FL | Broward County** **Project Manager / Lead Design Engineer** responsible for inspection report, rehabilitation, and construction inspection of structural and machinery repairs for two rolling-lift-span bridges. The project involved inspection and rehabilitation which included minor structural repairs and painting of three movable bridges (3rd Avenue, 7th Avenue and Andrews Avenue) and mechanical rehabilitation of drive machinery on two double-leaf rolling-lift-span bridges. Strain gage testing and balance calculations were provided on 3rd Ave Bridge.
11/12 – 06/14	**Districtwide Bridge Inspections Contract | Florida DOT** **Principal-in-Charge** responsible for overseeing the inspection of electrical/mechanical systems/components and detailed inspection report for the on-call inspection of bridge structures located throughout District 2 in compliance of federal and state regulations. Work included routine and interim inspections and non-destructive testing services on 35 fixed and movable bridges as well as inspection reports outlining detailed inspection findings and prioritized repair recommendations for noted deficiencies.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Fred Wetekamm, PE**	Years of relevant experience with this employer	5
Title	Senior Bridge Engineer	Years of relevant experience with other employer(s)	30

Degree(s) / Years / Specialization			B.S. / 1984 /Civil Engineering / Louisiana State University MEng. / Construction Engineering / 2018 / Univ. of Alabama Birmingham
Active registration number / state / expiration date			Professional Engineer: 25369 / LA / 3/31/2024 Maintenance & Rehabilitation of Historic Bridges (LADOTD) FHWA NHI Course #139005, Driven Pile Foundations – Construction Monitoring ATSSA Traffic Control Supervisor and Flagger
Year registered	1983	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities			**Senior Structural Engineer**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
8/20 – Present	**L H.001498.6; LA 24 and LA 16 Company Canal Vertical Lift Bridge | Bourge, LA | LADOTD** **Construction Engineer/Inspector** responsible for delivering construction engineering and inspection services for a new vertical lift bridge and operator's house. Services include daily monitoring of all construction activities; maintaining all construction field records; coordinating with DOTD, contractor, parish government, and utilities; performing field testing; maintaining records of contractual operations, pay estimates and progress reports; preparing final estimate packages; conducting construction progress meetings; construction and close-out.
07/16 – 09/18	**Bayou La Loutre Vertical Lift Bridge Rehabilitation (SP 002562) | St. Bernard Parish, LA | LADOTD** **Senior Project Engineer and CEI Inspector** in responsible charge. Contributed to the rehabilitation design to aid designers in understanding the bridge operation and maintenance preferences for the LADOTD and provided construction engineering and inspection services during construction. The Bayou La Loutre Bridge Rehabilitation Project scope consisted of bridge structural repairs, cleaning and painting of the bridge structure, installation of a new fender system, and replacement of the bridge operator house utilizing the current LADOTD BDEM and LSSRB. Built in 1957, this project was the first major rehabilitation to the bridge.
11/15 – 03/18	**Danziger Vertical Lift Bridge Rehabilitation (SP 000303.6) | Orleans Parish, LA | LADOTD** **Project Area Engineer** in responsible charge of contract administration and supervising the Project Engineer and LADOTD Certified Inspectors for construction inspection. This project scope involved the replacement of the asphaltic concrete roadway on the lift span (310-lf x 72-lf) with a latex modified concrete, replace the lifting ropes, replace most of the mechanical operating components, and rehabilitation of the operator house.

06/12 – 12/13	**US 90 Judge Seeber (Claiborne Ave) Vertical Lift Bridge (SP 001200) | New Orleans, LA | LADOTD** **Project Area Engineer** in responsible charge of contract administration and supervising the Project Engineer and LADOTD Certified Inspectors for construction inspection. This project scope involved the repainting of the bridge while maintaining marine and vehicular traffic, replacing deteriorated structural components, and repairing lift span guide rails.
01/20 – Present	**Almonaster Avenue Railroad Bridge of the Industrial Canal Rehabilitation | New Orleans, LA | Port of New Orleans** **Senior Structural Engineer** for the bridge assessment, rehabilitative engineering design, and construction inspection services required for the partial replacement of the Almonaster Avenue Bridge, a movable Strauss-heel trunnion bridge. H&H's 2019 assessment of the circa-1920, National Register of Historic Places eligible bridge revealed that improvements to the electrical and mechanical systems, superstructure, and counterweight were required to return this bridge to its full operating capability. Although the existing substructure could remain, modifications to other bridge elements were deemed necessary to accommodate the rehabilitated superstructure. H&H developed necessary design plans to replace the span drive and span lock machinery, operating strut, guide assembly, live load bearings, counterweight trunnion pin, and bushing. The main trunnion bearings were rehabilitated and repositioned.
04/08 – 08/19	**US 11 Over Lake Pontchartrain Bascule Draw Bridge | New Orleans, LA | LADOTD** **Engineer/Inspector** responsible for contract administration, supervision of the Project Engineer and LADOTD Certified Inspectors for construction inspection. This project scope involved removing / re-machining of the trunnions, replacing locking bars, and rehabilitating electrical operating components in the control cabinets, limit switches, and replacing the generator.
07/07 – 11/10	**LADOTD Construction Project | New Orleans, LA | LADOTD** **LA DOTD Construction Project Engineer** in responsible charge providing construction engineering and inspection services for the **South Louisiana Submerged Roads Program** which provided repairs and resurfacing of 56 roads in Orleans, Jefferson, and St Bernard Parishes that were damaged from Hurricane Katrina. The project was funded by FHWA's Emergency Relief Program. The project cost was approximately $100M.
07/12 – 05/16	**LADOTD Construction Project | New Orleans, LA | LADOTD** **LA DOTD Construction Project Engineer** in responsible charge providing construction engineering and inspection services for the **Paths to Progress (P2P) Program** which provided repairs and resurfacing of 60 roads in Orleans and Jefferson Parishes that were damaged from Hurricane Katrina. The project was funded by FHWA's Emergency Relief Program. This project required a coordinated effort between FHWA, LADOTD, Regional Planning Commission, and local entities. The project cost was approximately $90M.
07/07 – 08/18	**LADOTD Construction Project | New Orleans, LA | LADOTD** **LA DOTD Construction Project Engineer** in responsible charge providing construction engineering inspection services for the Fleur De Lis Roadway Rehabilitation Projects Phases 1, 2, and 3 Program which were complete reconstruction of the roadway and drainage. The project cost was approximately $25.2M.
11/09 – 12/12	**LADOTD Construction Project | New Orleans, LA | LADOTD** **LA DOTD Construction Project Engineer** in responsible charge providing construction engineering inspection services for Earhart Blvd. Rehabilitation Project. Directed all aspects of the program which was a complete reconstruction of the roadway and drainage from Hamilton to Fern. The project cost was approximately $11.2 M.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Erik Diaz, PE**	Years of relevant experience with this employer	3
Title	Structural Engineer	Years of relevant experience with other employer(s)	11

Degree(s) / Years / Specialization			B.S. / 2008 / Civil Engineering / Louisiana State University
Active registration number / state / expiration date			Professional Engineer: 37712 / LA / 09/30/2023 FHWA-NHI-130055 Safety Inspection of In-Service Bridges Maintenance & Rehabilitation of Historic Bridges (LADOTD)
Year registered	2013	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities			**Structural Engineer**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
07/16 – 07/17	**Two US-11 Bascule Bridges over Lake Pontchartrain Rehabilitation | Jefferson and St. Tammany Parishes, LA | LADOTD** **Senior Movable Bridge Structural Engineer** for the comprehensive rehabilitation of one bascule and replacement of another bascule bridge over Lake Pontchartrain. Work on this project included the inspection of old spans, the rehabilitation design development for the north bascule span and fender, as well as the design of construction plans for a new south bascule span.
01/20 – Present	**Almonaster Avenue Railroad Bridge of the Industrial Canal Rehabilitation | New Orleans, LA | Port of New Orleans** **Senior Structural Engineer** for the bridge assessment, rehabilitative engineering design, and construction inspection services required for the partial replacement of the Almonaster Avenue Bridge, a movable Strauss-heel trunnion bridge. H&H's 2019 assessment of the circa-1920, National Register of Historic Places eligible bridge revealed that improvements to the electrical and mechanical systems, superstructure, and counterweight were required to return this bridge to its full operating capability. Although the existing substructure could remain, modifications to other bridge elements were deemed necessary to accommodate the rehabilitated superstructure. H&H developed necessary design plans to replace the span drive and span lock machinery, operating strut, guide assembly, live load bearings, counterweight trunnion pin, and bushing. The main trunnion bearings were rehabilitated and repositioned. The project is designed in accordance to LADOTD Standards and Specifications.
08/19 – 08/20	**SR-605 Bascule Bridge Over Industrial Waterway | Harrison County, MS | MDOT** **Movable Bridge Senior Structural Engineer** performed the bridge load rating for movable bridge and fixed bridge approaches. Contributed to structural design for the comprehensive rehabilitation of this bascule bridge over the Industrial Waterway. Work on this project included design and detailing of a new PPC pile-supported reinforced concrete generator platform as well as the design and detailing of steel access improvements. All designs are in accordance with AASHTO, FHWA and MDOT guidelines and specifications.
10/14 – 12/15	**Bridge Ratings for 110 Bridges | Statewide | LADOTD** **Movable Bridge Structural Engineer** responsible for developing spreadsheets and processes for rating bridge substructures. Also, performed ratings for bridge superstructures and substructures using AASHTOWare and Excel. Wrote bridge rating reports.

12/12 – 10/15	**Houma Navigation Canal Bridge Rehabilitation | Houma, LA | LADOTD** **Movable Bridge Structural Engineer** responsible for performing bridge inspections to identify repairs for rehabilitation as well as providing bridge rating to identify areas for strengthening. Also, designed and detailed various elements for bridge rehabilitation.
08/19 – Present	**Lapalco Boulevard Movable Bridge over Harvey Canal | Jefferson Parish, Louisiana | Jefferson Parish DPW** **Movable Bridge Structural Engineer** for the pre-design inspection and design of a new three-lane double bascule movable bridge crossing of Harvey Canal and the widening of the existing four-lane Lapalco Boulevard to provide a facility carrying three lanes of traffic in each direction. The new bridge is constructed as an independent structure immediately adjacent and north of the existing bridge with a new operator house. Project includes rehabilitation to the existing four-lane bridge with three lanes of traffic and a new pedestrian/bike lane, improvements to bridge and roadway approaches, and development of a Traffic Control Plan.
08/19 – 02/20	**SR 609 Movable Bascule Bridge Rehabilitation | Ocean Springs, MS | MDOT** **Movable Bridge Senior Structural Engineer** for full rehabilitation of SR 609 bascule bridge, as a task-order to the IDIQ Master Bridge Contract which included developing standard and special bridge services, statewide for MDOT. Scope of work included inspection and rehabilitation of structural, mechanical, and electrical components of the bridge, as well as the roadway approaches and development of maintenance and repair plans. All designs are in accordance with AASHTO, FHWA and MDOT guidelines and specifications.
08/19 – 10/19	**Seabrook Bascule Bridge Bearing Repairs | New Orleans, LA | Port of New Orleans** **Movable Bridge Field Engineer** for the construction of repairs to the concrete bent cap at the toe of the span. Work on this project included design of bent cap strengthening due to cracking at bridge bearing, tracking contractor progress and construction compliance with design plans. Preparation of final acceptance report upon completion of construction.
12/15 – 08/19	**Replacement of Swing Bridge with New Vertical Lift | Sweeny, TX | UPRR** **Senior Movable Bridge Structural Engineer** for the design and construction of a new through plate girder vertical lift bridge over the San Bernard River near Sweeny Texas. The project included design of new steel through plate girder vertical lift, bridge protection cell (dolphin), approach spans and construction management. This project also included emergency bridge repairs due to failure of bridge pier from scour produced by Hurricane Harvey flooding.
11/18 – 08/19	**Comite River Diversion East | Baton Rouge Parish, LA | UPRR & USACE** **Senior Structural Engineer Representative** for KCS Railroad bridge portion of the project that provided flood relief for the Comite River through the construction of a diversion canal connected to the Mississippi River. The project included peer review of plans, calculations and constructability, using AREMA requirements, for a new railroad bridge that intersects with the diversion canal.
08/15 – 02/19	**Vermillion River Vertical Lift Bridges Rehabilitation | Vermillion Parish, LA | LADOTD** **Senior Structural Engineer** for the inspection, rating, and final rehabilitation recommendations report for two steel vertical lift bridges over the Vermillion River. Work on this project included inspection and load rating to identify components of the bridge to be rehabilitated. Evaluation of various alternatives for strengthening the bridge and increasing vehicular vertical clearance. Produced engineers cost estimate for repairs, and prepared final report of recommendations.
10/08 – 04/13	**Huey P. Long Bridge Over The Mississippi River | Bridge City, LA | New Orleans Public Belt Railroad And LADOTD** **Movable Bridge Structural Engineer** responsible for checking and approving shop drawings as well as performing various construction support calculations. The project was a major widening of the bridge including HPL trusses and approaches.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Linh-Thien Kim, PE**	Years of relevant experience with this employer	2
Title	Civil Engineer Intern	Years of relevant experience with other employer(s)	2

Degree(s) / Years / Specialization			BS / 2017 / Civil Engineering
Active registration number / state / expiration date			Professional Engineer/ 0047527 / LA / 09/30/2023 Safety Inspection of In-Service Bridges, NHI # 130055 NHI Course 130092. Fundamentals of LRFR and Applications of LRFR For Bridge Superstructures
Year registered	2023	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities			**Structural Engineer**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
07/20 – Present	**Almonaster Avenue Railroad Bascule Bridge over the Industrial Canal Rehabilitation | New Orleans, LA | Port of New Orleans** **Structural Engineer** contributing to the bridge assessment, complete rehabilitative engineering design, and construction inspection services required for the partial replacement of the Almonaster Avenue Bridge, a movable Strauss-heel trunnion bridge. H&H's assessment revealed that improvements to the electrical and mechanical systems, superstructure, and counterweight were required to return this bridge to its full operating capability. All design work is in accordance with Louisiana DOTD Standard and Specifications.
07/20 – Present	**SR 605 Movable Bascule Bridge Rehabilitation | Ocean Springs, MS | MDOT** **Structural Engineer** performed the bridge load rating for movable bridge and fixed bridge approaches. Contributing to the civil design for full rehabilitation of SR 605 double-leaf bascule bridge. Scope of work includes inspection and rehabilitation of structural, mechanical, and electrical components of the bridge, as well as the roadway approaches and development of maintenance and repair plans. All designs are in accordance with AASHTO, FHWA and MDOT guidelines and specifications. Load rating was performed using AASHTOWare BrDR load rating software.
01/19 - 04/19	**H.009498.5: LA 121: Calcasieu River Bridge | Lake Charles, LA | LADOTD** **Civil Engineer Intern**. Designed and detailed an LG-36 (I-Beam) Concrete Prestressed Girder Bridge using continuous deck spans on a horizontal curve with a 5% slope. The continuous deck spans were 240-foot- long using four 60-foot-long deck spans with a bridge width of 42.5' wide. The superstructure and girders were designed using Bentley's Conspan software and DOTD's Bridge Design Evaluation Manual. The substructure consists of pile bents that were designed using STAAD Modeling software and Excel postprocessing.

08/20 – Present	**Lapalco Boulevard Movable Bridge over Harvey Canal | Westwego, LA | Jefferson Parish DPW** **Civil Engineer** for the pre-design inspection, the rehabilitation and widening of the existing four-lane Lapalco Boulevard to provide a facility carrying three lanes of traffic in each direction, and the design of a new three-lane double bascule movable bridge crossing of Harvey Canal. project includes rehabilitation to the existing four-lane bridge with three lanes of traffic and a new pedestrian/bike lane. The scope of services also includes the design of a new bridge to be constructed as an independent structure immediately adjacent and north of the existing bridge with a new operator house. Load rating was performed using AASHTOWare BrDR load rating software. All design work is according to Louisiana DOTD Standard and Specifications and reviewed by LADOTD.
06/22 – Present	**SR 609 Movable Bascule Bridge Rehabilitation | Ocean Springs, MS | MDOT** **Movable Bridge Senior Structural Engineer** for full rehabilitation of SR 609 bascule bridge, as a task-order to the IDIQ Master Bridge Contract which included developing standard and special bridge services, statewide for MDOT. Scope of work included inspection and rehabilitation of structural, mechanical, and electrical components of the bridge, as well as the roadway approaches and development of maintenance and repair plans. All designs are in accordance with AASHTO, FHWA and MDOT guidelines and specifications. Load rating was performed using AASHTOWare BrR load rating software. The project is currently in the construction phase.
09/21 – 07/22	**Tennessee Bridge Inspection and Load Rating | Decatur, AL | Norfolk Southern Corporation** **Structural Engineer Intern** provided inspection, **load rating**, and engineering design services under the Systemwide Engineering and Design Services contract. The Steel repairs at Gulf Division MP 362.60-A Decatur, AL task was awarded to Hardesty & Hanover through this contract. The task involved the performance of an on-site inspection, the preparation of load rating calculations and the development of repair plans for the structure in accordance with the scope of work. The structure consists of three superstructure types: vertical lift span, deck plate girder span and seven through truss spans.
11/20 – Present	**Annual Inspection of Almonaster Railroad Bascule Bridge over the Industrial Canal | New Orleans, LA | Port of New Orleans** **Movable Bridge Engineer** for the annual inspection of the Almonaster Avenue Railroad Bascule, which involves a structural inspection of the fracture critical steel, primary and secondary steel members, an electrical inspection of the electrical systems and controls, and a mechanical inspection of the machinery.
06/19 – 09/19	**Annual Inspection of Seabrook Railroad Bascule Bridge | New Orleans, LA | Port of New Orleans** **Movable Bridge Engineer Intern** for the annual inspection of the Seabrook Trunnion Bascule Bridge. This inspection included a structural inspection of the fracture critical steel and primary and secondary steel members, an electrical inspection of the electrical systems and controls, and an inspection of the mechanical systems and machinery.
05/19 – 07/19	**H.003184.5: I-10: Texas State Line - East of Coone Gully | LADOTD** **Civil Engineer Intern**. Designed and detailed an LG-36 (I-beam) Concrete Prestressed Girder Bridge using continuous deck spans with a 2.5% slope. The continuous deck spans were 240 and 300 feet long using four 60-long and five 60-long deck spans, respectively. The bridge width was 72.5-foot-wide. Superstructure and girders were designed using Bentley's Conspan software and DOTD's Bridge Design Evaluation Manual. Substructure pile bents were designed using STAAD Modeling software/Excel postprocessing.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Roberto Viciedo, PE**	Years of relevant experience with this employer	24
Title	Senior Structural Engineer	Years of relevant experience with other employer(s)	1

Degree(s) / Years / Specialization			B.S. / 1995 / Civil Engineering / Florida International University
Active registration number / state / expiration date			Professional Engineer: 0036533 / LA / 03/31/2024
Year registered	2011	Discipline	Structural Engineering
Contract role(s) / brief description of responsibilities			**Senior Structural Engineer - Meets MPR 3**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
07/21 – Present	**Fisher Island Ferry Landing Ramps Replacement | Miami-Dade County, FL | Fisher Island Community Association, Inc.** **Senior Structural Engineer** responsible for the structural design of two ferry landing ramps on Fisher Island. Following an in-depth structural, mechanical, and electrical inspection of the ramps, H&H recommended a course of action for rehabilitation and replacement of the older, cable pulley ramps. The new ramps will operate hydraulically and be rated for AASHTO HS20. H&H is designing the mechanical and electrical systems for these ramps as well as providing construction support services including shop drawing review, RFI response, field visits, shop inspections, and tests.
03/18 – 06/19	**SR 609 Bascule Bridge over Old Fort Bayou Rehabilitation | Ocean Springs, MS | MDOT** **Senior Structural Engineer** for development of the structural rehabilitation design and construction phase services for SR 609 bascule bridge as a task-order to the IDIQ Master Bridge Contract which included developing standard and special bridge services statewide for MDOT. The scope of work included inspection and rehabilitation of structural, mechanical, and electrical bridge components, roadway approaches, and development of maintenance and repair plans.
01/08 – 08/16	**Gasparilla Island Swing Bridge over ICWW | Placida, FL | Gasparilla Island Bridge Authority** **Structural Task Leader** responsible for the final design and load rating for the replacement of a 220-foot swing span bridge. Also provided construction support services for this $20-million project consisting of 678 feet of the new bridge including a 250-foot deck girder swing span and approach spans utilizing Florida I-Beams. Embankments, supported by MSE walls, were protected by new bulkheads and revetment. In addition to the bridge structures, a new pile-supported tender house was included.
01/11 – 03/17	**SR-A1A Flagler Memorial Bridge over ICWW | Palm Beach, FL | Florida DOT** **Structural Task Leader** responsible for the design of twin double-leaf rolling lift bascule span superstructures, load rating, and construction support services for the $95 million design-build project that included replacement of the entire bridge off-line and parallel to the existing bridge to maintain traffic for this busy causeway connecting West Palm Beach to Palm Beach. The replacement bridge, completed in 2018, included a twin double-leaf rolling lift bascule span bridge with a 150-foot rolling-lift-span over the navigable channel; twelve 150-foot pre-stressed concrete approach spans; and approach roadway work.

03/15 – 12/18	**WAVE Streetcar/SE 3rd Avenue Bridge over New River | Fort Lauderdale, FL | Florida DOT** **Structural Engineer** responsible for the preliminary design and load rating analysis of the bascule span main girders as part of the engineering design (90% drawings) for the bridge improvements to accommodate the proposed WAVE Streetcar. H&H's scope included all necessary design modifications to the rolling-lift-span, pier, and associated mechanical/electrical systems and load rating to accommodate the new embedded rail while providing sufficient strength, stiffness, and ride-ability for the new mode of transportation. The goal was to replace the leaf with a new bascule span which is 61-feet-long between centers of roll and features tracks and treads on a 6-foot, 2-inch roll radius, mechanical drive train with enclosed gearing driving the rack pinion, and tail lock mechanism.
10/07 – Present	**NW South River Drive Bridge over Tamiami River Canal | Miami, FL | Miami Dade County Public Works** **Structural Engineer** responsible for design and detailing of the main girders and floor beams and managing construction support services phase for this $35 million bridge replacement project. Scope includes preliminary design of movable bridge alternatives during the PD&E, final design, and construction support services to replace the historical Tamiami Canal Swing Bridge with a 123-foot simple trunnion single-leaf through-girder bascule span bridge. The project includes providing a four-lane-wide bridge with 6-foot and 12-foot shared sidewalks and control house within a 50-foot limited right-of-way and low bridge profile which result in the need to use through-bascule girders. The floor system consists of floor beams and an Exodermic bridge deck with no steel stringers and lateral bracing.
01/16 – 12/16	**Raritan River Drawbridge | Perth Amboy/South Amboy, NJ | New Jersey Transit** **Structural Engineer** responsible for quality control review check of design calculations of truss and floor members of the movable span for the $425 million replacement of this bridge on North Jersey Coast Line. The project included a half-mile-long structure, with a movable swing span at the navigational channel and 3000 + linear feet of approaches between the Perth Amboy and South Amboy stations in NJ. The replacement was done off-line while maintaining full rail operations during construction. NJT implemented feasible navigational improvements without delaying the project delivery. The scope included a feasibility study of various alignments and bridge replacement alternatives. The new vertical lift bridge has a minimum 110-foot vertical clearance and a 300-foot navigational channel.
2017 – Present	**US-1 SR-5 Jupiter Federal Bridge | Jupiter, FL | Florida DOT** **Senior Structural Engineer** contributing to the preliminary, final, and post-design phases of this bascule bridge replacement project. As the Engineer of Record, H&H will address the structural and functional deficiencies of the existing US-1 / SR-5 Jupiter Federal Bridge from CR-A1A (Ocean Boulevard) to Beach Road. Scope includes the development of vertical and horizontal alignment for bridge replacement alternatives and the study of the resulting impacts. The design incorporates intersection improvements and improves traffic functions at both ends of the approximately 2,960-foot long (0.56 mile) project corridor into the bridge replacement design. The project will include ADA access ramps to the 8-foot sidewalks and a new 7-foot buffered bike lane for additional safety.
05/10 – 12/16	**SFRTA Railroad Bridge over New River | Fort Lauderdale, FL | Florida DOT** **Task Leader** responsible for the design of rolling-lift bascule span superstructure and also served as project manager of construction support services. Overall scope included preliminary PD&E study and final design for the off-line replacement of a single-leaf heavy rail bridge owned and operated by SFRTA and used by CSX Freight and Tri-Rail as an alternate route. The project included inspection of the structural, mechanical, and electrical systems and the development of rehabilitation and replacement options (swing and bascule span) with conceptual drawings, alignments, and cost estimates. The preferred alternative consisted of three 41-foot prestressed concrete approach spans and a 103-foot rolling-lift-span designed using the AREMA code.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Benjamin Hawthorne, PE, SE**	Years of relevant experience with this employer	17
Title	Bridge Structural Engineer	Years of relevant experience with other employer(s)	0

Degree(s) / Years / Specialization			B.S. / 2005 / Civil Engineering
Active registration number / state / expiration date			Professional Engineer: 44620 / LA / 09/30/2024
Year registered	2011	Discipline	Structural Engineering
Contract role(s) / brief description of responsibilities			**Structural Engineer – Meets MPR 3**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
03/20 – Present	**Middletown Swing Railroad Bridge Rehabilitation | Middletown, CT | Connecticut DOT** **Project Manager** for the rehabilitation of a 300-foot, single-track swing span, four 200-foot through truss approach spans, and a 60-foot through girder span. The structure is serves Providence & Worcester Railroad customers in Portland, CT. Rehabilitation and repair details are based on results of an in-depth structural, mechanical, and electrical inspection and load rating of the structure. Structural repairs target primary members in poor condition and any elements that do not rate for a 286K carload. Additional work includes safety upgrades to the access system and fender system repairs. Swing span operating system rehabilitation includes replacement of low-torque high-speed mechanical equipment and upgrades to the electrical system.
02/19 – 12/22	**Brorein Street Bascule Bridge Rehabilitation | Tampa, FL | City of Tampa** **Structural Engineer** responsible for design services, including a load rating analysis, for the rehabilitation of the movable span of the Brorein Street bascule bridge over the Hillsborough River in downtown Tampa, Florida. The project included widening of the approach spans and the bascule leaves to provide a 10-foot shared use path on each side.
07/13 – 05/19	**Sarah M. Long Vertical Lift Bridge | Kittery, ME | Maine DOT** **Bridge Structural Engineer** on joint-venture team for a complete vertical lift bridge replacement. Responsible for design of the steel box girder lift span and associated structural elements. Ben was involved in all phases of the project, providing design services for the preliminary design, final design, and design support during construction, including providing a preliminary design report, plans, design and design check computations, ratings, specifications, and estimates, for the replacement of the Sarah Mildred Long Bridge located on U.S Route 1 Bypass between Kittery and Portsmouth. The bridge carries Pan Am Railway and highway traffic and was designed in accordance with AREMA and AASHTO specifications.

08/17 – 07/19	**Rehabilitation of Route 202 Bridge Over Housatonic River | New Milford, CT | Connecticut DOT** **Team Leader/Structural Engineer** responsible for condition inspection of the New Milford truss bridge over the Housatonic River. This single-span, steel, through-truss bridge rehabilitation project addressed deficiencies on the steel truss superstructure and post-tensioned concrete deck and included sidewalk repairs and new bridge rail. The project included inspection, load rating, preliminary and final design as well as environmental permitting and public involvement. Ben provided technical oversight and peer review of the truss load rating procedures with the use of AASHTOWare as well as the structural repair details developed from the inspection information.
11/14 – 06/20	**Rehabilitation of AETNA Viaduct (I-84) Bridges/Phase 2 | Hartford County, CT | Connecticut DOT** **Project Engineer** for the design and construction support phases of the rehabilitation of bridges carrying I-84 over Amtrak's Hartford Line, Fastrack busway, parking areas, and local streets. Preliminary design phases of the project included condition inspection and **l**oad rating of the approximately 5,000-foot-long multi-girder viaduct structure to determine rehabilitation and repair strategies. Rehabilitation included: deck patching and overlay, deck end reconstruction and joint replacement, structural steel repairs primarily at beam ends, elastomeric bearing replacement, parapet safety upgrades including reconstructed median barrier with new deck overhangs, illumination upgrades, IMS facilities upgrades, and concrete substructure repairs. During construction, led the effort to design new high-load multi-rotational (HLMR) disc bearings and developed concrete column top reconstruction details to facilitate installation and improve long term durability of the column.
01/19 – Present	**East Haddam Swing Bridge over the Connecticut River Rehabilitation | Haddam, CT | Connecticut DOT** **Bridge Project Engineer** responsible for the preparation of load ratings and feasibility study reports in support of a rehabilitation of this 4-span truss swing bridge. The bridge, which opened in 1913 and has been posted on the National Register of Historic Places, carries two lanes of Route 82 traffic over the Connecticut River and includes a deck truss span, through truss span, and a 465-foot-long through truss swing span. Rated elements included gusset plates, pins, tension and compression members, truss chord box members subject to bending, floor beams, and stringers. The structural feasibility study evaluated the addition of an external sidewalk to allow pedestrian access across the bridge, which has a narrow 24.5-foot roadway. Load rating and feasibility analysis included the use of AASHTOWare Bridge Rating software and the creation of a 3D computer model using Midas Civil finite element analysis software. Ben has remained involved in the rehabilitation project through preliminary and final design as a Senior Structural Engineer providing technical expertise and review of truss strengthening, floor system replacement, and cantilever sidewalk development.
12/11 – 01/13	**Saugus Drawbridge Rehabilitation | Saugus, MA | Massachusetts Bay Transportation Authority** **Bridge Structural Engineer** responsible for analysis and design for this project involving comprehensive modeling, ratings analysis of as inspected conditions, real time structural monitoring, and strengthening of an existing pier compromised by extensive structural deterioration. Responsibilities included development of load rating methods to determine existing substructure capacity and design of an interim strengthening concept including a temporary pier to allow the bridge to remain in service at full capacity until a comprehensive replacement project can be undertaken. Temporary pier design included an integrated fender design that incorporated energy absorbing elements to provide adequate protection of the existing pier in a narrow footprint and in an area of poor soil conditions. As a sub-consultant on this project, it required cooperation of multiple parties to balance existing structural capacities, emphasis on rapid construction, and the need to maintain traffic prior to and during construction of the interim strengthening.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Robert Plocica, PE**	Years of relevant experience with this employer	19
Title	Mechanical Engineer	Years of relevant experience with other employer(s)	4

Degree(s) / Years / Specialization			ME, Structural Engineering and Mechanics, 2003, City College of New York BS, Mechanical Engineering, 1995, Binghamton University
Active registration number / state / expiration date			Professional Engineer / 87298 / FL / 2/28/2025 NBIS Team Leader, 2008
Year registered	2019	Discipline	Mechanical Engineering
Contract role(s) / brief description of responsibilities			**Mechanical Engineer**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
01/11 – 06/12	**2010 NYC Ferry Ops-Transfer Bridge Inspection at Staten Island Ferry Term | Staten Island & Manhattan, NY | New York DOT** **Lead Mechanical Engineer** for the mechanical & electrical inspections and reports for 7 transfer slips (3 on the Manhattan Side / Whitehall Terminal, and 4 on the Staten Island Side / St. George Terminal). Each slip has two upper pedestrian bridges, and one lower vehicular bridge. The lower bridge is used to moor the Ferry into position during docking operations.
11/15 – Present	**Wire Rope Study at the Staten Island Ferry | New York, NY | New York City DOT** **Mechanical Engineer** responsible for monitoring survey of ferry slip operating elevation limits. Performed statistical tidal analysis to evaluate difficulty mooring ferry during high tide levels.
05/15 – 10/15	**Transfer Bridge Inspection at the City and Hart Island Ferry Terminals | New York, NY | New York City DOT** **Mechanical Team Leader** responsible for performing mechanical inspection work for the transfer bridges at City and Hart Island. Each slip has one transfer bridge used to moor the Ferry into position during the docking procedure. The machinery includes winch assemblies, lifting chain falls, counterweight wire ropes and sheave assemblies and counterweights.
02/11 – 06/19	**Transfer Bridge Inspection at the Staten Island Ferry Terminals | New York, NY | New York City DOT** **Mechanical Engineer** responsible for performing the in-depth mechanical inspection and report work for the 7 transfer slips (3 on the Manhattan Side / Whitehall Terminal, and 4 on the Staten Island Side / St. George Terminal). Each slip has two upper pedestrian bridges, and one lower vehicular bridge. The lower bridge is used to moor the Ferry into position during the docking procedure.
12/08 – 11/09	**Rehabilitation of the Judge Seeber Lift Bridge | New Orleans, LA | LADOTD** **Mechanical Engineer** design for the rehabilitation of the Judge Seeber lift bridge. Design included replacement of the existing wire ropes, motor brakes, span locks and counterweight guides.

10/20 – 10/20	**Construction Engineering & Inspection Services for Rehabilitation of the Broadway Bridge (Vertical Lift) | New York DOT** **Mechanical Construction Engineer** for the rehabilitation of the Broadway Bridge over the Harlem River. Project mechanical construction inspection work included clean and inspect all the ropes and replace select ropes; replacement of primary reducers and provide shaft for auxiliary power; replacement of all pillow block sleeve bearing bushings; replacement of motor and machinery brakes; removal of abandoned rope oiling system; replacement of upper and lower air buffers; replacement of span lock machinery; replacement of elevators; balancing the lift span; repair of centering device. Responsible for reducer testing witnessing and performed thermal photography to aid in inspection/reporting effort.
08/19 – 01/21	**Construction Engineering Inspection Services for Madison Ave Bridge (Swing Bridge) Over Harlem River | New York DOT** **Mechanical Construction Engineer** for the replacement of span drive machinery, primary and secondary reducers and bearings; replacement of rack and pinions, center pin rehabilitation; replacement of end lifts at rest piers; replacement of centering locks, machinery, and receiving sockets at rest piers; new hydraulic auxiliary drive diesel powered by HPU and generator, removal of non-operational machinery; new electrically operated brakes; rehabilitation of machinery supports; new shafts and couplings; and cleaning, lubrication and adjustment of drum girder roller assembly. Performed shop and field construction inspections including observation of field surveys, electrical demolition and installation of temporary electrical items, and general demolition of existing structural and mechanical components slated for replacement under contract. Inspection reports were created to track shop work progress and MURK 1 DWRs were produced for field work tracking. Work also included reviewing and providing comments to change orders and coordinating with client, contractor, and designer to address field conditions to aid in streamlining work.
06/12 – Present	**Construction Support Services, Design & Options Study for Monroe St Bascule Bridge Over Portage River, Muskingum County, OH | Ohio DOT** **Mechanical Engineer** for study to determine bascule span replacement/rehabilitation options for the Port Clinton Bascule Bridge over the Portage River, and final design of the selected alternative. The three-span bridge includes a 99-foot double-leaf bascule main span flanked by steel girder approach spans was built in 1933. Examined movable span superstructure rehabilitation and replacement options. Performed the final design for the selected movable span replacement option and prepared the contract plans and special provisions. New machinery included Trunnion Bearing Assemblies, Operating Machinery and Span Lock Machinery. During construction, provided the DOT with review of Shop Drawings, Certified Prints, catalog cuts and shop and field procedure submittals for contract and design requirement compliance.
02/21 – 02/22	**Districtwide State In-Depth Bridge Inspections | Florida DOT** **Mechanical Engineer Inspector** assisted on this on-call District 6 Master Work Order Agreement. Services included providing routine and interim inspections of the mechanical and electrical systems on state-owned movable bridges in accordance with federal and state regulations. Inspection reports, outlining detailed inspection findings, and prioritized repair recommendations were provided to the prime consultant for entry into the statewide database system. Emergency inspection support was provided on request.
07/08 – 07/09	**Construction Inspection for the Hamilton Avenue Skew Bascule Bridge | Brooklyn, NY | New York City DOT** **Structural Engineer Inspector** provided structural construction inspection services during installation of new north bascule span, flanking span, and trunnion towers. Generated daily work reports for Resident Engineer. This bridge reconstruction project included the replacement of the two movable-span superstructures, replacement of the mechanical and electrical systems, and replacement of the existing pier-protection system.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**James Gentile, PE**	Years of relevant experience with this employer	5
Title	Mechanical Engineer	Years of relevant experience with other employer(s)	0

Degree(s) / Years / Specialization			B.S. / 2017 / Mech. Engineering / University of Connecticut
Active registration number / state / expiration date			Professional Engineer / 105612 / New York / 01/31/2025
Year registered	2022	Discipline	Mechanical Engineering
Contract role(s) / brief description of responsibilities			**Mechanical Engineer**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
05/18 – 12/19	**Keller Ferry Landings Replacement | Keller, WA | Washington State DOT Ferries** **Mechanical Designer** for electrical and mechanical system design implementation. This project involved developing electrical and mechanical plans, specifications, and cost estimates to relocate the operating equipment for two existing floating ferry landings onto two newly fabricated floating ferry landing. Designed improvements to the winch operating systems and developed a new vessel roller support cradle system. Construction support services were also provided.
11/21 – Present	**Fisher Island Ferry Landing Ramps Replacement | Miami-Dade County, FL | Fisher Island Community Association, Inc.** **Mechanical Engineer** responsible for the mechanical design of two ferry landing ramps on Fisher Island. Following an in-depth structural, mechanical, and electrical inspection of the ramps, H&H recommended a course of action for rehabilitation and replacement of the older, cable pulley ramps. The new ramps will operate hydraulically and be rated for AASHTO HS20. H&H is designing the mechanical and electrical systems for these ramps as well as providing construction support services including shop drawing review, RFI response, field visits, shop inspections, and tests.
02/18 – 06/19	**Southport and Fort Fisher Ferry Ramp Rehabilitation | Fort Fisher, NC | North Carolina DOT** **Mechanical Engineer** for the rehabilitation design of the of the Southport and Fort Fisher Ferry Ramps. The design focused on simplified and streamlined structural, mechanical, and electrical details that would provide reliable operation while decreasing the Ferry Division's annual maintenance costs. Innovative cylinder and float mechanism details allowed the elimination of the high maintenance existing counterweight system. A new lift bent crossbeam and structural modifications to the lift bent improved the structural integrity while enabling the bent to behave as a structural frame. Access platform modifications allowed for safe access by maintenance personnel to the new mechanical and electrical equipment.
12/17 – 11/19	**Bruckner Expressway Over Westchester Creek (Unionport Bridge) Replacement | New York, NY | New York DOT** **Mechanical Designer** for the complete replacement of the moveable bridge over Westchester Creek and approach ramps, including a movable bascule span, flanking span, and all approaches and approach ramps. He reviewed trunnion machinery shop drawings.

08/17 – 10/17	**Ferry Division – Preparation of Detailed Life Cycle | North Carolina | North Carolina DOT** **Mechanical Designer** for the analysis, design, and contract engineering inspection of moveable bridges. Work included structural, electrical, and mechanical type work. Work was associated with troubleshooting and repair projects to NCDOT-owned moveable bridges, i.e. bascule, swing span, and vertical lift bridges, on an "as-needed" basis. Plans for the work listed were prepared in electronic (Microstation) format. Mr. Gentile inspected all 14 of NCDOTs ferry slips, which included written mechanical condition overviews and life cycle analysis.
10/18 – Present	**In-Depth Inspection and Rehabilitation Plans for Five Movable Bridges | San Joaquin County, CA | San Joaquin County DPW** **Mechanical Designer** for a project that includes detailed mechanical and electrical inspection; preparation of inspection reports, including prioritized repair list and preliminary cost estimates; and final design documents for repairs to five movable bridges over various waterways in the San Joaquin Delta area of California. The bridges include one double leaf bascule bridge and four swing bridges, varying in age from 20 to 80 years old. Mr. Gentile prepared the rehabilitation plan set for all five bridges.
11/18 – 01/19	**Mercer Island Tunnel (No 99/26 LID) In-Depth Mechanical and Electrical Inspection | Mercer Island, WA | Washington State DOT** **Mechanical Designer** for an in-depth electrical and mechanical inspection of the electrical and mechanical systems. The tunnel is a 2.5-mile-long single bore tunnel with two southbound lanes in the upper roadway, two northbound lanes in the lower roadway, and a lower section utilidor for the pumping equipment. There is a north and a south operations building each with four 500HP extraction ventilation fans and two maintenance air fans. Each roadway is equipped with multiple 75HP jet fans and roadway dampers evenly spaced through the tunnels for the extraction fans. The tunnel has a fire pipe deluge system and pumping system to remover the water. The tunnel has a communication system-based control system with PLC controllers, hundreds of cameras with DVR controllers, a fire detection system, an air monitoring system, and a complete security system. Each piece of equipment is remotely accessible and operable from the control system, with centers in each operations building. Most of the electrical and mechanical equipment was visually inspected and operationally tested during the inspection. Mr. Gentile inspected much of the fire suppression system, including dampers, fire sprinkler piping, and standpipes.
07/17 – Present	**AGR. #181 Of Bridge Design, Task 01 | Delaware | Delaware DOT** **Mechanical Designer** for a task-order agreement for consulting services over a four year period. H&H is providing full-service design on an as needed basis for the Department's Bridge Management Section to meet the FHWA mandated NBIS inspections of required bridges. H&H is a sub to AECOM and performing mechanical and electrical inspections of the movable bridges. Mr. Gentile prepared preliminary cost estimates for maintenance and repair contract items.
07/17 – 12/21	**AGR. #1810F Bridge Design, Task 01 | Statewide, DE | Delaware DOT** **Mechanical Designer** for a task-order agreement for consulting services over a four-year period. H&H is providing full-service design on an as needed basis for the Department's Bridge Management Section to meet the FHWA mandated NBIS inspections of required bridges. H&H is a sub to AECOM and performing mechanical and electrical inspections of the movable bridges. Mr. Gentile prepared preliminary cost estimates for maintenance and repair contract items.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Travis Kimmins, PE**	Years of relevant experience with this employer	3
Title	Senior Mechanical Engineer	Years of relevant experience with other employer(s)	15

Degree(s) / Years / Specialization			M.S., Mechanical Engineering, 2003, University of Tennessee, Knoxville B.E., Mechanical Engineering, 2001, University of Tennessee, Knoxville
Active registration number / state / expiration date			Professional Engineer: 43676 / LA / 3/31/2024
Year registered	2019	Discipline	Mechanical Engineering
Contract role(s) / brief description of responsibilities			**Senior Mechanical Engineer - Meets MPR 3**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
11/21 – Present	**Fisher Island Ferry Landing Ramps Replacement | Miami-Dade County, FL | Fisher Island Community Association, Inc.** **Senior Mechanical Engineer** responsible for the mechanical design of two ferry landing ramps on Fisher Island. Following an in-depth structural, mechanical, and electrical inspection of the ramps, H&H recommended a course of action for rehabilitation and replacement of the older, cable pulley ramps. The new ramps will operate hydraulically and be rated for AASHTO HS20. H&H is designing the mechanical and electrical systems for these ramps as well as providing construction support services including shop drawing review, RFI response, field visits, shop inspections, and tests.
01/20 – Present	**Almonaster Avenue Railroad Bridge over the Industrial Canal Rehabilitation | New Orleans, LA | Port of New Orleans** **Mechanical Engineer** for the bridge assessment, complete rehabilitative engineering design, and construction inspection services required for the partial replacement of the Almonaster Avenue Bridge, a movable Strauss-heel trunnion bridge. H&H's 2019 assessment of the circa-1920 National Register of Historic Places eligible bridge revealed that improvements to the electrical and mechanical systems, superstructure, and counterweight were required to return this bridge to its full operating capability. Although the existing substructure could remain, modifications were deemed necessary to accommodate the rehabilitated superstructure. H&H developed necessary design plans to replace the span drive and span lock machinery, operating strut, guide assembly, live load bearings, counterweight trunnion pin, and bushing. The main trunnion bearings were rehabilitated and repositioned. All design work is in accordance with Louisiana DOTD Standard and Specifications.
09/19 – Present	**Southport Fort Fisher Ferry Ramps | Southport, NC | North Carolina DOT** **Senior Mechanical Engineer** serving on a task of H&H's Structures Management Unit Limited Services contract. Led mechanical system redesign, lifting structure redesign, and upgrade. Also provided construction support services for mechanical tasks and technical oversight. Performed work across Divisions 1, 2, and 3, as well as for the Ferry Division, on a variety of bridges, mechanical systems, and ramp/lift structures.

08/12 – 04/18	**Jamestown Scotland Ferry Hydraulic System Rehabilitation | Jamestown, VA | Virginia DOT** **Senior Movable Bridge Mechanical Engineer** responsible for the design of the hydraulic system to replace the existing hydraulic system. Provided construction services responsible including shop drawing reviews, responses to RFI's, witnessing shop testing, and field support during key construction events.
03/19 – Present	**SR 605 Bascule Bridge over Industrial Waterway Rehabilitation | Harrison County, MS | Mississippi DOT** **Mechanical Engineer** leading the design of the mechanical rehabilitation and providing construction services during construction of these twin double-leaf rolling bascules. The full rehabilitation of SR-605 bascule bridge, issued as a task-order to the IDIQ Master Bridge Contract, included engineering assessment, mechanical, electrical, and structural design in addition to the preparation of Traffic Control Plans. All designs will be completed in accordance with AASHTO, FHWA, and MDOT guidelines and specifications. H&H is currently performing construction phase services for the project.
11/20 – Present	**SR 609 Bascule Bridge Rehabilitation | Ocean Springs, MS | Mississippi DOT** **Lead Mechanical Engineer** responsible for conducting plans review of mechanical rehabilitation plans involving a full mechanical rehabilitation of the operating machinery as well as the HVAC and plumbing systems for the control house. Also provided construction support services as part of the full rehabilitation of the SR 609 bascule bridge. Issued as a task-order to the IDIQ Master Bridge Contract, the scope of this task order included developing standard and special bridge services, statewide for MDOT. Scope of work includes inspection and rehabilitation of structural, mechanical, and electrical components of the bridge, as well as the roadway approaches and development of maintenance and repair plans. All designs are in accordance with AASHTO, FHWA, and MDOT guidelines and specifications. H&H is currently performing construction phase services for the project.
03/11 – 06/18	**Terengganu Bridge, Kuala Terengganu, Malaysia – PJSI Consultants** **Senior Movable Bridge Mechanical Engineer** responsible for leading the hydraulic system design for Malaysia's first movable bridge, a double-leaf bascule to connect the peninsulas of Maura North and Maura South. The bridge has become Terengganu's signature landmark as it lures tourists to this oil-rich state. The bridge controls included programmable logic controller and relay circuits to control a hydraulic span drive system. Provided construction services support.
03/18 – 11/20	**Jupiter Federal Bridge Replacement | Jupiter, FL | Florida DOT** **Lead Mechanical Engineer** responsible for mechanical systems design for this bascule bridge replacement project. H&H served as Engineer of Record for the project, which addressed the structural and functional deficiencies of the existing US-1/ SR-5 Jupiter Federal Bridge from CR-A1A (Ocean Boulevard) to Beach Road. Scope included the development of vertical and horizontal alignment for bridge replacement alternatives and study of the resulting impacts. The design incorporated intersection improvements and improved traffic functions at both ends of the approximately 2,960-foot long (0.56 mile) project corridor into the bridge replacement design. The project included ADA access ramps to the eight-foot sidewalks and a new seven-foot buffered bike lane for additional safety. Performed the quality control reviews on the machinery, HVAC and plumbing systems.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Frank Marzella, PE**	Years of relevant experience with this employer	23
Title	Principal Associate	Years of relevant experience with other employer(s)	11

Degree(s) / Years / Specialization			B.E. / 1988 / Mech. Engineering / State University of NY at Stony Brook
Active registration number / state / expiration date			Professional Engineer: 78201 / FL / 02/28/2023
Year registered	2014	Discipline	Mechanical Engineering
Contract role(s) / brief description of responsibilities			**Mechanical Engineer**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
05/18 – 10/19	**Keller Ferry Landings Replacement | Keller, WA | Washington State DOT Ferries** **Project Manager/Lead Mechanical Engineer** for electrical and mechanical system design implementation. This project involved developing electrical and mechanical plans, specifications, and cost estimates to relocate the operating equipment for two existing floating ferry landings onto two newly fabricated floating ferry landing. Designed improvements to the winch operating systems and developed a new vessel roller support cradle system. Construction support services were also provided.
01/18 – 07/19	**Southport and Fort Fisher Ferry Ramp Rehabilitation | Fort Fisher, NC | North Carolina DOT** **Mechanical Engineer** for the rehabilitation design of the of the Southport and Fort Fisher Ferry Ramps. The design focused on simplified and streamlined structural, mechanical, and electrical details that would provide reliable operation while decreasing the Ferry Division's annual maintenance costs. Innovative cylinder and float mechanism details allowed the elimination of the high maintenance existing counterweight system. A new lift bent crossbeam and structural modifications to the lift bent improved the structural integrity while enabling the bent to behave as a structural frame. Access platform modifications allowed for safe access by maintenance personnel to the new mechanical and electrical equipment.
03/15 – 12/15	**Passenger Ferry Ramp, Safety Interlock Upgrade | Bellingham, WA | Port of Bellingham** **Project Manager/Project Mechanical Engineer** for upgrading the movable passenger ferry ramp system to provide redundant electrical safety interlocks to prevent inadvertent operation of the passenger ramp. Design work included the addition of safety interlock switches and mechanical tripping devices.
01/20 – Present	**Almonaster Avenue Railroad Bridge over the Industrial Canal | New Orleans, LA | Port of New Orleans** **Mechanical QC Engineer** for the bridge assessment and complete rehabilitative engineering design required for the partial replacement of the Almonaster Avenue Bridge. H&H's assessment revealed that improvements to the electrical and mechanical systems, superstructure, and counterweight were required to return this bridge to its full operating capability. The mechanical rehabilitation is planned to replace the span drive machinery, span lock machinery, main trunnion, counterweight, and link pins and bushings.

03/10 – 06/16	**SR 520 Evergreen Point Bridge and Landing Project | Seattle WA | Washington State DOT** **QC Engineer** on this design-build project to replace the SR 520 Floating Bridge with a new parallel bridge and maintenance facility. Prepared a design-build RFQ and RFP for the replacement of this bridge and bridge maintenance facility. The floating bridge work included preliminary design and complete technical requirements for a specialized structure. The Maintenance Facility included preliminary design and complete technical requirements for LEED compliant facility and is listed above as a separate project. The work also included support during the bidding and selection process as well as reviewing the design-build team's design submittals, attending task force meetings with the design-build team to keep the project requirements clear, and reviewing construction submittals.
09/15 – 12/18	**Broadway Bridge Rall Wheel Replacement | Portland, OR | Multnomah County** **Project Manager** for a major complex movable bridge project that included replacing the 8 - foot 4 - inch diameter Rall wheels at each corner of the bridge; replacing the 33-foot-long track; trunnion axle replacement and line boring of structure; and, associated control strut rehabilitation. Located in downtown Portland, the bridge spans the Willamette River. The bridge is a rare double-leaf Rall-type bascule structure that is more than 100 years old. The Rall wheels are part of the bridge operating mechanism and two Rall wheels support the entire weight of each of the bridge's bascule leaves.
04/18 – 11/18	**Alameda County Bascule Bridge Mechanical System Inspections | Alameda, CA | Alameda County Public Works Agency** **Project Manager/Lead Engineer** for mechanical and electrical inspection and condition assessment of the bridge machinery systems on the Park Street, High Street, and Fruitvale Avenue bascule bridges. The inspections were conducted conformance with the AASHTO Movable Bridge Inspection, Evaluation, and Maintenance Manual. H&H inspected and evaluated the bridge machinery systems and provided recommendations/cost estimated for long and short term rehabilitation.
06/18 – 10/18	**SR 529/20E Steamboat Slough Swing Bridges In-Depth Mechanical & Electrical Inspections | Everett, WA | Washington DOT** **Project Manager/Lead Mechanical Engineer** for the In-Depth mechanical & electrical system inspection on two through truss swing bridges over Steamboat Slough. The inspection was conducted conformance with the AASHTO Movable Bridge Inspection, Evaluation, and Maintenance Manual. Mechanical condition reports were developed that included maintenance, as well as short- and long-term rehabilitation recommendations
01/12 – 05/13	**Movable Bridge Condition Assessment Study | San Joaquin County, CA | San Joaquin County Department of Public Works** **Mechanical Engineer** for mechanical and electrical inspections on five movable bridges owned and operated by the San Joaquin County Department of Public Works. Finding reports were prepared including short- and long-term rehabilitation recommendations and cost estimates. These reports were utilized by San Joaquin County to secure BPMP funding from Caltrans.
08/17 - Present	**East Link Extension Sound Transit Expansion | Seattle, WA | Washington State DOT** **Project Manager** responsible for providing construction support and design review to fully integrate the Sound Transit Light Rail expansion on the I90 floating bridges and associated access tunnels. Work includes coordinating work with Seattle City Light, medium voltage power distribution, low voltage power distribution, cathodic and stray current mitigation, and remote control and monitoring of the bridges. Floating bridges include a highly specialized electrical system and the addition of light rail onto a floating bridge had never been performed before this project. Work includes attending design and construction meetings, on-site construction inspection, show drawing and testing review, and Request for Information submittals.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Andrew Barthle, PE**	Years of relevant experience with this employer	18
Title	Electrical Engineer	Years of relevant experience with other employer(s)	1

Degree(s) / Years / Specialization			B.S. / 2003 / Electrical Engineering / Rensselaer Polytechnic Institute
Active registration number / state / expiration date			Professional Engineer: 34062 / LA / 3/31/2025
Year registered	2008	Discipline	Electrical Engineering
Contract role(s) / brief description of responsibilities			**Electrical Engineer - Meets MPR 3**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
11/21 – 08/22	**Fisher Island Ferry Landing Ramps Replacement | Miami-Dade County, FL | Fisher Island Community Association, Inc.** **Electrical Engineer** responsible for the electrical design of two ferry landing ramps on Fisher Island. Following an in-depth structural, mechanical, and electrical inspection of the ramps, H&H recommended a course of action for rehabilitation and replacement of the older, cable pulley ramps. The new ramps will operate hydraulically and be rated for AASHTO HS20. H&H is designing the mechanical and electrical systems for these ramps as well as providing construction support services including shop drawing review, RFI response, field visits, shop inspections, and tests.
08/08 – 08/13	**Judge Seeber Vertical Lift Bridge (SP 700-99-0430) | New Orleans, LA | LADOTD** **Electrical Engineer** responsible for overseeing the replacement of the vertical lift bridge's entire electrical system including the replay-based control system, and essentially the in-kind replacement of the switched secondary resistance motor drive with synchro-tie skew control. Also prepared the initial scoping inspection report and coordinated post-design services for the electrical and machinery rehabilitation of a 250-foot tower-drive vertical lift span. The contract required the completion of the design in three months to meet the FEMA funding deadline.
08/08 – Present	**Bayou Teche Movable Bridge at Oaklawn (H.002798.6) | St. Mary Parish, LA | LADOTD** **Project Electrical Engineer** responsible for providing electrical design calculations, and plan preparations, and post-design services for the bridge power distribution and relay-based control system for this movable bridge. Built in 1941 to carry LA Route 323 over Bayou Teche, the original bridge is being replaced with a new hydraulically-operated swing bridge. H&H provided the electrical design for the bascule bridge in line with LADOTD's design requirements and standard design details and coordinated closely with the other design disciplines to assure success. All design deliverables adhered to the project schedule. Due to permitting issues, design activities were placed on hold for several years, extending the schedule.
04/16 – 06/17	**Mayport Ferry Bridge Inspections | Jacksonville, FL | Florida DOT** **Electrical Engineer** responsible for the inspection of the ferry electrical systems as well as the detailed inspection reports for the Mayport Ferry movable bridge.

10/19 – 10/21	**Seabrook Railroad Bascule Bridge Annual Inspection | New Orleans, LA | Port of New Orleans** **Electrical Engineer** for the annual inspection of the Seabrook Trunnion Bascule Bridge crossing the Inner Harbor Navigation Canal in New Orleans. Services included routine and fracture critical inspection involving the structural, mechanical, and electrical inspection of all components of the bascule, counterweight, and tower spans per the Bridge Safety Management Program. Also conducted NBIS and element inspection for the entire bridge.
03/18 – Present	**Saint Johns River Ferry | Duval County | Florida DOT** **Electrical Engineer –** D2 Local Government Bridge Inspection **-** responsible for conducting the inspection of electrical systems and the preparation of detailed inspection reports.
03/18 – Present	**Mayport Ferry Landing | Mayport, FL | Florida DOT** **Electrical Engineer –** D2 Local Government Bridge Inspection - responsible for conducting the inspection of electrical systems and the preparation of detailed inspection reports.
04/14 - Present	**Fort George Ferry Landing | Jacksonville, FL | Florida DOT** **Electrical Engineer –** D2 Local Government Bridge Inspection - responsible for conducting the inspection of electrical systems and the preparation of detailed inspection reports.
05/18 – Present	**SR-609 Movable Bascule Bridge Rehabilitation | Ocean Springs, MS | Mississippi DOT** **Lead Electrical Engineer** responsible for the electrical design for the full rehabilitation of the SR 609 bascule bridge as a task-order to the IDIQ Master Bridge Contract which includes developing standard and special bridge services, statewide for MDOT. The scope of work includes inspection and rehabilitation of structural, mechanical, and electrical bridge components, roadway approaches, and development of maintenance and repair plans. All designs are in accordance with AASHTO, FHWA, and MDOT guidelines and specs.
01/19 – 04/20	**SR-605 Movable Bascule Bridge Rehabilitation | Gulfport, MS | Mississippi DOT** **Quality Control Electrical Engineer** responsible for the quality control review for design assessment, design, plan review, and quality control of electrical systems for the SR 605 double-leaf bascule bridge, as a task-order to the IDIQ Master Bridge Contract which includes developing standard and special bridge services, statewide for MDOT. The scope of work included the inspection and rehabilitation of structural, mechanical, and electrical components of the bridge, as well as the roadway approaches and development of maintenance and repair plans. All designs were prepared in accordance with AASHTO, FHWA, and MDOT guidelines and specs.
01/20 – Present	**Almonaster Avenue Railroad Bridge of the Industrial Canal Rehabilitation | New Orleans, LA | Port of New Orleans** **Lead Electrical Engineer** for the bridge assessment, rehabilitative engineering design, and construction inspection services required for the partial replacement of the Almonaster Avenue Bridge, a movable Strauss-heel trunnion bridge. H&H's 2019 assessment of the circa-1920, National Register of Historic Places eligible bridge revealed that improvements to the electrical and mechanical systems, superstructure, and counterweight were required to return this bridge to its full operating capability. Although the existing substructure could remain, modifications to other bridge elements were deemed necessary to accommodate the rehabilitated superstructure. H&H developed necessary design plans to replace the span drive and span lock machinery, operating strut, guide assembly, live load bearings, counterweight trunnion pin, and bushing. The main trunnion bearings were rehabilitated and repositioned. All design work is in accordance with Louisiana DOTD Standard and Specifications.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Kenneth Pecquet, PE**	Years of relevant experience with this employer	3
Title	Electrical Engineer	Years of relevant experience with other employer(s)	11

Degree(s) / Years / Specialization			BS / 2012 / Electrical Engineering / University of New Orleans
Active registration number / state / expiration date			Electrical Engineer: 41471 / LA / 9/30/2023
Year registered	2023	Discipline	Electrical Engineering
Contract role(s) / brief description of responsibilities			**Electrical Engineer**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
12/19 – 01/21	**Bayou Teche Swing Bridge at Oaklawn (H.002798.6) | St. Mary Parish, Louisiana | LADOTD** **Movable Bridge Electrical Engineer Intern** responsible for providing post-design electrical design calculations and plan revisions for the bridge power distribution and relay-based control system for this movable bridge. Built in 1941, the original historically significant bridge was replaced with a new hydraulically operated swing bridge. H&H provided the electrical design for the bridge in line with LADOTD's design requirements and standard design details and coordinated closely with the other design disciplines to assure success. All design deliverables adhered to the schedule. Due to permitting issues, design was were placed on hold for several years extending the schedule.
10/21 – Present	**Fisher Island Ferry Landing Ramps Replacement | Miami-Dade County, FL | Fisher Island Community Association, Inc.** **Electrical EI** responsible for the electrical design of two ferry landing ramps on Fisher Island. Following an in-depth structural, mechanical, and electrical inspection of the ramps, H&H recommended a course of action for rehabilitation and replacement of the older, cable pulley ramps. The new ramps will operate hydraulically and be rated for AASHTO HS20. H&H is designing the mechanical and electrical systems for these ramps as well as providing construction support services including shop drawing review, RFI response, field visits, shop inspections, and tests.
01/20 – Present	**Almonaster Avenue Railroad Bridge over the Industrial Canal Rehabilitation | New Orleans, LA | Port of New Orleans** **Movable Bridge Electrical Engineer** for the bridge assessment, rehabilitative engineering design, and construction inspection services required for the partial replacement of the Almonaster Avenue Bridge, a movable Strauss-heel trunnion bridge's electrical systems. H&H's assessment of the circa-1920, eligible for the National Register of Historic Places bridge revealed that improvements to the electrical and mechanical systems, superstructure, and counterweight were required to return this bridge to its full operating capability. Although the existing substructure could remain, modifications were deemed necessary to accommodate the rehabilitated superstructure. H&H developed necessary design plans to replace the span drive/span lock machinery, operating strut, guide assembly, live load bearings, counterweight trunnion pin, and bushing. The main trunnion bearings were rehabilitated and repositioned.

10/19 – 12/20	**SR 609 Movable Bascule Bridge over Old Fort Bayou Rehabilitation | Ocean Springs, MS | Mississippi DOT** **Movable Bridge Electrical Engineer Intern** contributed to the electrical design services for the full rehabilitation of SR 609 bascule bridge, as a task-order to the IDIQ Master Bridge Contract which included developing standard and special bridge services, statewide for MDOT. Scope of work included inspection and rehabilitation of structural, mechanical, and electrical components of the bridge, as well as the roadway approaches and development of maintenance and repair plans.
03/19 – 01/20	**SR 605 Movable Bascule Bridge Rehabilitation | Harrison County, MS | Mississippi DOT** **Movable Bridge Electrical Engineer Intern** contributed to the electrical design for the full rehabilitation of SR-605 bascule bridge as a task-order to the IDIQ Master Bridge Contract which included engineering assessment, mechanical, electrical, and structural design in addition to the Traffic Control Plans.
10/19 – 01/20	**Annual Inspection of Almonaster Railroad Bascule Bridge over the Industrial Canal | New Orleans, LA | Port of New Orleans** **Movable Bridge Electrical Engineer Intern** for an annual inspection of the Almonaster Avenue Railroad Bascule, which involved a structural inspection of the fracture critical steel, primary and secondary steel members, an electrical inspection of the electrical systems and controls, and a mechanical inspection of the machinery.
06/19 – 09/19	**Annual Inspection of Seabrook Railroad Bascule Bridge | New Orleans, LA | Port of New Orleans** **Movable Bridge Electrical Engineer Intern** for the annual inspection of the Seabrook Trunnion Bascule Bridge. This inspection included a structural inspection of the fracture critical steel and primary and secondary steel members, an electrical inspection of the electrical systems and controls, and an inspection of the mechanical systems and machinery.
07/18 – Present	**Districtwide State In-depth Bridge Inspections Contract | District 2 (Jacksonville Area, FL) | Florida DOT** **Movable Bridge Electrical Engineer Intern** for the on-call inspection of movable bridge structures located throughout District 2 under the Master Work Order Agreement. Services include the mechanical and electrical system routine and interim inspections of nine assigned movable bridges in accordance with federal and state regulations. Inspection reports outlining detailed inspection findings and prioritized repair recommendations were provided to the prime consultant.
04/17 – 05/17	**US-1 over Snake Creek Canal Bascule Bridge Post-Irma Inspection | Monroe County, FL | Florida DOT** **Movable Bridge Electrical Engineer Intern** responsible for conducting inspection and preparing rehabilitative designs for Bridge Number 900077 after damage was inflicted by Hurricane Irma. Scope called for detailed mechanical, electrical, and structural field reviews to collect and compare current data with previous project data to verify any existing deficiencies which occurred prior to the storm. Inspection focused on control house, signage and associated assemblies, gate lights, generator, lighting, clearance gauges. An Inspection Report was submitted summarizing the findings. Repair plans, design details and associated cost estimates were performed.
04/19 – Present	**Jupiter Federal Bascule Bridge Replacement | Jupiter, FL | Florida DOT** **Movable Bridge Electrical Engineer Intern** contributing to the design of this bascule bridge replacement project. The SWAT process of overlapping the design phase with the PD&E phase requires that the preliminary design phase includes coordination and support of the NEPA process in developing the Type 2 Categorical Exclusion documentation. H&H will serve as Engineer of Record for the project which addresses the structural and functional deficiencies of the existing US-1 / SR-5 Jupiter Federal Bridge from CR-A1A (Ocean Boulevard) to Beach Road. Work includes the development of vertical and horizontal alignment for bridge replacement alternatives and the study of the resulting impacts. The design incorporates intersection improvements and improves traffic functions at both ends of the approximately 2,960-foot long (0.56 mile) project corridor into the bridge replacement design.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Christopher Svara, PE**	Years of relevant experience with this employer	27
Title	Senior Electrical Engineer	Years of relevant experience with other employer(s)	2

Degree(s) / Years / Specialization			BS / 1993 / Applied Physics / Jacksonville University BS / 1993 / Electrical Engineering / Columbia University
Active registration number / state / expiration date			Professional Engineer: 44080 / LA / 3/31/2024
Year registered	2019	Discipline	Electrical Engineering
Contract role(s) / brief description of responsibilities			**Senior Electrical Engineer - Meets MPR 3**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
05/18 – 10/19	**Keller Ferry Landings Replacement | Keller, Washington | Washington DOT** **Lead Electrical Engineer** for the electrical system design and construction support services. This project involved developing electrical plans, specifications, and cost estimates to relocate the operating equipment for two existing floating ferry landings onto two newly fabricated floating ferry landing. Supported the WSDOT during bidding, bid selection, and provided construction support services. Performed site visits and commissioning activities on the project.
08/13 – 06/14	**Hatteras Ferry Ramp Rehabilitation | Dare County, NC | North Carolina Division of Highways** **Lead Electrical Engineer** provided a rehabilitation design that included a new control system, a new distributed power distribution system, motor controllers, control stations, receptacles, lights, and hydraulic controls for the ramp. Provided the electrical design, including calculations, design drawings, and specifications. Following the completion of the Design Phase, during the Construction Phase provided construction support services, including shop drawing review, and Requests for Information.
08/08 – 08/13	**Judge Seeber Vertical Lift Bridge over Inner Harbor Navigational Canal (SP 700-99-0430) | New Orleans, LA | LADOTD** **Lead Movable Bridge Electrical Engineer** provided inspection and rehabilitative design services for the electrical rehabilitation of a 250-foot tower-drive vertical lift span. The rehabilitation design of this Preservation Priority Bridge encompassed various electrical elements including a new control system, new distributed power distribution system, motor controllers, control desk, and limit switches. Provided the electrical design, including calculations, design drawings, and specifications. During the construction phase, provided construction support services for the construction, including shop drawing review, and responded to various Requests for Information.
01/19 – Present	**SR 605 Movable Bascule Bridge Rehabilitation | Ocean Springs, MS | Mississippi DOT** **Movable Bridge Electrical Engineer** for the assessment, design, plan review, and quality control of SR 605 double-leaf bascule bridge, as a task-order to the IDIQ Master Bridge Contract which includes developing standard and special bridge services, statewide for MDOT. Work includes inspection and rehabilitation of bridge structural, mechanical, and electrical components, as well as the roadway approaches and development of maintenance and repair plans.

08/10 – 07/13	**Murray Morgan Vertical Lift Bridge Rehabilitation | Tacoma, WA | City of Tacoma** **Lead Movable Bridge Electrical Engineer** responsible for developing the electrical design required to replace the complete electrical system on a span drive lift bridge. Scope for this National Register of Historic Plans listed bridge included providing the electrical design, including calculations, design drawings, and specifications as well as providing construction support services for the construction, including shop drawing review, Requests for Information, meetings, on-site testing, and start up. This rehabilitation design included a new programmable logic control system, a radio communication system to reduce cables from the movable span to the fixed piers, control desk, new distributed power distribution system consisting of a movable span, near side, and far side electrical equipment locations, motor drives, utility service, and power distribution.
08/17 – 07/19	**I-90 Lacey V Murrow Pontoon Bridge Rehabilitation | Seattle, WA | Washington DOT Bridge Preservation Office** **Movable Bridge Electrical Engineer** for an I-90 Lacey V Murrow Bridge electrical inspection and rehabilitative design project. H&H's electrical inspection of eastbound I-90 revealed that the electrical switchgears and five pairs of transformers needed to be replaced and the neutral and ground conductors needed to be separated. H&H's rehabilitative recommendations also required that submersible fuses in three pontoons be reconfigured and reinstalled, and that a fault current and arc flash hazard analyses be performed on all medium voltage equipment. H&H was responsible for the in-depth inspection, associated inspection report, subsequent electrical system design, and construction support services.
07/10 – 04/16	**SR 520 Evergreen Point Floating Bridge and Landings Project | Seattle, WA | Washington DOT Bridge Preservation Office** **Bridge Electrical Engineer** on this design-build project to replace the SR 520 Floating Bridge with a new parallel bridge and maintenance facility. Prepared a design-build Request for Qualifications and Request for Proposal for the replacement SR 520 Evergreen Point Floating Bridge and Bridge Maintenance Facility. The floating bridge work included preliminary design and complete technical requirements for a specialized structure. The Maintenance Facility included preliminary design and complete technical requirements for LEED compliant facility. Work also included support during the bidding and selection process as well as reviewing the design-build team's design submittals, attending task force meetings with the design-build team to keep the project requirements clear, and reviewing construction submittals.
06/17 – 04/18	**Centerville Swing Bridge over the Chesapeake & Albemarle Canal Rehabilitation | Chesapeake, MA | City of Chesapeake** **Lead Movable Bridge Electrical Engineer** for the rehabilitation of the Centerville Swing Bridge's bascule span. The project consisted of a site inspection to verify the condition of the electrical systems. After the site visit, a detailed scope of work was developed to identify the rehabilitation work that was required. Once the scope was defined and approved by the City, then construction plans, specifications, calculations, and cost estimates were prepared for a complete electrical rehabilitation of the bridge electrical system. The planned scope of work also included construction support services.
06/18 – 10/18	**SR 529 / 20 E and 20 W Steamboat Slough Bridge In-Depth Inspection | Everett, WA | Washington DOT** **Lead Electrical Engineer** for the in-depth electrical system inspection on this through truss swing bridge over Steamboat Slough. The inspection was conducted conformance with the AASHTO Movable Bridge Inspection, Evaluation and Maintenance Manual. Electrical condition reports were developed that included maintenance, short-term, and long-term rehabilitation recommendations.

16. Staff Experience:

Firm Employed by	Hardesty & Hanover		
Name	**Marco Lara, PE**	Years of relevant experience with this employer	4
Title	Electrical Engineer	Years of relevant experience with other employer(s)	13

Degree(s) / Years / Specialization			B. S. / 2004 / Electrical Engineering
Active registration number / state / expiration date			Professional Engineer: 44115 / LA / 3/31/2024
Year registered	2019	Discipline	Electrical Engineering
Contract role(s) / brief description of responsibilities			**Electrical Engineer - Meets MPR 3**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
01/19 – Present	**Lapalco Boulevard Movable Bridge over Harvey Canal | Westwego, LA | Jefferson Parish DPW** **Electrical Engineer** contributing to the pre-design electrical inspection and resulting Bridge Design Report (BDR) for the rehabilitation and widening of the existing four-lane Lapalco Boulevard project includes rehabilitation to the existing four-lane bridge with three lanes of traffic and a new pedestrian/bike lanes as well as the design of a new three-lane double bascule movable bridge crossing of Harvey Canal to be constructed as an independent structure immediately adjacent and north of the existing bridge with a new operator house. Improvements to bridge and roadway approaches and development of a Traffic Control Plan was also included.
05/17 – 07/17	**Arthur Kill Vertical Rail Lift Bridge | Elizabethport, NJ / Staten Island, NY | New York City Economic Development Corp.** **Electrical Engineer** responsible for performing in-depth inspections of the existing span drive, limit switches, motor control center, termination cabinets, control console, and bridge electrical system on the Arthur Kill Vertical Lift Bridge. With a single-track tower drive and a 558-foot-long span, this bridge has the longest lift span of any bridge of its type in the world. Observed bridge operations and visually evaluated aerial cables. Performed electrical testing of electrical service, motors, motor brakes, and span locks. Reviewed previous bridge inspection reports and prepared checklist for field evaluation of corrected and uncorrected deficiencies.
02/13 – 06/14	**Marine Parkway Vertical Lift Bridge Inspection | New York, NY | MTA Bridges and Tunnels** **Electrical Engineer** responsible for in-depth electrical inspection of the existing span drive and synchro-tie motors, auxiliary drive motors, warning gates, limit switches, motor control center, termination cabinets, and control console. Also witnessed and oversaw voltage, current, and RPM chart recording of all the main motors in the North and South Towers to provide analysis and recommendations to the TBTA. Other responsibilities included insulation resistance (megger) testing and inspection of the main span drive motors. Inspection was performed in accordance with the requirements of FHWA IP 77-10 (Bridge Inspection Manual for Movable Bridges), NYSDOT TA 87-007, and the AASHTO Movable Bridge, Inspection, Evaluation, and Maintenance Manual.
1/11 – 12/12	**Center Street Swing Bridge | Cleveland, OH | Ohio DOT** **Electrical Inspector** responsible for engineering support and construction inspection of the electrical rehabilitation of a bob-tail swing bridge. A partial electrical system replacement was performed, which included new solid-state drives and motors while retaining and upgrading existing motor controls and wiring for traffic gates, locks, and wedges.

03/18 – 07/19	**Cass Street Bascule Bridge over Hillsborough River | Tampa, FL | Hillsborough County Government** **Electrical Engineer** responsibilities included producing and developing calculations and design plans for the rehabilitation of this historic double-leaf bascule bridge. The major rehabilitation involved replacing obsolete and aging electrical equipment such as the programmable Logic Controller (PLC), motor control panels and cabinets; conduit and wiring associated with a generator, automatic transfer switch, safety interlock, etc.; auxiliary drive bevel gear bushing, span drive motor, span lock & pinion, span lock brake & bushings; and emergency Drive bevel gear, shaft bushing, bearing &couplings, live load shoe, and lighting. H&H provided design plans for structural rehabilitation and controller system replacement. Services included inspections of the structural, electrical, and mechanical components; a bridge development report; structural, electrical, and mechanical construction plans; temporary traffic control plans (TTC); specifications; engineer's estimate of probable construction cost; and post-design services.
03/18 – 07/19	**Brorein Street Bascule Bridge over Hillsborough River | Tampa, FL | Hillsborough County Government** **Electrical Engineer** responsibilities included producing and developing calculations and design plans for this double-leaf bascule bridge rehabilitation. This rehabilitation involved replacing aging electrical equipment, such as the main drive motors, brakes, motor control panels, span drive system and lock motor, limit switches, lighting, and upgrading the electrical service. H&H provided designs for the National Register of Historic Places eligible bridge. Services included inspections of the structural, electrical, and mechanical components; a BDR; structural, electrical, and mechanical construction plans; TCP; specifications; and engineer's cost estimate.
04/09 – 06/13	**Crescent Beach Bridge Rehabilitation (SR 206) | St. Johns County, FL | Florida DOT** **Electrical Engineer** responsible for rehabilitation of existing double-leaf, trunnion bascule bridge. Rehabilitation consisted of replacement of electrical power and controls with new Motor Control Center (MCC) and programmable logic controller (PLC) and replacement of drum switches and wound rotor motors with flux vector motors, drives, and brakes. Also included replacement of traffic gates, new open grid decking, and tender house improvements. Permit application was created for submarine cable replacement. Duties included shop inspections, witness testing, field inspection, and estimate of completion.
07/10 – 01/13	**Sargent Barge Swinging Barge (Platoon) Bridge Rehabilitation | Matagorda County, TX | TexDOT** **Electrical Designer.** Drafted electrical repair plans for power distribution system, panel schedules, control schematics, equipment layouts and conduit and cable schedules. Design includes a programmable logic controller (PLC) control-based system using wireless modems to eliminate the submarine cable. Operating system included two winches on vector controlled variable speed drives, integrated to control back tension on the payout winch in each direction, to maintain absolute control of the barge in tidal currents. The center span is a 125-foot cable operated swinging barge with motor operated leveling spans and aprons on each end. Project included replacing timber leveling spans with steel framed open grid decks and the operating machinery, replacing the bridge winch machinery and controls, structural repairs, and replacing the traffic gates and miscellaneous roadway modifications.
10/21 – 12/22	**OSARC NBIS Inspection of Three Movable Bridges | Statewide, MS | Mississippi DOT** **Electrical Engineer.** H&H conducted in-depth inspections of the mechanical and electrical components of three movable bridges for Mississippi Office of State Aid Road Construction. These include the FAS 104/Wittman Road Bridge over Bayou Portage, the Popp's Ferry Road Bridge over Back Bay Biloxi, and the Cedar Lake Road Bridge over the Tchoutacabouffa River. Upon conclusion of each inspection, H&H delivered detailed inspection reports outlining the condition of the bridge and made recommendations for rehabilitation or replacement of deficient bridge machinery components.

16. Staff Experience:

<table>
<tr><td rowspan="3">  </td><td>Firm Employed by</td><td colspan="2">Hardesty & Hanover</td><td></td></tr>
<tr><td>Name</td><td>Raymond Mankbadi, PE</td><td>Years of relevant experience with this employer</td><td>16</td></tr>
<tr><td>Title</td><td>Senior Geotechnical Engineer</td><td>Years of relevant experience with other employer(s)</td><td>28</td></tr>
<tr><td colspan="3">Degree(s) / Years / Specialization</td><td colspan="2">M.S. / 1985 / Civil Engineering
B.S. / 1978 / Civil Engineering</td></tr>
<tr><td colspan="3">Active registration number / state / expiration date</td><td colspan="2">Professional Engineer: 41609 / LA / 09/30/2023</td></tr>
<tr><td>Year registered</td><td>2017</td><td>Discipline</td><td colspan="2">Civil Engineering</td></tr>
<tr><td colspan="3">Contract role(s) / brief description of responsibilities</td><td colspan="2">Quality Control Geotechnical – Meets MPR 6</td></tr>
<tr><td>Experience dates (mm/yy–mm/yy)</td><td colspan="4">Experience and qualifications relevant to the proposed contract; i.e., “designed drainage”, “designed girders”, “designed intersection”, etc. Experience dates should cover the years of experience specified in the applicable MPR(s).</td></tr>
<tr><td>03/18 – 06/19</td><td colspan="4">SR-609 Bascule Bridge Rehabilitation, IDIQ Master Bridge Design Contract | Ocean Springs, MS | Mississippi DOT
Lead Geotechnical Engineer responsible for generator foundation design of SR-609 bascule bridge as a task-order to the IDIQ Master Bridge Contract for standard and special bridge services statewide. The scope of work included inspection and rehabilitation of structural, mechanical, and electrical bridge components, roadway approaches, and development of maintenance and repair plans.</td></tr>
<tr><td>02/14 – 12/16</td><td colspan="4">Rehabilitation of Swing Bridge (BNSF #32.06) over Bayou Des Allemands | Des Allemands, LA | BNSF Railway Company
Lead Geotechnical Engineer for a 90-foot single track swing span, two jump spans, and ten approach spans of prestressed concrete box beam, crosses the Des Allemands Bayou in Des Allemands, Louisiana. The 90-foot swing span was replaced on the existing substructures which were reinforced by adding micropiles. Two jump spans were rehabilitated also. H&H provided professional engineering services for the development of final bridge and track designs, permitting, construction contract documents, construction management and construction support for the rehabilitation of the bridge. The project included the replacement of spans all associated mechanical and electrical components as well as evaluation, rating and improvement of swing span substructure and foundations. Lead Geotechnical Engineer involved in the design, construction support, and testing of micropiles.</td></tr>
<tr><td>04/12 – 02/19</td><td colspan="4">Reconstruction of Harlem River Drive at East 127th Street | Manhattan, NY | New York City DOT
Lead Geotechnical Engineer on a $160 million project which involved a full replacement of 10-span Harlem River Drive Viaduct over the entrance ramp at East 127th Street in Manhattan. Responsible for subsurface (boring) investigation, supervising general drilling activities, creating final bore logs, creating subsurface profile, and developing geotechnical report. Engineer in charge of preliminary design and final design of pier foundations (drilled shafts) and approach embankments. Engineer in charge of preparing final geotechnical drawings (plans), specifications, and quantity estimates as well as general project management for geotechnical tasks.</td></tr>
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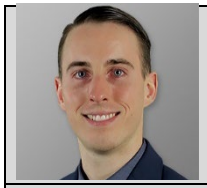
08/12 – 02/13	**Gasparilla Island Swing Bridge Replacement | Placida, FL | Gasparilla Island Bridge Authority** **Geotechnical Engineer** reviewed geotechnical work performed by sub-consultant, performed foundation analyses and design, provided geotechnical recommendation and QC and QA Services for the design of a new highway swing bridge. H&H implemented FDOT navigation vessel collision loads to develop the substructure. Project consists of 678-ft of new bridge including a 250-foot deck girder swing span and approach spans utilizing Florida I-Beams. Embankments are supported by MSE walls and protected by new bulkheads. In addition to the bridge structures and new pile supports, a tender house is part of the scope.
04/06 – 12/12	**Replacement of Route 52 Causeway, Somers Point Bridge | Somers Point & Ocean City, NJ | New Jersey DOT** **Lead Geotechnical Engineer** for $350 million bridge replacement project. Includes preliminary and final structural and geotechnical design for a 2.2-mile-long segmental concrete causeway, which replaces four bridges on Route 52. Geotechnical task leader responsible for all geotechnical aspects of construction including pile driving cofferdam in deep water, soil improvement, reinforcement embankment on soft soils, and instrumentation. Vibro Concrete Columns were utilized to improve the compressible soils. Prestressed concrete piles were utilized in the foundation. The scope of work included pavement design, subsurface/subsoil exploration program, foundation design, and preparation of foundation report.
03/18 – 06/19	**SR-605 Bascule Bridge Rehabilitation, IDIQ Master Bridge Design Contract | Ocean Springs, MS | Mississippi DOT** **Lead Movable Bridge Geotechnical Engineer** responsible for generator foundation design of SR-609 bascule bridge as a task-order to the IDIQ Master Bridge Contract for bridge services statewide. The scope of work includes inspection and rehabilitation of structural, mechanical, and electrical bridge components, roadway approaches, and development of maintenance and repair plans.
01/19 – Present	**Lapalco Boulevard Movable Bridge over Harvey Canal | Westwego, LA | Jefferson Parish DPW** **Lead Movable Bridge Geotechnical Engineer** for the pre-design inspection, the rehabilitation and widening of the existing four-lane Lapalco Boulevard to provide a facility carrying three lanes of traffic in each direction, and the design of a new three-lane double bascule movable bridge crossing of Harvey Canal. The scope also includes the design of a new bridge to be constructed as an independent structure immediately adjacent and north of the existing bridge with a new operator house. Improvements to bridge and roadway approaches for eastbound and westbound traffic as well as the development of a Traffic Control Plan is also included in scope.
04/06 – 04/10	**Construction Support Services for Willis Avenue Bridge over the Harlem River | New York, NY | New York DOT** **Lead Geotechnical Engineer** for the $612 million off-line replacement of a major 345-foot-long, swing bridge and 3,000 feet of highway approaches. Responsible for all geotechnical aspects of the foundation design including piles driving, cofferdam in deep water, soil improvement, reinforcement embankment on soft soils and instrumentation. Drilled shafts, steel H-piles, and mini piles were utilized in the foundations. The scope included subsurface/subsoil exploration program, foundation design, and preparation of foundation report.
01/20 – Present	**Lapalco Boulevard Bridge over Harvey Canal | Harvey, LA | Jefferson Parish Department of Public Works** **Lead Geotechnical Engineer** during the design phase to replace the existing bridge. Responsible for developing subsurface soil exploration program consisting of Standard Penetration Test borings and coordinating soil lab testing program to characterize subsurface conditions, develop soil subsurface profile, and determine engineering index properties. Performing foundation analyses to determine suitable deep foundation alternatives for the support of the proposed bridge and summarized findings in a Geotechnical Engineering and Foundation Report. The project is being undertaken to eliminate traffic bottlenecks that occur when six lanes of traffic meet the four-lane bridge. The existing bridge will be reconfigured and improved and a new bascule bridge and associated approaches parallel and adjacent to the existing bridge will be constructed. Each double-leaf bascule bridge will ultimately carry three lanes of traffic and provide pedestrian and bicycle accommodations.

16. Staff Experience:

<table>
<tr><td rowspan="4">  </td><td>Firm Employed by</td><td colspan="3">Hardesty & Hanover</td></tr>
<tr><td>Name</td><td>Peter Johnson, PE</td><td>Years of relevant experience with this employer</td><td>4</td></tr>
<tr><td>Title</td><td>Geotechnical Engineer</td><td>Years of relevant experience with other employer(s)</td><td>1</td></tr>
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<tr><td colspan="2">Degree(s) / Years / Specialization</td><td colspan="3">M.S. / 2020 / Civil Engineering
B.S. / 2017 / Civil Engineering</td></tr>
<tr><td colspan="2">Active registration number / state / expiration date</td><td colspan="3">Professional Engineer: 24GE05851700 / NJ / 4/30/2024</td></tr>
<tr><td>Year registered</td><td>2022</td><td>Discipline</td><td colspan="2">Civil Engineering</td></tr>
<tr><td colspan="3">Contract role(s) / brief description of responsibilities</td><td colspan="2">Geotechnical Engineer</td></tr>
<tr><td>Experience dates (mm/yy–mm/yy)</td><td colspan="4">Experience and qualifications relevant to the proposed contract; i.e., “designed drainage”, “designed girders”, “designed intersection”, etc. Experience dates should cover the years of experience specified in the applicable MPR(s).</td></tr>
<tr><td>04/19 - Present</td><td colspan="4">Lapalco Boulevard Bridge over Harvey Canal | Harvey, LA | Jefferson Parish Department of Public Works
Geotechnical Designer during the design phase to replace the existing bridge. Responsible for developing subsurface soil exploration program consisting of Standard Penetration Test borings and coordinating soil lab testing program to characterize subsurface conditions, develop soil subsurface profile, and determine engineering index properties. Performing foundation analyses to determine suitable deep foundation alternatives for the support of the proposed bridge and summarized findings in a Geotechnical Engineering and Foundation Report. The project is being undertaken to eliminate traffic bottlenecks that occur when six lanes of traffic meet the four-lane bridge. The existing bridge will be reconfigured and improved and a new bascule bridge and associated approaches parallel and adjacent to the existing bridge will be constructed. Each double-leaf bascule bridge will ultimately carry three lanes of traffic and provide pedestrian and bicycle accommodations.</td></tr>
<tr><td>08/17 – 12/17</td><td colspan="4">Reconstruction of Harlem River Drive at East 127th St | New York, NY | New York DOT
Geotechnical Designer during the construction phase for the full replacement of the 10-span Harlem River Drive Viaduct over the entrance ramp at E. 127th Street in the Borough of Manhattan. Provided field inspections.</td></tr>
<tr><td>07/17 – 10/17</td><td colspan="4">Van Wyck Expressway Widening between Kew Gardens Interchange and JFK Airport | Queens, NY | New York City DOT
Geotechnical Designer during the preliminary design phase to widen the Van Wyck Expressway (I-678) (VWE) to accommodate a fourth lane from the Kew Gardens Interchange to JFK Airport. Responsibilities included aiding in determining foundation concepts for a four-span temporary bypass structure for LIRR mainline tracks two and four. Performed analysis of spread footing, micropile, and drilled shaft foundation concepts. The project, for which H&H was a major subconsultant, involved approximately 20 bridges including four bridges that carry the LIRR over the Van Wyck Expressway, and the evaluation of operations of the various on/off ramps. The length of the project was approximately 4.3 miles. The VWE was widened by adding a fourth lane (fifth lane at some locations) in both directions to reduce congestion and delays. The added lanes are operated as Managed Use Lanes that can be dynamically managed.</td></tr>
</table>

04/19 - Present	**Replacement of Route 42 Bridges over Blackwood Railroad Trail | Haddon Township, NJ | New Jersey DOT** **Geotechnical Designer** during the preliminary engineering and final design phases for replacement of the EB and WB Route 42 bridges. Responsibilities include field inspection of borings, creating boring logs, creating a subsurface profile, performing foundation analyses, and assisting in the preparation of the foundation report. This project involves replacing two structurally deficient bridges and operational and safety improvements on a highly congested highway over a health and fitness trail.
06/20 – 12/20	**Bonnet Carre Spillway Bridge (L-845.6) Geotechnical Engineering Study | St. Rose, LA | Kansas City Southern Railroad Co.** **Geotechnical Designer** for a study that will be used to aid in the evaluation of alternatives to replace this freight rail bridge. Responsible for developing subsurface soil exploration program consisting of Standard Penetration Test (SPT) and Cone Penetration Test (CPT) borings and coordinating soil lab testing program to characterize subsurface conditions, develop soil subsurface profile, and determine soil engineering index properties. Performed foundation analyses to determine suitable deep foundation alternatives for the support of the proposed replacement bridge as well as settlement analyses for approach embankment construction recommendations. Summarized findings in a Geotechnical Engineering and Foundation report.
07/18 - Present	**Replacement of Connecticut River Bridge | Old Saybrook/Old Lyme, CT | Amtrak** **Geotechnical Designer** during the design phase to replace the existing truss approach spans and rolling lift movable span with a new structure on a new alignment. Responsible for preparing subsurface exploration program, field inspection of borings, creating boring logs and a subsurface profile, performing preliminary foundation analyses, and assisting in the preparation of geotechnical data and foundation reports. During the final design, both bascule and vertical lift main span alternatives are being developed.
06/17 – Present	**Replacement of F.R.E.C. Access Road Bridge over Toms River | Jackson, NJ | Kansas City Southern Railroad Company** **Geotechnical Designer** during the preliminary engineering and final design for the replacement of the Forest Resource Education Center (F.R.E.C.) Access Road Bridge. Responsible for preparing a subsurface investigation, creating bore logs, creating a subsurface profile, and field inspection of borings to characterize subsurface conditions, subsurface profile, and soil engineering index properties. Performed foundation design and analyses to determine abutment and wingwall pile foundation recommendations, designed gabion walls and permanent sheeting to provide grade separation for roadway widening and improve global stability, respectively. Involved in preparation of foundation plans and details. The bridge is being replaced to address substandard deck geometry, substandard sight distances, and aging substructure units to improve safety for motorists and pedestrians.
07/17 – 06/19	**Replacement of the Perquimans River Bridge | Hertford, NC | North Carolina DOT** **Geotechnical Designer** on this Design/Build project to replace the existing swing bridge. Responsible for pile foundation design and analyses as well as drafting foundation plans and notes. The existing bridge was replaced with a new off-line bridge as well as a new control house. H&H designed the new swing span, including structural, mechanical, electrical, and geotechnical engineering. The swing span structure consists of a center-pivot Warren through truss supporting the concrete deck. The new span improves geometrics, increases load carrying capacity and vertical clearance, and includes all the conveniences of a modern operating system.

16. Staff Experience:

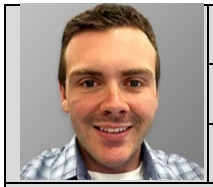
Firm Employed by	Hardesty & Hanover		
Name	**Robert Hideck, PE**	Years of relevant experience with this employer	7
Title	Senior Roadway Engineer	Years of relevant experience with other employer(s)	11

Degree(s) / Years / Specialization			B.S. / 2002 / Civil Engineering
Active registration number / state / expiration date			Professional Engineer: 41953 / LA / 3/31/2024
Year registered	2017	Discipline	Roadway Engineering
Contract role(s) / brief description of responsibilities			**Roadway Design Engineer – Meets MPR 4**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
11/20-present	**Almonaster Avenue Bridge Rehabilitation and New Connector Road | New Orleans, LA | Port of New Orleans** **Roadway Design Engineer** for the bridge assessment, complete rehabilitative engineering design, and road design services required for the partial replacement of the Almonaster Ave Bridge and a new connector road. H&H's assessment revealed that improvements to the electrical and mechanical systems, superstructure, and the connecting roads were required to return this bridge to its full operating capability. The road design services included a new alignment for the connecting road including all drainage structures. H&H also developed a hydraulic study and a site plan that included several retention ponds for drainage improvements. Other services included environmental, geotechnical, and pavement design.
01/14-present	**Districtwide Interstate Program Manager (IPM) | Florida DOT** **Project Engineer** assisting with the development and review of concept designs. This multi-discipline, indefinite quantity contract provided as-needed services to support the Florida DOT work program for all interstate highway improvements in the five-county FDOT District region. The geographic limits include over 150 miles of I-275, I-4, and I-75 and key contributing arterials.
04/17-05/21	**SR 75 (US 231) Reconstruction, SR 30A (US 98) to South Pipeline Road | Panama City, FL | Florida DOT** **Roadway, Signing and Pavement Markings, and Traffic Control Plans/Engineer of Record** responsible for design and preparation of roadway, signing and pavement marking, and temporary traffic control plans. H&H is providing design services for the single point urban interchange (SPUI) at SR 77 over US 231 and CSX RR improvement project. Work includes design for roadway and drainage design of the intersection, lighting design for the entire project, and bridge design for a new 840-foot steel bridge.
03/07-10/13	**Veterans Expressway (SR 589) Widening from Memorial Highway to Gunn Highway | Tampa, FL |Florida's Turnpike Enterprise** **Project Engineer** responsible for roadway design, preparation of plans, coordination of subconsultants and multiple disciplines, post-design services, and civil/site design for six toll sites. The existing conventional cash toll collection method was converted to an AET collection method. The project included two full interchanges and four partial interchanges. Due to the proximity to the Tampa International Airport, aviation permits were required throughout the project corridor and extensive coordination was required with the FAA.. The project also included the milling and resurfacing of the existing roadway, as well as widening and reconstruction.

12/13-05/19	**Homestead Extension of Florida's Turnpike (SR 821) - S of Killian Parkway to N of Sunset Drive | Miami, FL | Florida's Turnpike** **Roadway Engineer** responsible for roadway and TTC design for Kendall Drive and Sunset Drive and the mainline HEFT. This design-build project comprised the widening of the mainline HEFT (SR 821) from south of Killian Parkway to just north of Sunset Drive. The project also included development of express lanes, relocation of ramp tolling, and operational improvements to the Kendall Drive interchange as well as resurfacing and other minor improvements.
03/15-03/17	**Fort Hamer Bridge Approaches, Upper Manatee River Road to Fort Hammer Road | Manatee County, FL | Manatee County** **Project Roadway Engineer** responsible for roadway and temporary traffic control plans. This project included the design of over a mile of approach roadway for a new bridge over the Manatee River, connecting Upper Manatee River Road with Fort Hamer Road. The project was designed for stage construction with the two lanes being delivered with initial construction.
04/17-03/20	**SR 75 (US 231) from SR 30A (US 98) to Pipeline Road | Panama City, FL | Florida DOT** **Roadway, Signing and Pavement Markings, and TTCP Engineer of Record** responsible for design and preparation of roadway, signing and pavement marking, and traffic control plans for the single point urban interchange at SR 77 over US 231 and CSX RR improvement project. Work includes bridge, roadway, drainage, and lighting design.
09/15-12/18	**44th Avenue E from 45th Street E to 44th Avenue Plaza E, Braden River Segment | Manatee County, FL | Manatee County** **Roadway Engineer of Record/Senior Roadway Engineer** responsible for roadway and traffic control design and plans preparation. Project included the design for the reconstruction and extension of 44th Avenue East from 45th Street East to 44th Avenue Plaza East. The design plans include reconstruction from a two-lane roadway to a four-lane divided urban roadway. A new bridge was designed to cross over the Braden River, as well as a realignment of Morgan Johnson Road and Caruso Road to provide route continuity.
01/16-05/18	**I-75 SB Off-Ramp from S of Bypass Canal to EB/WB I-4 | Hillsborough County, FL | Florida DOT** **Project Engineer** responsible for the roadway and temporary traffic control (TTC) design and plans preparation for this two-mile roadway improvement project that included ramp widening, an extension of the ramp to provide off-line queueing, and an extended auxiliary lane on I-75. A unique aspect of the design team's approach was incorporation of operational improvements into a long-term buildout. This project was expedited for construction based on no right-of-way acquisition or impact to Florida Gas Transmission lines.
04/22-present	**Orlando South Ultimate Interchange Improvements | Orlando, FL | Florida's Turnpike Enterprise** **Project Engineer** responsible for concept development, coordination, and project oversight of a complex interchange, including system and service movements. This project includes an evaluation of a complex interchange that provides both direct and indirect ramping between Orange Blossom Trail and the adjacent two limited access highways. Project goal included: construction of direct connection ramps between freeways, an ultimate 10-lane typical section of the turnpike, implementation of AET, consideration of express direct connections, and improvement of surface street operations with two new reliever interchanges. The recommended configuration included improvements to the systems interchange, modification to two adjoining interchanges, and new proposed service interchanges.
03/06-12/07	**Starkey Road Final Design | Pinellas County, FL | Pinellas County Government** **Engineering Intern** responsible for design and development of plans and development of cross sections. This project included the widening of three segments of Starkey Road from a four-lane rural section roadway to a six-lane urban section roadway for a total length of 10.7 miles.

16. Staff Experience:

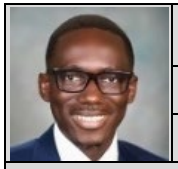


Firm Employed by	Hardesty & Hanover		
Name	**Dalton Hunt, EI**	Years of relevant experience with this employer	1
Title	Civil Designer	Years of relevant experience with other employer(s)	1

Degree(s) / Years / Specialization			B.S. / 2021 / Civil Engineering / Louisiana State University
Active registration number / state / expiration date			EI 35118 / Louisiana / 09/30/2024
Year registered	2022	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities			**Roadway Design**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
02/22 – Present	**Almonaster Avenue Bridge Rehabilitation and New Connector Road, New Orleans, LA – Port of New Orleans** **Engineer Intern** for the bridge assessment, complete rehabilitative engineering design, and road design services required for the partial replacement of the Almonaster Avenue Bridge and a new connector road. The road design services include a new alignment for the connecting road including all drainage structures. H&H also developed a hydraulic study and a site plan that includes several retention ponds for drainage improvements. All design work is according to LADOTD Standard and Specifications and reviewed by LADOTD.
04/22 – 09/22	**SR-605 Bascule Bridge over Industrial Waterway, Harrison County, MS – Mississippi DOT** **Engineer Intern** for the comprehensive rehabilitation of this bascule bridge over the Industrial Waterway. Work also included design and detailing of a new PPC pile-supported reinforced concrete generator platform. All designs are in accordance with AASHTO, FHWA and MDOT guidelines and specifications. Load rating was performed using AASHTOWare BrDR load rating software.
04/22 - Present	**IDIQ Contract for ADA Design Projects Statewide – LADOTD** **Engineer Intern** Responsible for the evaluation and consideration of current sidewalk features of Robert Blvd. in Slidell Louisiana. Plans were designed and revised in house in preparation of the overhaul of sidewalks and adding of ADA compliant handicap ramps and landing areas along the roadway to bring the sidewalks up to current LADOTD standards.
02/22 – Present	**Lapalco Boulevard Movable Bridge over Harvey Canal, Westwego, LA – Jefferson Parish DPW** **Engineer Intern** for the pre-design inspection, the rehabilitation and widening of the existing four-lane Lapalco Boulevard to provide a facility carrying three lanes of traffic in each direction, and the design of a new three-lane double bascule movable bridge crossing of Harvey Canal. project includes rehabilitation to the existing four-lane bridge with three lanes of traffic and a new pedestrian/bike lane. The scope of services also includes the design of a new bridge to be constructed as an independent structure immediately adjacent and north of the existing bridge with a new operator house. All design work is according to Louisiana DOTD Standard and Specifications and reviewed by LADOTD. Load rating was performed using AASHTOWare BrDR load rating software.

16. Staff Experience:

	Firm Employed by	Ardaman & Associates, Inc.		
	Name	**Albert Ayenu-Prah, Jr., PhD, PE**	Years of relevant experience with this employer	7
	Title	Project Engineer	Years of relevant experience with other employer(s)	7

Degree(s) / Years / Specialization	PhD / 2007 / Civil Engineering MS / 2004 / Civil Engineering BS / 2001 / Civil Engineering
Active registration number / state / expiration date	Professional Engineer: 37402 / LA / 3/31/2025
Year registered 2012 / Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities	**Geotechnical Project Engineer - Meets MPR 6**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
07/21 - Present	**SP No. H.004100.5 / I-10: LA 415 to Essen Lane on I-10 & I-12 (CMAR), Baton Rouge Parish, LA** **Project Engineer** Leads technical reviews pertaining to selection of design reaches, geotechnical design of deep foundations, earth retaining structures, slope stability, soil-structure interaction with existing structures and load testing recommendations. This is a Construction Management at Risk (CMAR) project which includes widening of the east and westbound lanes, elevated structures, interchanges, and ramps along I-10 from LA 415 in West Baton Rouge Parish to Essen Lane on I-10 and I-12 in East Baton Rouge Parish spanning approximately 2.5 miles.
04/21 - Present	**SP Nos. 700-29-0112, 700-29-0130, H.012565, H.012891, H.014251, H.014252, H.014253, H.014254, H.014256, H.014257 / Rural Bridge Initiative Phase II, West Feliciana, East Feliciana, Livingston, St. Bernard Parishes, LA** **Project Engineer** Leads technical reviews pertaining to selection of design reaches, geotechnical design of pile foundations, drivability, slope stability, settlement analyses and construction testing program recommendations. This project consists of the replacement of multiple small two-lane bridges throughout rural areas of Southeast Louisiana which generally ranged in length from 100 to 400 feet, mainly over small rivers and creeks.
12/20 - Present	**SP No. H.013897 / College Drive Flyover Ramp I-10/I-12 West, East Baton Rouge Parish, LA** **Project Manager** Leads technical reviews pertaining to Owner Verification (OV) of geotechnical design for various structures, as well as pavement design along the project alignment. This is a Design-Build project which includes modifying the I-10 West/College Drive exit into separate I-12 West and I-10 West exits., and Ardaman's scope consists of OV services.
03/19 – 07/20	**SP No. H.004100.5-2 / I-10 WIDENING (LA415 TO HOWARD ST), East Baton Rouge Parish, LA** **Project Engineer** Evaluated the laboratory test results, including consolidation testing, and produced logs for the widening of the East and Westbound lanes, elevated structures, and construction of interchange and ramps on Westbound lanes along I-10 between LA 415 and Howard Street spanning approximately 1 mile. The geotechnical investigation included 58 deep borings and 11 cone penetrometer (CPT) soundings, associated laboratory testing and the preparation of a geotechnical data report.

06/18 – Present	**SP No. H.004791 / LA 23 Belle Chasse Bridge and Tunnel, Plaquemine Parish, LA** **Project Manager** Leads geotechnical and pavement engineering design reviews pertaining to Owner Verification (OV) during design and construction phases. This is a P3 Project, consisting of replacing the Belle Chasse bridge and tunnel, and Ardaman's scope consists of OV services.
05/19 – Present	**SP No. H.003370 / I-220/I-20 Interchange Improvement and Barksdale Access Road, Bossier Parish, LA** **Project Engineer** Responsible for pavement design for all roadways. This Design-Build project consists of construction of an interchange and direct access road to I-20 from the Barksdale Air Force Base just outside of Bossier City. Structures include twin overpass bridges and access ramps.
09/17 – 06/18	**Roddy Road Safety Widening, Ascension Parish, LA** **Project Engineer** Responsible for pavement and deep foundation design for the safety widening along Roddy Road from LA 935 to LA 621. The project consisted of providing two 12-foot lanes, 4-foot shoulders, and a defined side ditch for roadside drainage, as well as the design of various turn lanes at the intersection locations.
01/15 – Present	**Pecue Lane / I-10 Interchange, East Baton Rouge Parish, LA** **Project Engineer** Performed geotechnical engineering analyses, including embankment settlement and slope stability of earth retaining structures, and deep foundations. The project consists of the construction of an interchange with multiple through and turn lanes, entrance and exit ramps in a congested area, replacing two existing overpass bridges, as well as roadway widening and extension. Mr. Ayenu-Prah is currently involved with the construction phase services including review of the pile driving system and high-strain dynamic testing.
07/15 – Present	**SP No. H.004273.5 / I-49 Connector (Lafayette Regional Airport), Lafayette Parish, LA** **Project Engineer** Responsibility includes geotechnical design and technical review for various structures along the project alignment. The project includes frontage roads, and elevated mainline viaduct structure, interchanges with associated ramps, and bridges over a total length of 5 miles. Mr. Ayenu-Prah helped characterize all of the soil borings and CPT soundings into various design reaches using an Ardaman created database across the 5-mile alignment and oversaw the pile foundation design, earth retained structures, slope stability, and embankment settlement. He is also helping to develop the preliminary geotechnical report.
11/15 – Present	**SP No. H.011309 / McArthur Interchange Completion Phase II, US 90Z, Jefferson Parish, LA** **Project Engineer** Responsible for geotechnical analyses and recommendations pertaining to elevated ramps and associated at-grade approaches. Performed design recommendations including deep foundations, pile group analyses, embankment settlement, and pile supported approach slab design for the construction of ramps entering and exiting Westbank Expressway. Project consists of horizontal and vertical design for widening the south frontage road from Peters Road and east bound Harvey Tunnel to Manhattan Boulevard, including four eastbound on and off ramps of the Westbank Expressway.

16. Staff Experience:

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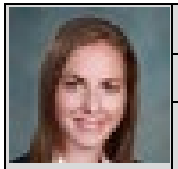
<tr><td rowspan="3">  </td><td>Firm Employed by</td><td colspan="3">Ardaman & Associates, Inc.</td></tr>
<tr><td>Name</td><td>Megan Bourgeois, PE</td><td>Years of relevant experience with this employer</td><td>16</td></tr>
<tr><td>Title</td><td>Project Engineer / Assistant Branch Manager</td><td>Years of relevant experience with other employer(s)</td><td>0</td></tr>
<tr><td colspan="2">Degree(s) / Years / Specialization</td><td colspan="3">BS / 2006 / Civil Engineering</td></tr>
<tr><td colspan="2">Active registration number / state / expiration date</td><td colspan="3">Professional Engineer: 36725 / LA / 03/31/2024
Traffic Control Supervisor Refresher / LA / 08/07/2024
DOTD Flagger / LA / 08/08/2024
Certified NHI Drilled Shaft Inspector</td></tr>
<tr><td>Year registered</td><td>2011</td><td>Discipline</td><td colspan="2">Civil Engineering</td></tr>
<tr><td colspan="3">Contract role(s) / brief description of responsibilities</td><td colspan="2">Geotechnical Project Manager - Meets MPR 6</td></tr>
<tr><td>Experience dates (mm/yy–mm/yy)</td><td colspan="4">Experience and qualifications relevant to the proposed contract; i.e., “designed drainage”, “designed girders”, “designed intersection”, etc. Experience dates should cover the years of experience specified in the applicable MPR(s).</td></tr>
<tr><td>10/09 – Present</td><td colspan="4">SP NO. H.004646.5 / I-20 Mississippi River Bridge Review, Vicksburg, MS
Project Manager Ms. Bourgeois manages this multi-million dollar, high risk, high technical needs, high visibility project consisting of investigating the movement of the I-20 Bridge in Vicksburg, Mississippi. She managed a highly technical team including academia, outside experts, including internationally recognized geotechnical engineers, geohydrologists, instrumentation specialists, and 3-D geotechnical modeling experts. She managed and personally oversaw a comprehensive laboratory testing program and was involved in refining the geotechnical site characterization for the bank/bluff where there was evidence of shifting creating movement in the bridge structure. The specialized testing, she personally performed or managed included x-ray diffraction for the determination of mineralogy, x-ray scanning of unextruded samples to identify existing shearing planes, stress-reversal direct shear tests to determine true residual angles of critical strata. She was instrumental in designing the geotechnical instrumentation for this project including vibrating wire piezometers, Casagrande type piezometers, In-place inclinometers, SAA inclinometers, and traditional inclinometers. In addition, Ms. Bourgeois performed seepage and drawdown analyses, slope stability analyses, evaluation of remedial measures, and developed technically feasible solutions. She co-authored the geotechnical analysis and design report. Currently, she is managing a phase of the project that included upgrading the entire instrumentation communication system and will be monitoring this system continuously.</td></tr>
<tr><td>03/19 – 07/20</td><td colspan="4">SP No. H.004100.5-2 / I-10 Widening (LA 415 To Howard St), East Baton Rouge Parish, LA
Project Manager Managed all aspects of the geotechnical investigation in support of the widening of the East and Westbound lanes, elevated structures, and construction of interchange and ramps on Westbound lanes along I-10 between LA 415 and Howard Street spanning approximately 1 mile. The geotechnical investigation included 58 deep borings and 11 cone penetrometer (CPT) soundings, electrical resistivity imaging along the entire alignment, laboratory testing and the preparation of a geotechnical data report.</td></tr>
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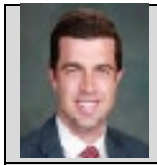
07/21 - Present	**SP No. H.004100.5 / I-10: LA 415 To Essen Lane On I-10 & I-12 (CMAR) Baton Rouge Parish, LA** **Project Engineer** Leads technical reviews for the selection of design reaches, geotechnical design of deep foundations, earth retaining structures, slope stability, soil-structure interaction with existing structures and load testing recommendations. This Construction Management at Risk (CMAR) project includes widening of the east and westbound lanes, elevated structures, interchanges, and ramps along I-10 from LA 415 in West Baton Rouge Parish to Essen on I-10 and I-12 in East Baton Rouge Parish spanning about 2.5 miles.
04/21 - Present	**SP Nos. 700-29-0112, 700-29-0130, H.012565, H.012891, H.014251, H.014252, H.014253, H.014254, H.014256, H.014257 / Rural Bridge Initiative Phase II, West Feliciana, East Feliciana, Livingston, St. Bernard Parishes, LA** **Project Engineer** Leads technical reviews for the selection of design reaches, geotechnical design of pile foundations, drivability, slope stability, settlement analyses and construction testing program recommendations. This consists of the replacement of multiple small two-lane bridges throughout rural areas of Southeast LA which ranged in length from 100 to 400 ft, mainly over small rivers and creeks.
07/21 – 01/22	**SP No. H.003931 / I-10 Calcasieu River Bridge, Calcasieu Parish, LA** **Project Manager** Managed all aspects of this project pertaining to coordination of fieldwork including 37 deep soil borings, 39 ECPTs and 13 electrical resistivity (ER) geophysical survey transects. Most of the soil borings were completed from a barge, some over a considerable amount of water. Some soil borings were completed from a marsh buggy over shallow water and thick marsh grass. She managed the laboratory testing program, processing and analyzing of the ECPT and ER data. She assisted with development of a geotechnical database and submittal of a geotechnical data report. This project obtained preliminary geotechnical data under a strict deadline for use in the design phase of a project that will consist of replacing the existing I-10 Calcasieu River Bridge with a new structure and improvements to I-10 near I-210 interchange and various other interchanges including entrances, exits and service roads.
10/18 – 01/20	**SP No. H.000263 / Chef Menteur Pass Bridge & Approach, Orleans Parish, LA** **Project Manager** Managed all aspects of an extensive field investigation program which included 37 deep soil borings, including borings over 200 ft in over 80 ft deep of high flow water. She managed laboratory testing program to provide geotechnical characterization data for use in design of deep foundations and embankments, oversaw the field resistivity testing program, and developed the data report.
10/15 – Present	**SP No. H.013579 / Pecue Lane I-10 Interchange I-10, East Baton Rouge Parish, LA** **Project Manager** Managed all aspects of the project that included field investigations, laboratory testing, and engineering design. This interchange consists of twin bridges with MSE wall abutments for both bridges crossing Interstate I-10 and on/off-ramps in south Baton Rouge. Ms. Bourgeois performed analyses including settlement estimates with recommendations for monitoring, driven pile design including down drag considerations, MSE Wall design, slope stability and pavement section recommendations; all completed according to DOTD standards. She is currently assisting with the field construction monitoring.
12/12 – Present	**SP No. H.009266 / I-10 Widening LA 73 to LA 30, Ascension Parish, LA** **Project Manager** Managing all aspects of the project that include field investigations consisting of 13 deep soil borings and 26 shallow soil borings, laboratory testing, and engineering design in support of the widening of the East and Westbound lanes and elevated structures along I-10 between LA 73 and LA 30 spanning approximately 5 miles. She performed analyses including settlement estimates with recommendations for monitoring, driven pile design including down drag considerations, and pavement section recommendations; all completed according to DOTD standards.

16. Staff Experience:



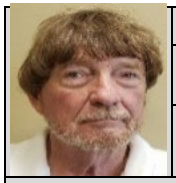
Firm Employed by	Ardaman & Associates, Inc.		
Name	**Robert Jewell, PE**	Years of relevant experience with this employer	15
Title	Project Engineer / Branch Manager	Years of relevant experience with other employer(s)	0

Degree(s) / Years / Specialization			BS / 2009 / Civil Engineering
Active registration number / state / expiration date			Professional Engineer: 38579 / LA / 9/30/2024 Traffic Control Supervisor / LA / 09/25/2024
Year registered	2013	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities			**Geotechnical Project Engineer - Meets MPR 6**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
10/18 – 01/20	**SP No. H.000263.5-1 / Chef Menteur Pass Bridge & Approach, Orleans Parish, LA** **Project Engineer** Helped manage and oversee all aspects of an extensive field investigation program which included 37 deep soil borings, including borings over 200 feet in over 80 feet deep of high flow water. Mr. Jewell also helped develop the soil boring logs and preparation of the data report.
10/18 – Present	**SP No. H.003370 / I-220 / I-20 Interchange Improvement And Barksdale Air Force Base Access Road, Bossier Parish, LA** **Project Manager** Prepared the preliminary design and planning report for this Design Build project which provides access to Interstate I-20 from the Barksdale Air Force Base (BAFB) and constructing an interchange and access road from Interstate 20 in Bossier City, LA. He oversaw the field construction services consisting of PDA monitoring, bi-directional load cell load tests, and settlement monitoring.
03/19 – 07/20	**SP No. H.004100.5-2 / I-10 Widening (LA 415 To Howard St), East Baton Rouge Parish, LA** **Project Engineer** Comanaged all aspects of the geotechnical investigation in support of the widening of the East and Westbound lanes, elevated structures, and construction of interchange and ramps on westbound lanes along I-10 between LA 415 and Howard Street spanning approximately 1 mile. The geotechnical investigation will include 58 deep borings and 11 cone penetrometer (CPT) soundings, field resistivity testing, and associated laboratory testing and the preparation of a geotechnical data report.
07/21 – Present	**SP No. H.004100.5 / I-10: LA 415 To Essen Lane On I-10 & I-12 (CMAR), Baton Rouge Parish, LA** **Project Manager** Leads all aspects of engineering analyses pertaining to selection of design reaches, geotechnical design of deep foundations, earth retaining structures, slope stability, soil-structure interaction with existing structures and load testing recommendations. This is a Construction Management at Risk (CMAR) project which includes widening of the east and westbound lanes, elevated structures, interchanges, and ramps along I-10 from LA 415 in West Baton Rouge Parish to Essen Lane on I-10 and I-12 in East Baton Rouge Parish spanning approximately 2.5 miles.

04/21 – Present	**SP Nos. 700-29-0112, 700-29-0130, H.012565, H.012891, H.014251, H.014252, H.014253, H.014254, H.014256, H.014257 / Rural Bridge Initiative Phase II, West Feliciana, East Feliciana, Livingston, St. Bernard Parishes, LA** **Project Manager** Leads all aspects of engineering analyses pertaining to selection of design reaches, geotechnical design of pile foundations, drivability, slope stability, settlement analyses and construction testing program recommendations. This project consists of the replacement of multiple small two-lane bridges throughout rural areas of Southeast Louisiana which generally ranged in length from 100 to 400 feet, mainly over small rivers and creeks.
07/21 – 01/22	**SP No. H.003931 / I-10 Calcasieu River Bridge, Calcasieu Parish, LA** **Project Engineer** Lead technical review of all aspects of this project pertaining to coordination of fieldwork including 37 deep soil borings, 39 ECPTs and 13 electrical resistivity (ER) geophysical survey transects. A majority of the soil borings were completed from a barge, some over a considerable amount of water. Some soil borings were completed from a marsh buggy over shallow water and thick marsh grass. Mr. Jewell also assisted with review of the laboratory testing program, processing and analyzing of the ECPT and ER data. He also assisted with development of a geotechnical database and preparation and submittal of a geotechnical data report. This project consisted of obtaining preliminary geotechnical data under an extremely strict deadline to be used in the design phase of a project that will consist of replacing the existing I-10 Calcasieu River Bridge with a new structure and improvements to I-10 near the I-210 interchange and various other interchanges including entrances, exits and service roads.
10/15 – Present	**SP No. H.013579 / Pecue Lane I-10 Interchange I-10, East Baton Rouge Parish, LA** **Project Engineer** This interchange consists of twin bridges with MSE wall abutments for both bridges crossing Interstate I-10, and on/off-ramps in south Baton Rouge. Mr. Jewell helped perform analyses including settlement estimates with recommendations for monitoring, driven pile and drilled shaft design including down drag considerations, MSE Wall design, slope stability and pavement section recommendations; all completed according to DOTD standards. Mr. Jewell is currently overseeing the construction phase which includes dynamic testing and settlement monitoring.
04/14 – Present	**SP No. H.004435 / I-12 To Bush Segment 2, LA 3241 (LA 36-LA435), St. Tammany Parish, LA** **Project Manager** Oversaw and coordinated the geotechnical investigation which included drilling 32 deep soil borings, 10 culvert borings, and 88 shallow roadway borings, sampling, and laboratory testing along the alignment which includes two bridges: LA 435 over Bayou Lacombe Tributary and LA 36 over Bayou Lacombe Tributary 2. Assisted in developing the geotechnical analyses and design recommendation report which included pile foundations for the bridge structures and shallow foundation design for the culverts. Mr. Jewell is currently overseeing the construction phase which includes dynamic testing and settlement monitoring.
10/14 – 12/16	**SP No. H.010601.5 / I-10 Widening (E. JET. I-49 TO LA 328), St. Martin Parish, LA** **Project Engineer** Oversaw and coordinated the geotechnical investigation which included 44 deep borings and 25 cone penetrometer (CPT) soundings, associated laboratory testing, and preparation of a geotechnical data report for the widening of the nine existing structures along I-10 between I-49 to LA 328 spanning approximately 7 miles.
07/09 – 08/11	**SP No. 700-29-0112 / LA-1- Phase 1, Lafourche Parish, LA** **Assistant Project Engineer** Served in the field as on-site geotechnical engineer during construction for this project in southeast Louisiana. He conducted dynamic monitoring using the Pile Driving Analyzer, performed CAPWAP analyses, reviewed drive logs, and supervised field technicians.

16. Staff Experience:



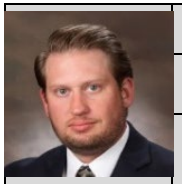
Firm Employed by	Ardaman & Associates, Inc.		
Name	**Julian "Jim" Porter**	Years of relevant experience with this employer	48
Title	Drilling Supervisor	Years of relevant experience with other employer(s)	4

Degree(s) / Years / Specialization	Attended LSU / USL 1969-1970
Active registration number / state / expiration date	Water Well Driller's License No. WWC-212 / LA / 06/30/2023 Traffic Control Supervisor Refresher / LA / 09/06/2023 DOTD Flagger / LA / 03/10/2024
Year registered / Discipline	
Contract role(s) / brief description of responsibilities	**Drilling Supervisor - Meets MPR 7**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
07/15 – Present	**SP No. H.004273.5 / I-49 Connector, Geotechnical Investigation, Lafayette Parish, LA** **Drilling Supervisor** Supervised the completion of preliminary field investigation consisting of 116 deep and shallow borings and 15 cone penetrometer test (CPT) soundings.
04/14 – Present	**SP No. H.004435 / I-12 TO Bush Segment 2, LA 3241, St. Tammany Parish, LA** **Drilling Supervisor** Oversaw the completion of 32 deep soil borings, 10 culvert borings, and 88 shallow roadway borings and sampling along the alignment which includes two bridges: LA 435 over Bayou Lacombe Tributary and LA 36 over Bayou Lacombe Tributary 2.
08/08 – 02/12	**SP No. 700-09-0166 & H.003886.5 / I-49 Segments E-J, Caddo, LA** **Drilling Supervisor** Conducted field reconnaissance, which included rights of entry, utility locations, access and locating all deep and shallow borings. Oversaw completion of numerous deep and shallow borings in accordance with LADOTD standards.
02/12 – 11/13	**SP No. H.003495.5 / I-49 Segment K (I-220 to MLK), Caddo Parish, LA** **Drilling Supervisor** Conducted field reconnaissance, which included rights of entry, utility locations, access and locating all deep and shallow borings. Oversaw completion of numerous deep and shallow borings in accordance with LADOTD standards.
10/18 – 01/20	**SP No. H.000263.5-1 / Chef Menteur Pass Bridge & Approach, Orleans Parish, LA** **Drilling Supervisor** Helped manage and oversee all aspects of an extensive field investigation program which included 37 deep soil borings, including borings over 200 feet in over 80 feet deep of high flow water. Ardaman also developed soil boring logs and prepared a geotechnical data report.

10/09 – Present	**SP No. H.004646.5 / I-20 Mississippi River Bridge Review, Vicksburg, MS** **Drilling Supervisor** Mr. Porter assisted with many aspects of this multi-million-dollar, high risk, high technical needs, high visibility project consisting of investigating the movement of the I-20 Bridge in Vicksburg, Mississippi. He was instrumental in designing and installing the geotechnical instrumentation for this project including vibrating wire piezometers, Casagrande type piezometers, In-place inclinometers, SAA inclinometers, and traditional inclinometers. Currently, he is assisting with a phase of the project that includes upgrading the entire instrumentation communication system and will be monitoring this system continuously.
04/21 – Present	**SP Nos. 700-29-0112, 700-29-0130, H.012565, H.012891, H.014251, H.014252, H.014253, H.014254, H.014256, H.014257 / Rural Bridge Initiative Phase II, West Feliciana, East Feliciana, Livingston, St. Bernard Parishes, LA** **Drilling Supervisor** Assisted with all aspects of this project pertaining to coordination of fieldwork including 31 deep soil borings. Some of these borings were performed through the middle of bridges and at hard access locations. This project consists of the replacement of multiple small two-lane bridges throughout rural areas of Southeast Louisiana which generally ranged in length from 100 to 400 feet, mainly over small rivers and creeks.
07/21 – 01/22	**SP No. H.003931 / I-10 Calcasieu River Bridge, Calcasieu Parish, LA** **Drilling Supervisor** Assisted with all aspects of this project pertaining to coordination of fieldwork including 37 deep soil borings, 39 ECPTs and 13 electrical resistivity (ER) geophysical survey transects. A majority of the soil borings were completed from a barge, some over a considerable amount of water. Some soil borings were completed from a marsh buggy over shallow water and thick marsh grass. This project consisted of obtaining preliminary geotechnical data under an extremely strict deadline to be used in the design phase of a project that will consist of replacing the existing I-10 Calcasieu River Bridge with a new structure and improvements to I-10 near the I-210 interchange and various other interchanges including entrances, exits and service roads.
03/19 – 07/20	**SP No. H.004100.5-2 / I-10 Widening (LA 415 to Howard St), East Baton Rouge Parish, LA** **Drilling Supervisor** Helped manage and oversee all aspects of an extensive field investigation program which included 58 deep soil borings and 11 cone penetrometer (CPT) soundings for the widening of the East and Westbound lanes, elevated structures, and construction of interchange and ramps on Westbound lanes along I-10 between LA 415 and Howard Street spanning approximately 1 mile.

16. Staff Experience:



Firm Employed by	Ardaman & Associates, Inc.		
Name	**Robert Rousset, PE**	Years of relevant experience with this employer	16
Title	Project Engineer / New Orleans Branch Manager	Years of relevant experience with other employer(s)	0

Degree(s) / Years / Specialization			BS / 2008 / Civil Engineering
Active registration number / state / expiration date			Professional Engineer: 38637 / LA / 9/30/2024
Year registered	2014	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities			**Geotechnical Project Engineer - Meets MPR 6**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
07/14 – 05/18	**SP No. H.004113 / I-12 to Bush Segment 3, LA Highway 3241 (LA 435 TO LA 40/LA 41), St. Tammany Parish, LA** **Project Manager** Oversaw and coordinated the geotechnical investigation which included 26 soil borings, sampling, and laboratory testing along the alignment that included one bridge, LA 435 over Talisheek Creek. Oversaw geotechnical analyses and preparation of design recommendation report which included pile supported approach slabs and pile foundations for the bridge structures and shallow foundation design for the culverts.
07/09 – 08/11	**SP No. 700-29-0112 / LA 1 – Phase 1, Lafourche Parish, LA** **Assistant Project Engineer** Served in the field as onsite engineer for Phase 1A of this project in southeast Louisiana. The completed project consisted of 17 miles of elevated roadway with low-level bridges and medium-level bridges, two elevated interchanges, and two fixed high-level bridges over navigable waterways. Conducted dynamic monitoring using PDA, performing CAPWAP analyses, reviewed drive logs, and supervised field technicians.
03/19 – 07/20	**SP No. H.004100.5-2 / I-10 Widening (LA 415 to Howard St), East Baton Rouge Parish, LA** **Project Engineer** Ardaman's scope of work for this project consisted of evaluating laboratory test results, including consolidation testing, and producing soil boring logs for the widening of the East and Westbound lanes, elevated structures, and construction of interchange and ramps on Westbound lanes along I-10 between LA 415 and Howard Street spanning approximately 1 mile. The geotechnical investigation included 58 deep borings and 11 cone penetrometer (CPT) soundings, electrical resistivity geophysical surveys, associated laboratory testing and the preparation of a geotechnical data report. Mr. Rousset assisted with the fieldwork portion of this project.
2020 – Present	**Rural Bridges Replacement Initiative (Multiple SP No.'s), Avoyelles and Webster Parishes, LA** **Project Engineer** This project consists of replacing multiple small rural bridges throughout Central and North Louisiana. He oversees the field investigation, lab testing, and engineering analyses for the project. Engineering analyses consisting of axial pile capacities, pile drivability, settlement, and slope stability analyses.

16. Staff Experience:

	Firm Employed by	A P S Engineering and Testing, LLC		
	Name	**Sergio Aviles, PE**	Years of relevant experience with this employer	11
	Title	President	Years of relevant experience with other employer(s)	10
Degree(s) / Years / Specialization		BS / 2001 / Civil Engineering / Geotechnical		
Active registration number / state / expiration date		Professional Engineer: 33571 / LA / 3/31/2024		
Year registered	2007	Discipline	Civil Engineering	
Contract role(s) / brief description of responsibilities		**Geotechnical Project Manager - Meets MPR 6**		

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
09/19-06/20	**Project No. H.004100: I-10 Widening LA 415 to Essen LN | LADOTD** **Project Manager** to the Geotechnical investigations for the DOTD geotechnical retainer to drill and sample a total of 52 deep borings starting at the Washington Exit and ending at the LSU lakes. Along with this drillingand sampling APS will also test for strength and engineering characteristics of the soils with. A total of eight (8) over the waterborings and 44 land borings with approximate 1000 Triaxial Compression, Unconsolidated Drained Or Undrained (UU) and Atterberg Limits. . CMAR project
08/16-10/19	**Project No. H.012422: I-10/I-110 Interchange Modification at Terrace Ave | LADOTD** **Project Manager** to the Geotechnical Investigations for the DOTD geotechnical retainer to drill and sample a total of six (6) deep borings for the design of the Terrace Ave exit. APS tested for strength and engineering characteristics of the soils with approximate 100 Triaxial Compression, Unconsolidated Drained Or Undrained (UU) and Atterberg Limits by A P S Laboratory.
11/17-2/18	**Project No. H.013193 US 61 Thompson Creek Bridge Replacement | LADOTD** **Project manager** to the Geotechnical Investigations for the DOTD geotechnical retainer to drill and sample a total of eight (8) deep borings for the replacement bridge at US 61 over Thompson Creek. APS tested for strength and engineering characteristics of the soils.
11/19-Present	**Project No. H.001352 and H.002273 Comite River Diversion Bridge at LA 67, LA 19 and LA 19 Railroad Bridge LA 67 and LA 19-** **Project manager** for the Geotechnical design of the diversion CMAR project
03/19-05/19	**Project No. H.001344 US 190 over Bogue Falaya River | LADOTD** **Project Manager** for the Geotechnical Investigation and Design of the proposed new bridge. A total of 19 deep borings were drilled and tested for the foundation recommendation. Mr. Aviles is the project manager for the project design team.
12/19-3/20	**Project No. H.010155 US 90 Railroad Overpass SE of LA 85** **Project Manager** for the Geotechnical Investigation and Design for the proposed new overpass. A total of six (6) deep borings were drilled and tested for Geotechnical recommendation.

02/17-10/17	**Project No. H.002861 Earhart Expressway/Causeway Boulevard** **Project manager** to the Geotechnical investigations and analysis assigned to help calculating the resistance factors. APS was tasked with developing the LRFD factors for both existing structures and the new elevated sections to connect to Causeway Blvd. Per the task order APS drill and tested 85 borings to 120 feet near the proposed and existing structures. APS engineering staff provides designer with pile tip elevations for five elevated ramps to connect Earhart to Causeway Blvd. Provided boring logs, information on site conditions, site preparation recommendations, and load- length curves.
07/14-08/14	**Project No. 700-51-0110: US 90 elevated portion for the future I-49 corridor.** **Project Manager** to the Geotechnical investigations and analysis as assigned for roads and bridges design. APS performed all the preliminary drilling, testing, and CPT for US 90 and Highway 318 Intersection. A total of 46 boring and 11 CPT along with all the testing required by LADOTD.
2001-2005	The following lists consist of projects that Mr. Aviles did the design or assisted on the design while at LADOTD. These projects include pile design, slope stability, settlement analysis, and construction services (PDA, CAPWAP, and WEAP). **ON SYSTEM PROJECTS LIST:** Mr. Aviles served as the staff geotechnical engineer while at the Pavement and Geotechnical Section for the following projects below: Below projects varies from Embank Design, Pile Design, Drilled Shaft design, MSE wall design, and construction supervision. Major projects cost estimated over one million dollars: 015-04-0037 LA524-LA123 Route US165, 015-05-0035 LaSalle, 015-07-0044 (Route 165 Cadwell, 276-03-0016 Tangipahoa River Bridge, 3132 Innerloop 427-01-0029, 362-01-0009 Rat Bois, 452-01-0039 I-55 CrossOvers, 742-07- 0098 Susek Drive, Bayou Perrie and Sand Beach Bayou 103-01-0025, Broadway Ave.700-40-0127, Cameron Route La. 27 193-02-0042, Causeway Boulevard interchange Route I-10 450-15-0098,Clayton-Greenville 026-03-0025, Crescent City Connection 283-08-0143(46), Cross Bayou Bridge 090-01-0020, Flannery at Florida 742-17-0008.

16. Staff Experience:

	Firm Employed by	A P S Engineering and Testing, LLC		
	Name	**Sairam Eddanapudi, PE**	Years of relevant experience with this employer	11
	Title	Chief Engineer	Years of relevant experience with other employer(s)	8
Degree(s) / Years / Specialization		ME / 2002 / Civil Engineering BE / 1999 / Civil Engineering		
Active registration number / state / expiration date		Professional Engineer: 35129 / LA / 3/31/2024		
Year registered	2009	Discipline	Civil Engineering	
Contract role(s) / brief description of responsibilities		**Geotechnical Engineer and QA Manager - Meets MPR 6**		

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
09/19-Present	**Project No. H.004100: I-10 Widening LA 415 to Essen LN | LADOTD** **Project QA Manager** to the Geotechnical Investigations of this CMAR project. A P S was tasked thru our DOTD geotechnical retainer to drill and sample a total of 52 deep borings starting at the Washington Exit and ending at the LSU lakes. Along with this drillingand sampling APS will also test for strength and engineering characteristics of the soils with. A total of eight (8) over the waterborings and 44 land borings with approximate 1000 Triaxial Compression, Unconsolidated Drained Or Undrained (UU) and Atterberg Limits.
08/16-10/19	**Project No. H.012422: I-110 Interchange Modification at Terrace Ave | LADOTD** **Quality Assurance Manager** for Geotechnical Investigations for this project. APS was tasked thru our DOTD geotechnical retainer to drill and sample a total of six (6) deep borings for the design of the Terrace Ave exit. APS tested for strength and engineering characteristics of the soils with approximate 100 Triaxial Compression, Unconsolidated Drained Or Undrained (UU) and Atterberg Limits by APS Laboratory.
11/17-2/18	**Project No. H.013193: US 61 Thompson Creek Bridge Replacement-** **Quality Assurance Manager** to the Geotechnical investigations for this project. A P S was tasked thru our DOTD geotechnical retainer to drill and sample a total of eight (8) deep borings for the replacement bridge at US 61 over Thompson Creek. APS tested for strength and engineering characteristics of the soils. Mr. Sai was QA to the Geotechnical Investigations.
11/19-Present	**Project No. H.001352 and H.002273: Comite River Diversion Bridge at LA 67, LA 19 and LA 19 Railroad Bridge LA 67 and LA 19** **Senior Design Engineer** for the geotechnical design team for this CMAR project. A P S was selected with the winning team for the design of the diversion CMAR project.
03/19-05/19	**Project No. H.001344: US 190 over Bogue Falaya River** **Senior Design Engineer** for this project. A P S was selected with the winning team for the Geotechnical Investigation and Design of the proposed new bridge. A total of 19 deep borings were drilled and tested for the foundationrecommendation.

16. Staff Experience:

	Firm Employed by	A P S Engineering and Testing, LLC		
	Name	**Surendra Raj Pathak, PE**	Years of relevant experience with this employer	7
	Title	Chief Engineer	Years of relevant experience with other employer(s)	10
Degree(s) / Years / Specialization		MS / 2013 / Civil Engineering BE / 1998 / Civil Engineering		
Active registration number / state / expiration date		Professional Engineer: 43487 / LA / 9/30/2023		
Year registered	2019	Discipline	Civil Engineering	
Contract role(s) / brief description of responsibilities		**Geotechnical Engineer - Meets MPR 6**		

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
09/19-Present	**Project No. H.004100: I-10 Widening LA 415 to Essen LN | LADOTD** **Project Quality Control** to the geotechnical investigations for this project. A P S was tasked thru our DOTD geotechnical retainer to drill and sample a total of 52 deep borings starting at the Washington Exit and ending at the LSU lakes. Along with this drillingand sampling APS will also test for strength and engineering characteristics of the soils with. A total of eight (8) over the waterborings and 44 land borings with approximate 1000 Triaxial Compression, Unconsolidated Drained Or Undrained (UU) and Atterberg Limits
08/16-10/19	**Project No. H.012422: I-110 Interchange Modification at Terrace Ave | LADOTD** **Quality Control** to geotechnical investigations for this project. A P S was tasked thru our DOTD geotechnicalretainer to drill and sample a total of six (6) deep borings for the design of the Terrace Ave exit. APS tested for strength and engineering characteristics of the soils with approximate 100 Triaxial Compression, Unconsolidated Drained Or Undrained (UU)and Atterberg Limits by A P S Laboratory.
11/17-2/18	**Project No. H.002273, H.000710, and H.001352 Comite River Diversion Bridge at LA 67, LA 19 and LA 19 Railroad Bridge LA 67 and LA 19 | LADOTD** **Quality Control** to the geotechnical investigations for this project. A P S was tasked thru our DOTD geotechnical retainer to drill and sample a total of 12 deep borings for the new and replacement bridges at Highway 19, 67, and 964. APS tested for strength and engineering characteristics of the soils.
11/19-Present	**Project No. H.001352 and H.002273: Comite River Diversion Bridge at LA 67, LA 19 and LA 19 Railroad Bridge LA 67 and LA 19** **Design Engineer** for the design of the diversion CMAR project. A P S will be theGeotechnical designers for the project.
03/19-05/19	**Project No. H.001344: US 190 over Bogue Falaya River** **Design Engineer** for the Geotechnical Investigation and Design of the proposed new bridge. A total of 19 deep borings were drilled and tested for the foundation recommendation.
12/19-3/20	**Project No. H.010155: US 90 Railroad Overpass SE of LA 85** **Design Engineer** for the project design team. A P S was selected with the winning team for the GeotechnicalInvestigation and Design for the proposed new overpass. A total of six (6) deep borings were drilled and tested for Geotechnical recommendation.

16. Staff Experience:

	Firm Employed by	A P S Engineering and Testing, LLC		
	Name	**Van George**	Years of relevant experience with this employer	8
	Title	Senior Driller	Years of relevant experience with other employer(s)	10
Degree(s) / Years / Specialization				
Active registration number / state / expiration date				
Year registered		Discipline		
Contract role(s) / brief description of responsibilities		**Drill Manager - Meets MPR 7**		

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
09/19-Present	**Project No. H.004100: I-10 Widening LA 415 to Essen LN- | LADOTD** **Head Driller** for the geotechnical field investigations. A P S was tasked thru our DOTD geotechnical retainer to drill and sample a total of 85 deep borings that included land (77) and over water borings (8) starting at the Washington Exit and ending at the Acadia Exit. APS performed all the laboratory testing per ASTM standards to facilitate the geotechnical design. Soil classification tests such as, natural moisture contents, Unconsolidated Undrained, liquid and plastic limits, unit weight, grain-size analyses, consolidations, and specific gravity were performed. All laboratory testing was performed at our accredited Laboratory. Additionally, 1000 Triaxial Compression tests (Unconsolidated Undrained) were performed to determine the soil strength. All testing was performed at our accredited Laboratory.
08/16-10/16	**Project No. H.012422: I-110 Interchange Modification at Terrace Ave | LADOTD** **Head Driller** for the Geotechnical Field Investigations. APS was tasked thru our DOTD geotechnical retainer to drill and sample a total of six (6) deep borings for the design of the Terrace Ave exit ramp. APS performed all the laboratory testing per ASTM standards to facilitate the geotechnical design. Soil classification tests such as, natural moisture contents, Unconsolidated Undrained, liquid and plastic limits, unit weight, grain-size analyses, consolidations, and specific gravity were performed. All testing was at our accredited Laboratory.
11/17-2/18	**Project No. H.013193: US 61 Thompson Creek Bridge Replacement** **Head driller** for the Geotechnical Field Investigations. APS was tasked thru our DOTD geotechnical retainer to drill and sample a total of eight (8) deep borings for the replacement bridge at US 61 over Thompson Creek. APS performed all the laboratory testing per ASTM standards to facilitate the geotechnical design. Soil classification tests such as, natural moisture contents, Unconsolidated Undrained, liquid and plastic limits, unit weight, grain-size analyses, consolidations, and specific gravity were performed. All laboratory testing was performed at our accredited Laboratory.
11/17-2/18	**H.002273, H.000710, and H.001352 Comite River Diversion Bridge at LA 67, LA 19 and LA 19 Railroad Bridge LA 67 and LA 19** **Head Driller** for the geotechnical field investigations. APS was tasked thru a DOTD geotechnical retainer to drill and sample 12 deep borings for the new replacement bridges at Highway 19, 67, and 964. A P S performed all the laboratory testing per ASTM standards to facilitate the geotechnical design. Soil classification tests such as, natural moisture contents, Unconsolidated Undrained, liquid and plastic limits, unit weight, grain-size analyses and specific gravity were performed. All testing was performed at our accredited Laboratory.

03/19-05/19	**Project No. H.001344: US 190 over Bogue Falaya River** **Head Driller** for the Geotechnical Field Investigations. APS was selected with the winning team for the Geotechnical Investigation and Design of the proposed new bridge. A total of 19 deep borings were drilled and tested for the foundation recommendation. A P S performed all the laboratory testing per ASTM standards to facilitate the geotechnical design. Soil classification tests such as, natural moisture contents, Unconsolidated Undrained, liquid and plastic limits, unit weight, grain-size analyses, consolidations, and specific gravity were performed. All laboratory testing was performed at our accredited Laboratory.
12/19-1/20	**Project No. H.010155: US 90 Railroad Overpass SE of LA 85** **Head Driller for the geotechnical field investigations.** A P S was selected with the winning team for the Geotechnical Investigation and Design for the proposed new overpass. A total of six (6) deep borings were drilled and tested for Geotechnical recommendation. A P S performed all the laboratory testing per ASTM standards to facilitate the geotechnical design. Soil classification tests such as, natural moisture contents, Unconsolidated Undrained, liquid and plastic limits, unit weight, grain-size analyses, consolidations, and specific gravity were performed. All laboratory testing was performed at our accredited Laboratory.
07/14-08/14	**Project No. 700-51-0110: US 90 elevated portion for the future I-49 corridor.** **Head Driller** for the geotechnical field investigations. A P S performed all the preliminary drilling, testing, and CPT for US 90 and Highway 318 Intersection. A total of 46 boring and 11 CPT along with all the testing required by LADOTD. A P S performed all the laboratory testing per ASTM standards to facilitate the geotechnical design. Soil classification tests such as, natural moisture contents, Unconsolidated Undrained, liquid and plastic limits, unit weight, grain-size analyses, consolidations, and specific gravity were performed. All laboratory testing was performed at our accredited Laboratory.
02/17-10/17	**Project No. H.002861: Earhart Expressway/Causeway Boulevard** **Head Driller** for the geotechnical field investigations. A P S was tasked with developing the LRFD factors for both existing structures and the new elevated sections to connect to Causeway Blvd. Per the task order APS drill and tested 85 borings to 120 feet near the proposed and existing structures. A P S performed all the laboratory testing per ASTM standards to facilitate the geotechnical design. Soil classification tests such as, natural moisture contents, Unconsolidated Undrained, liquid and plastic limits, unit weight, grain-size analyses, consolidations, and specific gravity were performed. All laboratory testing was performed at our accredited Laboratory. A P S engineering staff provides designer with pile tip elevations for five elevated ramps to connect Earhart to Causeway Blvd. Provided boring logs, information on site conditions, site preparation recommendations, and load-length curves.
01/04-05/12	**Private Jobs:** Drilling for warehouses, chemical plants, and private land development projects. **Project No. N/A: Levees (Kenner)** – New Orleans, LA: Drill and sample with 5" Shelby tubes, 80' to 100' holes. **Project No. N/A: New Orleans East Levee** – New Orleans, LA: Drill and sample with 5" Shelby tubes, 80'.

16. Staff Experience:

	Firm Employed by	Chustz Surveying, LLC		
	Name	**James H. Chustz, Jr., PLS**	Years of relevant experience with this employer	28
	Title	Chief Engineer	Years of relevant experience with other employer(s)	20
Degree(s) / Years / Specialization			LSU / 1983/ Boundary Surveying Classes	
Active registration number / state / expiration date			Professional Land Surveyor: 4657 / LA / 3/31/2024	
Year registered	1992	Discipline	Professional Land Surveyor	
Contract role(s) / brief description of responsibilities			**Professional Land Surveyor - Meets MPR 5**	

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
01/22-present	**Automated Revetment Surveys on the Mississippi, Atchafalaya, and Red Rivers, USACE, New Orleans District, LA, MVN Contract W912P8-20-C-0057.** **Contract Role: Principal/Surveyor** – Mr. Chustz was responsible for the overall management of this job. Chustz provided Automated Multibeam Underwater Imaging surveys for 456 miles on the Mississippi, Atchafalaya and Red Rivers. DGPS and Automated River Gauges were used for control. Deliverables included ASCII XYZ Files and QA/QC Reports.
11/21-06/22	**H.012563.5, LA 73 Bayou Manchac Bridge, Prairieville, LADOTD** **Contract Role: Principal/Surveyor** – Mr. Chustz was responsible for the overall management of this job. The types of surveys that Chustz provided were Topographic, Hydrographic, Aerial LiDAR, Static GPS, and RTK. Deliverables included MicroStation InRoads DGN, DTM, and ALG files, Utility Forms, GPS Photos, and ASCII Files.
08/21-11/21	**Post Ida Emergency Services for Multibeam and LiDAR, Donaldsonville to Venice, USACE, New Orleans District, MVN Contract W912P8-20-D-0001.** **Contract Role: Principal/Surveyor** – Mr. Chustz was responsible for the overall management of this job. Chustz provided Multibeam Hydrographic Underwater Imaging, Aerial LiDAR, and Aerial Imagery surveys of the Mississippi River, locating obstructions after hurricane Ida. Deliverables included Obstruction Forms, an Orthomosaic, XYZ ASCII Files, and a Final Survey Report.
11/21-12/21	**Post Ida Grand Isle Surveys, Grand Isle, USACE, New Orleans District, MVN Contract W912P8-20-D-0001.** **Contract Role: Principal/Surveyor** – Mr. Chustz was responsible for the overall management of this job. Chustz provided Static GPS, Single Beam and Multibeam Hydrographic Underwater Imaging, Aerial LiDAR, and Aerial Imagery surveys of the Grand Isle jetty system. Deliverables included Static GPS Network Reports, an Orthomosaic, XYZ ASCII Files, and a Final Survey Report.
05/16-09/17	**I-10 Cable Barrier, Lafayette to Jennings, LADOTD, H.010962.** **Contract Role: Principal/Surveyor** – Mr. Chustz was responsible for the overall project management of this contract. The types of surveys that Chustz provided were Aerial LiDAR, RTK Control and Ground Truthing, and Static GPS.

11/19 – 12/20	**2020 Automated Revetment Surveys on the Mississippi, Atchafalaya and Red Rivers, New Orleans District | MVN Contract W912P8-15-C-005** **Contract Role: Principal/Surveyor** responsible for the overall project management of this contract. Chustz provided multibeam surveys for 320 miles of riverbank on the Mississippi River, 130 on the Atchafalaya River and Red River.
1/19 – 10/19	**2019 Mississippi River General Hydrographic Surveys, Vicksburg District | MVK Contract W912EE-17-D-0008** **Contract Role: Principal/Surveyor** responsible for the overall project management of this contract. Chustz provided automated hydrographic surveys utilizing single beam and multibeam technology positioned by DGPS for 297 miles along the banks of the Mississippi River. Deliverables included Gridded XYZ files and Benchmark Description Forms.
10/17 – 12/18	**H.013193, 2017 Thompson Creek Bridge Replacement | DOTD** **Contract Role: Principal/Surveyor** responsible for the overall project management of this contract. Chustz provided Conventional Hydrographic and Topographic surveys of the Little Natalbany River bridge crossing at US61. Deliverables included a GPS Sketch, ASCHJ files, MicroStation DGN and DTM files, Utility Reports, and a Location Report.
08/16 – 12/16	**2016 Bridge Surveys, Southern Louisiana | DOTD Contract 4400006382, Task Order 05** **Contract Role: Principal/Surveyor** responsible for the overall project management of this contract. Chustz provided Hydrographic Single Beam Surveys for 17 bridges across Southern Louisiana. Deliverables included Survey Reports, Sounding Charts, Field Notes, Annotated Photos, and Bridge Data Charts.
12/20-10/21	**H.014633.5, LA 29 Bayou Cocodrie Bridge Scour Repair, LADOTD** **Contract Role: Principal/Surveyor** responsible for the overall management of this job. The types of surveys that Chustz provided were Topographic, Aerial LiDAR and Photogrammetry, Static GPS, and RTK. Deliverables included Microstation InRoads DGN, DTM, and ALG files, Utility Forms, GPS Photos, and ASCII Files repositioned.

16. Staff Experience:

	Firm Employed by	Chustz Surveying, LLC		
	Name	**Julian A. Chustz, PLS**	Years of relevant experience with this employer	15
	Title	Surveyor	Years of relevant experience with other employer(s)	0
Degree(s) / Years / Specialization		BS / 2012 / Geomatics		
Active registration number / state / expiration date		Professional Land Surveyor / 5251 / LA / 9/30/2023		
Year registered	2021	Discipline	Professional Land Surveyor	
Contract role(s) / brief description of responsibilities		**Professional Land Surveyor - Meets MPR 5**		

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
11/21-06/22	**LA 73 Bayou Manchac Bridge, Prairieville, LADOTD, H.012563.5.** **Contract Role: Surveyor** – Mr. Chustz was responsible for data coordination and deliverables. The types of surveys that Chustz provided were Topographic, Hydrographic, Aerial LiDAR, Static GPS, and RTK. Deliverables included Microstation InRoads DGN, DTM, and ALG files, Utility Forms, GPS Photos, and ASCII Files.
09/21-11/21	**Emergency Grand Isle Post Hurricane Zeta LiDAR/Photogrammetry Surveys, Grand Isle, New Orleans District, MVN Contract W912P8-20-D-0001.** **Contract Role: Surveyor** – Mr. Chustz was responsible for data coordination and deliverables. The types of surveys that Chustz provided were Topographic, Aerial LiDAR and Photogrammetry, Static GPS, and RTK. Deliverables included a DTM File and an ASCII Coordinate File.
05/16-08/17	**I-10 Cable Barrier, Lafayette to Jennings, DOTD, H.010962.** **Contract Role: Surveyor** – Mr. Chustz was responsible for data coordination and deliverables. The types of surveys that Chustz provided were Aerial LiDAR, RTK Control and Ground Truthing, and Static GPS. Deliverables included ASCII and LAS Files.
09/16-01/17	**Impala Burnside Terminal Survey, Burnside, Project No. 16-514.** **Contract Role: Surveyor** – Mr. Chustz was responsible for multibeam and aerial LiDAR data coordination and deliverables. The type of surveys that Chustz provided were RTK and Digital Level control surveys, Aerial 3D Laser Scan, Multibeam Hydrographic Underwater Imaging and Topographic surveys. Deliverables included LAS Files and gridded Multibeam Data.
08/16-09/16	**Jimmie Davis Bridge Hydro Survey, Shreveport, DOTD Contract 4400006382, Task Order 06.** **Contract Role: Surveyor** – Mr. Chustz was responsible for Multibeam Processing and QA/QC of the hydrographic data. Chustz provided High Resolution Multibeam Underwater Imaging surveys of the Jimmie Davis Bridge in Shreveport, LA. Deliverables included a gridded XYZ file of the Multibeam survey data and a Detailed Survey Report.
11/19 – 09/20	**2020 Automated Revetment Surveys on the Mississippi, Atchafalaya and Red Rivers, New Orleans District | MVN Contract W912P8-15-C-005** **Contract Role: Surveyor** responsible for the overall project management of this contract. Chustz provided multibeam surveys for 320 miles of riverbank on the Mississippi River, 130 on the Atchafalaya River and Red River.

02/19 – 10/19	**2019 Mississippi River General Hydrographic Surveys, Vicksburg District | MVK Contract W912EE-17-D-0008** **Contract Role: Surveyor** responsible for the overall project management of this contract. Chustz provided automated hydrographic surveys utilizing single beam and multibeam technology positioned by DGPS for 297 miles along the banks of the Mississippi River. Deliverables included Gridded XYZ files and Benchmark Description Forms.
10/17 – 12/18	**2017 Thompson Creek Bridge Replacement | DOTD H.013193** **Contract Role: Surveyor** responsible for the overall project management of this contract. Chustz provided Conventional Hydrographic and Topographic surveys of the Little Natalbany River bridge crossing at US61. Deliverables included a GPS Sketch, ASCHJ files, MicroStation DGN and DTM files, Utility Reports, and a Location Report.
08/16 – 12/16	**2016 Bridge Surveys, Southern Louisiana | DOTD Contract 4400006382, Task Order 05** **Contract Role: Surveyor** responsible for the overall project management of this contract. Chustz provided Hydrographic Single Beam Surveys for 17 bridges across Southern Louisiana. Deliverables included Survey Reports, Sounding Charts, Field Notes, Annotated Photos, and Bridge Data Charts.
12/20-10/21	**H.014633.5, LA 29 Bayou Cocodrie Bridge Scour Repair, LADOTD** **Contract Role: Surveyor** responsible for the overall management of this job. The types of surveys that Chustz provided were Topographic, Aerial LiDAR and Photogrammetry, Static GPS, and RTK. Deliverables included Microstation InRoads DGN, DTM, and ALG files, Utility Forms, GPS Photos, and ASCII Files repositioned.

16. Staff Experience:

	Firm Employed by	Chustz Surveying, LLC		
	Name	**Mark Huber, CH**	Years of relevant experience with this employer	3
	Title	Supervisor-QA/QC & Hydrographic Surveys	Years of relevant experience with other employer(s)	43
Degree(s) / Years / Specialization				
Active registration number / state / expiration date			Certified Hydrographer #181 / National / 12/31/2024	
Year registered	1995	Discipline	Survey (Certified Hydrographer)	
Contract role(s) / brief description of responsibilities			**Certified Hydrographer**	

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
01/22-07/22	**Automated Revetment Surveys on the Mississippi, Atchafalaya, and Red Rivers, USACE, New Orleans District, LA, MVN** **Contract Role: Supervisor - QA/QC & Hydrographic Surveys** – Responsible for the Hydrographic Surveys and the QA/QC of final deliverables. Chustz provided Automated Multibeam Underwater Imaging surveys for 456 miles on the Mississippi, Atchafalaya and Red Rivers. DGPS and Automated River Gauges were used for control. Deliverables included ASCII XYZ Files and QA/QC Reports.
11/21-02/22	**LA 73 Bayou Manchac Bridge, Prairieville, LADOTD, H.012563.5.** **Contract Role: Supervisor - QA/QC & Hydrographic Surveys** – Responsible for the Hydrographic Surveys and the QA/QC of final deliverables. The types of surveys that Chustz provided were Topographic, Hydrographic, Aerial LiDAR, Static GPS, and RTK. Deliverables included Microstation InRoads DGN, DTM, and ALG files, Utility Forms, GPS Photos, and ASCII Files.
08/21-09/21	**Post Ida Emergency Services for Multibeam and LiDAR, Donaldsonville to Venice, USACE, New Orleans District, MVN** **Contract Role: Supervisor - QA/QC & Hydrographic Surveys** – Responsible for the Hydrographic Surveys and the QA/QC of final deliverables. Provided Multibeam Hydrographic Underwater Imaging, Aerial LiDAR, and Aerial Imagery surveys of the Mississippi River, locating obstructions after Hurricane Ida. Deliverables: Obstruction Forms, an Orthomosaic, XYZ ASCII Files, and Final Survey Report.
07/21-10/21	**LA 29 Bayou Cocodrie Bridge Scour Repair, Ville Platte, LADOTD, H.014633.5.** **Contract Role: Supervisor - QA/QC & Hydrographic Surveys** – Mr. Huber was responsible for the Hydrographic Surveys and the QA/QC of final deliverables. The types of surveys that Chustz provided were Topographic, Hydrographic, Aerial LiDAR and Photogrammetry, Static GPS, and RTK. Deliverables included Microstation InRoads DGN, DTM, and ALG files, Utility Forms, GPS Photos, and ASCII Files.
03/20-04/20	**NOV NFL Mitigation Project Fritchie Marsh (ED-20-030), Slidell, New Orleans District, MVN Contract W912P8-15-D-0009.** **Contract Role: Supervisor - QA/QC & Hydrographic Surveys** – Mr. Huber was responsible for the Hydrographic Surveys and the QA/QC of final deliverables. Mr. Huber was responsible for the QA/QC of final deliverables. Chustz provided Hydrographic Single Beam Surveys utilizing DGPS and a Temporary Staff Gauge, and Topographic Surveys utilizing RTK GPS. Deliverables included a Detailed Survey Report, Description Forms, KMZ Files, a Fully Constrained GPS Network Report, and GIS Shape Files.

16. Staff Experience:

	Firm Employed by	Chustz Surveying, LLC		
	Name	**Robbie Benoit**	Years of relevant experience with this employer	15
	Title	Supervisor-CADD & Deliverables	Years of relevant experience with other employer(s)	20
Degree(s) / Years / Specialization		AS / 2003 / Industrial Engineering		
Active registration number / state / expiration date				
Year registered		Discipline		
Contract role(s) / brief description of responsibilities		**CADD Supervisor**		

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
01/22-07/22	**Automated Revetment Surveys on the Mississippi, Atchafalaya, and Red Rivers, USACE, New Orleans District, LA, MVN** **Contract Role: Supervisor – Deliverables** – Mr. Benoit was responsible for final deliverables. Chustz provided Automated Multibeam Underwater Imaging surveys for 456 miles on the Mississippi, Atchafalaya and Red Rivers. DGPS and Automated River Gauges were used for control. Deliverables included ASCII XYZ Files and QA/QC Reports.
03/22-08/22	**LA 20: LA 304 – LA 307, Chackbay, LADOTD H.014728.5.** **Contract Role: Supervisor – CADD & Deliverables** – Mr. Benoit was responsible for final CADD products and deliverables. The types of surveys that Chustz provided were Topographic, Hydrographic, Aerial LiDAR and Photogrammetry, Static GPS, and RTK. Deliverables included Microstation InRoads DGN, DTM, and ALG files, Utility Forms, GPS Photos, and ASCII Files.
11/21-02/22	**LA 73 Bayou Manchac Bridge, Prairieville, LADOTD, H.012563.5.** **Contract Role: Supervisor – CADD & Deliverables** – Mr. Benoit was responsible for final CADD products and deliverables. The types of surveys that Chustz provided were Topographic, Hydrographic, Aerial LiDAR, Static GPS, and RTK. Deliverables included Microstation InRoads DGN, DTM, and ALG files, Utility Forms, GPS Photos, and ASCII Files.
11/21-12/21	**Post Ida Grand Isle Surveys, Grand Isle, USACE, New Orleans District, MVN Contract W912P8-20-D-0001.** **Contract Role: Supervisor – Deliverables** – Mr. Benoit was responsible for final deliverables. Chustz provided Static GPS, Single Beam and Multibeam Hydrographic Underwater Imaging, Aerial LiDAR, and Aerial Imagery surveys of the Grand Isle jetty system. Deliverables included Static GPS Network Reports, an Orthomosaic, XYZ ASCII Files, and a Final Survey Report.
08/21-12/21	**LA 301 Priest Cana Bridge, Crown Point, LADOTD, H.014284.5.** **Contract Role: Supervisor – CADD & Deliverables** – Mr. Benoit was responsible for final CADD products and deliverables. The types of surveys that Chustz provided were Topographic, Hydrographic, Static GPS, and RTK. Deliverables included Microstation InRoads DGN, DTM, and ALG files, Utility Forms, GPS Photos, and ASCII Files.

16. Staff Experience:

	Firm Employed by	Chustz Surveying, LLC		
	Name	**Mark Coinche, CST**	Years of relevant experience with this employer	22
	Title	Party Chief	Years of relevant experience with other employer(s)	21
Degree(s) / Years / Specialization				
Active registration number / state / expiration date				
Year registered		Discipline		
Contract role(s) / brief description of responsibilities		**OSHA Safety Officer and Field Supervisor**		

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
03/22-08/22	**LA 20: LA 304 – LA 307, Chackbay, LADOTD H.014728.5.** **Contract Role: Supervisor – Field Crews** – Mr. Voinche was responsible for field supervision and data collection. The types of surveys that Chustz provided were Topographic, Hydrographic, Aerial LiDAR and Photogrammetry, Static GPS, and RTK. Deliverables included Microstation InRoads DGN, DTM, and ALG files, Utility Forms, GPS Photos, and ASCII Files.
11/21-02/22	**LA 73 Bayou Manchac Bridge, Prairieville, LADOTD, H.012563.5.** **Contract Role: Supervisor – Field Crews** – Mr. Voinche was responsible for field supervision and data collection. The types of surveys that Chustz provided were Topographic, Hydrographic, Aerial LiDAR, Static GPS, and RTK. Deliverables included Microstation InRoads DGN, DTM, and ALG files, Utility Forms, GPS Photos, and ASCII Files.
08/21-09/21	**Post Ida Emergency Services for Multibeam and LiDAR, Donaldsonville to Venice, USACE, New Orleans District, MVN** **Contract Role: Supervisor – Field Crews** – Mr. Voinche was responsible for field supervision and data collection. Chustz provided Multibeam Hydrographic Underwater Imaging, Aerial LiDAR, and Aerial Imagery surveys of the Mississippi River, locating obstructions after hurricane Ida. Deliverables included Obstruction Forms, an Orthomosaic, XYZ ASCII Files, and a Final Survey Report.
07/21-10/21	**LA 29 Bayou Cocodrie Bridge Scour Repair, Ville Platte, LADOTD, H.014633.5.** **Contract Role: Supervisor – Field Crews** – Mr. Voinche was responsible for field supervision and data collection. The types of surveys that Chustz provided were Topographic, Hydrographic, Aerial LiDAR and Photogrammetry, Static GPS, and RTK. Deliverables included Microstation InRoads DGN, DTM, and ALG files, Utility Forms, GPS Photos, and ASCII Files.
08/16-09/16	**Jimmie Davis Bridge Hydro Survey, Shreveport, DOTD Contract 4400006382, Task Order 06.** **Contract Role: Supervisor – Field Crews** – Mr. Voinche was responsible for field supervision and data collection. Chustz provided High Resolution Multibeam Underwater Imaging surveys of the Jimmie Davis Bridge in Shreveport, LA. Deliverables included a gridded XYZ file of the Multibeam survey data and a Detailed Survey Report.

16. Staff Experience:

	Firm Employed by	Chustz Surveying, LLC		
	Name	**Craig Villemarette**	Years of relevant experience with this employer	24
	Title	Party Chief	Years of relevant experience with other employer(s)	4
Degree(s) / Years / Specialization				
Active registration number / state / expiration date				
Year registered		Discipline		
Contract role(s) / brief description of responsibilities		**Party Chief**		

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
01/22-07/22	**Automated Revetment Surveys on the Mississippi, Atchafalaya, and Red Rivers, USACE, New Orleans District, LA, MVN** **Contract Role: Party Chief** – Mr. Villemarette was responsible for the supervision of his crew and hydrographic data collection. Chustz provided Automated Multibeam Underwater Imaging surveys for 456 miles on the Mississippi, Atchafalaya and Red Rivers. DGPS and Automated River Gauges were used for control. Deliverables included ASCII XYZ Files and QA/QC Reports.
11/21-12/21	**Post Ida Grand Isle Surveys, Grand Isle, USACE, New Orleans District, MVN Contract W912P8-20-D-0001.** **Contract Role: Party Chief** – Mr. Villemarette was responsible for the supervision of his crew and hydrographic data collection. Chustz provided Static GPS, Single Beam and Multibeam Hydrographic Underwater Imaging, Aerial LiDAR, and Aerial Imagery surveys of the Grand Isle jetty system. Deliverables included Static GPS Network Reports, an Orthomosaic, XYZ ASCII Files, and a Final Survey Report.
08/21-09/21	**Post Ida Emergency Services for Multibeam and LiDAR, Donaldsonville to Venice, USACE, New Orleans District, MVN** **Contract Role: Party Chief** – Mr. Villemarette was responsible for the supervision of his crew and hydrographic data collection. Chustz provided Multibeam Hydrographic Underwater Imaging, Aerial LiDAR, and Aerial Imagery surveys of the Mississippi River, locating obstructions after hurricane Ida. Deliverables included Obstruction Forms, an Orthomosaic, XYZ ASCII Files, and a Final Survey Report.
09/16-01/17	**Impala Burnside Terminal Survey, Burnside, Project No. 16-514.** **Contract Role: Party Chief** – Mr. Villemarette was responsible for the supervision of his crew and hydrographic data collection. The type of surveys that Chustz provided were RTK and Digital Level control surveys, Aerial 3D Laser Scan, Multibeam Hydrographic Underwater Imaging and Topographic surveys. Deliverables included LAS Files and gridded Multibeam Data.
08/16-09/16	**Jimmie Davis Bridge Hydro Survey, Shreveport, DOTD Contract 4400006382, Task Order 06.** **Contract Role: Party Chief** – Mr. Villemarette was responsible for the supervision of his crew and hydrographic data collection. Chustz provided High Resolution Multibeam Underwater Imaging surveys of the Jimmie Davis Bridge in Shreveport, LA. Deliverables included a gridded XYZ file of the Multibeam survey data and a Detailed Survey Report.

16. Staff Experience:

Firm Employed by	Moffatt & Nichol		
Name	**Eric Smith, PE**	Years of relevant experience with this employer	25
Title	Vice President/Sr Coastal Engineer	Years of relevant experience with other employer(s)	2

Degree(s) / Years / Specialization			MSE / 1997 / Naval Architecture and Marine Engineering BS / 1996 / Civil Engineering
Active registration number / state / expiration date			Professional Engineer: #34931 / MD / 09/2023
Year registered	2007	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities			**Navigational Study**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
09/2013-12/2014	**Port of Lake Charles New Liquid and Dry Bulk Handling, Lake Charles, LA.** **Coastal engineer** who performed a static mooring analysis to establish the preliminary locations of the breasting and mooring dolphins relative to the loading platform. M&N then performed dynamic mooring analyses to validate the berth geometry and establish a practical mooring arrangement for the design basis tankers. The mooring analyses were extended to set the maximum environmental conditions that would cause the design maximum tanker to approach the limits of the operating envelope of the loading arms. Moffatt & Nichol performed berthing energy calculations using guidelines provided by the Permanent International Association of Navigational Congress (PIANC) to establish the fender requirements for the breasting dolphins.
06/2011-07/2014	**Burnside Master Planning, Environmental Permitting, and Engineering Services, Darrow, LA.** **Senior coastal engineer** who provided project engineering to support pier design, including dynamic mooring analysis of bulkers at berth subject to wind and currents and passing vessel impact analysis for vessels transiting the Mississippi River. Provided oversight of full mission bridge simulations of docking and departure maneuvers to the berth.
04/2005-05/2008	**Sabine Pass LNG Marine Terminal, Cameron Parish, LA.** **Navigation expert** for oversight of real time LNG carrier maneuvering studies to ensure the design range of LNG carriers would safely perform the inbound and outbound transit maneuvers to the marine facilities.
08/2001-02/2005	**Paulus Hook Pier and Ferry Terminal, Jersey City, NJ.** **Coastal engineer** who developed operational and design wave conditions for pier and floating dock structures at the ferry terminal. Installed two subsurface instruments to collect wave and current data at the proposed site of the new ferry terminal and coded data reduction routines to post-process wave data. Determined that passing Hudson River ferry traffic generates operational wave energy at the site. Numerically modeled wind-generated waves to calculate design wave conditions for structural design. Created a computational panel model of floating docks to calculate motions and forces under operational conditions.

09/2014-10/2014	**Icy Strait Point Cruise Terminal, Alaska.** **Senior marine engineer** for mooring design of cruise terminal mooring. Responsible for technical oversight and QC for numerical mooring analysis of design cruise ships to fixed mooring structures with floating passenger loading platform.
8/2010-09/2014	**Dundalk Marine Terminal Fender Upgrades Study and Final Design, Baltimore, MD.** **Project manager** who performed condition inspection for fenders at Dundalk Marine Terminal (DMT), South Locust Point (SLP), and Fairfield Marine Terminal (FMT). Prepared an inspection report and recommendations for repair. Prepared construction documents to replace and repair fendering systems at DMT and FMT.
06/2015-11/2015	**ADM Barge Mooring and Navigation Studies, Barcarena, Brazil.** **Technical lead** for studies supporting the design and operation of a floating barge unloading facility. The analysis included AQWA dynamic mooring analysis of the unloader and barge subject to wind, wave, and currents to evaluate the performance of the mooring system, operational downtime, and the requirements for wave screens at the terminal. Real time maneuvering simulations modeled barge approach and departure using typical push boats.
04/2002-06/2002	**U.S. Coast Guard Station Governors Island Inspection and Repair of Ferry Slips and Transfer Bridge System, New York, NY.** **Civil engineer and diver** for inspection of two ferry berths and two transfer bridges, including timber piles and deck, steel girders, abutments, steel H piles, timber sheathing, and wales.
11/2018-12/2019	**Repauno Port and Rail Terminal Dock 2 Design, Gibbstown, NJ.** **Project Manager** for the design of a liquid bulk energy terminal on the Delaware River. The design includes two berths, 11 mooring dolphins, two loading platforms, an access trestle, and a dredge berth pocket. The design included subsurface investigation, vessel maneuvering studies, mooring analysis, and structural design to accommodate variable geotechnical and seismic conditions for liquified gas infrastructure.
01/2017-06/2017	**Cape Fear River Channel Deepening, Wilmington, NC.** **Sr. Coastal Engineer** overseeing recommended improvements to the federal channel, incorporating insights gained from studying existing ship traffic (AIS) data. Supervised real time vessel simulation testing program to validate concept channel designs for improving the Cape Fear River channel and turning basin. Evaluated ship wake impacts from larger vessels transiting in the deepened channel.
12/2015-03/2016	**Oak Point Terminal Maneuvering Studies, Bronx, New York.** **Technical lead** for maneuvering simulations of barge-based cement unloader to a space constrained terminal on the Bronx River. Real time simulations determined procedures for approach, landing, and securing barges at the terminal. Final maneuvers included deploying mooring lines from barge winches and terminal winches to hold the barge fast and walk the barge into the slip behind the unloading terminal. Provided recommendations on dredging area and operational limits at the terminal.
01/2011-07/2011	**Fraser River Navigation Simulations, Vancouver, British Colombia.** **Project engineer** who assessed the required channel widths, depths, and turning areas to maneuver post-Panamax containerships to the proposed berth on Fraser River. The analysis included the annual prediction of available transit windows, given tide and river stage conditions. Provided recommendations on channel improvements and dredging to facilitate terminal development.

16. Staff Experience:

Firm Employed by	Moffatt & Nichol		
Name	**Jeff Sheldon, PE**	Years of relevant experience with this employer	36
Title	Vice President, Sr Coastal Engineer	Years of relevant experience with other employer(s)	2

Degree(s) / Years / Specialization			MS / 1985 / Civil Engineering BS / 1984 / Civil Engineering
Active registration number / state / expiration date			Professional Engineer: #29462 / LA / 09/2023
Year registered	2001	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities			**Scour Analysis**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
07/2008-05/2011	**LA 45 Goose Bayou Hydraulic Analysis, Jefferson Parish, LA.** **Senior coastal and hydraulic engineer** for a study to define the environmental conditions and calculate wave and current forces and potential scour impacting the design of a new, two-lane bridge. Determined 100-year return interval water level, significant wave height, and maximum wave height. Used HEC-RAS to determine design flow velocities as input to determining scour potential.
08/2020-01/2022	**SR 25 MacKay River Bridge Replacement Study, Glynn County, GA.** **Senior coastal/hydraulic engineer** providing QA/QC for an unsteady 2D tidal hydraulic numerical model study to determine potential scour, storm surge, and vessel impact velocities to inform bridge foundation design.
11/2009-12/2009	**US 80 Skidaway Narrows Bridge Replacement Study, Chatham County, GA.** **Assistant project manager and senior hydraulic engineer** providing QA/QC for an unsteady 1D tidal hydraulic numerical model study to determine potential scour, storm surge, and vessel impact velocities to inform bridge foundation design.
09/2009-10/2010	**NCDOT Scour Studies for Bridges across Tidally Influenced Water Bodies, Coastal Areas, NC.** **Senior coastal engineer** who analyzed 36 coastal bridges to assess their vulnerability to tidal-induced scour, which involved the review of NCDOT data; estimation of drainage areas and upstream watershed flows; determination of tidal prism and bridge cross-section opening; determination of velocities, water depths, and scour depths for controlling flow events; and preparation of Bridge Scour Reports and Scour Evaluation Assessments for NCDOT.
04/2021-Ongoing	**US 64 Alligator River Bridge Replacement, Tyrrell / Dare Counties, NC.** **Project manager and senior coastal engineer** for a hydrodynamic study and a sea level rise probabilistic analysis to determine design parameters for evaluating scour and the low chord elevation for a replacement bridge. The study involves numerical modeling of historical hurricane events, statistical analysis, and a Monte-Carlo simulation of potential sea level rise scenarios to calculate appropriate design conditions.

04/2019-12/2020	**Mid-Currituck Bridge, Currituck County, NC.** **Project manager** for the hydraulic design of the Mid-Currituck Bridge. The project included the development of a 2D hydrodynamic model of Currituck Sound. Completed model runs for several potential hurricane tracks and extracted current velocity and water level results. Performed scour analyses and calculated the wave and current loads for the proposed bridge foundations. Reviewed an HEC-RAS model for Maple Swamp to obtain the "no-rise" MOA for the Mid-Currituck project.
06/1999-08/2004	**Route 234 Bridges over Occoquan River, Prince William and Fairfax Counties, VA.** **Senior hydraulic engineer** for river and tidal mechanics and scour analysis required to replace two existing bridges. Performed HEC-2/HEC-RAS modeling of river flows to determine water levels and performed 2D modeling using RMA-2 to confirm water levels and determine flow velocities for input to scour analysis.
06/1999-12/2009	**Route 123 Bridges over Occoquan River, Prince William and Fairfax Counties, VA.** **Senior hydraulic engineer** for river and tidal mechanics and scour analysis required to replace two existing bridges. Performed HEC-2/HEC-RAS modeling of river flows to determine water levels and performed 2D modeling using RMA-2 to confirm water levels and determine flow velocities for input to scour analysis.
07/1998-12/2000	**U-92A Smith Creek Parkway, Wilmington, NC** **Hydraulic engineer** for the hydraulic analysis and design, including scour analysis for several structures that are part of the intersection of Smith Creek Parkway with NC 117-NC 133 on the Northeast Cape Fear River.
03/2019-03/2020	**Southdock Ferry Terminal, Ocracoke, NC.** **Project manager and senior coastal engineer** providing engineering, permitting, and construction services for the NCDOT Ferry Division for an emergency repair of the Southdock Ferry Terminal. As part of this effort, hydrodynamic, morphological, and wave models of Hatteras Inlet were developed to investigate the erosion pattern near the Southdock Hairpin Turn and verify potential structure alignments to provide shoreline protection.
08/2006-09/2008	**AASHTO Guide Specifications for Bridges Vulnerable to Coastal Storms and Handbook of Retrofit Options for Bridges Vulnerable to Coastal Storms.** **Project team member** that developed a multi-level, performance-based guide specification and commentary that provides design strategies for applying loads associated with waves, surges, currents, and/or winds to determine structure responses. The team developed a retrofit manual that guides the screening and prioritization process for structures requiring structural retrofit to withstand these forces. The manual also presents suggested retrofit techniques.

16. Staff Experience:

Firm Employed by	Moffatt & Nichol			
Name	**Paul Hoo, PE**		Years of relevant experience with this employer	16
Title	Structural Engineer		Years of relevant experience with other employer(s)	19
Degree(s) / Years / Specialization			MS / 1992 / Advanced Civil and Structural Engineering BS / 1985 / Civil Engineering	
Active registration number / state / expiration date			Professional Engineer: #58062 / FL / 02/28/2025	
Year registered	2002	Discipline	Civil Engineering	
Contract role(s) / brief description of responsibilities			**Pontoon Structure Design**	

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
07/2007-10/2009	**Granville Island Public Market Marina | Vancouver, British Columbia | Canadian Housing & Mortgage Corp.** **Project manager** for the design and construction of a new public marina, ferry docks, and handicap access gangways. Utilized an innovative semi-floating transition platform for the handicap access. Other components of the project included preparation and submission of a permit application to the Vancouver Fraser Port Authority, and prepared detailed cost estimates for the work, specifications, and construction supervision.
03/2007-04/2007	**Vancouver Convention Centre Expansion – Mega Yacht Marina and Float Plane Facilities | Vancouver British Columbia | Harbour Navigation Ltd** **Project manager** for preparation of concepts and preliminary design of the new float plane base facilities and 50-slip mega-yacht marina in the water lot in front of Vancouver's new waterfront convention centre.
02/2010-06/2012	**South Harbour Expansion | Powell River, British Columbia** **Project manager** responsible for the expansion of the south harbour, marina and waterfront improvements that included reconfiguring two existing rubble mound breakwaters to allow for an expanded harbour, supply and install new floats, pilings, gangway, and utilities. The harbour expansion accommodates an additional 35 - 40 vessels ranging in length from 30ft up to 60ft.
03/2012-04/2013	**Fleet Diving Unit (Pacific) | Colwood, British Columbia** **Project manager/structural engineer** responsible for the conceptual design for a replacement floating dock, and moorings at the existing G-Jetty site. Project involved interacting with a multi-discipline team to refine concepts and layouts for the floating dock and the shoreline interface.
03/2008-05/2015	**Detailed Design of Boat Ramp at Nakusp | BC Hydro, British Columbia** **Project manager** for the detailed design of a replacement boat launch ramp at Nakusp on the Upper Arrow Lakes Reservoir. The project involved demolition of an existing timber trestle boat launch ramp, provided a replacement 30-metre-wide gravel filled ramp, scour protection, and floating walkway.

07/2007–05/2011	**Detailed Design of Boat Ramps at McDonald Creek, Burton, and Fauquier | British Columbia | BC Hydro** **Project manager** for the detailed design of improvements to the existing boat launch ramps at McDonald Creek Provincial Park and Fauquier, and a new boat launch ramp at Burton including highway entry/exit design on the Upper Arrow Lakes Reservoir. The project involved providing turnarounds, ramp extensions, floating log breakwaters, floating walkways and abutments, new parking area and site access roads.
05/2008-04/2013	**Detailed Design of Boat Ramps at Valemount, Bush Harbour and Centennial Park | British Columbia | BC Hydro** **Project manager** for the detailed design of improvements to the existing boat launch ramps at Valemount, Bush Harbour on the Kinbasket Reservoir, and Centennial Park on the Mid-Columbia River. The project involved providing turnarounds, ramp extensions, floating log breakwaters, walkways and abutments, new parking area, and site access roads.
03/2005-12/2005	**Penticton Marina | Penticton, British Columbia | Greyback Construction Ltd.** **Structural engineer** responsible for the design of the timber breakwater, mooring piles for floats, and restaurant floor slab and support piles. Design incorporated a gap between the bottom of the timber panels and the lake bed to allow water to circulate into the enclosed area and fish to pass under the structure. The steel pipe piles supported the reinforced concrete floor suspended slab above the lakebed.
05/2004-07/2004	**Queen Charlotte City Gangway Approach Design | Charlotte City, British Columbia | Department of Fisheries and Ocean Queen** **Structural Engineer** who prepared design calculations and details for a steel walkway trestle and ramp for relocation of floats at the Queen Charlotte Marina, in accordance with CAN/CSA-S16.1-M89 Limit States Design of Steel Structures.
06/2005-09/2005	**Design of Relocated Seaplane Floats, Barge and Walkway Supports | Vancouver, British Columbia | West Coast Air** **Structural engineer** who designed the proposed relocation of the seaplane floats including piled moorings for floats, walkways, and coordination of the electric power supply for the terminal buildings.
04/1992-07/1992	**FPL's 28 MW Floating Power Plant | Rockfort, FL | Florida Power and Light Company** **Engineer** involved in the supervision of the dredging in front of the existing 40 MW power plant at Rockfort to accommodate FPL's 28 MW power range.
08/2004-10/2004	**Fuel Barge Relocation | Port Hardy, British Columbia | Petro Canada** **Engineer** who investigated various options for a replacement floating breakwater for Port Hardy and provided cost estimates.
08/2004–10/2004	**Pacific Marine Training Institute Mooring Design | N. Vancouver, British Columbia | Fraser River Pile & Dredge Ltd.** **Structural engineer** who prepared the designs for the mooring anchors for the floating pontoon dock.

16. Staff Experience:

<table>
<tr><td rowspan="3">  </td><td>Firm Employed by</td><td colspan="3">Moffatt & Nichol</td></tr>
<tr><td>Name</td><td>Kevin Hanegan, PE</td><td>Years of relevant experience with this employer</td><td>11</td></tr>
<tr><td>Title</td><td>Coastal Engineer</td><td>Years of relevant experience with other employer(s)</td><td>2</td></tr>
<tr><td colspan="3">Degree(s) / Years / Specialization</td><td colspan="2">PhD / 2020 / Coastal Hydrodynamics and Morphology
MS / 2011 / Coastal and Marine Engineering and Management
BS / 2009 / Civil Engineering</td></tr>
<tr><td colspan="3">Active registration number / state / expiration date</td><td colspan="2">Professional Engineer #41433 / LA / 9/2023</td></tr>
<tr><td>Year registered</td><td>2017</td><td>Discipline</td><td colspan="2">Civil Engineering</td></tr>
<tr><td colspan="3">Contract role(s) / brief description of responsibilities</td><td colspan="2">Coastal modeling</td></tr>
<tr><td>Experience dates (mm/yy–mm/yy)</td><td colspan="4">Experience and qualifications relevant to the proposed contract; i.e., “designed drainage”, “designed girders”, “designed intersection”, etc. Experience dates should cover the years of experience specified in the applicable MPR(s).</td></tr>
<tr><td>01/2014-01/2017</td><td colspan="4">Increase Atchafalaya Flow to Eastern Terrebonne Marshes Project Feasibility and Schematic Design, St. Mary and Terrebonne Parish, LA.
Assistant Project Manager and Hydraulic Engineer for the Increase Atchafalaya Flow (TE110) Project, part of the 2012 LA Coastal Master Plan, includes dredging of the Gulf Intracoastal Waterway (GIWW) and installation of a diversion structure at the Bayou Boeuf Lock to increase the amount of freshwater reaching the Central Terrebonne Marshes. A feasibility study was conducted to recommend the preferred project alternative to maximize benefits while reducing costs and adverse impacts. Assisted in the development of an advanced hydrodynamic, salinity, and ecologic model to predict the changes in vegetation community type and land loss for a 50-year period in the future for both the Future without Project and Future with project conditions. A first of its kind, the model couples a MIKE21-FM model of the Lower Atchafalaya River, the GIWW, and the Terrebonne marsh area to a wetland morphology module that predicts accretion, marsh collapse, and community switching. With this model, the project team analyzed the long-term land loss and community change for several project configurations, basing the alternative evaluation on the project goal of land loss prevention. Additional modeling was conducted to optimize project cost and diversion operation so that the project benefits of land loss prevention could be realized while minimizing flooding and navigation impacts. Also assisted in the preliminary design of project features, including diversion channel dimensions, bed protection, and dredging extents. Determined the optimal diversion channel geometry, established control structure elevations and operational regime, and developed conceptual design of navigation structures based on a detailed navigation assessment.</td></tr>
<tr><td>08/2016-08/2019</td><td colspan="4">New Orleans Municipal Yacht Harbor Rehabilitation, New Orleans, LA.
Coastal engineer who performed and supervised the development of coastal and environmental design criteria for a floating dock system. Determined offshore extreme and operational wave conditions and simulated their propagation and transmission into the harbor using a Business model. Performed hydrologic modification impact assessment to obtain relevant coastal use permits.</td></tr>
</table>

11/2009-12/2016	**San Francisco and Sausalito Ferry Terminal Improvements, San Francisco Bay, CA.** **Coastal engineer** who developed MIKE-21 SW wind-wave model of the San Francisco Bay for determining extreme wave loads impacting the proposed new San Francisco and Sausalito ferry terminal boarding floats. As part of the modeling effort, a comprehensive extreme analysis of all wind measurements near the project area was performed to determine the most appropriate for use in the wave-generation modeling. Once the design wave conditions were determined, the floating body hydrodynamics modeling software ANSYS-AQWA was used to determine extreme mooring loads for design of float mooring piles. An innovative, MATLAB-based tool was developed to extract time-dependent wave-induced pressures from the AQWA results for direct use as load cases in structural modeling software, allowing more precise design of float structural components. An additional methodology was developed to calculate the wave induced pressure at float elements above the still water level which are not represented in AQWA.
10/2018-01/2019	**Tensaw Bridge Replacement – Seawall Design, Mobile, AL.** **Coastal engineer** responsible for determining environmental design criteria for the seawall to protect abutments for the proposed Tensaw Bridge replacement. An iterative design process analyzed protection options including a seawall, revetment and hybrid approaches.
11/2012-12/2016	**Kaneohe Bay Marina Improvement, Marine Corps Base, HI.** **Coastal engineer** who developed an ANSYS-AQWA model of the proposed floating wave attenuator for the Kaneohe Bay Marina Improvement Project. Analyzed motions and mooring forces under extreme wave loading for input into the mooring pile system design process.
10/2012-12/2012	**Gibsons Landing Harbour – Modeling and Analysis of Dual Float, Gibsons, British Columbia, Canada.** **Coastal engineer** who developed MIKE-21 SW wind-wave generation model of Howe Sound in British Columbia to determine design and operational wave conditions at Gibsons Landing Harbour. The wave parameters were then used to develop an ANSYS-AQWA model of a proposed berthing float at the harbor to calculate the expected float motions and mooring forces. The expected operability of the float was calculated from the motion results based on several operability criteria, and the mooring forces were determined so that the pile mooring system could be designed to withstand extreme storm conditions.

16. Staff Experience:

Firm Employed by	Moffatt & Nichol		
Name	**Maged El-Mestkawy, PE**	Years of relevant experience with this employer	1
Title	Civil Engineer	Years of relevant experience with other employer(s)	23

Degree(s) / Years / Specialization			PhD / 1998 / Civil/Geotechnical Engineering MS / 1992 / Civil/Structural Engineering BS / 1984 / Civil/Structural Engineering
Active registration number / state / expiration date			Professional Engineer #200399 / MD / 3/2/2025
Year registered	1999	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities			**Vessel impact loads on mooring and fender structures**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
04/2010 - 07/2010	**Port Mann Bridge, British Columbia MOT, Vancouver, BC.** **Senior marine engineer** for Level III design check of vessel collision loads on the proposed bridge pylons. Reviewed current and future vessels fleet characteristics, passing under the Port Man Bridge. Performed independent evaluation of seasonal water level variation and current aberrancy probability, and Geometric probability. Independently, estimated the barge collision force on the bridge pylons.
10/2022 - Ongoing	**Louisiana Department of Transportation & Development (LADOTD) Underwater Bridge Inspections, Statewide.** **Marine engineer** providing inspections of submerged elements performed in accordance with the FHWA, BIRM, AASHTO MBE, current NBIS requirements and LADOTD engineering and maintenance directives. Bridge types included movable swing span bridges, bascule bridges, truss bridges, timber stringer bridges, cable-stayed bridges, single and multi-span bridges up to 8 miles in length.
03/1998 - 01/1999	**Maryland Transit Administration, Baltimore, MD. Comprehensive inspection of the subway structures.** **Project engineer/team leader** for the structural inspection of the subway including tunnels, stations, ventilation shafts and miscellaneous structures. The scope of work included concrete and steel sampling, testing, and preparing reports including inspection findings, recommendations, repair actions, cost estimates, and repair prioritization.
03/1999 - 04/2000	**Biannual Safety Inspection of On-Service Bridges, Cecil and Carroll Counties, MD.** **Inspection team leader** of several concrete and steel bridges including field inspection, damage assessment, and reporting to federal, state and local authorities.
01/2009 - 08/2010	**Nunavut - Mary River Project, Baffinland Iron Mines Corporation, Canada.** **Manager/lead engineer** for basic engineering design of iron export terminal in Steensby Inlet Baffinland. Offshore ore loading berth. Designed access trestle and wharf deck slab, girders, and concrete caissons. Evaluated the floating ice impact load and designed the concrete ice deflector.

16. Staff Experience:

	Firm Employed by	Moffatt & Nichol		
	Name	**Teodors Ribakovs**	Years of relevant experience with this employer	18
	Title	Coastal Engineer	Years of relevant experience with other employer(s)	0

Degree(s) / Years / Specialization	BS / 2005 / Ocean Engineering
Active registration number / state / expiration date	
Year registered / Discipline	
Contract role(s) / brief description of responsibilities	**Vessel impact loads on mooring and fender structures**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
03/2021-06/2021	**Port Everglades General Planning Consultant Services, Work Authorization #2 Cruise Vessel Mooring and Berthing Analysis for Berth 4 Slip 2, Fort Lauderdale, FL.** **Marine lead** for a berthing and static mooring analysis for three specific cruise vessels at Slip 2, Berth 4 at Port Everglades. Mooring analysis was completed using the OPTIMOOR program, developed by Tension Technology International. Performed a berthing energy calculation to determine the limiting approach velocity allowed for incoming cruise vessels to avoid exceeding the capacity of the existing fender system at Berth 4. Additionally, calculated the berthing impact energy required to be absorbed by the fender system from PIANC's "Guidelines for the Design of Fender Systems 2002" for the largest draft and displacement cruise vessel at the loaded draft. The feasibility of accommodating the three specific cruise vessels at Slip 2 (Berth 4) was assessed by completing a static mooring analysis, which examined each cruise vessel in a portside side-to and a starboard side-to configuration. Responsible for recommended Berth 4 upgrades, which included the replacement of ten bollards as well as two new high wind bollards and the addition of ten new fenders, which spans the length of anticipated parallel midbody contact with new vessels. Oversaw the preparation of the Class 5 cost estimate.
03/2018-08/2018	**ENLINK – Floating Dock Facility Evaluation, Geismar, LA.** **Marine lead** for a mooring/berthing analysis and structural evaluation for the floating dock facility on the Mississippi River in Geismar. Project established limitations in approach velocity, such that the capacity of the support piles of the floating dock is not exceeded. Berthing analyses were to be conducted for an LPG tanker and two rafted 25,000 BPD barges, including the accompanying tug.
10/2016-02/2018	**TxDOT Galveston-Bolivar Ferry Landing Repairs, Galveston-Bolivar, TX.** **Mooring-lead** in charge of performing berthing energy calculations related to the design of dolphins which accommodate Bolivar ferry landings. The contract included line items to repair and replace existing ferry landing ramps, landing towers, landing a-frames, work docks, monopiles, marine fenders, wing walls, outer dolphins, gangways, navigation lights, retro-reflective material, paint, rust removal, and the introduction of new technology to upgrade the present structures for less repairs and preventative maintenance. Reviewed proposed designs for fender systems.

11/2011-06/2012	**Lake Charles Refinery Dock 1 and 2 Rehabilitation, Lake Charles, LA.** **Marine lead** for marine engineering services to repair Docks 1 & 2 at ConocoPhillips' Lake Charles Refinery Westlake Marine Terminal. The project includes an analysis of the existing and new structures and the berthing and mooring capabilities. Studies included marine loading arm optimization, pipework optimization, and 100-year flood events, considering waves and sea-level rise. Moffatt & Nichol also developed working envelopes to ensure gangway access for barge personnel and provide miscellaneous mechanical and electrical design.
08/2016-Ongoing	**Venture Global, Plaquemines Parish, LA.** **Marine engineer** working with the owner for engineering, procurement, and construction (EPC) level design of an LNG facility in Plaquemines Parish, Louisiana. The work included supporting the development of marine facilities basis on design, MetOcean study, storm surge study, vessel maneuvering and navigation study, development of material offloading facilities, development of LNG marine facilities layout, preliminary structural design, and specifications.
01/2014-01/2015	**American Styrenics, Deep Draft Dock Along Mississippi River.** **Marine lead** for developing a new deep draft dock that accommodates chemical tankers and barges. Duties include the development of a new layout to accommodate the design range of vessels and barges, providing specifications for the fender system, which must accommodate ranging river level elevations of the Mississippi River, providing specifications for marine loading arms, oversight of mooring analyses to ensure layout satisfies OCIMF and PIANC recommendations.

16. Staff Experience:

	Firm Employed by	Pelican Marine Design, LLC		
	Name	**William D. Scherer, PE**	Years of relevant experience with this employer	10
	Title	Managing Partner	Years of relevant experience with other employer(s)	20
Degree(s) / Years / Specialization			B.S. / 1993 / Naval Architecture & Marine Engineering /	
Active registration number / state / expiration date			Professional Engineer #30117 / LA / 9/30/2024	
Year registered	2002	Discipline	Naval Architecture & Marine Engineering	
Contract role(s) / brief description of responsibilities			**Naval Architect, Project Manager**	

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
02/13 - Present	**Pelican Marine Design, LLC | St. Rose, LA** **Managing Partner & Principal Naval Architect** Developed proposals and cost estimates for numerous repair and modifications projects of riverine and offshore vessels. Provided on-site support at facilities, shipyards and onboard vessels with travel primarily in Louisiana, Florida, Texas, Washington & California. Inspected barges, ferries, pushboats, tugs and offshore supply vessels. Attended client meetings and provided guidance and advice on project scope and path. Routinely liaised with ABS, USCG and other classification societies to obtain drawing and stability approvals and requisite certificates. Performed inclining experiments and deadweight surveys on river ferries, barges and offshore supply vessels. Performed intact and damage stability analyses on river ferries, barges and offshore supply vessels. Developed engineering drawings including: general arrangements, lines plans, piping diagrams, structural arrangements, etc. to meet the requirements of the US Code of Federal Regulations, ABS and other classification societies. Developed weight estimates and material take-off lists. Designed and analyzed extensive structural modifications to deck and tank barges for mission systems. Designed installations of deck outfitting items like bitts, chocks, kevels and winches. Performed equipment sizing, selection and specification. Interacted with equipment vendors for proper selection & installation. Performed structural analysis of wheel loading on several deck barges. Designed and analyzed a 45 ft ramp for dump truck access to a large material barge in Baton Rouge, LA.
09/13 – 12/13	**M/V Pointe-A-La-Hache | Harvey, LA | Plaquemines Parish** **Managing Partner** that provided necessary submittals to the USCG Marine Safety Center for the modifications performed by the shipyard on the M/V POINTE A LA HACHE (150'x60'x10' ferry owned by Plaquemines Parish, LA). Pelican was retained to complete necessary submittals to the USCG Marine Safety Center so that an updated stability letter could be obtained. The vessel had minimal drawings and documentation so Pelican generated various drawings so that the submittal could be completed. He worked with the local USCG representative to take measurements of the hull. These measurements were used to create a hull lines plan, outboard profile and tank arrangement drawing. Pelican performed an inclining experiment to the satisfaction of the USCG and later performed the intact and damaged stability analysis. Pelican also created the stability test procedures, stability test report and intact and damaged stability analysis for submittal to USCG Marine Safety Center.

07/16 – 11/16	**Center Point Barge Conversion | Port Allen, LA | Center Point Terminal Company** **Managing Partner** who provided engineering support for the conversion of deck barge LOCKWOOD 2001 (200'-0 x 48'-0 x 12'-0") to a terminal dock barge. He translated the client's overall desired design parameters into a preliminary and then final design which included a 26 ft extension to the candidate deck barge among other items. Work primarily included: on site survey of both the existing terminal and the candidate deck barges, participation in project meetings at the client's office in Port Allen, structural design and calculations for the 26 ft stern extension, two small hose handling crane foundations, shell reinforcement for new fenders, various deck foundations, pipe supports, a deckhouse and special bow and stern piling brackets. He also engaged in configuration control of the design with the client's drafting contractor and provided production support Q&A for the shipyard where the conversion took place.
10/93 – 09/07	**Northrop Grumman Ship Systems – Avondale Shipyard, New Orleans** **Ship Design Manager** department manager and naval architect, managed design development of complex and large commercial and military vessels. Performed standard 'design spiral' evolutions in ship designs from initial concept to preliminary, then continued into contract then detail design and carried all the way to delivery and sea trials. Managed a department of 25 personnel, responsible for technical content of deliverables as well as schedule and manhours.
10/07 – 08/11	**Elliott Bay Design Group, New Orleans** **Project Manager & Sr. Naval Architect** Routinely interacted with shipyards, vessel operators and vendors to execute vessel projects up to $1.6M in engineering fees. Responsible for schedule and budget on assigned projects. Project manager and lead naval architect for sponsoning project for the Crowley deck barge Julie B. (ex. 455-2). Managed structural and stability calculations and drawing generation and submittals for American Bureau of Shipping (ABS) review on behalf of the USCG. Also managed lofting and modeling of steel parts to be cut and assembled by shipyard. Interacted with client, ABS and shipyard. Approximate project cost $250k in engineering fees. Also inspected several inland deck barges being used for British Petroleum (BP) well remediation efforts in the Atchafalaya Basin. Executed structural and stability checks for same barges.
08/11 – 02/13	**Resolve Engineering Group, New Orleans** **Project Manager & Sr. Naval Architect** Routinely interacted with shipyards, vessel operators and vendors to execute inland and ocean-going vessel projects. Responsible for schedule and budget on assigned projects. Executed structural & stability calculations for several inland deck barges, passenger vessels and offshore supply vessels.

	Firm Employed by	Pelican Marine Design, LLC		
	Name	**Brandon Taravella, PE**	Years of relevant experience with this employer	15
	Title	Managing Partner	Years of relevant experience with other employer(s)	9
Degree(s) / Years / Specialization			Ph.D., / 2009 /Engineering & Appl Sci (NA&ME) M. S. / 2005/ Engineering (NA&ME) B.S. / 2003 /Naval Architecture & Marine Engineering (NA&ME)	
Active registration number / state / expiration date			Professional Engineer #32494 | Louisiana | 9/30/2024	
Year registered	2006	Discipline	Naval Architecture & Marine Engineering	
Contract role(s) / brief description of responsibilities			**Naval Architect**	

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
03/08-Present	**Pelican Marine Design | St. Rose** **Managing Partner & Principal Naval Architect** Represented Bollinger Quick Repair for multiple State of LA and Plaquemines Parish ferry modifications. Reviewed engineering drawings and calculations for the USCG Marine Safety Center. Performed inclining experiments and deadweight surveys on river ferries and inland pushboats. Worked with local US Coast Guard representatives to obtain Certificates of Inspection for inland river ferries. Performed intact and/or damage stability analyses on river ferries, passenger vessels (other than ferries) and inland pushboats. Provided structural calculations, docking drawings and pumping plans necessary to dry dock various vessel types including inland barges and pushboats. Created engineering drawings including: general arrangements, lines plans, piping diagrams, electrical diagrams, safety diagrams, etc. to meet requirements of the US Code of Federal Regulations. Completed steering system calculations including sizing hydraulic system components and rudder structural components for ferries and inland pushboats. Performed structural calculations to ABS standards for inland river ferries, inland pushboats and barges Designed structural modifications to existing engine/gear foundations to accept new engines/gears for vessel repower (ferries and pushboats). Executed design of several small inland deck barges built in LA and FL.
09/13 – 12/13	**M/V Pointe-A-La-Hache | Harvey, LA | Plaquemines Parish** **Managing Partner** that provided necessary submittals to the USCG Marine Safety Center for the modifications performed by the shipyard on the M/V POINTE A LA HACHE (150'x60'x10' ferry owned by Plaquemines Parish, LA). Pelican was retained to complete necessary submittals to the USCG Marine Safety Center so that an updated stability letter could be obtained. The vessel had minimal drawings and documentation so Pelican generated various drawings so that the submittal could be completed. He worked with the local USCG representative to take measurements of the hull. These measurements were used to create a hull lines plan, outboard profile and tank arrangement drawing. Pelican performed an inclining experiment to the satisfaction of the USCG and later performed the intact and damaged stability analysis. Pelican also created the stability test procedures, stability test report and intact and damaged stability analysis for submittal to USCG Marine Safety Center.

04/18 – 04/18	**Landing Barge 304-004 Modifications | Harvey, LA | State of Louisiana** **Managing Partner** for the modifications performed by the shipyard on ferry Landing Barge 304-004 (owned by the State of Louisiana). Provided engineering calculations and drawings for the structural and electrical modifications.
03/13 – 03/13	**M/V Belle Chasse II | Harvey, LA | Plaquemines Parish** Managing Partner for the intact and damaged stability analysis required for the modifications to the M/V Belle Chasse II ferry (144'x55'x8' ferry owned by Plaquemines Parish, LA). These modifications included the addition of two potable water tanks. Pelican Marine Design, LLC was contracted to perform an intact and damaged stability analysis and submit the stability report to the USCG Marine Safety Center so that a Stability Letter could be obtained. Pelican Marine Design, LLC performed the analysis and submitted the report.
05/01 – 03/08	**Northrop Grumman Ship Systems – Avondale Shipyard, New Orleans** **Naval Architecture Supervisor** supervised design development of complex and large commercial and military vessels. Performed standard 'design spiral' evolutions in ship designs from initial concept to preliminary, then continued into contract then detail design and carried all the way to delivery and sea trials. Supervised a group of 12 personnel, responsible for stability calculations, weight estimating and structural calculations.

16. Staff Experience:

	Firm Employed by	Urban Systems, Inc.		
	Name	**Alison C. Michel, PE, PTOE, PTP, RSP$_{2i}$**	Years of relevant experience with this employer	21
	Title	President/Transportation Engineer	Years of relevant experience with other employer(s)	3

Degree(s) / Years / Specialization			BS / 1997 / Civil Engineering
Active registration number / state / expiration date			Professional Engineer #30261 / LA / 3/31/2025 Professional Traffic Operations Engineer #1023 / LA / 11/06/2023 Professional Transportation Planner #626 / LA / 11/20/2023 Road Safety Professional #115 / LA / 12/21/2024
Year registered	2002	Discipline	Professional in Charge of Traffic Engineering Tasks
Contract role(s) / brief description of responsibilities			**Traffic Engineering/Design Analysis, and TMPs**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
04/09 -08/12	**Sangani Boulevard Widening | City of D'Iberville | Seymour Engineering** **Signal, Striping/Signage:** Ms. Michel designed prepared traffic signal design/modification plans, striping and signage plans, traffic control devices plan for the sequence of construction and prepared a construction cost estimate for the Sangani Boulevard Widening project in D'Iberville, MS. Ms. Michel assisted with coordination between multiple stakeholders which included the City, MDOT and the business owners. Special attention was given to maintain access to businesses during the various phases of construction.
02/10 -07/10	**LPV 16.2 Bonnabel Boulevard Floodgate | Jefferson Parish, LA | US Army Corps of Engineers** **TCDP:** Ms. Michel designed the traffic control devices plans for construction of the LPV 16.2 Bonnabel Blvd. Floodgate in Jefferson Parish, LA. Plans included: haul routes, bypass for the ramp tie in to Bonnabel; diverting Bonnabel southbound traffic to the temporary bypass ramp; and diverting northbound traffic to Bonnabel southbound travel lanes. Plan changes due to unforeseen conditions included details for floodwall construction diverting Bonnabel northbound and southbound traffic to the temporary roadway and closing Bonnabel Boulevard. The plans met US Army Corps of Engineers, Jefferson Parish and MUTCD standards. Inspections were conducted after any changes to the traffic control plan and/or at thirty (30) day intervals.
03/11-05/13	**Huey P. Long Bridge Widening - (West & Eastbank Approaches and Main Bridge Deck) |Jefferson Parish, LA | Kiewit Massman** **TCDP:** The contractor for the Huey P. Long Widening in Jefferson Parish, LA brought on USI about half-way into construction to improve the flow of traffic during required closures. Ms. Michel prepared traffic control devices plans (TCDP) for multiple phases of construction. The TCDPs also included the design of a traffic signal plan for the installation of temporary signal heads to control lane shifts.

01/09 -04/12	**East Route of the Thibodaux East-West Connector Stage 0 Feasibility Study | Thibodaux, LA | Duplantis Design Group** **Traffic Engineering Studies**: Ms. Michel was project manager for the traffic study portion of a Stage 0 Feasibility study to evaluate alternative traffic control at the intersection of LA 20 (Canal Boulevard/Jackson Street) at Thompson Place/Back Street to provide access to accommodate a proposed east-west connector road through Thibodaux, LA. The subject intersection is a five-legged intersection formed by Jackson Street, Back Street, Thompson Place, and Canal Boulevard. Volume and intersection control data were analyzed using HCS+ software for the unsignalized and signalized intersections and SIDRA software for roundabouts to generate Level of Service and delay estimates for each location. Intersection geometry was modeled using VISSIM software to determine the expected operation. Roundabouts were analyzed using SIDRA software.
01/12 - 04/12	**I-12 to Bush Environmental Impact Statement Route LA 3241, St. Tammany Parish, LA, Tetra Tech, Inc.** **Environmental Study:** Ms. Michel was the project manager for the traffic study associated with the I-12 to Bush Environmental Study. She led the team that conducted field investigations on existing routes to document existing conditions, note traffic patterns and traffic control devices, identify any existing safety concerns, and examine potential tie-in points for the new alignment.

16. Staff Experience:

	Firm Employed by	Urban Systems, Inc.		
	Name	**Nicole H. Stewart, PE, PTOE**	Years of relevant experience with this employer	17
	Title	VP / Transportation Engineer	Years of relevant experience with other employer(s)	1

Degree(s) / Years / Specialization			BS / 2004 / Civil Engineering
Active registration number / state / expiration date			Professional Engineering #34750 / LA / 9/30/2023 Professional Traffic Operation Engineer #2923 / LA / 8/2023
Year registered	2012	Discipline	Professional Traffic Operation Engineering
Contract role(s) / brief description of responsibilities			**Traffic Engineering/Design Analysis, and TMPs**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
04/10-09/11	**I-10 Crossing - Irish Bayou Bridge, New Orleans, LA, Barriere Construction Co.,LLC** **TCDP:** Ms. Stewart was the project manager for this project which involved designing traffic control devices plans for the I-10 Highway Crossing Levee Enlargement project at Irish Bayou Road in New Orleans East. The plans included multiple and phased road closures of a six (6) lane section of Interstate 10 including nighttime closures. In addition to managing the project, she was responsible for QA-QC.
06/11-03/12	**Southeast Louisiana Urban Flood Control Project Improvements To Two-Mile Canal (Patriot Street Canal), Phase I, Barataria Blvd To First Avenue Canal, Jefferson Parish, LA, Circle Construction, LLC.** **TCDP:** Ms. Stewart designed the Traffic Control Devices Plans for the improvements to the Two Mile Canal. These plans included traffic closure details, signage, flagmen, and haul routes. Ms. Stewart conducted inspections throughout construction to confirm compliance with the plans that had been approved by Jefferson Parish.
09/11-02/12	**Williams Boulevard Floodgate, Kenner, LA, Boh Bros Construction Company, LLC** **TCDP**: The design of Traffic Control devices Plans to include haul routes were prepared for the two phased closure of Williams Boulevard at the Lake Pontchartrain Levee Floodgate by Ms. Stewart. The plans were prepared in accordance with Jefferson Parish and MUTCD Standards. Once the plan was implemented MS. Stewart conducted inspections
09/10-08/11	**MacArthur Interchange Signal Modification/ Signage & Striping / Traffic Control Devices Plans Harvey, LA,** **Design Engineering, Inc.** **Traffic Operations Analysis:** The traffic study to evaluate the existing and projected operating conditions of the lower Westbank Expressway was prepared by Ms. Stewart. In the Design Phase, Ms. Stewart designed the new traffic signals for the interchange and neighboring intersections. She prepared the striping and signage plans to accommodate the ramp changes and prepared Traffic Control Devices Plans for the various stages of construction.

05/18-04/19	**TMP for I-10: West of 108 to I-210 Interchange: Rubblize and Overlay** TMP:As the lead engineer for this Traffic Management Plan, Ms. Stewart was responsible for the preparation of the safety analysis. She conducted the analysis per the guidelines set forth by LADOTD in *Guidelines for Crash Data Analysis* for this TMP in Lake Charles, LA. She conducted queue analysis to identify when lane closures would be permitted, identified the construction impact area and reviewed crash data for more than 350 collisions. Ms. Stewart identified trends and calculated crash rates and determined that the section of I-10 that was going to be rubblized had a crash rate that was higher than the statewide average and required mitigation.
04/10-07/11	**Lakefront Airport T-Walls Reach LPV 105.01, New Orleans, LA, Quality Enterprises USA Inc.** **TCDP:** Following Hurricane Katrina, USACE led a series of projects to reconstruct the T-walls and to strengthen and raise the levee system adjacent to the Lakefront Airport in Eastern New Orleans. Ms. Stewart was the engineer responsible for the traffic control devices' plans to ensure that the contractor could safely work adjacent to motorists while maintaining twenty-four-hour daily access to the Lakefront Airport. Ms. Stewart inspected the traffic control devices monthly and reported back to the contractor any deficiencies requiring corrective action.
10/12-05/14	**North Terminal Louis Armstrong New Orleans International Airport, Jefferson Parish, LA, Atkins North America, Inc.** **Signage and striping:** Ms. Stewart was the lead engineer for the design of the signage and striping plans for the landside roadways. The plans were designed in accordance with the Manual of Uniform Traffic Control devices and LADOTD standards. Ms. Stewart also prepared specifications and a cost estimate for all of the striping and signage items.

16. Staff Experience:

Firm Employed by	Urban Systems, Inc.		
Name	**Christine M. Darrah, PE**	Years of relevant experience with this employer	8
Title	Transportation Engineer	Years of relevant experience with other employer(s)	20

Degree(s) / Years / Specialization	BS / 1994 / Civil Engineering
Active registration number / state / expiration date	Professional Engineer #25828 / LA / 9/30/2023
Year registered / Discipline	Professional Civil Engineering
Contract role(s) / brief description of responsibilities	**Transportation Engineer / Design Analysis and QA/QC**

Experience dates (mm/yy–mm/yy)	Experience and qualifications relevant to the proposed contract; *i.e.*, "designed drainage", "designed girders", "designed intersection", etc. Experience dates should cover the years of experience specified in the applicable MPR(s).
03/14-present	**Transmission Line Reconductoring Projects, New Orleans, LA, Entergy** **TCDP:** Ms. Darrah designed numerous Traffic Control Devices Plans for over 100 miles of transmission line replacement to meet US Army Corps of Engineers, LADOTD, parish and MUTCD standards. The plans and specifications included, but were not limited to, the proper placement of temporary Traffic Control Devices (signs, barricades, and drums, etc.) for city street, highway and interstate closures to facilitate traffic and oversized equipment safely and efficiently through the traffic control zones. Interstate projects included lane closures, intermittent full closures and rolling closures of the interstate system. Ms. Darrah assisted Entergy with permit preparation for work on state routes and road closure request with local entities.
06/22-10/22	**Kansas City Southern KCS Acadian Thruway, East Baton Rouge Parish, Russell Marine, LLC** **TCDP:** This project included lane closures and full closure of Acadian Thruway at the KCS bridge near the I-10 interchange in East Baton Rouge Parish. Ms. Darrah prepared the Traffic Control Devices Plans applying MUTCD and LADOTD standards for proper placement of traffic control devices to facilitate traffic safely and efficiently through the traffic control zone. Additional project efforts included designing lane closures on I-10 onramp for laydown access and police-controlled haul routes.
03/21-04/21	**I-610 Transmission Line Crossing at Frenchman, New Orleans, LA, Entergy Services, Inc.** **TCDP:** Ms. Darrah was the Project Engineer for the interstate closure project to assure public safety during overhead transmission lines repairs, this included a full closure of both directions of I-610 and westbound on ramp Elysian Fields Ave, in New Orleans. Ms. Darrah coordinated the six hour interstate closure and associated detours with LADOTD and City of New Orleans, LA . She designed Traffic Control Devices Plans applying MUTCD, LADOTD and City of New Orleans standards for proper placement of traffic control devices including portable changeable message boards. Ms. Darrah utilized AutoCAD to assist in final preparation of plans.
12/14-09/15	**SELA 26 Widening of Florida Ave. Canal Phase II and III, New Orleans, LA , Boh Bros Construction Company, LLC** **TCDP:** Ms. Darrah designed Traffic Control Devices Plans for the widening of the Florida Ave. Canal and several surrounding streets. The design met US Army Corps of Engineers, LADOTD and MUTCD standards. The plans included multiple traffic control zones along Florida Ave and in the surrounding neighborhood. Detour routes were selected, and signage installed to direct motorists on Florida Ave in a single direction and around the associated closures. Haul routes were also designated.

17. Firm Experience:

Firm name	Hardesty & Hanover, LLC		Past Performance Evaluation Discipline(s)*	Bridge	
Project name	**Keller Ferry North & South Terminal & Pontoon Replacement**		Firm responsibility (prime or sub?)	Prime	
Project number	Y-11702	Owner's name	Washington State DOT – Ferries Division		
Project location	Keller, WA		Owner's Project Manager	Becky Spangle	
Owner's address, phone, email	2901 3rd Ave. Ste. 500, Seattle, WA 98121 | (206) 464-6400 | spangleb@wsdot.wa.gov				
Services commenced by this firm (mm/yy)	05/18	Total consultant contract cost ($1,000's)		$ 188	
Services completed by this firm (mm/yy)	12/19	Cost of consultant services provided by this firm ($1,000's)		$ 188	

After Washington State Ferries discovered significant corrosion on the Keller Ferry Landing floating pontoons, it was determined that the landings needed to be replaced. Hardesty & Hanover was selected to evaluate the condition of the existing mechanical and electrical systems for possible relocation and re-use with the replacement float terminal and ramp structures.

Hardesty & Hanover prepared a full mechanical and electrical system relocation PS&E for the replacement floating structures. These systems included the land and ferry transfer span winch and roller support systems, the floating pontoon winch location/anchorage system, the vessel nose guidance system and all associated electrical power (shore power feed and power distribution) design and the associated control systems design.

Plans, specifications, and estimates were all prepared in accordance with WS Ferries requirements. Detailed mechanical/electrical equipment system configurations and mountings to the new floating pontoon structure were developed and coordinated with the Washington State Ferries design team. Worn or failing machinery components were evaluated and replaced or upgraded as required.

Key members: Steve Mikucki, PE; Chris Svara, PE; Alec Noble, PE; Frank Marzella, PE; James, Gentile, PE

17. Firm Experience:

Firm name	Hardesty & Hanover, LLC		Past Performance Evaluation Discipline(s)*	Bridge	
Project name	**Fisher Island Ferry Landing Ramps Replacement**		Firm responsibility (prime or sub?)	Prime	
Project number		Owner's name	Fisher Island Community Association, Inc.		
Project location	Miami, FL		Owner's Project Manager	Michael Posey	
Owner's address, phone, email	42100 Fisher Island Dr. Miami Beach, FL 33109 | (305) 535-6000| mposey@fisherislandfica.com				
Services commenced by this firm (mm/yy)	07/21	Total consultant contract cost ($1,000's)		$ 404	
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm ($1,000's)		$ 404	

Hardesty & Hanover is designing a replacement for two ferry landing ramps on Fisher Island, Miami-Dade County, FL. This upscale residential community is accessible only via ferry, and as such, these ramp structures play an important role in connecting Fisher Island to the surrounding Miami Beach area.

Following an in-depth structural, mechanical, and electrical inspection of the ramps, H&H recommended a course of action for rehabilitation and replacement of the older, cable-pulley ramps. The new ramps will operate hydraulically, decreasing the burden of maintenance. In addition, the new ramps will be rated for AASHTO HS20, which the old ramps are not. This improvement ensures increased strength and reliability, both of which are crucial for these ramps, which run continuously all day. Due to the constraints of the location, the new ramps will be similar in appearance to the existing ramps. H&H's scope of services also included design for the mechanical and electrical systems of these ramps, as well as construction support services including but not limited to shop drawing review, RFI responses, field visits, shop inspections, and tests.

Key members: Steve Mikucki, PE; Alec Noble, PE; Tim Noles, PE; Roberto Viciedo, PE; James Gentile, PE; Travis Kimmins, PE; Andrew Barthle, PE

17. Firm Experience:

Firm name	Hardesty & Hanover, LLC		Past Performance Evaluation Discipline(s)*	Bridge	
Project name	**Staten Island Ferry:2010 Biennial Transfer Bridge Inspections**		Firm responsibility (prime or sub?)	Sub	
Project number		Owner's name	New York City DOT		
Project location	Staten Island and Manhattan, New York		Owner's Project Manager	Earl Baim	
Owner's address, phone, email	16 Court St. #1620, Brooklyn, NY 11241 | (646) 892-1350 | ebaim@dot.nyc.gov				
Services commenced by this firm (mm/yy)	01/10	Total consultant contract cost ($1,000's)		$ N/A	
Services completed by this firm (mm/yy)	06/11	Cost of consultant services provided by this firm ($1,000's)		$ 131	

Hardesty & Hanover, as a sub-consultant to McLaren Engineering Group, performed the mechanical and electrical inspection and developed the condition reports for the seven ferry slip terminals that accommodate the Staten Island Ferries, connecting Staten Island to Lower Manhattan. Our role in the project started in 2011 and ended in 2012. Three ferry slips are located on Manhattan (Whitehall Terminal) and four ferry slips are located on the Staten Island side (St. George Terminal). Each ferry slip consists of a Lower Bridge to moor the ship and transfer authorized vehicular traffic to the lower deck of the ferry, and two Upper Bridges to transfer pedestrian traffic from the waiting area of the terminal to the upper deck of the ship.

The operating machinery for each bridge consists of a complex system of operating ropes, sheaves and gear driven machinery located at the gallows tower of the ferry terminals. The bridges are connected to counterbalance weights that travel within enclosed tower legs used to support the gallows tower. The system has several safety features in case certain critical machinery components fail, including brakes, self-locking gears (worm gearing), and safety chains.

Each bridge is equipped with a separate drum controller for operation. The bridge systems are electrically interlocked, such that the lower range of motion of the upper bridges cannot interfere with the Lower Bridge in the upmost position. The bridge and counterweight positions are also monitored by several limit switches located at the bridges, as well as the counterweight guide rails. All systems are automated such that the bridges will raise due to the 6 ft +/- tidal change in NY harbor. A float that travels up and down within a tube extending down into the waterway measures the tide elevation and positions the bridges so the lower bridge is not submerged in water if unattended.

Key members: Steve Mikucki PE; Alec Noble PE; Milos Kivich PE; Robert Plocica PE

17. Firm Experience:

Firm name	Hardesty & Hanover, LLC		Past Performance Evaluation Discipline(s)*	Bridge	
Project name	**Southport and Fort Fisher Ferry Ramp Rehabilitation**		Firm responsibility (prime or sub?)	Prime	
Project number	7000018555	Owner's name	North Carolina Department of Transportation		
Project location	Southport, NC		Owner's Project Manager	Tim Sherrill, PE	
Owner's address, phone, email	1000 Birch Ridge Dr, Raleigh, NC 27699 | 919.707.6423 | tsherrill@ncdot.gov				
Services commenced by this firm (mm/yy)	11/17	Total consultant contract cost ($1,000's)		$ 202	
Services completed by this firm (mm/yy)	07/21	Cost of consultant services provided by this firm ($1,000's)		$ 202	

The North Carolina Department of Transportation's Ferry Division enlisted H&H to conduct a structural, mechanical, and electrical overview inspection of all 16 assets under the Ferry Division's purview. The purpose was to familiarize the team with the current configuration of the various NCDOT ferry division assets in advance of preparing a detailed life cycle cost analysis for each of the asset locations.

Three distinct options were studied in an effort to help the NCDOT determine the most cost-effective path forward for their ferry division assets. Comprehensive estimates were developed to aid the NCDOT in determining an annual operating budget that takes into account the maintenance, rehabilitation, replacement, dolphins, and dredging associated with those efforts required to keep a robust and active ferry system operating in a safe and reliable manner for the traveling public. Furthermore, the life cycle analysis calculations prepared for the study took into account items such as annual inflation and future wear and tear to more accurately represent operating costs on an annual basis.

Given that short-term funding for the retrofit and/or replacement of the various ferry ramps would need to happen in a systematic and staggered approach, H&H developed a proposed sequence of work to assist the NCDOT in prioritizing and planning for the proposed upgrades to the existing ferry system. The inspection and subsequent life cycle cost analysis was a fast-tracked project, with the total duration from the start of field work to delivering the final life cycle cost analysis report taking just under three months to complete.

H&H was then contracted by the NCDOT to perform the rehabilitation design of the of the first two priority structures (Southport and Fort Fisher Ferry Ramps). The design focused on simplified and streamlined structural, mechanical, and electrical details that would provide reliable operation while decreasing the Ferry Division's annual maintenance costs. Innovative cylinder and float mechanism details allowed the elimination of the high maintenance existing counterweight system. A new lift bent crossbeam and structural modifications to the lift bent improved the structural integrity while enabling the bent to behave as a structural frame. This allowed for removal of the existing counterweights without the need for additional framing or support piles. Access platform modifications allowed for safe access by maintenance personnel to the new mechanical and electrical equipment. Construction support services included shop drawing reviews, providing responses to RFI's, review of CPM schedules, witnessing shop testing, and field support including field testing.

Key members: Tim Noles, PE; James Gentile, PE; Frank Marzella, PE; Alex Noble, PE

17. Firm Experience:

Firm name	Hardesty & Hanover, LLC		Past Performance Evaluation Discipline(s)*	Bridge	
Project name	**Hatteras Island Ferry Ramps**		Firm responsibility (prime or sub?)	Prime	
Project number	7000013553	Owner's name	North Carolina Department of Transportation		
Project location	Hatteras Island, NC		Owner's Project Manager	Dan Muller	
Owner's address, phone, email	310 New Bern Ave. Raleigh, NC 27601 | 919.707.6421 | Dan.muller@dot.gov				
Services commenced by this firm (mm/yy)	12/12	Total consultant contract cost ($1,000's)		$ 104	
Services completed by this firm (mm/yy)	03/15	Cost of consultant services provided by this firm ($1,000's)		$ 104	

Hardesty & Hanover was selected to perform this two-year on-call contract with a one-year extension for the North Carolina Department of Transportation to provide movable bridge engineering services. Services under this contract include peer review of the Department's inspection practices, rehabilitation design, and construction support.

As a part of an On-Call Contract, H&H performed rehabilitation engineering services for the Hatteras Island Ferry Ramps. Scope of Services included: contract drawings and special project provisions for replacement of the mechanical and electrical systems for each of the three ferry ramps. During the design phase, H&H was able to incorporate several additional features into the design. This provided the client with additional built-in value as well as long term cost savings, which was found through the extended service interval and a more efficient operating system.

H&H assisted NCDOT with compliance shop testing of individual components. This testing was conducted at the contractor's facility to ensure the system component met the special contract provisions. Once components were tested, satisfactorily approval was given to proceed with assembly. A number of the components were shop assembled and tested as a complete assembly to which H&H provided the client with inspection and approval.

During construction, H&H provided engineering inspection as the systems were completed. This service aided in early problem detection as well as compliance with specifications. Once the construction was completed, H&H assisted the Department with final inspection and acceptance testing to verify contract compliance and to place the ramps back in service.

Key members: Tim Noles, PE; Christopher Svara, PE, Don Marinelli, PE

17. Firm Experience:

Firm name	Ardaman & Associates, Inc.		Past Performance Evaluation Discipline(s)*	Geotech	
Project name	**I-20 Mississippi River Bridge Review**		Firm responsibility (prime or sub?)	Prime	
Project number	SP No. H.004646 09-L1049 H.010603.6 13-3720 H.010612.6 20-3729	Owner's name	LADOTD		
Project location	Madison Parish, LA		Owner's Project Manager	Chris Nickel	
Owner's address, phone, email	1201 Capitol Access Road, Baton Rouge, LA		225.379.1100	Chris.Nickel@la.gov	
Services commenced by this firm (mm/yy)	10/09	Total consultant contract cost ($1,000's)		$ 7,326	
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm ($1,000's)		$ 7,326	

Ardaman conducted a geotechnical study to develop a list of technically feasible remedial alternatives to decrease the potential for ground movements to occur at the site of the I-20 Bridge. Movement of the east abutment of the bridge was first realized in 2001 during an inspection. Over the years Mississippi DOT has retained several consultants who have studied the problem, but no viable solution was identified.

Ardaman conducted a comprehensive review of past slope stability evaluations and recommendations. This task was followed by developing a refined geotechnical site characterization plan for the bank/bluff area for further analyses. Drilling operations included obtaining extremely sensitive samples containing prehistoric shear planes from the river via barge and on land, all with extremely difficult access conditions. The drilling program also included installation of geotechnical instrumentation such as Shape Accelerator Arrays, inclinometers, and vibrating wire piezometers. Engineering analyses performed included seepage and drawdown analyses and both equilibrium and finite element numerical modeling slope stability analyses.

As part of the project, Ardaman developed a full slope stabilization design and construction remediation strategy and a monitoring program for the bluff instability and ground movements affecting the existing I-20 Mississippi River Bridge.

Ardaman is currently managing a phase of the project which involves upgrading the entire instrumentation communication system. It also includes gathering and continuously monitoring various types of instrumentation data, inspects of the site and monitoring changes in topography by obtaining periodic survey data.

Key members: Megan Bourgeois, PE; Robert Jewell, PE; Dr. Albert Ayenu-Prah, PhD, PE; Robert Rousset, PE; Jim Porter

17. Firm Experience:

Firm name	Ardaman & Associates, Inc.			Past Performance Evaluation Discipline(s)*	Geotech
Project name	**I-10 Calcasieu River Bridge**			Firm responsibility (prime or sub?)	Prime
Project number	SP No. H.003931	Owner's name	LADOTD		
Project location	Calcasieu Parish, LA			Owner's Project Manager	Kristy Smith
Owner's address, phone, email	1201 Capitol Access Road, Baton Rouge, LA | 225.379.1387 | Kristy.Smith@la.gov				
Services commenced by this firm (mm/yy)	07/21	Total consultant contract cost ($1,000's)			$ 1,695
Services completed by this firm (mm/yy)	01/22	Cost of consultant services provided by this firm ($1,000's)			$ 1,695

Ardaman conducted a Geotechnical Investigation to provide preliminary field data to be used in the design phase of a project that consists of replacing the existing I-10 Calcasieu River Bridge with a new structure. The proposed alignment of the project is approximately 9 miles in length and includes improvements to I-10 near the I-210 interchange and various other interchanges including entrances, exits and service roads.

Ardaman's scope of work for this phase of the project included drilling and laboratory testing of a total of 37 deep soil borings to depths up to 220 feet below ground surface and 39 ECPTs to depths up to 80 feet below ground surface, most with difficult access. Additionally, 13 electrical resistivity (ER) geophysical survey transects up to 1,100' feet in length were performed along the alignment producing soil profiles with depths up to 219 feet below ground surface.

A total of 23 of these soil borings were performed while the drill rig was mounted on a barge in water depths up to approximately 40 feet. A total of 4 of these soil borings were completed from a drill rig mounted onto a marsh buggy in shallow water depths with thick marsh grass. A detailed safety plan was developed and adhered to throughout drilling operations. Additionally, coordination and permits with the US Coast Guard was completed in order to gain access to some of the soil boring locations while others (along with the ER surveys) located within LADOTD right-of-way near the interstate had to be coordinated with the local LADOTD district office, LA State Troopers and a certified Traffic Control Contractor.

Laboratory testing which was performed based on LADOTD standards included strength, appropriate classification testing and consolidation testing. Engineering services included supervision of the field program, development of the laboratory testing program, quality control review, development of a geotechnical database and preparation and submittal of a geotechnical data report including soil boring logs, ECPT sounding logs in the LADOTD format and soil profiles.

Key members: Robert Jewell, PE; Megan Bourgeois, PE; Dr. Albert Ayenu-Prah, PhD, PE; Robert Rousset, PE; Jim Porter

17. Firm Experience:

Firm name	Ardaman & Associates, Inc.		Past Performance Evaluation Discipline(s)*	Geotech	
Project name	**LA-1 Phases 1 and 2**		Firm responsibility (prime or sub?)	Prime	
Project number	SP No. 700-29-0112, 700-29-0130	Owner's name	LADOTD		
Project location	Port Fourchon to Leeville; and Leeville to Golden Meadow, LA		Owner's Project Manager	Ching Tsai (Phase 1) Timothy Nickel (Phase 2)	
Owner's address, phone, email	1201 Capitol Access Road, Baton Rouge, LA | 225.379.1100 | Timothy.Nickel@la.gov				
Services commenced by this firm (mm/yy)	01/03	Total consultant contract cost ($1,000's)		$ 3,400	
Services completed by this firm (mm/yy)	12/11	Cost of consultant services provided by this firm ($1,000's)		$ 3,400	

The project consisted of the construction of a replacement highway between Port Fourchon and Golden Meadow, Louisiana consisting of 17 miles of elevated roadway with pile supported approaches, low-level bridges and medium-level bridges, two elevated interchanges, and two fixed high-level bridges over navigable waterways. Once completed, the new highway will be almost as long as the Pontchartrain Bridge near New Orleans, generally regarded as the world's longest bridge. Ardaman faced an additional challenge of drilling in the sensitive marsh environment under jurisdiction of LA's Dept. of Natural Resources. This concern was addressed by developing an environmentally sensitive drilling program that included custom designing airboats mounted with drilling equipment.

Ardaman was retained by the LADOTD at the beginning of the project in 2003 and was involved through the end of 2011. The scope of services included:

- Geotechnical field exploration (field reconnaissance, rights of entry, utility location, marsh access, mobilization/demobilization, GPS location/elevation) for Phases 1 and 2; consisting of over 100 borings and CPT soundings
- Geotechnical laboratory testing services for Phases 1 and 2;
- Geotechnical design of Phase 1; and
- Pile quality assurance testing and resistance verification services during construction of Phase 1, Consisting of over 400 piles.

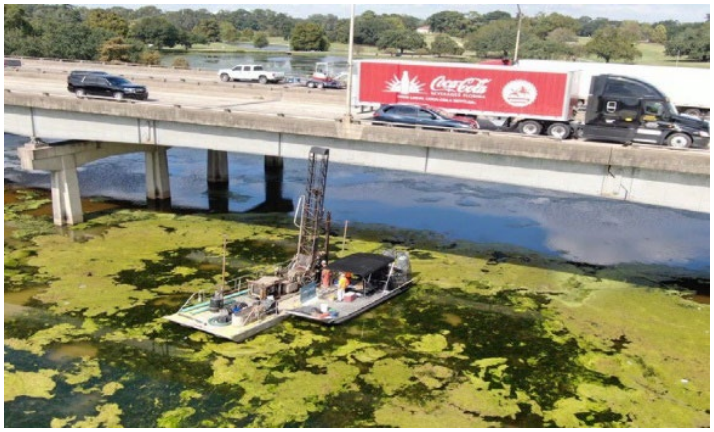
In addition to the vast scope of field investigation that included deep borings, shallow borings and ECPT soundings and laboratory testing, the scope of services for this project also included pile foundation design, testing, and inspection services.

Key members: Robert Jewell, PE; Megan Bourgeois, PE; Robert Rousset, PE; Jim Porter

17. Firm Experience:

Firm name	A P S Engineering and Testing, LLC.		Past Performance Evaluation Discipline(s)*	Geotech	
Project name	**I-10 Widening LA 415 to Essen Lane**		Firm responsibility (prime or sub?)	Sub	
Project number	H.004100	Owner's name	LADOTD		
Project location	Baton Rouge, LA		Owner's Project Manager	Kristy Smith, PE	
Owner's address, phone, email	1201 Capitol Access Road, Baton Rouge, LA | 225.379.1016 | Kristy.Smith@la.gov				
Services commenced by this firm (mm/yy)	09/19	Total consultant contract cost ($1,000's)		$ N/A	
Services completed by this firm (mm/yy)	On-going	Cost of consultant services provided by this firm ($1,000's)		$ 400	

Geotechnical investigation to provide client with the necessary information for planning and design I-10 widening. APS was tasked through our LADOTD Geotechnical Retainer to drill and sample a total of 52 deep borings staring at the Washington Exit and ending at the LSU lakes. Along with this drilling and sampling, APS will also test for strength and engineering characteristics of the soils. A total of eight over the water borings and 44 land borings will approximate 1000 triaxial compression, unconsolidated drained or undrained (UU) and Atterberg limits.



Key members:
Sergio Aviles, PE;
Sai Eddanapudi, ME, PE;
Surendra Raj Pathak, MS, PE;
Eric Bateaste

17. Firm Experience:

Firm name	A P S Engineering and Testing, LLC		Past Performance Evaluation Discipline(s)*	Geotech	
Project name	**Comite River Diversion Bridge at LA67, LA19, and LA19 Railroad Bridge**		Firm responsibility (prime or sub?)	Sub	
Project number	H.001352 and H.002273	Owner's name	Huval & Associates, Inc.		
Project location	East Baton Rouge Parish, LA		Owner's Project Manager	Thomas Gattle, III, PE	
Owner's address, phone, email	922 West Pont Des Mouton Road | 337.234.3798 | mailto:tgattle@huvalassoc.com				
Services commenced by this firm (mm/yy)	05/20	Total consultant contract cost ($1,000's)	$ N/A		
Services completed by this firm (mm/yy)	On-going	Cost of consultant services provided by this firm ($1,000's)	$ 115		

Geotechnical engineering to provide client with the necessary information for planning and building of LA 19 RR Bridge, slope stability (embankment), LA 19 Railroad Bridge – embankment /MSE wall settlement/retaining wall, LA 19 Twin Bridges – PPC piles, LA 67 bridge – drilled shafts. All the necessary design will be done. APS no issue as of today. APS also drilled and sampled all the borings for LADOTD through geotechnical retainer and tested in house by APS laboratory.

Key members:
Sergio Aviles, PE
Sai Eddanapudi, ME, PE
Surendra Raj Pathak, MS, PE
Eric Bateaste

17. Firm Experience:

Firm name	Chustz Surveying, LLC		Past Performance Evaluation Discipline(s)*	Survey	
Project name	**Mississippi, Atchafalaya, and Red River Revetment Surveys**		Firm responsibility (prime or sub?)	Prime	
Project number	W912P8-20-C-0057	Owner's name	New Orleans Army Corps of Engineers		
Project location	Throughout the New Orleans District		Owner's Project Manager	M. Damien French	
Owner's address, phone, email	7400 Leake Ave. New Orleans, LA | 504.862.1865 | Michael.d.french@usace.army.mil				
Services commenced by this firm (mm/yy)	01/22	Total consultant contract cost ($1,000's)		$ 1,182	
Services completed by this firm (mm/yy)	07/22	Cost of consultant services provided by this firm ($1,000's)		$ 1,182	

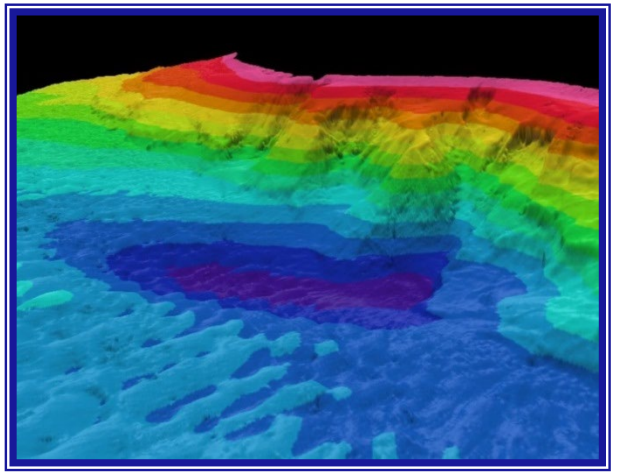
Chustz Surveying (CSI) was tasked to perform the Multibeam Hydrographic Surveys for the Automated Revetment Surveys on the Mississippi, Atchafalaya and Red Rivers including the Old River Control Channels from Mile 326.0 to Mile 0.0 utilizing multibeam hydrographic and real time mobile terrestrial laser scanning survey methods.

CSI developed a strategic work plan to cover as much geographic area as possible deploying multiple survey vessels on all three waterways to efficiently collect the data. Data was collected and transported back to the office on a daily basis for processing, editing, combining and transmittal. A Riegl VZ400 laser scanner, an R2Sonic 2024, an R2Sonic 2022, and our Echoboat unmanned survey drone equipped with a R2Sonic 2020 multibeam echosounder were utilized to perform these tasks, each with its own specialized application.

The hydrographic data was processed by highly trained technicians with the latest version of HYPACK while the laser data is processed with Terrascan. All of the current data is compared to historical data as part of our QA/QC process prior to transmittal.

CSI has extensive experience with multibeam surveying and is confident in our ability to collect the most accurate data, while meeting or exceeding the requirements of the latest version of the USACE New Orleans District Guide for Minimum Survey Standards. All surveys were conducted in accordance with the then current USACE Engineer Manuals.

Members Utilized in this Project Submittal: James H. Chustz, Jr., PLS; Julian A. Chustz, PLS; Mark Huber, CH., Robbie Benoit, Mark Voinche, CST, Craig Villemarette, Blake Conner, Mason Dupre, LSI



Multibeam data revealing scouring along the bank of the Mississippi River

Scope of Work Relevant to the Contract:

- HYDROGRAPHIC SURVEYS

17. Firm Experience:

Firm name	Chustz Surveying, LLC		Past Performance Evaluation Discipline(s)*	Survey	
Project name	**LA 20: LA 304 – LA 307**		Firm responsibility (prime or sub?)	Prime	
Project number	H.014728.5	Owner's name	Louisiana Department of Transportation and Development		
Project location	Chackbay, LA		Owner's Project Manager	Stan Ard, PLS	
Owner's address, phone, email	1201 Capitol Access Rd. Baton Rouge, LA | 225.379.1102 | Stanley.ard@la.gov				
Services commenced by this firm (mm/yy)	03/22	Total consultant contract cost ($1,000's)	$ 204		
Services completed by this firm (mm/yy)	08/22	Cost of consultant services provided by this firm ($1,000's)	$ 204		

Chustz Surveying was tasked to conduct a comprehensive topographic and hydrographic survey along 5 miles of LA HWY 20 from LA HWY 304 to LA HWY 307. The survey extended from apparent right-of-way to apparent right-of-way with cross sections every 50 feet. All roads, utilities above and underground, including all sewer, water, electric, telephone, television, gas, pipelines, and traffic utilities were part of the survey.

To accomplish this, Chustz deployed multiple crews to the job site to conduct the static GPS Control surveys utilizing Trimble GPS/GNSS receivers. Prior to the GPS survey, LA OneCall was notified and the site was marked. Once control was established, the crew collected the required topographic, hydrographic, and utility data. Hydrographic data was collected from our CEE-USV unmanned single beam survey drone. The crews collected data at and accessed all manholes to acquire shots at all pipe/catch basin inverts along with measuring all pipe dimensions and creating sketches.

Due to heavy traffic, Chustz collected the required road and bridge data with aerial LiDAR from our Reigl Ricopter sUAS equipped with a Reigl VUX-1uav laser scanner. In addition, Chustz collected Aerial Photogrammetry surveys from our SenseFly eBee X survey drone to provide real-time high resolution aerial imagery. Once all data was processed it was then mapped in Microstation InRoads and final deliverables included DGN, DTM, ALG, and ASCII files.

Members Utilized in this Project Submittal: James H. Chustz, Jr., PLS; Julian A. Chustz, PLS; Mark Huber, CH., Robbie Benoit, Mark Voinche, CST, Craig Villemarette, Blake Conner, Mason Dupre, LSI

Our Riegl Ricopter LiDAR sUAS

Scope of Work Relevant to the Contract:

- TOPOGRAPHIC SURVEYS
- HYDROGRAPHIC SURVEYS

17. Firm Experience:

Firm name	Chustz Surveying, LLC		Past Performance Evaluation Discipline(s)*	Survey	
Project name	**LA 73 Bayou Manchac Bridge**		Firm responsibility (prime or sub?)	Prime	
Project number	H.012563.5	Owner's name	Louisiana Department of Transportation and Development		
Project location	Prairieville, LA		Owner's Project Manager	Eric Lanier, PLS	
Owner's address, phone, email	1201 Capitol Access Rd Baton Rouge, LA | 225.379.1101 | Eric.lanier@la.gov				
Services commenced by this firm (mm/yy)	11/21	Total consultant contract cost ($1,000's)	$ 101		
Services completed by this firm (mm/yy)	02/22	Cost of consultant services provided by this firm ($1,000's)	$ 101		

Chustz Surveying was tasked to conduct a bridge scour repair survey at Bayou Cocodrie. The survey along Bayou Manchac extended a minimum 175 feet upstream and 175 feet downstream from the faces of the bridge and extended a minimum 1150 feet south of the southern end of the bridge to 1675 feet north of the southern end of the bridge. A complete topographic survey including all utilities and all drainage features were surveyed. Bridge features surveyed included top of roadway deck elevations along centerline and right/left gutterlines, top of guard rail elevations, and centerline of bridge pier locations.

To accomplish this, Chustz deployed multiple crews to the site to begin the static GPS survey utilizing Trimble GPS/GNSS receivers. Once control was established, the crew began collecting the required toporaphic data using RTK and conventional survey methods with total stations.

Due to the narrow bridge and heavy traffic, Chustz had to collect the required bridge data using aerial LiDAR from our Reigl Ricopter sUAS equipped with a Reigl VUX-1uav laser scanner. Additional terrestrial LiDAR was collected to determine bridge pile centerlines and any other required bridge features from below. All data was processed utilizing Trimble Business Center where it was adjusted and constrained to the static GPS. The data was then mapped in Microstation InRoads and final deliverables included DGN, DTM, ALG, and ASCII files.

Scope of Work Relevant to the Contract:

- TOPOGRAPHIC SURVEYS
- HYDROGRAPHIC SURVEYS

Members Utilized in this Project Submittal: James H. Chustz, Jr., PLS; Julian A. Chustz, PLS; Mark Huber, CH., Robbie Benoit, Mark Voinche, CST, Craig Villemarette, Blake Conner, Mason Dupre, LSI

17. Firm Experience:

Firm name	Moffat & Nichol	Past Performance Evaluation Discipline(s)*	Bridge		
Project name	**Burnside Bulk Coal Terminal Development**		Firm responsibility (prime or sub?)	Prime	
Project number		Owner's name	Trafigura Mexico		
Project location	Darrow, LA		Owner's Project Manager	Gustavo Fernandez	
Owner's address, phone, email	Rue de Jargonnant 5, Geneva, 1207| +41 (0) 22 594 6900| gustavo.fernandez@trafigura.com				
Services commenced by this firm (mm/yy)	06/11	Total consultant contract cost ($1,000's)	$ 9,000		
Services completed by this firm (mm/yy)	07/14	Cost of consultant services provided by this firm ($1,000's)	$ 8,000		

Provided Impala Warehousing with master planning, environmental permitting, and engineering services to assist with redeveloping the Burnside Terminal into a state-of-the-art major bulk terminal for coal, bauxite, and alumina. To assess condition, performed a topside site investigation and review of existing facilities, including an ore dock and an alumina dock. The findings were used as input to develop wharf loading parameters based on current usage, identify deficient structures, provide alternatives for structure repair or replacement necessary to adequately support existing loads, and provide opinions of probable cost for upgrade or replacement. Also analyzed mooring to support planning and design services for safe and efficient mooring for various-sized bulkers to berth at wharf-side terminals and a midstream mooring location.

Performed detailed design services, which included bid documents, drawings, and specifications for a new foundation and superstructure for the existing bulk material berth; civil site improvements, including erosion control, grading, drainage, selective concrete demolition, and utility construction; rehabilitation of the coal wharf access trestle; construction of the continuous barge unloader foundation and access trestle, including installation of the barge maneuvering system and conveyor support piles to the transfer tower; rail demolition in preparation for new rail construction; relocation of approximately 3,700 feet of existing rail track without impacting overhead or underground utilities; fire water, potable water, wash-down water, and dust suppression water for the berths and the West Yard; and mechanical and electrical services for the terminal, including four substations, duct banks, and overhead power distribution. Design services also included an integrated stormwater and dust suppression retention system. The system included a pump system to transmit stormwater from a receiving ditch to a multi-cell pond to encourage settling and a pump system to recirculate treated water back to the dust suppression system. Finally, Moffatt & Nichol provided 30% design for conveyors, transfer towers, transfer chutes, and related equipment. Drawings and technical specifications for fabrication and installation construction contracts will be prepared for prequalified fabricators and installers.

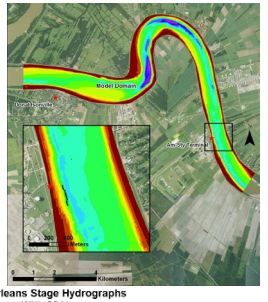
During construction, the owner integrated Moffatt & Nichol staff responsible for the project's design phase into their construction management team. Moffatt & Nichol's on-site staff provided document control and technical, schedule, and contractual support, allowing for an accelerated schedule during construction and commissioning. The on-site engineering team reached out to Moffatt & Nichol staff firmwide for additional support during the design phase, which enhanced their ability to respond quickly to requests for information and shop drawing review.

17. Firm Experience:

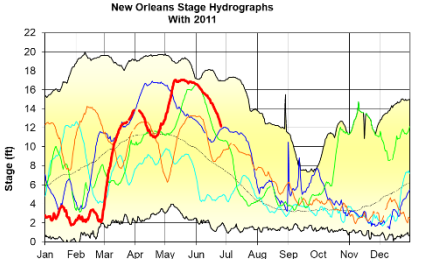
Firm name	Moffat & Nichol	Past Performance Evaluation Discipline(s)*	Bridge
Project name	**Mississippi River Deep Draft Liquid Dock Loading/Unloading Facility**	Firm responsibility (prime or sub?)	Prime
Project number		Owner's name	Am Sty
Project location	St. James, LA	Owner's Project Manager	Rena Cutno
Owner's address, phone, email	9901 Highway 18, St. James, LA 70086 | 225-746-5556 | Rcutno@amstyrenics.com		
Services commenced by this firm (mm/yy)	02/14	Total consultant contract cost ($1,000's)	$ 2,171
Services completed by this firm (mm/yy)	10/14	Cost of consultant services provided by this firm ($1,000's)	$ 2,171

Moffatt & Nichol (M&N) was retained to develop a new deep draft dock for the St. James Americas Styrenics facility. M&N provided pre-FEED, FEED, permitting, navigation industry consultation, design development of PS&E documents as well as to provided assistance during construction. The project included design of a modification to an existing barge facility which would be able to facilitate the construction of the deep draft dock facility (54,000 DWT design vessel) , while maintaining shallow draft (barge) loading / unloading operations during construction.

Pre-FEED included a screening phase to determine the best location and configuration for the dock. In coordination with operational, geotechnical, levee crossing, environmental, structural, Mississippi River design constraints. The USCG and Maritime Navigation Safety Association (MNSA) along with local, state, federal permitting agencies were engaged to provide feedback for the seven alternative arrangements being considered. Upon selection of preferred alternative, M&N proceeded with the FEED phase, which included a static mooring analysis using OPTIMOOR, to establish the preliminary locations of the breasting and mooring dolphins relative to the loading platform, followed by a series of dynamic mooring analyses, using TERMSIM II to validate the berth geometry and establish a practical mooring arrangement for the design vessel, and also establish the maximum environmental conditions that would cause the design vessel to approach the limits of operating envelope of the facility. The static mooring analysis was then updated using OPTIMOOR to verify the arrangement determined under the FEED phase of the project. M&N performed berthing energy calculations in accordance with Permanent International Association of Navigational Congress (PIANC) guidelines to establish the fender requirements for breasting dolphins.



A 3D hydrodynamic model (DELFT 3D) of the Mississippi River was developed to evaluate scour potential of the structure and to assess the current speeds as part of the navigation simulation at the new terminal. Model simulations were performed for low flow, high flow, and very high flow (50 year return period) conditions, with the results imported into navigation studies and the design of the terminal. A Mississippi River Water level analysis was performed to determine construction operation windows as the USACE will not permit construction activities when the stage of the Mississippi River is above 11 feet at the Carrolton Gauge. Once the conceptual expanded facility layout and arrangement was finalized, M&N completed the preliminary and final design (detailed design services, bid documents and specifications for two mooring dolphins and three breasting dolphins, a loading platform, including four loading arms and an elevated pipe support and access trestle as well as the process piping and marine loading arms, and the electrical and instrumentation design) and developed a construction cost estimate.



17. Firm Experience:

Firm name	Moffat & Nichol	Past Performance Evaluation Discipline(s)*		Bridge	
Project name	**Bolivar Ferry Terminal Marine Structural Evaluation**		Firm responsibility (prime or sub?)		Sub
Project number		Owner's name	Texas Department of Transportation		
Project location	Bolivar Peninsula, TX		Owner's Project Manager	Donald Marquise	
Owner's address, phone, email	125 East 11th Street, Austin, TX 78701| (409) 795-2245| Donald.Marquise@txdot.gov				
Services commenced by this firm (mm/yy)	06/19	Total consultant contract cost ($1,000's)		$ 450	
Services completed by this firm (mm/yy)	12/19	Cost of consultant services provided by this firm ($1,000's)		$ 277	

As subconsultant to another consultant, Moffatt & Nichol evaluated and provided repair/modification recommendations for the existing marine structures at the Galveston-Bolivar Ferry Terminal. These structures, specifically the wing wall structures, landing ramp spring box assemblies, landing ramp rockers, and spring box support platforms were evaluated for adequacy in accommodating a 1,600-ton vessel. Furthermore, Moffatt & Nichol's scope of work also included updating the asset management and maintenance program that the team helped develop for the ferry terminal's marine structures and facilities. The updates were based on comments and inputs from Texas Department of Transportation (TxDOT).

Items added to the asset management and maintenance program included the following.

- Moving the contact surface of the wing wall
- Removal of unused monopiles and donut fenders
- Repair/replacement of donut fenders
- Replacement of old-style landing rockers
- Installation of new bolts for the new-style landing cover plates
- Repair of the top seal of the donut fenders
- Anti-fouling and thermal sprayed aluminum coating requirement for donut fender steel members
- Counterweight tower leg repairs
- Removal/refurbishment of unused counterweight tower members
- Repair/replacement of lifting beam padeyes
- Installation of TxDOT-provided timber fenders
- Replacement/retrofit of spring box assemblies
- Relocation of a pair of donut fenders
- Shore power maintenance/repair

17. Firm Experience:

Firm name	Pelican Marine Design, LLC		Past Performance Evaluation Discipline(s)*		Other (Ferry Design)
Project name	**M/V BELLE CHASSE II**		Firm responsibility (prime or sub?)		Sub
Project number	N/A	Owner's name	Plaquemines Parish		
Project location	Bollinger Quick Repair, Harvey, LA		Owner's Project Manager		Allen Stein (now Matthew Kuehne, General Mgr.)
Owner's address, phone, email	615 Destrehan Ave., Harvey LA 70058, 504-340-0621, matthewk@bollingershipyards.com | mailto:ebaim@dot.nyc.gov				
Services commenced by this firm (mm/yy)	03/13	Total consultant contract cost ($1,000's)		$ N/A	
Services completed by this firm (mm/yy)	03/13	Cost of consultant services provided by this firm ($1,000's)		$ 4	

Modifications were performed by the shipyard on the M/V BELLE CHASSE II (144'x55'x8' ferry owned by Plaquemines Parish, LA). These modifications included the addition of two potable water tanks. Pelican Marine Design, LLC was contracted to perform an intact and damaged stability analysis and submit the stability report to the USCG Marine Safety Center so that a Stability Letter could be obtained. Pelican Marine Design, LLC performed the analysis and submitted the report. 100% of this work was completed in Louisiana.

Key members: William D. Scherer, P.E., Brandon Taravella, P.E.

17. Firm Experience:

Firm name	Pelican Marine Design, LLC		Past Performance Evaluation Discipline(s)*		Other (Ferry Design)
Project name	**M/V POINTE A LA HACHE**			Firm responsibility (prime or sub?)	Sub
Project number	N/A	Owner's name	Plaquemines Parish		
Project location	Bollinger Quick Repair, Harvey, LA		Owner's Project Manager		Allen Stein (now Matthew Kuehne, General Mgr)
Owner's address, phone, email	615 Destrehan Ave., Harvey LA 70058, 504-340-0621, matthewk@bollingershipyards.com | mailto:ebaim@dot.nyc.gov				
Services commenced by this firm (mm/yy)	09/13	Total consultant contract cost ($1,000's)			$ N/A
Services completed by this firm (mm/yy)	12/13	Cost of consultant services provided by this firm ($1,000's)			$ 10

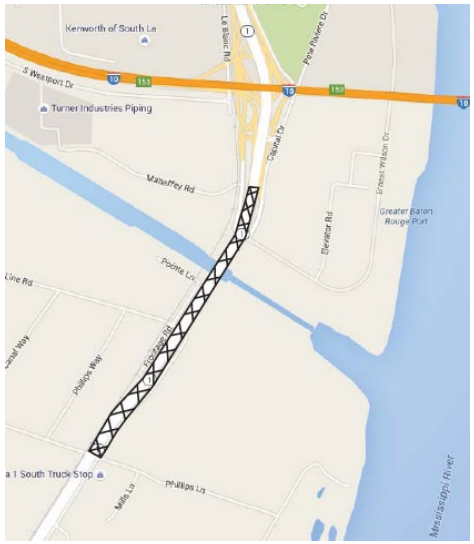
Modifications were performed by the shipyard on the M/V POINTE A LA HACHE (150'x60'x10' ferry owned by Plaquemines Parish, LA). Pelican Marine Design, LLC (PMD) was retained to complete necessary submittals to the USCG Marine Safety Center so that an updated stability letter could be obtained. The vessel had minimal drawings and documentation so PMD generated various drawings so that the submittal could be completed. PMD worked with the local USCG representative to take measurements of the hull. These measurements were used to create a hull lines plan, outboard profile and tank arrangement drawing. PMD performed an inclining experiment to the satisfaction of the USCG and later performed the intact and damaged stability analysis. PMD also created the stability test procedures, stability test report and intact and damaged stability analysis for submittal to USCG Marine Safety Center. 100% of this work was performed in Louisiana.

Key members: William D. Scherer, P.E., Brandon Taravella, P.E.

17. Firm Experience:

Firm name	Urban Systems, Inc.		Past Performance Evaluation Discipline(s)*	Traffic	
Project name	**Bridge Preventative Maintenance Port Allen Bridge**		Firm responsibility (prime or sub?)	Sub	
Project number	H.001234.4	Owner's name	Louisiana Department of Transportation and Development		
Project location	Port Allen, LA		Owner's Project Manager	Brian Delatte	
Owner's address, phone, email	1201 Capitol Access Rd Baton Rouge, LA | 225.379.1823 | Brian.Delatte@la.gov				
Services commenced by this firm (mm/yy)	11/12	Total consultant contract cost ($1,000's)	$ N/A		
Services completed by this firm (mm/yy)	06/16	Cost of consultant services provided by this firm ($1,000's)	$ 63		

The objective was to conduct a Level 3 Transportation Management Plan (TMP) based on LADOTD EDSM VI.1.1.8 for reconstruction of two (2) bridge structures over the Intracoastal Waterway (ICWW) in Port Allen, Louisiana. A TMP was critical for this location as the LA 1 bridge serves as the major crossing of the ICWW and serves up to 45,000 vehicles per day. An important aspect of this project was how to minimize construction impacts on an already congested roadway section. Peak intersection turning movements and seven-day hourly volume counts with classification were collected within the study area. Peak intersection capacity analysis was conducted using Synchro software to determine the impact the different phases on construction would have on the subject intersections. A unique part of the capacity analysis was to analyze a non-typical stop-controlled intersection with different gap acceptance values to match field conditions.



A safety analysis was conducted based on the LADOTD's *Guidelines for Crash Data Analysis, June 2014*. Crash rates were calculated for each location and compared to LADOTD's statewide averages and to LADOTD's High Potential for Safety Improvements (formerly the Abnormally High Crash) List. Charts were developed at each location based on collisions by type, injury severity, time and pavement conditions.

An important strategy to minimize work zone impacts was an evacuation plan as LA 1 is a critical artery during a hurricane evacuation.

A list of potential stakeholders was developed for a future stakeholder's meeting. The list was crucial for this project as many port related and industrial businesses are located in the project area and should be informed about the project.

Members Utilized in this Project Submittal: A. Michel, M. Morgan, N. Stewart

17. Firm Experience:

Firm name	Urban Systems, Inc.		Past Performance Evaluation Discipline(s)*	Traffic	
Project name	**Huey P. Long Bridge Widening (Westbank and Eastbank Approaches and Main Bridge Deck Widening)**		Firm responsibility (prime or sub?)	Sub	
Project number	SP 005-10-0037/006-01-0021/006/02/0064/006-25 0001/006-30-0041	Owner's name	Louisiana Department of Transportation and Development		
Project location	Route US 90 Jefferson Parish, LA		Owner's Project Manager	Lee Horstmann	
Owner's address, phone, email	1201 Capitol Access Rd Baton Rouge, LA 70802 | 225.302.2200 | lee.horstmann@kiewit.com				
Services commenced by this firm (mm/yy)	02/11	Total consultant contract cost ($1,000's)	$ N/A		
Services completed by this firm (mm/yy)	04/13	Cost of consultant services provided by this firm ($1,000's)	$ 49		

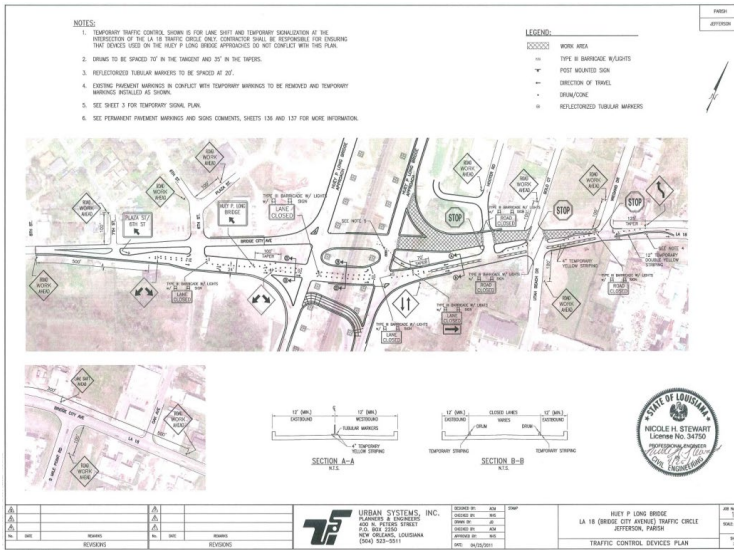
Urban Systems, Inc. provided Traffic Engineering Services for the Huey P Long Project for the contractor starting about half-way into the construction project. This was a multi-phase project as construction conditions and required closures changed.

A few of the phases that were addressed were:

- Jefferson Highway Detours
- Huey P. Long Bridge Southbound Approach Closure
- Huey P. Long Bridge – Rerouting Huey P. Long Northbound Approach

Plans for these phases included the following:

- **Traffic Control Devices Plans** for the redirection and protection of traffic in the active area of construction.
- **Traffic Signal Plans** for the installation of temporary traffic signal heads. The temporary signals were utilized in conjunction with the permanent signal plan. The plans included the temporary striping and signage that were required in addition to the permanent installation.
- **Permanent Pavement Markings and Signs Plans** which were used to identify which signs should be covered and which striping should not be installed during each phase of construction.



Members Utilized in this Project Submittal: A. Michel, N. Stewart

18. Approach and Methodology:

PROJECT UNDERSTANDING

This project consists of surveying, designing and construction of two (2) new ferry landings located in Plaquemines Parish, Louisiana (Pointe-A-La-Hache) – one on each side of the Mississippi River approximately ¼ mile upstream of the current ferry location. The project also includes modifications to the existing connecting roadways, ramp bridges, lifting towers, and mooring dolphins along with the associated substructures and foundations and support services during the Construction Phase.

LAND AND HYDROGRAPHIC SURVEYS

A complete topographic survey including all utilities with depths and all drainage will be performed in accordance with the LADOTD Location and Survey Manual, along with finish floor elevations of all buildings that fall within the survey limits. Both sites will be tied into the existing U.S. Army Corps of Engineers Levee Baseline and the nearest Mississippi River gauge station located either upstream or downstream. A drainage map will also be prepared. The H&H Team member Chustz will also perform a multi-beam hydrographic survey within the survey limits which will include sufficient data to ensure accurate location of all objects and features and will meet the accuracy requirements specified in the LADOTD Location & Survey Manual. The hydrographic survey will be collected from a vessel equipped with an R2Sonic multibeam system utilizing the boat launch in Empire, LA. Hydrographic data will be constrained to GPS horizontally and vertically tied to the project benchmark. The deliverables will include all normal Survey Inroads deliverables along with all point clouds collected.

GEOTECHNICAL

The geotechnical portion of this project will consist of geotechnical investigation and foundation design.

Subsurface Conditions: A preliminary review of the USACE surficial geology map indicates a subsurface profile composed of cohesive soils consisting of clay, silt, and silty clay to a depth of approximately 150 feet, underlain by a layer of natural granular soils consisting of silty sand and clayey sand extending to a depth of approximately 175 feet, underlain by another layer of cohesive soils consisting of clays and sandy clays to a depth of 300 feet. The near-surface clays contain high amounts of preserved organic (vegetative) materials with some sand intermixed. The project locations are part of the Mississippi River Delta and are rich in organics grouped in seismic Site Class E and/or F.

Geotechnical Investigations: Scope of work calls for two deep borings in the channel (at location of ferry landing), one deep boring on land (near bridge end), and two willow subgrade soil survey borings on land (for pavement) for each Ferry Landing Site. H&H Team members Ardaman and APS will perform geotechnical investigation consisting of sampling, laboratory testing, soil classification, site characterization, and soil boring logs including deep foundation borings as described in the scope of work. They bring a wealth of experience in the transportation and infrastructure arena with long-standing relationship with the LADOTD.

To confirm available geotechnical information and to better characterize subsurface soil conditions, we envision implementing a geotechnical exploration program involving soil borings with laboratory testing. The minimum depth of boring will be 120 ft below existing ground line. The actual depths of boring will be deeper than 120 ft depending on the anticipated foundation loads and loss of soil from scour. The soil borings will be made using wet/mud rotary methods below the water table, with solid stem auguring per ASTM D1452 and undisturbed samples in cohesive soils will be collected per ASTM D1587. The Standard Penetration Testing (SPT) in cohesionless soils will be carried out in accordance with the ASTM D1586. H&H Team plans to collect continuous soil samples in the upper 10 feet followed by samples at 5-foot intervals in cohesive soils and at 3-foot intervals in cohesionless soils. Where Shelby tube is retrieved with no recovery, the hole will be cleaned out and a SPT will be performed directly below the previous sampling interval to accurately characterize subsurface soil profile and to establish relevant soil parameters. The soil borings will be logged in the field using the visual-manual method for classification in accordance with ASTM D2488 and H&H will classify the soils according to the Unified Soil Classification System (USCS) per ASTM D2487. The deliverables during the geotechnical investigation will be: Geotechnical Investigation Plan, Geotechnical Data Report, and Geotechnical Interpretation Report.

Foundation Design: Based on the subsurface conditions, it is our opinion that deep foundations should be considered for the support of the Ferry Landing's bridge, lifting tower, and mooring dolphin to limit settlement to acceptable level. Per our preliminary assessment, the precast prestressed concrete piles and steel pipe piles are viable options to support the Ferry landing's elements. The deep foundation will be designed to resist wave forces, impact forces during ferry berthing and impact from errant

vessel. Also, the deep foundation design will include reduction in foundation capacity to account for loss of soil support from scour. Modifications to the bank or channel geometry, including temporary conditions will also be analyzed for slope stability.

COASTAL DESIGN

Scour Analysis and River Stage Study: Team member Moffatt & Nichol will complete an analysis following LADOTD requirements of impacts on the ferry structure including wave impact loads on the mooring and fender structures. The river mechanics and stream hydraulics (HHA) analysis will be performed using HEC-RAS 5.0.7 computer program, and HEC-18 and HEC-23 for scour at the waterway crossing (culverts or bridges) and scour countermeasure design, as applicable. In addition, our team will use applicable software and procedures approved by the LADOTD and FEMA, such as using HEC-RAS 5.0.7 hydraulic models (U.S. Army Corps of Engineers [USACE]) and Federal Highway Administration (FHWA) publications for stream stability, scour calculations, and scour countermeasure designs (HEC-18, HEC-20, and HEC-23), as applicable. Furthermore, we will use the U.S. Geologic Survey StreamStats website, watershed modeling system (WMS 12.0, FHWA), and HEC-HMS (USACE) to perform all necessary GIS-integrated watershed modeling, hydrologic calculations, and flood discharges (peak flows and hydrographs). We will perform a coastal engineering evaluation to establish design parameters for wave impact forces and pressures on mooring and fender structures. Existing water level and storm surge data will be collected and analyzed for prevailing and storm conditions. This information will be used as input in a nearshore spectral wave model. The nearshore spectral wave model will transform offshore wave conditions based on available wave hindcast data to the project site for prevailing and storm conditions to optimize the pier deck elevation and determine the resulting forces. In addition, specific hurricane events that have affected the area will be evaluated. We will provide a final analysis report detailing the development of the hydraulic models and associated hydrologic calculations, scour and countermeasure designs, and recommendations to ensure continual zero impact to existing flood elevations which includes finalized results, printouts, comparison tables, and copies of the hydraulic models and will address comments and provide revisions to the hydraulic models, as appropriate, to secure approval by LADOTD and other regulatory agencies.

Vessel Impact Loads Study: First we will perform a vessel impact study and a hydraulic analysis to support the design of the mooring and fender structures. Second, a mooring analysis will consider passing vessel impacts and be performed using a dynamic mooring program Optimoor (dynamic) or equivalent (such as aNyMoor.Termsim). The operation limits will be based on the loads on mooring lines, fenders, bollards, and the maximum allowable vessel motions. The passing vessel study will consider different passing vessel sizes, distances, speeds, and directions (inbound and outbound), with current (flood and ebb) and operational winds applied simultaneously. The passing vessel effects will be evaluated using Research on Passing Effects on Ships (ROPES) or an equivalent tool. This effort aims to design mooring and berthing hardware to handle various environmental conditions.

STRUCTURAL DESIGN

The new superstructure will consist of a Link Bridge supported by a Pontoon (refer to Pontoon Barge Design). The shore end of the Link Bridge will pivot about two spherical bearing assemblies mounted on the abutment and the seaward end will be supported on the Pontoon. The Pontoon will move up and down as the water level fluctuates between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS). A mechanized Ship Ramp will be provided on the Pontoon side opposite to the Link Bridge to load and offload vehicles on and off the ferries. All structural elements, Link Bridge, Pontoon Deck, and Ship Ramp will be designed for HL93 loading in accordance with the latest AASHTO LRFD Bridge Design Specifications and for all additional Louisiana Special Design Vehicles (LASDV 1 - 8). The longitudinal geometry of the Link Bridge and its interaction with the moving Pontoon will be designed to account for extreme water levels thus eliminating the need for Lift Towers and an additional set of machinery to lower and raise the seaward end of the Link Bridge during such drastic water level changes.

The Link Bridge will consist of a steel framing and an aluminum deck. The steel framing will consist of two longitudinal main supporting girders or trusses (parallel to traffic), transverse floorbeams spanning between main girders or trusses, longitudinal stringers spanning between floorbeams, and a diagonal bracing system for lateral support. The aluminum deck, developed and patented by our own George Patton, will consist of modular extruded deck panels with a solid riding surface to protect the steel framing superstructure. This aluminum deck also offers a skid resistant wearing surface to improve vehicles rideability.

The mechanized Ship Ramp will operate similarly to the existing in that the hinged end will pivot about two spherical bearing assemblies mounted on the Pontoon and the free end will be lowered to service the ferries and kept raised after the ferries depart.

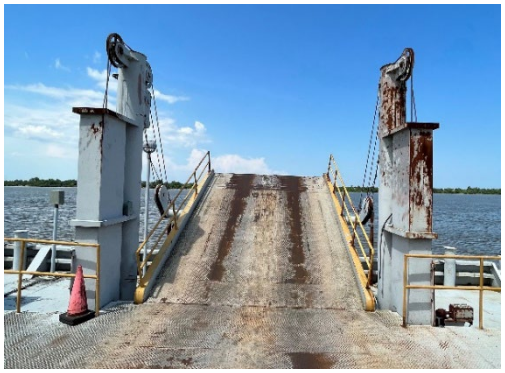
The Ship Ramp will consist of a transfer bridge and an apron structure hinged at the end of the transfer bridge. Like the Link Bridge, the transfer bridge will consist of a steel framing and an aluminum deck. The apron structure will consist of a solid steel plate supported on inverted WT rolled shapes with hinged neoprene flaps at the end. The hinged apron structure and neoprene flaps provide immediate vertical adjustability as the ferry deck goes up and down as vehicles get loaded and offloaded.

All steel members will be hot dipped galvanized. The galvanized girder-floorbeam-stringer framing with the aluminum solid deck provides perhaps one of the lightest and most durable systems available for this type of structure.

Pontoon Barge(s) and Associated Apron Structure: The geometry and structural design of the pontoon barges will be very similar to common inland deck barges and will be in accordance with American Bureau of Shipping's Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways. The interface with ramps will be included and vehicle wheel loading will be accounted for as required in the ABS Rules. General Arrangement, Scantling Drawings and Outfitting drawings will be the primary drawings developed. Intact stability calculations will be performed based on vehicular and ramp loading. Next, based on the drawings, a 3D model of the barges and their structure will be created with each steel part being labeled. Assembly drawings of the structure will then be created based on the desired erection sequence. Finally, nested part drawings for numerically controlled (NC) cutting will be generated and provided to the fabricator along with the assembly drawings. These structures will be designed by our Team member Pelican Marine Design.

MECHANICAL DESIGN

Since there are no federal design standards for ferry slip machinery design, H&H typically uses AASHTO guidelines where applicable for ramp bridge mechanical systems. H&H will set the specific design criteria in coordination with LADOTD to optimize the best system for the Pointe-A-La-Hache ferry slips. H&H assumes the general arrangement of the existing machinery is acceptable and can be improved upon based on experiences at other facilities in North America. Some advantages to the overhead counterweighted system feature a partially balanced bridge, and therefore a lighter operating (or winch) system and the associated components. From our cursory site inspection, the existing counterweights are guided within the tower structure on either side of the bridge ramp. Sheave assemblies are located at the tower tops to support the span and counterweights. The bridge ramp is connected to the counterweights with a series of ropes. Due to the marine environment, we recommend the use of drawn galvanized wire ropes to extend their service life. The winch machinery is lightly loaded (lifting operating loads only) in this counterweighted system, so the winch components would be detailed proportional to the load anticipated. To complement the winch drive, the mooring system can easily be an extension and use similar posts located at the ends of the bridge ramp and would pay out mooring hooks to secure the ship tight to the mooring dolphins while the ferry is being loaded and unloaded with vehicles and passengers. H&H recommends having an initial discussion with LADOTD to outline safety interlocks, and automatic control systems to adjust for water elevations when not in use. Some systems we have implemented for other clients in different regions can be briefly discussed and determined if they would offer benefits at this location.



ELECTRICAL DESIGN

The electrical system for the Pointe-A-La-Hache Ferry Ramp bridge will be a robust, heavy-duty system designed to complement the mechanical system and consisting of proven, long term reliable components. The incoming service will be provided by the local utility; H&H will coordinate the electrical system design based on available power. Utility power will be routed to a weatherproof free-standing enclosure on the bridge structure including the connection of a portable generator in the event of utility failure. In addition to the power distribution equipment, the enclosure will contain motor starters and electromagnetic relay control components to allow operation and correct sequencing of the bridge ramp systems. The control system will operate and sequence all motors associated with the bridge ramp, and the system will be provided with a float mode to automatically adjust the bridge ramp as the ferry rises and falls with changing tidal and loading conditions. A pendant control station will operate the bridge ramp as well as traffic signals and traffic gates, and area lighting and maintenance receptacles will be powered through the power distribution system lighting panel. H&H will provide a design drawing package comprised of one- and three-line power diagrams, relay

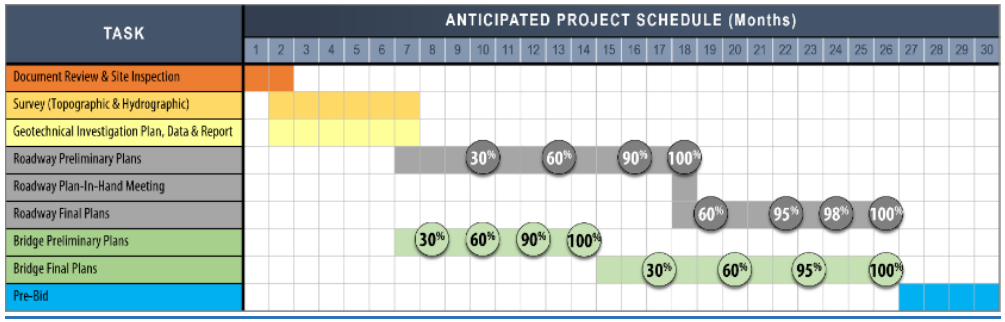
controls schematics, utility service plans, lighting plans, cabinet layouts, limit switch installation details and all other drawings required.

ROADWAY DESIGN

Roadway Design will include Design Report; Preliminary and Final Construction Plans; and Transportation Management Plan (TMP). H&H understands the roadway aspects anticipated to be associated with this project which will involve the design of new roadways on both sides of the river and potentially intersection improvements. Our goal is to team with LADOTD as a qualified full-service engineering firm to provide general roadway design engineering services across the state. H&H will use LADOTD Road Design Manual for all construction plan development and project delivery with preliminary plan submittal stages: 30%, 60%, 95%, & 100% and Final Plan submittal stages: 60%, 95%, 98%, and 100%. Where design guidance is not available via LADOTD documentation for a particular issue, H&H leans on our knowledge of the AASHTO "Green Book" for geometrics, the AASHTO Roadside Design Guide for roadside safety issues, the AASHTO Guidelines for Geometric Design of Low-Volume Roads, and the MUTCD for Signing and striping as needed. The H&H Team is proficient in using LADOTD's current preferred software including InRoads SelectSeries II, CADConform, and HYDRWin and have already started transitioning to Bentley's OpenRoads platform.

Transportation Management Plan: Our team member, Urban Systems Inc. (USI), Urban Systems has experience in the development of Traffic Management Plans for a multitude of project types. These have included all TMP levels (including Level 2). The TMP defines management strategies and describes how they will be used to manage the work zone impacts of a road and bridge project. USI has also a great deal of experience in preparation of traffic control device and detour plans (TCDPs) for construction work zones. Among many of Urban Systems' specialized services is their breadth of experience in the preparation of traffic control device and detour plans (TCDPs) for construction work zones that encompass a broad range of construction activities and construction sequencing requirements to ensure safe and efficient movement of traffic (vehicle, pedestrian, and bicyclists) through and around the construction work zone.

ANTICIPATED SCHEDULE



***NOTES: 1) This schedule does not include LA DOTD review time. 2) Project Letting and Construction not shown.*

QUALITY CONTROL

The H&H Quality Management Plan (QMP) is submitted with this proposal. It fosters improvement of quality by providing tools to the project team, so all professional services are performed and delivered in accordance with applicable industry standards of care and project scope requirements within schedule and budget.

19. Workload:

Firm(s)	Past Performance Evaluation Discipline(s) *	Contract Number and State Project Number	Project name	Remaining Unpaid Balance**
Hardesty & Hanover	Bridge	4400000642 H.002798.6	Bayou Teche Bridge (Oaklawn) Construction Support Services	$11,932
	Bridge	4400023909 H.002798.6	Oaklawn Bridge Walkway/Parking Lighting	$110,862
	Road	4400011199 H.014363.5	Sidewalk Improvements to Conform to ADA – Task Order 1, St. Tammany Parish	$15
	CE&I/OV	4400017430 H.001498.6	LA 24 and LA 316: Company Canal Bridge, Terrebonne Parish	$1,890,158
	CE&I/OV	4400024021 H.015028.6	LA 302: Bayou Barataria MB Replacement Route: LA 302	$5,243,795
Ardaman & Associates, Inc.	Geotech	H.009266	I-10 (LA 73 to LA 30) Route I-10 Ascension Parish	$75,956
	Geotech	H.012565, H.012891, H.014251, 252, 253, 254, 256, 257	Rural Bridge Replacement – Phase II, Districts 02, 03, 07, 61, 62	$2,288
	Geotech	H.004273	I-49 Connector, Lafayette	$498,797
	Geotech	H.004647.6	Mississippi River Bridge at Vicksburg, MS	$864,986
	Geotech	H.004791	LA 23: Belle Chasse Bridge and Tunnel (HBI)	$261,887
	Geotech	H.013897	I-10 / I-12 College Drive Flyover	$296,008
	Geotech	H.004113	I-12 to Bush LA 3241 (LA 435 – LA 40/LA 41) Construction Phase	$47,212
	Geotech	H.014217, 218, 225, 228, 233, 236	Rural Bridges Replacement Phase II – Districts 04 & 05	$6,441.68
	Geotech	H.04435.5	I-12 to Bush LA 3241 (LA 36 – LA 435) Construction Phase	$49,310
	Geotech	H.004100.5-3	I-10: LA 415 to Essen Lane on I-10 & I-12	$237,569
	Geotech	H.002244.5	Boudreaux Canal Bridge (LA 56)	$164,537
	Geotech	H.004100	I-10: CMAR 30% Segment 1 Design	$115,786
	Geotech	H.001166.6	Caddo Lake Bridge (PDA)	$25,997
	Geotech	H.012030	KCS Railroad Overpass HBI (US 371)	$127,060
	Geotech	H.014258.5	LA 1: Port Allen Canal Bridge Phase 2	$104,825
	Geotech	H.012047, 542, 543 544, 562	Bridge Replacements District 08	$1,018,378
APS Engineering and Testing, LLC	Geotech	H.013127	Retainer Contract for Geotechnical Services	$325,700
Chustz Surveying, LLC	Survey		None	$0
Moffatt & Nichol, Inc.	Bridge	4400013322 H.009730.5	Gresham TO4 for movable bridges	$22,554

	Bridge	4400013322 H.009730.5	Gresham TO5 Vicksburg	$187,766
	Bridge	4400023512 . 80772	HNTB - LADOTD Huey P. Long US-190 Bridge Inspection	$292,254
	Bridge	4400013321 H.009730.5	HNTB-GNO	$451,280
	Bridge	4400017089 H.011331.1	LADOTD Inventory and Insp. of Signs	$1,193,444
	Bridge	4400019121 H.009730.5	LADOTD UWBI - TO1	$240,865
	Bridge	4400019121 H.009730.5	LADOTD UWBI - TO2	$2,290,560
Pelican Marine Design, LLC	Bridge		None	$0
Urban Systems, Inc.	Traffic	440005142 H..011309.5	Mac Arthur Final Design	$30,687
	Traffic	PSLC-STJ-Supp-2 H.004891	Reserve to I-10 Connector	$6,605

20. Certifications/Licenses:

DBE Certifications:

RTA DOTD

LOUISIANA UNIFIED CERTIFICATION PROGRAM

Disadvantaged Business Enterprise Program (DBE)

Small Business Element (SBE)

This is to certify that under Title 49, Part 26 of the Code of Federal Regulations & under the State of Louisiana United Certification Program (LAUCP)

APS Engineering & Testing, LLC

Is a Certified Disadvantaged Business Enterprise (DBE) & Small Business Element (SBE) in the following specialties:

NC221310, NC221320, NC541330, NC541370, NC541380, NC541620, NC541690

NOTE: There may be other approved NAICS Codes. The online DBE Directory includes a complete list of approved codes.

Certificate Eligibility: October 2022 to October 2023

This certificate is valid through the above date provided. This firm meets the on-going programmatic standard and fulfills the annual update requirement to remain in good standing as a DBE. This certification is subject to annual verification and suspension or revocation based upon reasonable cause to believe that the firm is ineligible.

Rhonda Wallace

Rhonda Wallace, DBE/SBE Programs Manager

Louisiana Department of Transportation & Development

RTA DOTD

LOUISIANA UNIFIED CERTIFICATION PROGRAM

Disadvantaged Business Enterprise Program (DBE)

Small Business Element (SBE)

This is to certify that under Title 49, Part 26 of the Code of Federal Regulations & under the State of Louisiana United Certification Program (LAUCP)

Urban System Associates, Inc.

Is a Certified Disadvantaged Business Enterprise (DBE) & Small Business Element (SBE) in the following specialties:

NC541330, NC541340, NC541990

NOTE: There may be other approved NAICS Codes. The online DBE Directory includes a complete list of approved codes.

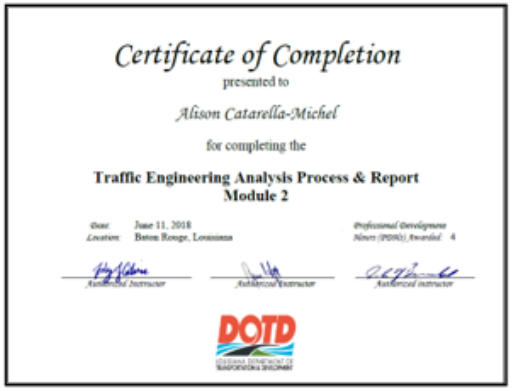
Certificate Eligibility: February 2023 to February 2024

This certificate is valid through the above date provided. This firm meets the on-going programmatic standard and fulfills the annual update requirement to remain in good standing as a DBE. This certification is subject to annual verification and suspension or revocation based upon reasonable cause to believe that the firm is ineligible.

Rhonda Wallace

Rhonda Wallace, DBE/SBE Programs Manager

Louisiana Department of Transportation & Development



Certificate of Completion

presented to

Alison Catarella-Michel

for completing the

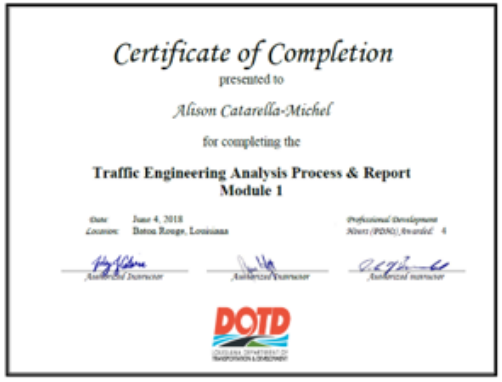
Traffic Engineering Analysis Process & Report
Module 2

Date: June 11, 2018
Location: Baton Rouge, Louisiana

Professional Development Hours (PDH) Awarded: 4

Authorized Instructor | Authorized Instructor | Authorized Instructor

DOTD



Certificate of Completion

presented to

Alison Catarella-Michel

for completing the

Traffic Engineering Analysis Process & Report
Module 1

Date: June 4, 2018
Location: Baton Rouge, Louisiana

Professional Development Hours (PDH) Awarded: 4

Authorized Instructor | Authorized Instructor | Authorized Instructor

DOTD

Certificate of Completion

presented to

Alison Catarella-Michel

for completing the

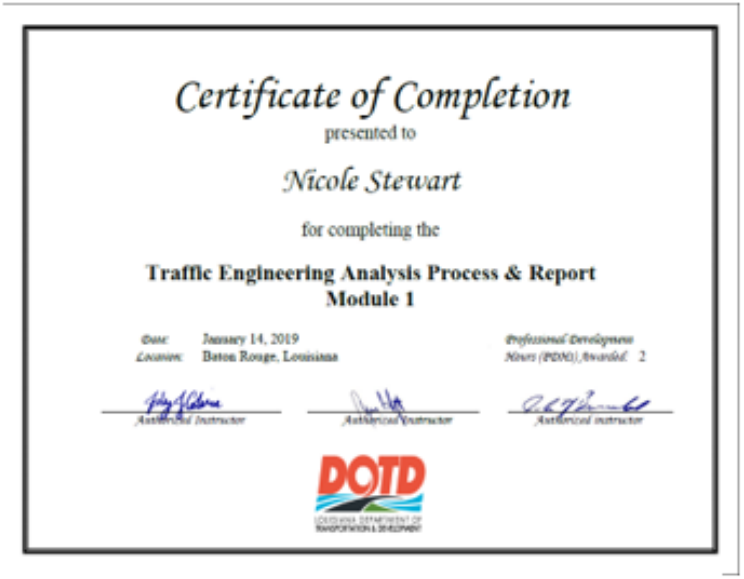
Traffic Engineering Analysis Process & Report
Module 3

Date: September 10, 2018
Location: Baton Rouge, Louisiana

Professional Development Hours (PDH) Awarded: 3

Authorized Instructor | Authorized Instructor | Authorized Instructor

DOTD



Certificate of Completion

presented to

Nicole Stewart

for completing the

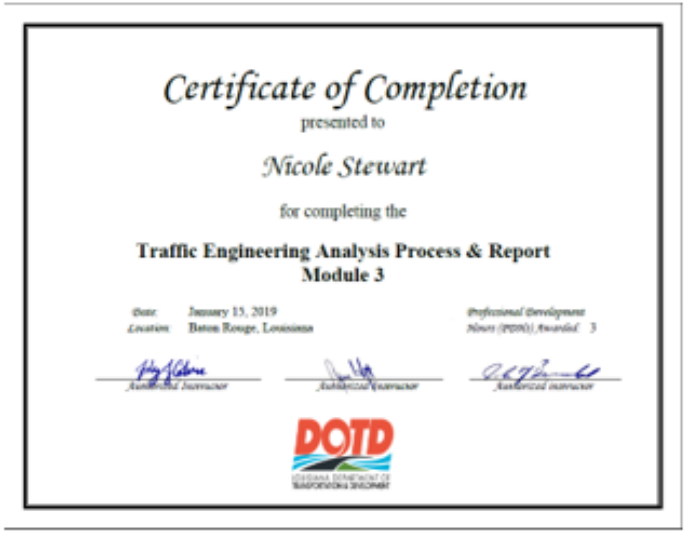
Traffic Engineering Analysis Process & Report
Module 1

Date: January 14, 2019
Location: Baton Rouge, Louisiana

Professional Development Hours (PDH(s)) Awarded: 2

Authorized Instructor | Authorized Instructor | Authorized Instructor

DOTD



Certificate of Completion

presented to

Nicole Stewart

for completing the

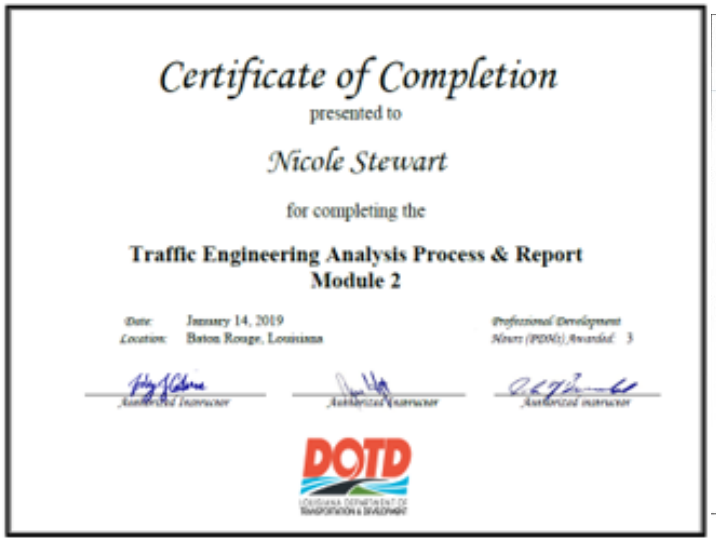
Traffic Engineering Analysis Process & Report
Module 3

Date: January 15, 2019
Location: Baton Rouge, Louisiana

Professional Development Hours (PDH(s)) Awarded: 3

Authorized Instructor | Authorized Instructor | Authorized Instructor

DOTD



Certificate of Completion

presented to

Nicole Stewart

for completing the

Traffic Engineering Analysis Process & Report
Module 2

Date: January 14, 2019
Location: Baton Rouge, Louisiana

Professional Development Hours (PDH(s)) Awarded: 3

Authorized Instructor | Authorized Instructor | Authorized Instructor

DOTD

ATSSA TRAINED

PROOF OF TRAINING

THIS CERTIFICATE HEREBY RECOGNIZES THAT

Nicole Stewart
has attended
Traffic Control Technician-LA State Specific
Training Course

4/6/2021 to 4/6/2025
Training Valid Through

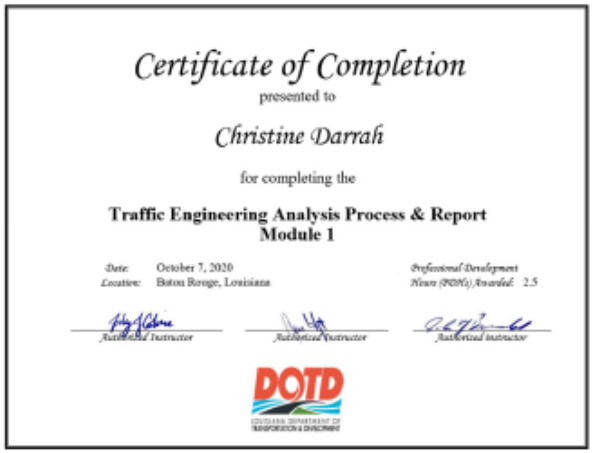
Director of Training

Baton Rouge, LA
Location

President, CEO

ATSSA provides training and certification but neither constitutes employment by ATSSA.

ATSSA American Traffic Safety Services Association ATSSA.com



Certificate of Completion

presented to

Christine Darrah

for completing the

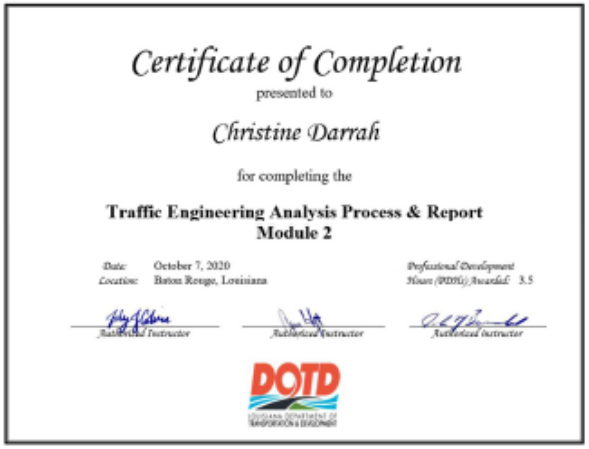
Traffic Engineering Analysis Process & Report
Module 1

Date: October 7, 2020
Location: Baton Rouge, Louisiana

Professional Development Hours (PDHs) Awarded: 2.5

Authorized Instructor | Authorized Instructor | Authorized Instructor

DOTD



Certificate of Completion

presented to

Christine Darrah

for completing the

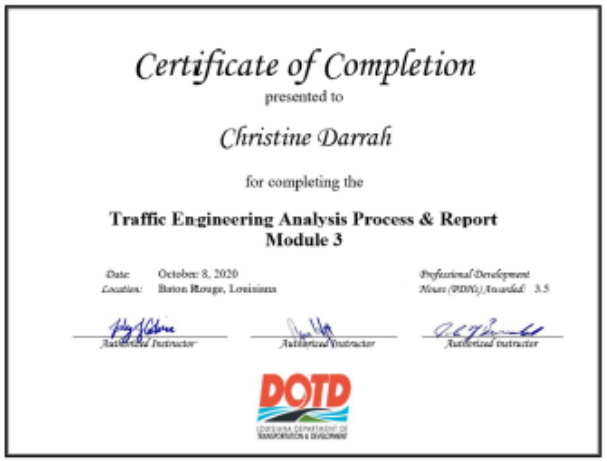
Traffic Engineering Analysis Process & Report
Module 2

Date: October 7, 2020
Location: Baton Rouge, Louisiana

Professional Development Hours (PDHs) Awarded: 3.5

Authorized Instructor | Authorized Instructor | Authorized Instructor

DOTD



Certificate of Completion

presented to

Christine Darrah

for completing the

Traffic Engineering Analysis Process & Report
Module 3

Date: October 8, 2020
Location: Baton Rouge, Louisiana

Professional Development Hours (PDHs) Awarded: 3.5

Authorized Instructor | Authorized Instructor | Authorized Instructor

DOTD

21. QA/QC Plan and/or Work Plan:

Appears on the following page.

Hardesty & Hanover, LLC
QUALITY MANAGEMENT PLAN

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Quality Management Plan Authorization

- The Hardesty & Hanover Quality Management Plan consists of procedures that have been developed to assure that the various elements of the project are carried out in a planned and controlled manner and in accordance with the industry standards.
- The herein described Quality Management Plan is an accurate and consistent reflection of Hardesty & Hanover policies and procedures.

Revision: 0
Issue Date: May 12, 2023

Signature
Keith Griesing, PE – H&H Quality Manager

12 MAY 2023
Date

1. Introduction

Hardesty & Hanover (H&H) has committed to fostering the improvement of quality by generating this Quality Management Plan (QMP) for providing guidance to the project team. The objective of the QMP is to provide tools to the project team so that our professional services are performed and delivered in accordance with applicable industry standards of care and to the satisfaction of project scope requirements while remaining within the allocated schedule and budget.

The Quality Management Plan includes the H&H firm standard Quality Assurance and Quality Control Plans. Together these plans form our Quality Management System (QMS). The intent of the QMS is to define procedures for Quality Control and Quality Assurance which minimize errors, discrepancies, and omissions in H&H's work products.

Hardesty & Hanover acknowledges that H&H and their subconsultants are fully responsible for QC/QA of their own work and the client bears no responsibility for performing QC/QA of the work of Hardesty & Hanover or their subconsultants.

1.1 Quality Elements

1.1.1. Definitions

a) **Contract Requirements:** Established by **LADOTD** for each project, these requirements take precedence over any other practices established by H&H. Notwithstanding specific contract requirements, minimum H&H quality practices and industry standard of care are applicable to all projects. Contract Requirements are identified in the sections below.

b) **Project Specific Engineering Oversight Practices:** These practices are established by H&H during project initiation and will vary depending on the classification of the project as determined by the firm. Engineering Oversight activities are a supplement to, and not a replacement of, project quality activities. Project Specific Engineering Oversight Practices are identified in the sections below.

c) **Quality Control (QC**): Procedures of checking the accuracy and consistency of the work product to minimize errors, discrepancies, and omissions, to ensure adherence to industry standards, and to deliver an exceptional product to our clients.

d) **Quality Assurance (QA):** Procedures of reviewing the design and development processes to ensure the Quality Control procedures are in place, implemented per firm policy and the desired level of quality has been attained and will continue to be obtained. Quality Assurance identifies procedural shortfalls and recommends changes to improve processes where appropriate.

e) **Quality Control Plan:** This document defines the intent and practices for overall Quality Control with an emphasis on the activities of the project technical staff. The design and document review process and practices are defined in this document. Project specific modifications to the Quality Control Plan are identified in Section 3.4.1.

f) **Quality Assurance Plan:** This document defines the intent and practices for overall Quality Assurance and Engineering Oversight, identifying key staff and their respective project management and quality management responsibilities. Project specific modifications to the Quality Assurance Plan are identified in Section 3.4.2.

g) **Design Policies:** These are supplemental documents that are exclusively for internal use. These are not submitted to **LADOTD.** Portions of Design Policies may be used in the development of a Project Quality Control Process, for example if a specific Design Practice is recommended for use to address a particular project design element.

1.1.2. Quality Management System

Customer Satisfaction and Quality Management System Improvement

H&H is continually striving to improve customer satisfaction. Our Quality Management System is a living document that will be continually assessed and revised to reflect best practices and lessons learned. This process includes clarification of design information to support construction or production, correction and prevention of errors and omissions, and response to client comments, complaints, and feedback.

Quality Control Program Objectives

Quality Control is a series of activities, actions and procedures routinely undertaken to ensure that our services and their representative work products are produced to the requisite standard of care and in accordance with the defined technical philosophy of the firm.

Our Quality Control process ensures that each work product is thoroughly reviewed in detail by someone in addition to the review by the Designer/Originator/Producer who prepared that work product for conformity with generally accepted standards of design and engineering practice.

Unless otherwise approved by the engineer in responsible charge, at least one of the primary individuals involved in preparing (Designer) or checking (Checker) a document shall be a Professional Engineer, experienced and qualified in the appropriate engineering discipline and project jurisdiction. Comments generated by the quality control process are to be resolved to the satisfaction of both the Designer and the Checker. The process of Quality Control (QC) is documented and recorded in a manner which allows for management of the process and review of the process through Quality Assurance (QA). The full detailed QC process can be found in our QC Plan attached in Appendix C.

Quality Assurance Program Objectives

The Quality Assurance Program encompasses the systematic review of our design and development processes and our Quality Control activities to confirm that the desired level of quality has been attained and will continue to be obtained. Quality Assurance identifies procedural shortfalls and recommends changes to improve our processes. Quality Assurance is a company-wide process that confirms that the proper processes are in place to assure that our services and products meet the requisite standard of care. A brief summary of our Quality Assurance process follows. The full detailed QA process can be found in our QA Plan attached in Appendix B.

Quality Assurance

Quality Assurance reviews will be performed to confirm conformance with the Quality Management Plan of a given project. The review shall verify that each project has sufficiently accomplished all quality goals set forth in the Quality Management Plan.

Documentation is kept which provides a record that the design development and review process was performed as required. This documentation is to include records of the important steps which led to the development of final planning documents as well as the final design, such as preliminary concepts, model validation, design calculations, computer code input and any communications, instructions, and directives which have a direct bearing on the project.

Types of documentation to be reviewed for compliance with the procedures set out in the Quality Control Plan:

a) Design Criteria
b) Reports – All reports prepared for the project irrespective of type.
c) Interdisciplinary Coordination – Minutes of meetings and attendance lists.
d) Calculations/Computer Solutions
e) Drawings
f) Specifications
g) External Comment Responses
h) Prior Audit Documents – All documentation provided by the Quality Auditor including recommendations for improvement, nonconformance reports, and any other check lists.

Additionally, the Quality Assurance Review is used to identify areas of weakness in the Quality Control process and develop preventive actions that focus on areas of potential nonconformance to reduce the risk associated with these areas.

If the QA Review identifies potential nonconformities, the review shall also include determination of their probable cause, determination of preventive action needed, implementation of preventive action and determining if preventive action was implemented and effective in preventing nonconformity. The Project Manager is responsible for developing and implementing preventive actions that address the potential areas of nonconformance identified in the QA Review and working to reduce or eliminate the risk in these areas.

Control of Nonconforming Product
Corrective action will be appropriate to the severity of the nonconformance identified. The Project Manager shall develop and implement any corrective action procedure taken. The corrective action procedure shall be approved by the Chief Technical Officer. The procedure shall identify the nonconformance root cause and the necessary actions required to resolve the nonconformance to the satisfaction of the client. The procedure shall address nonconformity identification (including client complaints), cause determination, action to prevent recurrence, identifying and implementing the corrective action, recording results, and determining if the corrective action was implemented and effective in resolving the nonconformance.

2. Effective Date and Revisions

As the QMP is a living document that reflects the currently accepted standards of care and lessons learned on H&H projects, the contents of the H&H QMP will be updated as needed. Updates will be issued as controlled documents (i.e., with versions and revision dates).

The project management team is responsible for providing the project staff with relevant portions of the QMP.
Quality Management Plans, once approved by the firm and the client, are unique to the project. Such a plan may not be modified or re-used for another project without approval of the Quality Manager.

3. Quality Management Plan Development

H&H will continually develop and implement measures that assure the various elements of this project are performed in a planned and controlled manner according to, at a minimum, the prevailing standard of care for professional practice applicable to the service being provided.

H&H quality control and assurance activities are dictated by this Quality Management Plan. The plan establishes policy, sets procedures, and controls those which may be specifically assigned to a project.

The plan describes the program, responsibilities and actions required by all project participants to ensure that quality control procedures are performed and documented. As a result, all interested parties can be assured that an appropriate level of engineering quality will be provided, and that the technical staff members will recognize their role in the quality process.

3.1 Project Summary

3.1.1. Project Staff

There are several responsible parties involved in the Quality Assurance and Quality Control of a project from inception to completion. Their project and quality specific roles and responsibilities are described in the Quality Assurance Plan Section 2.0 contained in Appendix B of this document. The H&H Quality Manager (QM) will be responsible for the plan execution. For this project, the following persons will be responsible for the various roles:

H&H Quality Manager (QM) – Keith R. Griesing, PE

The H&H Quality Manager is responsible for annual review of this QMP. The review shall include all aspects of the plan including but not limited to review of comments by clients, audits by clients and corrective action costs, if any. The QM will recommend improvements to the plan upon completion of the review.

H&H Project Manager (PM) – Babak Naghavi, PhD, PE, PH

Responsible for all activities necessary to deliver H&H services in accordance with contract requirements, including:

- Licensed by the State of Louisiana as a professional engineer.
- Experienced in the design of similar structures.
- Acts as primary point of contact and project communications for H&H.
- Develops a comprehensive Project Management Plan as a requirement for Project Initiation which includes the Project Technical Approach Plan.
- Establishes and monitors the project budget, schedule, and staffing requirements.
- Establishes design criteria and design parameters, working with the technical discipline leads. Design criteria shall meet all the requirements of the LADOTD Design Criteria Checklist contained in Appendix E.
- Coordinates with subconsultants.
- Provides communication and direction to technical staff.
- Chairs project meetings, produces and distributes minutes as needed.
- Leads the project delivery efforts and works closely with the project Technical Leads in defining the technical direction of the project.
- Serves as Project Quality Lead.
- Reviews the H&H Quality Assurance Review Form prepared by the Project Quality Lead/Reviewer and certifies the deliverable is ready for submission.
- Completes and signs the LADOTD Consultant Submittal QC/QA Certification Form contained in Appendix E.

The following roles will be designated upon Task Assignment from the personnel listed on the Organization Chart included in Appendix A.

H&H Discipline Leads/EORs:

- Engineers in responsible charge of a specific design segment in their area of expertise.
- Required to sign/seal as Engineer of Record (EOR) unless client or other requirements exist.
- The EOR must stamp the general notes sheets for their discipline.
- Licensed by the State of Louisiana as a professional engineer.
- Experienced in the design of similar structures.
- Ensure the QC/QA certification is signed by all responsible parties.

H&H QC Reviewers:

- Responsible of a specific review of the design segment in their area of expertise.
- Responsible for ensuring that the QC process has met the requirements of this QMP; is complete and the design calculations, drawings, special provisions, and cost estimate are in accordance with LADOTD Bridge Design practices, policies, and procedures.
- Licensed by the State of Louisiana as a professional engineer.
- Experienced in the design of similar structures.
- Responsible for oversight of project specific quality activities including the collection and appropriate filing of all Quality Control and Quality Assurance documentation. Maintains an auditable record of all QC reporting forms generated during design reviews.
- Communicates with Project Manager on a regular basis to maintain the QC review schedule for projects.
- Verifies that the QC activities have been performed and that qualified and competent personnel have undertaken the QC activities.
- Performs Quality Assurance Reviews documented with the H&H Quality Assurance Review and Certification Form. The Reviewer/PQL shall review the project Quality Control documentation in advance of submission to confirm that design QC activities are complete, comply with the Quality Management Plan and meet the requirements of the LADOTD Consultant Submittal Review Checklist contained in Appendix E.

H&H Designers:

- Engineers directly responsible for the development of design calculations, drawings, special provisions including Non-Standard items, and cost estimate.
- Licensed by the State of Louisiana as a professional engineer or certified as an engineer intern.
- Assemble design calculations from all designers, finalize the calculation book, and seal the cover sheet of the calculation book for their discipline.
- Ensure the names of the designer, design checker, and reviewer are correctly shown on the title block of each plan sheet. Stamp all plan sheets or designate a designer, design checker, or reviewer who shall be licensed by the State of Louisiana as a professional engineer to stamp the sheets developed under their supervision.
- Prepare the QA information package upon completion of the QC process.

H&H Design Checkers:

- Engineer responsible for performing a full technical review of the design calculations, drawings, special provisions including Non-Standard items, and cost estimate.
- Licensed by the State of Louisiana a professional engineer or certified as an engineer intern; however, if the designer is an engineer intern, the design checker must be a professional engineer.

3.1.2. Training

H&H will only employ qualified personnel to execute the scope of work.

The Project Manager is responsible to review the record of each employee and determine if the background and experience of the employee is acceptable for the assigned scope of work.

The Project Manager is responsible to ensure staff assigned to the Project is properly trained in the QMP, Procedures/Instructions, any project-unique technical requirements, availability of technical resources, etc. within H&H organization as they relate to the Scope of Work, and has valid evidence of fitness (certification, license, etc.) for executing the work for this Project.

Training will consist of in-house education and field experience. H&H staff found deficient will not be assigned work in their area of deficiency until requirements for the position are met.

3.1.3. Project Description

To provide surveying, designing, and construction support to construct two (2) new ferry landings located in Plaquemines Parish, LA (Pointe-A-La-Hache).

3.1.4. Scope of Work

This project consists of surveying, designing and construction support to construct two (2) new ferry landings located in Plaquemines Parish, Louisiana (Pointe-A-La-Hache) – one on each side of the Mississippi River approximately ¼ mile upstream of the current ferry location.

3.2 Survey

This project is located in Plaquemines Parish, Louisiana (Pointe-A-LA-Hache) and consists of two separate sites on opposite sides of the Mississippi River, to be described below. A complete topographic survey including all utilities with depths and all drainage is required, along with finish floor elevations of all buildings that fall within the survey limits. This project shall be completed in accordance with the Location and Survey Manual and all current accepted Location and Survey Automation procedures.

SITE 1: (Located on the south side of the Mississippi River and north of the intersection of LA 23 and Morris Ln.). This portion of the survey shall begin at a point at the intersection of a gravel road and LA 23 (same point being

approximately 250 ft. northwest of the intersection of LA 23 and Morris Ln.). From the point of beginning, the survey shall proceed in a northeasterly direction along the same gravel road and perpendicular with LA 23 for a linear distance of approximately 1,275 ft. (including approximately 300 ft. out from bank of river). The width of survey and DTM shall be 150 ft. The survey shall then proceed in a northwesterly direction and perpendicular to LA 23, for 525 ft. The survey shall then proceed in a northeasterly direction and perpendicular to LA 23, for 775 ft. (including approximately 300 ft. out from bank of river). The width of survey and DTM shall vary. Please see attached survey request sketch for detailed limits of survey.

SITE 2: (Located on the north side of the Mississippi River and near the intersection of Hwy 15 and Adema Ln.). This portion of the survey shall begin at a point along Hwy 15 approximately 100 ft. southeast of the intersection of Adema Ln. and Hwy 15 and proceed in a southeasterly direction along Hwy 15 for a linear distance of approximately 425 ft. The survey shall then proceed 400 ft. perpendicular to the centerline of Hwy 15 and along property line (including approximately 370 ft. out from crown of levee and 200 ft. from bank). The width of survey and DTM shall be approximately 425 ft. Please see attached survey request sketch for detailed limits of survey.

Both sites shall be tied into the existing U.S. Army Corps of Engineers Levee Baseline and the nearest Mississippi River gauge station located either upstream or downstream.

A drainage map shall be required. Please refer to the Location and Survey Photogrammetry Unit for detailed instructions of what is required on the drainage map. All sub-structures shall be located. Permission of landowners shall be acquired by H&H before entering any property associated with this description. All work is to be done in English units of measurement.

3.2.1. Hydrographic Survey:

H&H shall perform a multi-beam hydrographic survey within the applicable limits of survey. H&H shall record sufficient data to ensure accurate location of all objects and features obtained during the survey and shall meet the accuracy requirements specified in the Location & Survey Manual. The deliverables shall include all normal Survey Inroads deliverables along with all point clouds collected.

3.3 Geotechnical

The geotechnical portion of this project will consist of furnishing geotechnical investigation services and foundation design for the following proposed structures. Hereafter, all sites are referred to as ferry landing sites, regardless of whether the final design includes a bridge, lifting tower, and mooring dolphin.

Project No.	District	Site Description	Length (ft)	Deep Borings	Subgrade Borings
H.006226	02	East Bank Structure	Varies	3	2
		West Bank Structure	Varies	3	2

The following scope is applicable to the typical type of ferry landing site anticipated for this project. The number of borings is estimated based on ferry landing layout and conforms to typical DOTD practice and AASHTO requirements. Each Ferry Landing Site shall include two deep borings in the channel (at location of ferry landing), one deep boring on land (near bridge end), and two shallow subgrade soil survey borings on land (for pavement). H&H shall notify DOTD immediately if it becomes evident that a particular site requires geotechnical investigation and/or engineering efforts that are beyond this scope, including additional borings.

3.3.1. Geotechnical Investigation

H&H shall perform a geotechnical investigation consisting of soil borings, laboratory testing, soil classification, site characterization, and soil boring logs. In addition to the referenced ASTM designations, refer to FHWA Geotechnical Engineering Circular No. 5 (GEC 5) for best practices pertaining to geotechnical site characterization.

3.3.2. Field Investigation – Deep Foundation Borings

The field investigation will consist of soil borings with laboratory testing. Borings shall be made to a minimum depth of 120 feet below existing ground line; however, actual depths may need to be deeper depending on the anticipated foundation reactions. Reduction in foundation capacity due to scour shall be considered when planning the geotechnical investigation. Water level readings shall be made in all soil borings made over land. If the field investigation requires multiple days to complete, at least one 24-hour water level observation shall be made. Boring locations shall be located initially using a hand-held GPS. Final coordinates and elevations shall be surveyed.

Sampling

Soil borings shall be made using wet/mud rotary methods below the water table, with solid stem auguring (ASTM D1452) permissible above the water table. Sampling shall consist of pushing thin-walled Shelby tubes in cohesive soils (ASTM D1587) and Standard Penetration Testing (SPT) in cohesionless soils (ASTM D1586). Continuous sampling shall be performed within at least the upper 10 feet, followed by either:

- Sampling at 5-foot centers in cohesive soils, or
- Sampling at 3-foot centers in cohesionless soils.

H&H may increase the depth of continuous sampling to develop relevant soil parameters within the continuous sampling zone. Shelby tube sampling in cohesionless soils and SPT sampling in cohesive soils will not be allowed, except on a case-by-case basis where Shelby tubes cannot be pushed into very hard cohesive soils. When a Shelby tube is retrieved with no recovery, the hole shall be cleaned out and a SPT shall be performed directly below the previous sampling interval.

Borehole Abandonment

Boreholes shall be backfilled in accordance with all local, State, and Federal regulations. Refer to the Construction of Geotechnical Boreholes and Groundwater Monitoring Systems Handbook for State regulations in the making of boreholes.

Sample Storage and Transport

The following practices shall be observed during transport and storage of the samples:

- Cohesive samples may be extruded in the field provided they are stiff enough to be wrapped and transported, otherwise, samples shall be extruded at the laboratory;
- Shelby tubes not extruded in the field shall be sealed using expansion packers to prevent moisture loss and disturbance;
- Samples shall be extruded using a continuous pressure hydraulic ram. Extrusion by any other method, such as water pressure, is prohibited;
- Samples shall be extruded directly onto a sample trough, not caught by the hand; and
- Samples shall be transported vertically in the same orientation that they were sampled. Follow ASTM D4220 for sample transportation except as noted herein.

Field Logs

Where samples are extruded in the field, soil borings shall be logged in the field using the visual- manual method for classification (ASTM D2488).

3.3.3. Field Investigation – Shallow Subgrade Soil Survey

Subgrade soil survey borings shall be made where new pavement and/or pavement rehabilitation is required on each site. Subgrade soil survey borings can be made utilizing continuous-flight augers, pneumatic, or direct-push sampling. The depth of each boring should be at least 8 feet below the finished roadway elevation or natural ground, whichever is greater, with additional sampling and testing requirements for areas of cut/fill greater than 10 feet. In these cases of excessive cut/fill heights, the deep soil borings may be more appropriate.

3.3.4. Laboratory Testing

All laboratory testing shall conform to applicable ASTM and AASHTO test designations.

Ferry Landing Borings

The following laboratory tests shall be performed, at a minimum:

- Moisture content (ASTM D2216) – all samples;
- Unconsolidated-undrained triaxial compressive strength (ASTM D2850) – 75% of all cohesive samples;
- Atterberg Limits (ASTM D4318) – 75% of all cohesive samples; and
- Grain size testing (ASTM D1140 and ASTM D6913) – as needed to classify granular soils.

If consolidation testing is needed, one-dimensional consolidation tests (ASTM D 2435) may be performed in cases where settlement due to fill is expected to be significant.
Dry preparation methods shall not be used for any ferry landing structural borings.

Extrusion Logs

While extruding soil samples, an extrusion log shall be made using the visual-manual classification method. New pocket penetrometer readings shall be made on representative portions of the samples.

Shallow Subgrade Soil Surveys

The different layers of the soil strata shall be identified every foot or strata break at the discretion of the lab engineer of record using the AASHTO classification system (ASTM D3282, AASHTO M 145) and the following tests:

- Atterberg Limits (ASTM D4318) – 100% of all cohesive samples; and
- Moisture content (ASTM D2216) – all samples;
- Grain size testing (ASTM D1140 and ASTM D6913) – as needed to classify granular soils;
- Hydrometer tests (ASTM D7928) – 75% of samples;
- Percent Organics (ASTM D2974) – as needed; and
- pH (ASTM G51) and resistivity (AASHTO T 288) – as needed, at applicable pipe crossings.

Dry preparation methods (ASTM D421) shall be used where applicable to test shallow subgrade soil survey samples.

3.3.5. Site Characterization & Boring Logs

H&H shall use the field and laboratory data to classify the soils according to the Unified Soil Classification System (USCS) (ASTM D2487). The results shall be presented on signed and sealed soil boring logs adhering to the standard DOTD boring log format. In addition to the USCS classification, the soil descriptions shall include soil consistency/strength, color, and other details or inclusions such as seams, nodules, and organics. Shallow Subgrade soil survey borings shall be presented in a tabular format containing all test results and classified using the AASHTO soil classification method.

3.3.6. Geotechnical Engineering Design

The following geotechnical design elements are anticipated for this project. Should the project scope change from these assumptions, DOTD should be notified immediately.

3.3.7. Driven Pile Design

Driven pile foundations may be used to support proposed ferry landing bridges, lifting towers, and mooring dolphins. Pile tip elevations shall be designed using the static equilibrium methods presented in FHWA Geotechnical Engineering Circular No. 12 (GEC 12). Specifically, the Nordlund and α methods shall be used in cohesionless and cohesive soils, respectively.

LRFD Design

The load and resistance factor design (LRFD) method shall be used to set pile lengths. Subsurface data for each ferry landing site shall be evaluated and divided into design “sites” (design reaches) based on the variability of the data.

Refer to GEC 5 for best practices on selecting sites for LRFD design. At a minimum, all of the following resistance factors (φ) and corresponding pile resistance verification methods shall be evaluated based on costs and engineering benefits:

- φ = 0.80: One Test Pile per design site with 2% (or a minimum of two) production piles tested using dynamic monitoring and signal matching;
- φ = 0.65: One Indicator Pile per design site with 2% (or a minimum of two) production piles tested using dynamic monitoring and signal matching; or
- φ = 0.50: No Test/Indicator Piles, end-of-drive pile resistance verification using the Modified Gates equation.

Recent bid histories for estimating the costs of various resistance factor scenarios are found at: http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Engineering/Project_Management/Pages/Cost_Estimating_Tools.aspx

Scour

Pile design shall consider scour in accordance with Bridge Design Technical Memorandum 21 (BDTM.21). Per Bridge Design Technical Memorandum 32, Rev. 3 (BDTM.32.3), required nominal resistances shall be computed for two cases and presented on the Pile Data Tables:

- The case where the pile is driven to the required tip elevation without the benefit of predrilling, and thus developing full side friction along its entire embedment length; and
- The case where the contractor performs predrilling to the scour elevation in order to advance the pile; thus, eliminating side friction within the predrill/scour zone.

Lateral Loading

Lateral load analysis shall be performed using a p-y method in accordance with GEC 12. P-y methodology shall be performed to check for lateral stability and displacement of deep foundations. P-y modifiers (p-multipliers) should be considered for special conditions such as group effects and sloped geometry (to include battered piles). For deep foundations installed in inclined conditions the following should be adhered:

- Battered piles inclined in the direction of loading or vertical piles loaded in the direction of the downward slope inclination will have a negative angle of inclination (-) and the P- multipliers (Pm) will range from 0.3 to 1.0.
- Battered piles inclined against the direction of loading or vertical piles loaded in the direction of the upward slope inclination will have a positive angle of inclination (+) and the P-multipliers (Pm) will be range from 1.0 to 2.0.

Other Considerations

Additional design considerations such as uplift, group effect, downdrag, etc. shall be addressed in accordance with GEC 12.

3.5.1 Drilled Shaft Design – (If applicable)

Drilled shaft foundations may be considered for support of proposed ferry landing structures. Shaft tip elevations shall be designed using the static equilibrium methods presented in *FHWA Geotechnical Engineering Circular No. 10* (GEC 10).

LRFD Design

The load and resistance factor design (LRFD) method shall be used to set shaft lengths. Subsurface data for each ferry landing site shall be evaluated and divided into design "sites" (design reaches) based on the variability of the data. Refer to GEC 5 for best practices on selecting sites for LRFD design.

Drilled shafts shall be designed with a resistance factor, φ, of 0.70, corresponding with field verification using bi-directional load testing. Refer to LTRC Project 07-2GT, Calibration of Resistance Factors Needed in the

LRFD Design of Drilled Shafts (Abu-Farsakh et al., 2010) to determine appropriate locally calibrated resistance factors for static design methods without load testing.

Other Considerations
Additional design considerations such as lateral loading, uplift, group effect, and down drag shall be addressed in accordance with GEC 10.

3.3.8. Ferry Landing Foundation Load Test Program

If the project subsurface conditions are difficult, significant uncertainties exist in the foundation design, and cost savings can be predicted, a load test program may be appropriate. Depending on project conditions, a load test program may be included either in the Design or in the Construction phase. The load test program shall include the following:

1. Location and Type of proposed load test;
2. Design of test foundation (pile, drilled shaft, or other);
3. Dynamic test procedures and schedules;
4. Load increment requirements;
5. Maximum test load;
6. Instrumentation requirements;
7. Load test Layout and Design Sheets for plans;
8. Special Provisions for construction of test foundation and load test methodology;
9. Interpretation of load test results and recommendations; and
10. Foundation load test report.

3.3.9. Slope Stability

Modifications to the bank or channel geometry, including temporary conditions should be analyzed for slope stability. The following maximum resistance factors and equivalent factors of safety shall be considered:

- Typical conditions: $\varphi = 0.75$ (equivalent minimum FoS ≈ 1.3);
- Critical slopes (slopes with structures, etc.): $\varphi = 0.65$ (equivalent minimum FoS ≈ 1.5); and
- Rapid drawdown: $\varphi = 0.85$ (equivalent minimum FoS ≈ 1.2).

All potentially critical geometry, groundwater, surface water, and other loading conditions shall be considered for drained and undrained conditions as applicable.

3.3.10. Embankment Settlement

The addition of fill may lead to settlement concerns of existing subsurface soils. Consolidation/settlement analysis may be needed to determine the amount of settlement in inches/feet, to estimate the time required for settlement to take place when the proposed embankment is constructed on the project subsurface soils, and to make appropriate Engineering Design Recommendations relative to consolidation settlement. An embankment settlement analysis should include modeling of the appropriate borings logs and critical embankment geometry. Determine the predicted total consolidation settlement and the predicted time rate to achieve only 1 inch of post-construction settlement. If reaching 1 inch of post-construction settlement is anticipated to occur in a time period greater than 5 months, recommendations to reduce the amount of consolidation settlement and/or to accelerate the settlement through the use of lightweight fills, surcharge placement, wick drains or other methods should be determined by the engineer. If necessary, engineer should provide recommendations for a settlement monitoring program.

3.3.11. Earth Retaining Structures (ERS)

When adequate space is not available or mitigation of soil erosion is needed for slopes along waterway, a retaining wall may be required. DOTD has used Sheet Pile Walls as temporary and permanent retaining structures. Wall types, such as cantilever or anchored should be selected based on function of the wall, soil characteristics

and proximity to ferry landing structures. Earth retaining structure calculations must include:

- Global stability check of ERS;
- External stability check of ERS;
- Settlement analysis of ERS (If applicable);
- Analysis of governing load conditions under drained and undrained soil conditions; and
- Analysis of any other critical/governing configurations of the ERS.

If sheet piles will be required to construct the design, sheeting must be designed by the Geotechnical engineer and section type, tip elevations, cutoff elevations, and stationing must be provided in plans. Calculations should include appropriate undrained and drained soil conditions and estimated long-term and short-term deflections. The resistance factors from the AASHTO Bridge Design Specifications, latest edition, shall be used to design sheet pile walls. The USACE Design Guide titled "EM-1110-2-2504- Design of Sheet Pile Walls" may be used as a reference.

3.3.12. Deliverables

The following deliverables shall be provided during the course of the geotechnical investigation:

Geotechnical Investigation Plan

Prior to beginning the field work associated with the geotechnical investigation, submit a site layout with proposed boring locations for review and approval. Additionally, coordinate with district personnel and provide traffic control plan if traffic will be affected. Traffic control plan should include anticipated dates of road/lane closure and limits of road/lane closure. Final traffic control plan should be submitted 60 days prior to anticipated closure dates.

Geotechnical Data Report

H&H shall furnish a final Geotechnical Data Report (GDR) detailing the results of the subsurface investigation. The GDR shall contain only factual information and no opinions or engineering recommendations. The GDR shall include, at a minimum:

1. Cover letter with executive summary describing the subsurface investigation
2. Table of contents
3. Report Body containing the following sections, at a minimum:
    a. Project Description
    b. Summary of subsurface investigation, including description of methods and standards used
    c. Summary of laboratory testing performed, including description of methods and standards used
4. Appendix containing the following items, at a minimum:
    a. Boring plan
    b. General ferry landing plan & profile sheet used to establish the boring locations
    c. Soil boring logs
    d. Plots of grain size distribution curves and consolidation tests, as applicable
    e. Laboratory test data sheets, including extrusion logs, stress vs. strain plots for triaxial testing, consolidation test deformation vs. time plots (when applicable), Atterberg Limit worksheets, etc.

Geotechnical Interpretation Report

H&H shall furnish a final Geotechnical Interpretation Report (GIR) detailing assumptions, design methodologies, and final recommendations. The report shall be signed and sealed by a Professional Civil Engineer registered in the State of Louisiana, and shall include the following items, at a minimum:

1. Cover letter with executive summary describing the structure type, loads, and pile lengths. All plan-related notes and tables shall be provided in the cover letter.
2. Table of contents
3. Report Body containing the following sections, at a minimum:
    a. Project Description
        i. Summary of structure type

ii. Summary of subsurface investigation
iii. Summary of laboratory testing performed

b. Subsurface Conditions
i. Generalized subsurface profile
ii. Summary of groundwater conditions

c. Foundation Analyses
i. Summary of design codes and specifications followed
ii. Description of static pile analysis method(s) used as well as any relevant assumptions
iii. Discussion of the evaluation of various LRFD resistance factors, field verification methods, and associated costs
iv. Recommended foundation tip elevations/lengths
v. Brief construction recommendations, identification of potential difficult driving conditions, etc.

d. Slope Stability Recommendations (if applicable)
e. Embankment Settlement Recommendations (if applicable)
f. Earth Retaining Structures Recommendations (if applicable)

4. Appendix containing the following items, at a minimum:
a. Any revised documents from the GDR, such as boring plans or soil boring logs
b. Plots of relevant soil data versus elevation including the interpreted design profile for each design site
c. Nominal pile resistance versus elevation plots for each design site and pile size/type
d. Pile data table
e. Plots of settlement versus time for any relevant consolidation settlement runs (if applicable)
f. Slope stability output plots for any relevant global stability analyses as well as external stability calculations for ERS (if applicable)

Report Format
The report shall be submitted in electronic format as a searchable .pdf file with bookmarks denoting the various sections of the report. Report body, charts, and figures shall be generated directly from the source applications in order to minimize file size. Documents scanned as raster images shall only be used when no other option exists for their inclusion into the report. All pages shall print to either 8.5" x 11" or 11" x 17" without scaling or adjustment.

Geotechnical Data
All geotechnical data shall be furnished to DOTD in a gINT .gpj file adhering to the DOTD's standard gINT schema (a template file can be furnished upon request).

Soil Boring Logs
In addition to including half-size boring logs in the GIR, the logs shall also be included in the plans as signed and sealed full-size sheets.

3.4 Roadway Design

H&H shall provide the following items:

5. Design Report Form
6. Preliminary and Final Construction Plans
7. Transportation Management Plan (TMP)
a. It is anticipated that a level 2 TMP will be warranted
b. See EDSM VI.1.1.8
8. The Consultant's assistance with permit application drawings, if required, shall be established by a fully executed Supplemental Agreement or Extra Work letter.

Design Report Form
H&H shall prepare the latest version of the DOTD Design Report Form. The report shall be approved by the DOTD

Project Team prior to construction plan development. H&H should reference any relevant environmental documents for design criteria used in Line & Grade development. H&H is responsible for preparing and submitting any design waivers or exceptions.

Preliminary and Final Construction Plans

Required Plan Submittals:

- 30%, 60%, 90%, 100% Preliminary Plans
- 60%, 95%, 98%, 100% Final Plans
- Special Provisions and NS Pay Items

30% Preliminary Plans include:

- Title Sheet and Layout Map
  - With traffic data
- Typical Sections (pavement design)
- Plan and Profile sheets with existing topographical survey shown
  - No vertical alignment (profile) shown
- Existing Drainage Map
- Preliminary Design Report
- Soil boring and pH/resistivity request submitted 60%

Preliminary Plans include:

- Title Sheet and Layout Map
- Typical Sections and Details Sheets
- Plan and Profiles Sheets
  - Horizontal/Vertical Alignment Provided
  - 1"=50' plan/profile sheets with subsurface drainage and/or open ditch drainage as required
- Summary of Estimated Quantities
  - (No quantities provided, just a list of required pay items)
- Geometric Details
- Existing Drainage Map
- Design Drainage Map
- Drainage Design
  - The Engineer shall prepare a drainage report with calculations for design of maximum capacity of inlets, pipes, and other structures. Drainage design shall comply with the guidelines set in the latest edition of the LA DOTD Hydraulics Manual.
- Cross Sections
  - (Not completely refined, just big picture view of corridor with R/W shown)
- Utility Relocation Recommendations 90%

Preliminary Plans include:

- Title Sheet and Layout Map
- Typical Sections and Details Sheets
- Summary of Estimated Quantities
  - (No quantities provided for pay items)
- Plan and Profiles Sheets
  - Further refined alignments and more detail shown
  - 1"=50' plan/profile sheets with subsurface drainage and/or open ditch drainage as required
- Existing Drainage Map

- Design Drainage Map
- Summary of Drainage Structures Sheet
- Geometric Details
- Suggested Sequence of Construction
- Cross Sections
    - Incorporates any alignment changes between 60% and 90% submittals
    - Shows Required Right of Way lines (if applicable) and Limits of Construction
- Preliminary Engineer's Construction Cost Estimate
- Updated Utility Relocation Recommendations

Plan-In-Hand Meeting (PIH)

Following the submittal of the 90% Preliminary Plans, the Engineer shall participate in the PIH meeting. This is an in-person meeting to discuss review comments received from the 90% preliminary plan submittal. See Note 2 for more details.

Plan-In-Hand Deliverables:

- 90% Preliminary Plans (as described above): One set of half-sized (11x17")
- Preliminary Engineer's Construction Cost Estimate (as described below)
- Meeting documentation (as described below)

Preliminary Engineer's Construction Cost Estimate

The Engineer shall develop an itemized construction estimate at 90% Preliminary Plans. The estimate shall be broken down by control sections and individual pay items as defined in the Louisiana Standard Specifications for Roads and Bridges, AASHTOWare Project Preconstruction, and Trns•port, or as directed. Due to federal funding, the project quantities and/or cost estimation may need additional documentation in order to divide the quantities between local and federal funds. The estimate shall be presented on 8 ½" x 11" paper, itemized by pay item number, listing the appropriate pay item description. Item costs shall be based on item bid history or regional market conditions, whichever is most appropriate.

Meeting Documentation

The Engineer shall be responsible for conducting the meeting and preparing and distributing meeting minutes accordingly to all members present. H&H will be required to provide a disposition of comments for the Plan-in-Hand Review to satisfy constructability review requirements.

100% Preliminary Plans includes:

- Title Sheet and Layout Map
- Typical Sections and Details Sheets
- Summary of Estimated Quantities
- Plan and Profiles Sheets
- Existing Drainage Map
- Design Drainage Map
- Summary of Drainage Structures Sheet
- Reference Points and Bench Mark Elevation sheets
- Geometric Details
- Suggested Sequence of Construction
- Cross Sections
- 100% Preliminary Plans QC Review Checklist
- Updated Engineer's Cost Estimate based on any changes made as a result of the comments received at the PIH.

100% Preliminary Plans QC Review Checklist

The Engineer shall complete the DOTD QC Review Checklist in accordance with the DOTD Construction Plans QC/QA Manual for review.

60% Final Plans include:

- All sheets included in the 100% preliminary plan submittal revised to include any comments received from the plan reviewers
- Summary of Estimated Quantities and associated Summary Tables should have quantities and quantity calculations provided for each pay item at this point.
- Final Hydraulic Design report submitted for review.
- Suggested Striping and Permanent Signing Layout
- Erosion Control Plan

95% Final Plans include:

- All sheets included in the 60% final plan submittal revised to include any comments received from the plan reviewers
- This submittal initiates the development of the PS&E package (Plans, Specifications, and Estimate)
    - Develop any Non-standard specifications
- Updated Engineer's Cost Estimate
- Complete the Constructability/Bid-ability Form
    - The Design Review portion of the form shall be filled out by the designer prior to 95% Final Plans submittal.
    - See the Plan Constructability Review Form at: http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Engineering/Road_Design/ Pages/Standard-Forms.aspx
    - See EDSM III.I.I.32
    - If the Project Manager decides to have a 95% Final Plan meeting, the use of the Constructability/Bid-ability form is not required. In lieu of the form, meeting minutes shall be taken documenting that the plans were reviewed for constructability/bid-ability.

98% Final Plans include:

- All sheets included in the 95% final plan submittal revised to include any comments received from the plan reviewers
- This submittal is predominantly to advance the PS&E package and to submit the plans to DOTD PQU (Plan Quality Unit) for review
- Final Plan QC Review Checklist
- Updated Engineer's Cost Estimate

100% Final Plans include:

- All sheets included in the 98% final plan submittal revised to include any comments received from the plan reviewers.
- Final Engineer's Cost Estimate

Notes on Preliminary and Final Plans

1. This project shall be designed in accordance with the 2016 Edition of the Louisiana Standard specifications for Roads and Bridges, as well as the Louisiana Department of Transportation and Development Minimum Design Guidelines.
2. H&H is responsible for providing the Project Manager with a disposition of comments at each plan

submittal and project progress meeting. At the conclusion of the project, H&H shall submit a final disposition of comments and meeting minutes booklet disclosing all comments and dispositions throughout the life of the design stage of the project.

3. H&H shall provide support to the DOTD staff regarding technical questions and shall provide the DOTD Project Manager with meeting minutes following any project progress or plan review meetings.
4. Items provided by the Department :
    a. Environmental Approval
    b. Pavement design
        - See Typical Section on pg. 28 of the Off-System Highway Bridge Program Guidelines. Pavement and Geotechnical may be consulted if site conditions and ADT require a more thorough design.
    c. Standard Plans (as needed) and Special Details
2. H&H is expected to prepare for, and attend, the following (but not limited to) meetings:
    a. Project Kick-Off
    b. Plan-in-Hand
    c. 95% Final Plan Review (with discussion of Risk, TMP, Mitigations, Phasing)
    d. Project Progress Meetings (as needed)
3. Constructability: H&H shall, throughout the life of the project, provide internal constructability reviews to ensure successful project bid-ability.
4. Vehicular Traffic Control:
    - Provide traffic control plan with details on the sequence of construction sheets to minimize closures to vehicular traffic for work near LA 23 and LA 15.
5. Pre-bid Questions:
    - The Consultant shall provide assistance with answers to pre-bid questions submitted to the Department through the “Falcon” system.
6. Electronic files will be in MicroStation and InRoads formats and certified by CADconform.
7. H&H shall provide the Department with a Final Calculations Report (electronic format is acceptable) of all design and engineering related calculations pertinent to the project The report should be indexed and tabbed for ease of navigation. Information contained in the report should be neatly arranged and legible.

3.5 Bridge Design

The plans may include but not necessarily be limited to ramp bridges, lifting towers, and mooring dolphins along with the associated substructures and foundations. Construction support shall also be included during the Construction Phase.

H&H shall perform bridge engineering services including the following major tasks:

1. Development of Preliminary and Final Plans for the new East and West Bank Ferry Landings and shall include:
    a. Establishment of design criteria including Design Vessel, Berthing Velocity, Wind, Debris, and River Current loadings, Design Vehicle and Speed, Loading on Mooring Facilities, Loading on Bridges and ramps, and completion of a Final Design Criteria Document.
    b. Design of Landing Ramp Bridges structural design and detailing including:
        i. Girders, floorbeams, stringers, grating deck, and barrier.
        ii. Lift Tower, Platform and Tower Access.
        iii. Lift Beam and Lifting Assembly.
        iv. End Pile Bent and Pivot Assembly.
    c. Design of Mooring structural design and detailing including:
        i. Tripod mooring dolphins.
        ii. Mooring fenders.
        iii. Chained mooring dolphins.

d. Design and details of approach span and any associated soil/embankment retaining system.
e. Design and details of new Pontoon Barge(s) and associated apron structures.
f. Design and details of Roadway and Pedestrian Guardrails for the new Ramp Bridges.
g. Design details and specifications for the Ramp Bridge mechanical system, including lifting tower machinery.
h. Final Design and details for Ferry Landing electrical systems and components including general plans and elevation of electrical components and systems, one- line and three-line power diagrams, motor starter diagrams, control schematics, conduit and wiring schedule, equipment schedule, panel board schedule, and associated details.
i. Provide LRFR bridge ratings including inventory and operating rating for HL-93 and inventory rating for LADV-11 for the Ramp Bridges. The bridge rating shall be performed in accordance with the latest edition of the AASHTO Manual for Bridge Evaluation, LADOTD Policies and Guidelines for Bridge Rating and Evaluation, and Bridge Design Technical Memoranda. The bridge rating report shall also be prepared in accordance with the aforementioned publications for each structure.

2. Production and transmittal of Plans, specifications and/or special provisions and non- standard (NS) pay items, and Engineer's Construction Cost Estimate.

Project Schedule and Deliverable Milestones: shall be as determined by the Department in coordination with H&H.

Consultant Submittals

- Design Criteria
- 30%, 60%, 90%, 100% Preliminary Plans
- 30%, 60%, 95%, 100% Final Plans
- Special Provisions and NS Pay Items
- Construction Cost Estimate
- Design Calculations
- As-Designed Bridge Rating Reports

3.5.1 Services to be performed / items to be provided by DOTD

- As-built plans of existing ferry landings
- Most recent DOTD inspection reports
- Existing bridge rating report or rating summary sheet

3.5.2 Services to be performed / items to be provided by Entity

- Approach Roadway (West Bank)
  - Survey Data & Maps
  - Geotechnical Data
  - Final / As-Built Plans & Specs

3.6 Deliverables

Document	Hold Point	Witness Point
Quality Assurance / Quality Control Plan (QMP)		X
Schedule		X
Survey – Topographical and Hydrographic, both sites	X	
Geotechnical Investigation Plan		X

Document	Hold Point	Witness Point
Geotechnical Data Report		X
Geotechnical Interpretation Report	X	
Roadway Preliminary Plans – 30%		X
Roadway Preliminary Plans – 60%		X
Roadway Preliminary Plans – 90%	X	
Roadway Preliminary Plans – 100%	X	
Roadway Final Plans – 60%		X
Roadway Final Plans – 95%		X
Roadway Final Plans – 98%	X	
Roadway Final Plans – 100%	X	
Bridge Preliminary Plans – 30%		X
Bridge Preliminary Plans – 60%		X
Bridge Preliminary Plans – 90%	X	
Bridge Preliminary Plans – 100%	X	
Bridge Final Plans – 30%		X
Bridge Final Plans – 60%		X
Bridge Final Plans – 95%	X	
Bridge Final Plans – 100%	X	
Technical Specifications – 60%		X
Technical Specifications – 95%	X	
Technical Specifications – 100%	X	
Construction Cost Estimates – Preliminary		X
Construction Cost Estimates – Final	X	
Design Calculations	X	

3.6.1 Electronic Deliverables

Consultant hereby agrees to produce electronic deliverables in conformance with DOTD Software and Deliverable Standards for Electronic Plans document in effect as of the effective date of the most recent contract action or modification, unless exempted in writing by the Project Manager. Consultant is also responsible for ensuring that sub-consultants submit their electronic deliverables in conformance with the same standards. DOTD Software and Deliverable Standards for Electronic Plans document and DOTD CAD Standards Downloads are available via links on the DOTD web site.

Consultant shall apply patches to CAD Standard Resources and install incremental updates of software as needed or required. Consultant hereby agrees to install major updates to software versions and CAD Standard Resources in a timely manner. Major updates of CAD standards and software versions shall be applied per directive or approval of the DOTD Design Automation Manager. Such updates will not have a significant impact on the plan development time or project delivery date, nor will they require Consultant to purchase additional software. Prior to proceeding with plan development, Consultant shall contact the Project Manager for any special instructions regarding project-specific requirements.

If any Digital Plan Delivery Standard conflicts with written documentation, including DOTD plan-development Manuals, the Digital Plan Delivery Standard governs. Consultant is responsible for contacting the Project Manager should questions arise.

Consultant shall upload (or check in) electronic deliverables directly into the DOTD ProjectWise repository at each plan delivery milestone. Consultants are responsible for performing certain operations at each milestone including, but not limited to, the following:

- Upload (or check in) CAD plan deliverables to the discipline "Plans" folder
- Apply and maintain indexing attributes to CAD plans (and other deliverables as needed)
- Publish PDF format plan submittals in ProjectWise using automated publishing tools
- Digitally sign PDF format plan submittals in ProjectWise according to DOTD standards and procedures (Final Plans, Revisions and Change Orders). Signatures shall be applied in signature blocks provided with electronic seals and Title Sheets.

Additionally, after reviewing deliverables for each submittal milestone, the Project Manager shall notify Consultant regarding the availability of two automatically generated informational reports in ProjectWise. These reports document the completion status and other information regarding indexing attributes and CAD standards. Consultants shall take these reports into account and make any necessary adjustments to plans before the next submittal milestone; or sooner, if directed by the Project Manager.

3.6.2 Audit Schedule

In accordance with Section 6.2 of the Quality Assurance Plan, Quality Audits shall be determined and scheduled by the Chief Technical Officer or Quality Manager.

3.7 Project Specific Procedures

Quality Management Plans

A Quality Assurance Plan is submitted as Appendix B of this QMP.
A Quality Control Plan is submitted as Appendix C of this QMP.

3.7.1. Quality Control Plan Modifications

There are no modifications to the QC Plan.

3.7.2. Quality Assurance Plan Modifications

There are no modifications to the QA Plan.

Appendix A

H&H Organizational Chart

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

Legend

- APS Engineering & Testing, LLC
- Ardaman & Associates, Inc.
- Chustz Surveying, LLC
- Moffatt & Nichol
- Pelican Marine Design
- Urban Systems, Inc.
- TCT / TCS / Flagger
- ✖ MPR No.

QUALITY CONTROL

Stephen Mikucki, PE[3]
Ray Mankabadi, PE[6]
Alexander Noble, PE
Timothy Noles, PE[3]

PROJECT MANAGER

Babak Naghavi, PhD, PE, PH [1, 2] .....

SURVEY SERVICES

James Chustz, PLS[5] .....
Julian Chustz, PLS[5] .....
Mark Huber, CH .....
Robbie Benoit .....
Mark Coinche, CST .....
Craig Villemarette .....

GEOTECHNICAL DESIGN

Peter Johnson, PE
Albert Ayenu-Prah, PE[6] .....
Megan Bourgeois, PE[6] .....
Robert Jewell, PE[6] .....
Julian (Jim) Porter[7] .....
Robert Rousset, PE[6] .....
Sergio Aviles, PE[6] .....
Sairam Eddanpudi, PE[6] .....
Surendra Raj Pathak, PE[6] .....
Van George[7] .....

COASTAL DESIGN

Eric Smith, PE .....
Jeff Sheldon, PE .....
Kevin Hanegan,PE .....
Maged El-Mestkawy, PE .....
Teodors Ribakovs .....

TRAFFIC SERVICES

Alison Michel, PE .....
Nicole Stewart, PE .....
Christine Darrah, PE .....

STRUCTURAL DESIGN

Erik Diaz, PE
Linh Kim, PE .....
Roberto Viciedo, PE[3]
Benjamin Hawthorne, PE[3]

MECHANICAL DESIGN

Robert Plocica, PE
James Gentile, PE
Travis, Kimmins, PE[3]
Frank Marzella, PE

ELECTRICAL DESIGN

Andrew Barthle, PE[3]
Ken Pecquet, PE .....
Chris Svara, PE[3]
Marco Lara, PE[3]

ROADWAY DESIGN

Rob Hideck, PE[4]
Dalton Hunt, EI .....

MARINE / PONTOON DESIGN

William Scherer, PE .....
Brandon Taravella, PhD, PE .....
Paul Hoo, PE .....

CONSTRUCTABILITY

Fred Wetekamm, PE .....

Appendix B

H&H Quality Assurance Plan

Table of Contents

1.0 Introduction

Quality Assurance is the systematic review of our design and development processes and our Quality Control activities to confirm that the desired level of quality has been attained and will continue to be obtained. Quality Assurance identifies procedural shortfalls and recommends changes to improve our processes.

Quality Assurance is a company-wide process that confirms that the proper processes are in place to assure that our services and products meet the requisite standard of care.

2.0 Key Definitions and Roles

2.1 Key Definitions

a) **Back Checker:** The individual who reviews the Checker's comments. The Originator / Producer functions as the Back Checker unless another qualified individual is assigned by the PM.

b) **Checker**: The individual who through education and/or experience is knowledgeable within an area of technical subject matter, who has been assigned by project leadership to perform an accuracy and correctness check of technical content.

c) **Check Print**: The copy of the work product to be used in the quality control process. The Check Print may be a hard (paper) copy or a digital file such as a Portable Document File (PDF) that is capable of recording review markups. A Check Print is required at each Hold Point and may be requested by the Client, PM, or HQ at a Witness Point. Refer to the appropriate process by document type / class in section 4 for Check Print contents.

d) **Director of Engineering:** The Director of Engineering is responsible for overall allocation of staff to projects directly or through coordination with the Office Managers and/or other Staffing Managers, depending on the business unit. For the purposes of this document, the title "Staffing Manager" is used to represent the role of the Office Manager, New York Staffing Manager, or Director of Engineering with respect to assignment of resources.

e) **Engineer of Record:** A licensed Professional Engineer responsible for signing and sealing design reports, plans, and specifications which they prepared, or which were prepared under their direct supervision.

f) **Fundamental Project:** Projects that represent core services for existing clients that do not represent significant or unusual risk to the firm or substantial revenue relative to a specific business unit. Refer to Operating Policy OP-06 for further information.

g) **Hold Point**: A level of design where specific aspects of the project such as design objectives, design criteria, and principal geometry are typically locked in. At a minimum, Concept level plans (10-15% design), Final plans (100% design), and Issued For Construction (IFC) or Released For Construction (RFC) plans are mandatory Hold Points.

h) **HQ**: Also referred to as Headquarters Engineering. This specifically refers to the authority of the technical directors such as but not limited to the Chief Technical Officer, Director of Engineering, Risk Management Officer, Quality Manager, or respective Practice Leaders and Chief Engineers.

i) **Independent Check**: Verification of a calculation by performing a separate standalone calculation to confirm results in lieu of performing a detailed check.

j) **Internal Technical Reviewer**: Reviewer for a project or portion thereof that has not been a principal participant in the development of a work product.

k) **Key Project:** Any project that does not meet the definition of a Fundamental Project. Refer to Operating Policy OP-06 for further information.

l) **Originator / Producer**: The individual, qualified by experience in the applicable discipline, who is assigned to prepare documents and/or generate work product.

m) **Phase Submittal**: A milestone submittal of a preliminary work product to a client (i.e., concept plans, 60% plans, or similar prior to final.)

n) **Plans**: Drawings and/or CADD files created by H&H for use by the Client as part of the contract or bid documents or, in the case of alternative delivery such as design/build, to construct the project.

o) **Preliminary:** A document, including reports, plans, specifications, or similar documents, prepared by H&H and submitted to the client prior to the anticipated final submittal of such document. Preliminary documents are 100% complete and validated by QC but represent a lesser level of development than the final work product.

p) **Principal In Charge:** The Principal in Charge (PIC) is responsible for the overall project and delivery of our services to the client. The PIC leads negotiations for contractual agreements with the client and is responsible for overall client satisfaction. The PIC is to be aware of the project performance, both technical and financial, and ensure the Project Manager is performing his/her duties in accordance with the firm requirements.

q) **Project Management Plan (PMP):** The plan developed by the Project Manager prior to project initiation to describe "how" and "by whom" a specific project will be performed, including detailed budget, schedule, resources, responsibilities, communications, and quality. The Project Management Plan includes the Operations Plan, Technical Plan and Quality Management Plan.

r) **Quality Management Plan (QMP):** The plan developed by the Project Manager to describe specific quality requirements for a given project. The QMP typically includes variances or enhancements to the firm standard QMP.

s) **Quality Control (QC**): Procedures of checking the accuracy and consistency of the work product to minimize errors, discrepancies, and omissions, to ensure adherence to industry standards and to deliver an exceptional product to our clients.

t) **Quality Assurance (QA):** Procedures of reviewing the design and development processes to ensure the Quality Control procedures are in place, implemented per firm policy and the desired level of quality has been attained and will continue to be obtained. Quality Assurance identifies procedural shortfalls and recommends changes to improve processes where appropriate.

u) **Quality Auditor:** A person who is an Engineer or Manager that is assigned by HQ to perform a Quality Assurance Audit for a project.

v) **QC Stamp:** A physical or digital stamp applied to work product to signify that it is the check copy (aka Check Print) and for recording the initials and dates of the individuals who performed the quality control process.

w) **Verifier**: The individual assigned to verify that the Checker's and Originator / Producer's comments have been implemented. The Verifier may be any individual assigned by the PM but will preferably be the Checker.

2.2 Key Roles

There are several responsible parties involved in the Quality Assurance of a project from inception to completion. Their project and quality specific roles and responsibilities are described below.

Based on the project staffing needs identified, in terms of skill set and level of experience, and the basic project organization structure, the staff related to the key roles of Project Manager, Project Engineer, Project Quality Assurance Lead, and Discipline or Task Lead should be identified. An org chart or responsibility matrix showing these positions should be included in the project files and updated to reflect any staff changes as the project progresses.

2.2.1 Discipline or Task Lead

a) Project Responsibilities

1) Typically, the engineer in responsible charge of a specific design segment and required to sign/seal as Engineer of Record (EOR) unless client or other requirements exist.

b) Quality Responsibilities

1) Responsible for ensuring that QC has been completed and that the documents have been provided to the Project Quality Assurance Lead, or the Project Manager if no Project Quality Assurance Lead has been assigned for their specific design segment or portion of a project.

2) Responsible for coordination with the Project Engineer if a Project Submission Report is to be prepared, as described in Section 5

2.2.2 Project Engineer

A project may have more than one Project Engineer (PE) on large multi-disciplinary projects where work is divided into segments or disciplines. The Project Engineer shall be a licensed Professional Engineer in the jurisdiction of the project.

a) Project Responsibilities

1) The Project Engineer is responsible for project development and delivery according to the requirements communicated by the Project Manager (PM).

2) Based on the organization of the project as determined by the Chief Technical Officer and the PM, the Project Engineer may be the technical lead for key decisions during the project development process. Alternatively, the Project Engineer may lead the project delivery efforts and work closely with the project Technical Lead in defining the technical direction of the project.

3) Provides communication and direction to technical staff.

4) In coordination with each design lead, the Project Engineer is encouraged to prepare a Project Submission Report as described in Section 5

b) Quality Responsibilities

1) Serves as an intermediary between the Project Quality Assurance Lead and project development activities.

2) In instances where the Project Engineer is the technical lead for the project, the Project Engineer is responsible to document the key decisions including code interpretations, contract nonconformances, and deviations made and document acceptance of these decisions by the PM. Documentation of such instances must be made available to the Project Quality Assurance Lead and Quality Manager.

3) In instances where the Project Engineer is the Project Quality Assurance Lead, the Project Engineer is responsible for all responsibilities listed in Section 2.2.3 below including but not limited to:
    a) Scheduling Quality Assurance Reviews as required in Section 3.1 below.
    b) Providing necessary information to the Quality Auditor. Necessary information includes write-ups for complex or complicated design documents or computations to facilitate review.

2.2.3 Project Quality Assurance Lead

The Project Quality Assurance Lead (PQAL) is assigned by the Project Manager and may be a third party not involved in project development but is typically the Project Engineer. The PQAL is responsible for the collection and appropriate filing of all Quality Control and Quality Assurance documentation. If separate from the Project Engineer, the PQAL should be a licensed professional engineer, and responsible for oversight of project specific quality activities.

The PQAL shall report to the Project Manager and the Quality Manager as outlined below.

The PQAL must be familiar with Client Requirements.

a) Project Responsibilities
    1) Communicates with Project Manager and Project Engineer on a regular basis to maintain the QC review schedule for projects.
    2) Maintains an auditable record of all QC reporting forms generated during design reviews.

b) Quality Responsibilities
    1) Has ‘halt work’ authority for nonconformance.
    2) Responsible for management of the Quality Control and Quality Assurance process either directly or through delegation.
    3) Shall direct QC efforts and verify that the QC activities have been performed and that qualified and competent personnel have undertaken the QC activities in coordination with the Project Engineer. Quality Control shall be done by project level staff directly involved with design activities.
    4) Responsible for performing Quality Assurance Reviews. The PQAL shall review the project Quality Control documentation in advance of submission to confirm that design QC activities are complete and comply with the Quality Management Plan.
        a. Quality Control Documents that are not accompanied by appropriate information or explanation may be rejected by the PQAL and returned to the Project Engineer for completion.
        b. Documents the results of the QA review activities, verifies incorporation of comments made during QA reviews, and resolves outstanding comments through communication with the Project Manager and Project Engineer.
            i. Identifies and records nonconformance on the Quality Assurance Report Form.
            ii. Tracks, monitors, and reports to the Project Manager and Quality Manager on the status of outstanding design-related nonconformance reports as requested.
    5) Generates Quality Assurance reports using the Quality Assurance Report Form when requested by the Quality Manager. The report is submitted to HQ and a copy is placed in the project files.

2.2.4 Project Manager

The Project Manager (PM) is responsible for all activities necessary to deliver H&H services in accordance with the contract requirements.

a) Project Responsibilities:

1) The Project Manager is responsible for the project financial performance as well as oversight of the technical sufficiency of the services.

2) The PM is responsible for developing the Project Technical Approach Plan in accordance with Operating Policy OP-06 and for meeting all project specific goals set forth in the Plan.

3) The PM directs the development and delivery process. The PM also directs all communication with the Client.

4) The PM coordinates with the Staffing Manager on project staff needs.

5) The PM's activities shall include, as a minimum, assessment and evaluation of the following as they are applicable to a given project:

a. Design reports

b. Analytical approach

c. Drawing details for conformity to Contract requirements

d. Project Specifications for conformity to Contract requirements

e. Design and Work Plans

f. Major temporary components' effect on permanent components

g. Field design changes

h. Design approvals for Materials and procedures

i. As-Built Plans for conformity with final design and Contract requirements.

6) The PM, and/or staff working under the direct supervision of the PM, shall conduct an assessment and evaluation of design such that the PM can certify to the Chief Technical Officer, the Quality Manager, and to the Client, if required, that the design satisfies the Contract requirements, including the following requirements:

a. Accuracy

b. Adequacy

c. Conformance to standards of practice

d. Compliance with codes and standards

e. Quality

f. Fitness for purpose and/or function as specified and/or implied in the Contract

g. Conformance with the standard practices and specifications of the Client.

7) Sign the Quality Assurance Report Form.

a. The Project Manager, certifies that the noted submittal for the referenced project has completed and met the requirements of the Project Quality Management Plan, is complete for the level of development and meets the requirements of Hardesty & Hanover.

b) Quality Responsibilities

1) The Project Manager develops a Quality Management Plan to meet the specific project goals and requirements. The QMP is submitted to the Quality Manager for review.

2.2.5 Discipline Chief Engineer

a) Project Responsibilities

1) Does not typically have direct project development responsibilities unless assigned to the project.

b) Quality Responsibilities

1) Upon request of the Project Manager, resolves and documents the resolution of any differences of opinion between the Checker and Back Checker during Quality Control and provides this information to the Project Quality Assurance Lead (PQAL) or the Project Manager if no PQAL has been assigned.

2) Attends both the Project Initiation Technical Meeting and the Project Staff Kick-off Meeting. Based on the scope and discussions at the Project Initiation Technical Meeting, the CTO and Chief Engineers decide the level of HQ Oversight and Chief Engineer (or delegate) involvement appropriate for the project.

2.2.6 Quality Manager

The Quality Manager (QM) has firm wide responsibility for confirming that Project Managers have developed and adhered to Quality Management Plans for individual projects. The QM is responsible for meeting the quality goals and objectives set by the Chief Technical Officer.

The QM provides oversight of the review and audit process through coordination with the Project Managers and Project Quality Assurance Leads.

a) Project Responsibilities:

1) Reviews and approves Quality Management Plans in support of firm goals.

b) Quality Responsibilities:

1) Develops a framework for the H&H Quality Control and Assurance Plans. Manages and implements these policy documents.

2) Evaluates existing plans to determine if plans are effective.

3) Recommends improvements to existing plans.

4) Directs the performance of internal audits of the quality process on a project-by-project basis. Prepares nonconformance reports if required.

5) Has ‘halt work’ authority for nonconformance.

6) Prepares periodic reports to the Chief Technical Officer identifying:

a. QC activities performed by project as directed by the QM

b. Submissions-prior completed and future planned

c. Projects that may require additional technical oversight

d. Contract nonconformance reports

e. QC Plan nonconformance reports.

2.2.7 Chief Technical Officer

The Chief Technical Officer (CTO) is responsible for the technical quality of the services of the firm. In this capacity, the CTO defines policies and directives that establish the minimum performance criteria for the technical services of the firm.

a) Quality Responsibilities:

1) Establishes quality goals and objectives

2) Monitors the performance of the Quality Manager and supporting quality staff

3) Performs independent review of Key Projects

4) Has 'Halt work' authority for project technical services.

3.0 General Intent

All projects require a Quality Management Plan (QMP) as part of the Project Management Plan. Planning for Quality Assurance is an integral part of the QMP to be developed by the Project Manager prior to project inception. The Quality Management Plan shall follow the H&H Quality Management Plan Template, modified as necessary for project and client requirements, to ensure the quality of our services meets the requirements of the client within the requisite standard of care. All Quality Management Plans are subject to the approval of the Quality Manager.

The intent of this Quality Assurance Plan is to provide procedural controls for maintaining the quality of work delivered to the Client through communication and verification. Quality Assurance is not a substitute for appropriate project quality control activities.

Quality Assurance is validation that our services and products meet the requisite standard of care and communication of those standards. It is a company-wide process that confirms that the proper processes are in place and being followed.

Examples of Quality Assurance activities include:

a) Quality Assurance Review – Review, by the Project Quality Assurance Lead, of documented internal and external comments generated during the internal QC process or external milestone review and confirmation that all comments were addressed, or the reviewer agrees to non-incorporation on the basis of sufficient explanation.

b) Quality Assurance Audit – Audits consist of a review, by HQ or their designee in conjunction with the Project Manager and the Project Quality Assurance Lead, of Quality Control functions and documentation for conformance with applicable procedures. Quality Assurance Audits are covered in Section 6 of this document.

c) Project Initiation Meetings – Project Initiation Meetings consist of two meetings held prior to the initiation of services and are discussed further in Section 5.

d) Project Submission Reports – Optional report, prepared prior to phase or final submission of design plans and calculations and provided with the submission. Further discussion provided in Section 5.

3.1 Schedule & Frequency of QA Activities

QC processes are performed as work products are developed and/or at various stages of project development and need to be accounted for in the project development schedule. Quality Assurance must consider that the work may proceed through several major stages and that at completion of each milestone in the development of a project, major interdisciplinary coordination, or Internal Technical Review, the Quality Control documentation will be developed.

The key to assurance of quality is verification that the quality control procedures and supplementary activities have been implemented and, if not, the Project Manager is informed of the discrepancies. The PM is responsible to plan and execute corrective actions. These actions require documentation by the Quality Manager and review of this documentation by the firm's Chief Technical Officer.

4.0 Documentation Requirements

4.1 Control of Documents

The Project Manager is directly or through delegation responsible for the handling and storage of all project documents. The Project Manager should identify and communicate to all project staff the location of all project documentation. Access to project documentation - including but not limited to filing, letters, memos, records, reports, calculations, computer output, drawings, specifications, and QA/QC documentation - shall be in accordance with the Hardesty & Hanover "Document Control and Retention Guidelines" and the requirements of the Project Information Control System (PICS). Files may be accessed by authorized personnel only.

The Project Quality Assurance Lead is responsible for the proper use, distribution, and approval of quality related documents. The Project Quality Assurance Lead, in implementing these duties, will prepare and distribute a written procedure for use on the project, as well as any checklists of quality related documents considered to be necessary.

Documentation must be kept in order to provide a record that the development and review process was performed as required. This documentation must include records of the important steps which led to the development of final planning documents as well as the final design, such as preliminary concepts, model validation, design calculations, computer code input and any communications, instructions and directives which have a direct bearing on the project.

4.2 Change Control of Design Documents

4.2.1 Change Control of Design Documents during Design

Once a Quality Assurance review has been initiated on a milestone submittal, work shall not continue to be progressed until after the submission has been made. Revisions to Project Design Documents shall not be permitted prior to a milestone submittal after the Verifier has signed off on the Check Print.

4.2.2 Change Control of Documents during Construction

The Project Manager is responsible to provide the interface with the client during the pre-bid, bid, and award stages of the Construction Contract. Supplements or addenda developed during this period shall receive the same level of review as the original document and be reviewed by the Discipline or Task Lead Engineer prior to issue.

As-Built Drawings and Specifications shall be developed per Contract/Agreement requirements. As-Builts shall be independently reviewed to assure field marked prints and other sources of as-built information have been correctly translated onto the original document.

Revisions to Project Design Documents shall be controlled. Methods are established with the project Construction Management Team on a project-specific basis to assure revisions are reviewed to the same level as the original documents for the area of change and previous versions of the documents undergoing change have been appropriately controlled to prevent inadvertent use. Prior to submission, the Project Manager and Discipline or Task Lead Engineer shall review the Project Design Documents. Records of these activities shall be maintained by the Discipline or Task Lead Engineer.

4.3 Control of Records

Sufficient documentation and records will be accumulated to provide objective evidence that the design development and review process has been performed in accordance with accepted engineering practice, as well as in

conformance to contractual requirements and client directions, including pertinent quality records of subconsultants, if any.

The documentation will include not only final design documents, such as drawings and specifications, but records of important steps which led to the final design, such as design calculations, communications, instructions and directives which have a direct bearing on the project.

Control of records shall be in accordance with the Hardesty & Hanover "Document Control and Retention Guidelines" and the requirements of the Project Information Control System (PICS). Records will be filed by subject, date, file category, etc. Quality Assurance reviews and audits and corrective action will be stored electronically and filed in the 200-PM\QA folder in the electronic project files along with the approved Project Quality Management Plan.

An Index of Project Records will be part of the File. Responsibility for the accuracy and completeness of the records is assigned to the Project Manager or their designee.

Access to records will be under control of the Project Manager or their designee.

Removal of records to a location other than the immediate area where the file is located will be restricted to authorized persons (Principal and Project Manager). Measures to identify removed files and their current location shall be maintained. Security measures as determined by the Project Manager will be applied to those records dealing with Construction Cost Estimates.

The Project Manager, in accordance with the provisions of the contract, will identify those records to be transmitted to the Client upon completion of the Project and transmit the appropriate records.

5.0 Communication Protocols

Quality should be advocated from the top down and the bottom up through communication between all levels of the project. Quality is achieved through adequate planning, scoping, communications and coordination, supervision, and technical direction; by providing adequate time in the schedule for thorough reviews; by proper definition of job requirements and procedures; by the use of appropriately skilled personnel; and by individuals performing their work functions carefully.

The Project Manager is responsible to ensure the project team understands the necessary steps and has the proper time to execute the necessary activities.

This section sets the minimum requirements for communication during project development.

5.1 Pre-Project

During the period before the initiation of the project, the Project Manager is responsible to develop the QMP as required by Operating Policy OP-06. During this phase, the Project Manager must communicate with the Client, HQ, the Quality Manager, and the Staffing Managers for the various disciplines required by the scope of services to identify resources for delivery and quality activities. Information from the QMP shall be entered into the Vision database, including but not limited to, designation of project category as Key or Fundamental per Operating Policy OP-06, project stage and proposed submission schedule.

In some circumstances the Quality Management Plan may be part of the project pursuit process and proposal. This is particularly true with Design-Build pursuits. For all projects, the QMP is subject to approval of the Quality Manager and/or Chief Technical Officer for use during project execution.

5.2 Project Start-up

Assuring the quality of our services requires each project to begin with the ultimate goals in mind. To this end, the quality process will have several specific and required steps as part of the project start-up procedure. The following identifies the minimum recommended steps to be taken and documented prior to the initiation of any project.

5.2.1 Project Initiation Technical Meeting

Subsequent to review of the Project Technical Plan, the CTO will determine if the project requires a Project Initiation Technical Meeting. If required, a Project Initiation Technical Meeting will be scheduled with the firm technical managers. The purpose of this meeting is to discuss the following:

a) Scope of services
b) Client expectations
c) Project schedule
d) Anticipated work plan and staffing needs
e) Specific technical requirements or complexities
f) Risks associated with the project and the intended mitigation measures
g) Quality Management Plan

The following individuals, or their appointed representative, should participate in the Project Initiation Technical Meeting:

a) Chief Technical Officer
b) Chief Operating Officer/Director of Project Management
c) Quality Manager
d) Principal-in-Charge (At their discretion)
e) Project Manager
f) Project Engineer

The Project Manager shall be responsible for taking minutes of the meeting and distributing the minutes to all attendees. Approved minutes shall be filed in the Project folder.

Subsequent to the Project Initiation Technical Meeting, the Staffing Manager will assign specific resources for the project based on the needs identified at the meeting. These specific resources should be utilized by the project management team to fulfill the key roles in the project work plan.

The Project Initiation Technical Meeting may serve as the formal initiation of the project.

5.2.2 Project Staff Kick-off Meeting

Once the specific resources are assigned and their roles identified, the Project Management team should schedule a Project Staff Kick-off meeting. The Project Staff Kick-off meeting serves to inform the assigned staff of the following:

a) Scope of services
b) Project schedule including document submittals, number, and degree of completion
c) Key staff roles and associated responsibilities
d) Quality Management Plan including key staff assigned for Quality Control and Assurance activities
e) Quality activities shall occur and be documented throughout the project development process.

The following individuals, or their appointed representative, should participate in the Staff Kick-off Meeting:

a) Project Manager
b) Project Engineer

c) Project Quality Assurance Lead

d) Project Discipline or Task Leads

The Project Manager shall prepare and submit the minutes of the meeting to the attendees of the Project Staff Kick-off meeting and the Project Initiation Technical Meeting.

5.3 Project Development

Phase submissions to the client, and other preliminary document reviews, such as technical policy or constructability, should be identified in the Quality Management Plan. At project inception, the Project Manager will assign dates to each phase submission and provide the schedule in Vision for incorporation into a companywide schedule for quality management activities. The Project Manager shall inform the Quality Manager or a member of the quality management support staff, as appropriate, of changes to the project schedule that impact the milestone dates.

Communication processes during project development at a minimum should include the following:

a) Providing all information covered during the Project Staff Kick-off Meeting and the minutes from that meeting to any new staff joining the project.

b) Coordination with the Project Quality Assurance Lead, Discipline or Task Leads, and the Project Engineer to ensure that all documentation is being filed according to the QMP.

c) Coordination with the Project Quality Assurance Lead, Discipline or Task Leads, and the Project Engineer in advance of phase and/or final submittals for Quality Assurance Verification Processes.

Progress beyond set milestones shall not be permitted without the authority of the Project Manager and communication to the Project Quality Assurance Lead. The PM is responsible for confirming that Quality Control processes have been completed and documented, that the Reviewer has verified that all comments have been correctly incorporated, and that the document review is complete, with any outstanding issues resolved in accordance with the procedures in the Quality Control Plan. The PM shall sign and seal the Quality Assurance Review & Certification Form (Form QAR) for all external submittals or as directed by the QM.

5.3.1 Project Submission Report

To facilitate the Quality Assurance process, Project Managers are strongly encouraged to include a Project Submission Report (PSR) with phase and final submissions where the submission deliverable is not a report. A PSR covers one distinct discipline or task associated with the project, but several disciplines or tasks may be combined in to one report at the discretion of the Project Manager. The PSR is developed in coordination with the Discipline or Task Leads and the Project Engineer.

A PSR typically consists of the following sections:

a) Introduction – This section contains a brief summary of the project, a description of the design elements covered in the PSR, a statement of purpose for the submission, and a list of any reference documents.
b) Design and Performance Criteria
c) Design Approach
d) Design Changes from Prior Submission (if appropriate)
e) Detailed Discussion of the PSR Design Elements
f) Responses to Comments on Prior Submission (if appropriate)
g) Summary of Design Variations.

5.4 Post Design

5.4.1 Post Design Kickoff Meeting

At the start of the Post Design Phase, the Project Management team should schedule a Project Post Design Kick-off meeting. The Post Design Kick-off meeting serves to inform the assigned staff of the following:

- Approved stamps to be used
- Appropriate use of stamps for Shop Drawings vs Construction procedures, calculations, catalog cuts, etc.
- Correct review and mark -up procedure as per the firm QC Plan
- Logging requirements and maintenance of logs

6.0 Quality Assurance Verification

Documentation is to be kept which provides a record that the design development and review process was performed as required. This documentation is to include records of the important steps which led to the development of final planning documents as well as the final design, such as preliminary concepts, model validation, design calculations, computer code input and any communications, instructions, and directives which have a direct bearing on the project.

Types of documentation to be reviewed for compliance with the procedures set out in the Quality Control Plan:

a) Design Criteria

b) Reports – All reports prepared for the project irrespective of type.

c) Interdisciplinary Coordination – Minutes of meetings and signed attendance lists.

d) Calculations/Computer Solutions

e) Drawings

f) Specifications

g) External Comment Responses

h) Prior Audit Documents – All documentation provided by the Quality Auditor including recommendations for improvement, nonconformance reports, and any other check lists.

6.1 Quality Assurance Reviews

Quality Assurance reviews should be implemented in advance of all external submittals for a project. A Quality Assurance Review documents compliance with the QC Plan and identifies areas of nonconformance.

A Quality Assurance Review consists of review, by the Project Quality Assurance Lead, of documented internal and external comments generated during the internal QC process or external milestone review and confirmation that all comments were addressed, or the reviewer agrees to non-incorporation on the basis of sufficient explanation.

The goal of the Quality Assurance Review is to identify areas of weakness in the Quality Control process and develop preventive actions that focus on areas of potential nonconformance to reduce the risk associated with these areas.

The QA Review should identify potential nonconformities, their probable cause, determination of preventive action needed, implementation of preventive action and determining if preventive action was implemented and effective in preventing nonconformity.

The Project Manager is responsible for developing and implementing preventive actions that address the potential areas of nonconformance identified in the Quality Assurance Review and works to reduce or eliminate the risk in

these areas. The Project Quality Assurance Lead shall document the preventive action procedures and lead the discussion with the Project Manager, Project Engineer, and HQ.

Any preventive action procedure shall identify the necessary steps required to reduce the risk of nonconformance. The steps should include, but not be limited to, quality review of the proposed work prior to submission and "lessons learned" from previous or similar types of projects.

6.1.1 Phase Submittals

Phase submittals are required to be checked, back checked, corrected, and verified prior to submittal in accordance with the Quality Control Plan. The level of detail of the review may be varied at the discretion of the PM provided that all critical information, either specifically required by the contract or considered fundamental to the development of the design, is verified to have received a full check and back check as detailed in the Quality Control Plan for the classification of document and as appropriate for the level of development.

At a minimum, the following items shall be verified:

a) Presence of a completed Quality Control Stamp on a check print of all submittal documents.

b) Completion of any Internal Technical Reviews

c) Incorporation and/or response to all comments from both internal reviewers and external milestone reviewers (if applicable). All comments should be responded to on a Comment Response Form (CRF). CRF format to be determined by the PM in consideration of any Client requirements

6.1.2 Design Build Submittals

In general, specific requirements for design build submittals will be addressed in the contract and/or the Project Management Plan. Design Build submittals shall be subject to the same Quality Assurance process as defined herein for design projects. All final design build submittals (i.e., 90% submittals or those marked for construction such as "Issued For Construction" (IFC) or "Released For Construction" (RFC)), whether submitted as a phase submittal or as part of a complete set of final documents, will be subject to a Quality Assurance Review.

6.2 Quality Assurance Audits

Quality Assurance Audits will be performed to confirm conformance with the Quality Management Plan of a given project. The focus of the audit is to verify that each project has sufficiently accomplished all quality goals set forth in the Quality Management Plan, to identify any areas of nonconformance, and determine any corrective actions. Quality Assurance Audits will be scheduled by the Quality Manager and Chief Technical Officer.

The minimum number of Quality Audits shall be once during the life of the Contract/Agreement or a minimum of once a year on multi-year Contracts/Agreements and once per year during post design (CSS) activities. Additional Quality Assurance Audits may be scheduled by HQ during extended periods of project development, after a period of interruption in work, during post design services (construction support services), or during or immediately after inspection operations.

6.2.1 Quality Assurance Audit Process

Audits will be administered and documented by a Quality Auditor assigned by HQ. The Principal-in-Charge, Project Manager, and Project Quality Assurance Lead shall participate in the QA Audit if requested by the Quality Auditor. The Project Quality Assurance Lead is responsible to provide all necessary information for the audit.

Personnel conducting audits are required to be objective and impartial in conducting the audit. Self-audits shall not be allowed.

The evaluation will consist of review of documents, site visits (if applicable), discussions with staff, and nonconformance evaluations. The purpose of the evaluation is to confirm adherence to the QMP.

Results of Quality Audits shall be documented in the Quality Audit Log. If issues of nonconformance are identified, recommended corrective and preventative actions shall be generated as a portion of the Nonconformance Report. Where applicable, systemic corrective and preventative actions are communicated companywide to affect a companywide change.

Follow-up Quality Audits are performed as necessary, to ensure implementation of corrective action with the results reported to the Project Engineer, Project Manager, Quality Manager, and Chief Technical Officer.

6.3 Control of Nonconforming Product

A nonconformance in work output occurs when non-trivial errors are discovered in output documents issued as final documents. Final documents are signed and dated documents ready to be issued for construction, bid, or procurement.

Reports of nonconformances discovered by outside sources shall be processed by the Project Manager and Quality Manager.

6.3.1 Corrective Action

If required, any Corrective Action is monitored to ensure closure.

Corrective action will be appropriate to the severity of the nonconformance identified. The Project Manager shall develop and implement any corrective action procedure taken. The corrective action procedure shall be approved by the Chief Technical Officer. The procedure shall identify the nonconformance root cause and the necessary actions required to resolve the nonconformance to the satisfaction of the client. The procedure addresses nonconformity identification (including client complaints), cause determination, action to prevent recurrence, identifying and implementing the corrective action, recording results, and determining if the corrective action was implemented and effective in resolving the nonconformance.

7.0 Sub-Consultants

Subconsultants are responsible for performing their own Quality Control. H&H Project Managers shall require QA/QC Plans from all sub-consultants. Subconsultants that choose not to provide their own QA/QC plans must adopt the H&H QA/QC plans. H&H Project Managers are responsible for the following:

a) Review of sub-consultant's internal QA/QC Plan for adequacy in meeting client and project requirements. If inadequate, H&H will require further provisions be incorporated into the sub-consultant's QA /QC Plan as necessary to meet project requirements.

b) If the subconsultant has adopted the H&H QA/QC plan, H&H Project Managers shall provide copies of the plans and review the requirements with the subconsultant's Project Manager at project initiation.

c) Meet with sub-consultant's Project Manager periodically to ensure that the sub-consultant is adhering to their QA/QC Plan. The H&H Project Manager is responsible for auditing subconsultants in accordance with the subconsultant audit schedule provided in the Project Management Plan.

Appendix C

H&H Quality Control Plan

Hardesty & Hanover, LLC
Quality Control Plan

Table of Contents

1.0 Introduction

Quality Control is a series of activities, actions and procedures routinely undertaken to ensure that our services and their representative work products are produced to the requisite standard of care and in accordance with the defined technical philosophy of the firm. This manual defines specific procedures for executing quality control functions in the preparation of engineering studies and designs, including reports, plans, specifications, and other similar documents. This Quality Control Plan (QCP) shall be implemented as an element of the overall project Quality Management Plan (QMP) where either specifically called for in the Contract, Project Management Plan (PMP), or where implied by project or industry standards.

2.1 Key Definitions and Roles

The following definitions are used throughout this manual:

a) **Back Checker:** The individual who reviews the Checker's comments. The Originator/Producer functions as the Back Checker unless another qualified individual is assigned by the Project Manager (PM).

b) **Checker**: The individual who through education and/or experience is knowledgeable within an area of technical subject matter, who has been assigned by project leadership to perform an accuracy and correctness check of technical content.

c) **Check Print**: The copy of the work product to be used in the quality control (QC) process. The Check Print may be a hard (paper) copy or a digital file such as a Portable Document File (PDF) that is capable of recording review markups. A Check Print is required at each Hold Point and may be requested by the Client, PM, or Headquarters Engineering (HQ) at a Witness Point. Refer to the appropriate process by document type/class in Section 4 for Check Print contents.

d) **Hold Point**: A level of design where specific aspects of the project such as design objectives, design criteria, and principal geometry are typically locked in. Hold Points require completion of all Quality Control procedures and Quality Assurance Review and Certification before a submittal can be made. Once the QC process is initiated, the work product cannot continue to be progressed. The project Hold Points shall be established by the PM in compliance with Client and HQ requirements at the beginning of the project. All external milestone submittals are Hold points.

e) **HQ**: Also referred to as Headquarters Engineering. This specifically refers to the authority of the technical directors such as but not limited to the Chief Technical Officer, Director of Engineering, Risk Management Officer, Quality Manager, or respective Practice Leaders and Chief Engineers.

f) **Independent Check**: Verification of a calculation by performing a separate standalone calculation to confirm results in lieu of performing a detailed check.

g) **Internal Technical Reviewer**: Reviewer, assigned by HQ, for a project or portion thereof that has not been a principal participant in the development of a work product.

h) **Originator/Producer**: The individual, qualified by experience in the applicable discipline, who is assigned to prepare documents and/or generate work product.

i) **Phase Submittal**: A milestone submittal of a preliminary work product to a client (i.e., Concept plans, 60% plans, or similar prior to final.)

j) **Plans**: Drawings and/or CADD files created by Hardesty & Hanover (H&H) for use by the Client as part of the contract or bid documents or, in the case of alternative delivery such as Design/Build, to construct the project.

k) **PE**: Project Engineer.

l) **PM**: Project Manager.

m) **Preliminary**: A document, including reports, plans, specifications, or similar documents, prepared by H&H and submitted to the client prior to the anticipated final submittal of such document. Preliminary documents are 100% complete and validated by QC but represent a lesser level of development than the final work product.

n) **Quality Management Plan (QMP):** The plan developed by the Project Manager to describe specific quality requirements for a given project. The QMP typically includes project-specific amendments to the current edition of the H&H Quality Management Plan.

o) **QC Stamp**: A physical or digital stamp applied to work product to signify that it is the Check Copy (aka Check Print) and for recording the initials and dates of the individuals who performed the quality control process.

p) **Quality Assurance**: The systematic review of design and development processes, specifically Quality Control activities, to confirm that processes are implemented per policy and the desired level of quality has been attained and will continue to be obtained. Quality Assurance identifies procedural shortfalls and recommends changes to improve our processes.

q) **Report**: Any document (letter, report, inspection report, etc.) prepared under the terms of a Contract and intended for distribution outside of H&H, which includes statements of professional opinion, condition assessment, calculation, evaluation, design, engineering judgment, cost estimates, etc.

r) **Specifications**: Custom technical specifications or special provisions prepared by H&H to amend, supplement, or modify the project's standard construction or material specifications.

s) **Stet**: Let it stand (used as an instruction on a printed proof to indicate that a correction or alteration should be ignored).

t) **Verifier**: The individual assigned to verify that the Checker's and Originator/Producer's comments have been implemented. The Verifier may be any individual assigned by the PM but will preferably be the Checker.

u) **Witness Point**: A level of design that has not been identified as a Hold Point by the Client, the PM, or HQ but for which QA activities may be required. Witness Points may include items such as the Quality Management Plan, project schedule, interim phase submittals (30%,60%,90%), field inspection MOT plans, field inspection verification plans, and internal progress sets. All external milestone submittals, whether Witness or Hold Points require Quality Assurance Review and Certification prior to submittal.

v) **Work Product**: A document or other product produced by H&H for a client under the terms of a contract. Work products may be hard copies, electronic deliverables, or electronic files (e.g., CADD files, spreadsheets or similar.)

3.0 General Intent

It is the general intent of this plan to define procedures for quality control which minimize errors, discrepancies, and omissions in H&H's work products. Furthermore, such procedures are intended to produce concise, delineated records of the in-house quality control process.

Although the physical process may vary for detailed checking of the various types of work products prepared under the requirements of this plan, the intent is for each work product to be thoroughly reviewed in detail by someone in addition to the review by the Originator/Producer who prepared that work product for conformity with generally accepted standards of design and engineering practice. Items transmitted purely for informational purposes and coordination of the design development may not need to follow the full QC process but must be reviewed by someone other than the Originator and documented with a QAR form. Frequency and content of required documentation shall be determined by the Quality Manager. Unless otherwise approved by the engineer in responsible charge, at least one of the primary individuals involved in preparing (Originator/Producer) or checking (Checker) a document shall be a Professional Engineer, experienced and qualified in the appropriate engineering discipline. Similar credentials are required in the event the work product is other than an engineering work product.

Comments generated by the quality control process are to be resolved to the satisfaction of both the Originator/Producer and the Checker. The process of Quality Control (QC) is to be documented and recorded in a manner which allows for management of the process and review of the process through Quality Assurance (QA).

Some work products and services may require the use of third-party information and/or materials provided by the client, or the use of data, documents or services provided by subcontractors, subconsultants, and suppliers. As required in their subcontract and approved Quality Management Plan, if one exists, subcontractors, subconsultants, and suppliers are ultimately responsible for the quality of the goods, work products and services they provide. Where H&H has a prime contractual relationship, H&H will review subcontractor, subconsultant, and supplier work products, supplied materials, and services only to verify compliance with contractual requirements and to coordinate the work. This does not preclude project specific reviews of subcontractor, subconsultant, and supplier work product if such reviews are required by contract.

4.0 Process by Document Type / Class

Each type of work product produced will be subjected to a detailed quality control process as defined herein. Prior to initiation of the quality control process the PM/PE shall review and coordinate with the Originator/Producer the appropriate level of detail and information for a given document type or class and level of development. Work products of a type not specifically noted shall be processed by the most appropriate process, as determined by the PM. Except as noted for preliminary documents in Article 6.1, all documents submitted to someone outside the design team (or design build team in the case of a Design/Build project) shall be checked in accordance with the requirements of this section. Specific colors are assigned to each role in the checking process; however, alternate color schemes may be used as long as the role and associated color are clearly identified. The Project Manager or Project Engineer shall modify permissions to the project submittal folders to prevent editing of documents that have completed the QC process.

4.1 Design Plans

All drawings shall be checked for technical content, clarity, style, and conformance with design criteria and Client/H&H standards by someone other than the Originator/Producer. This process shall be executed and documented as noted below and in the flow chart of Figure 1.

Design Plan Development

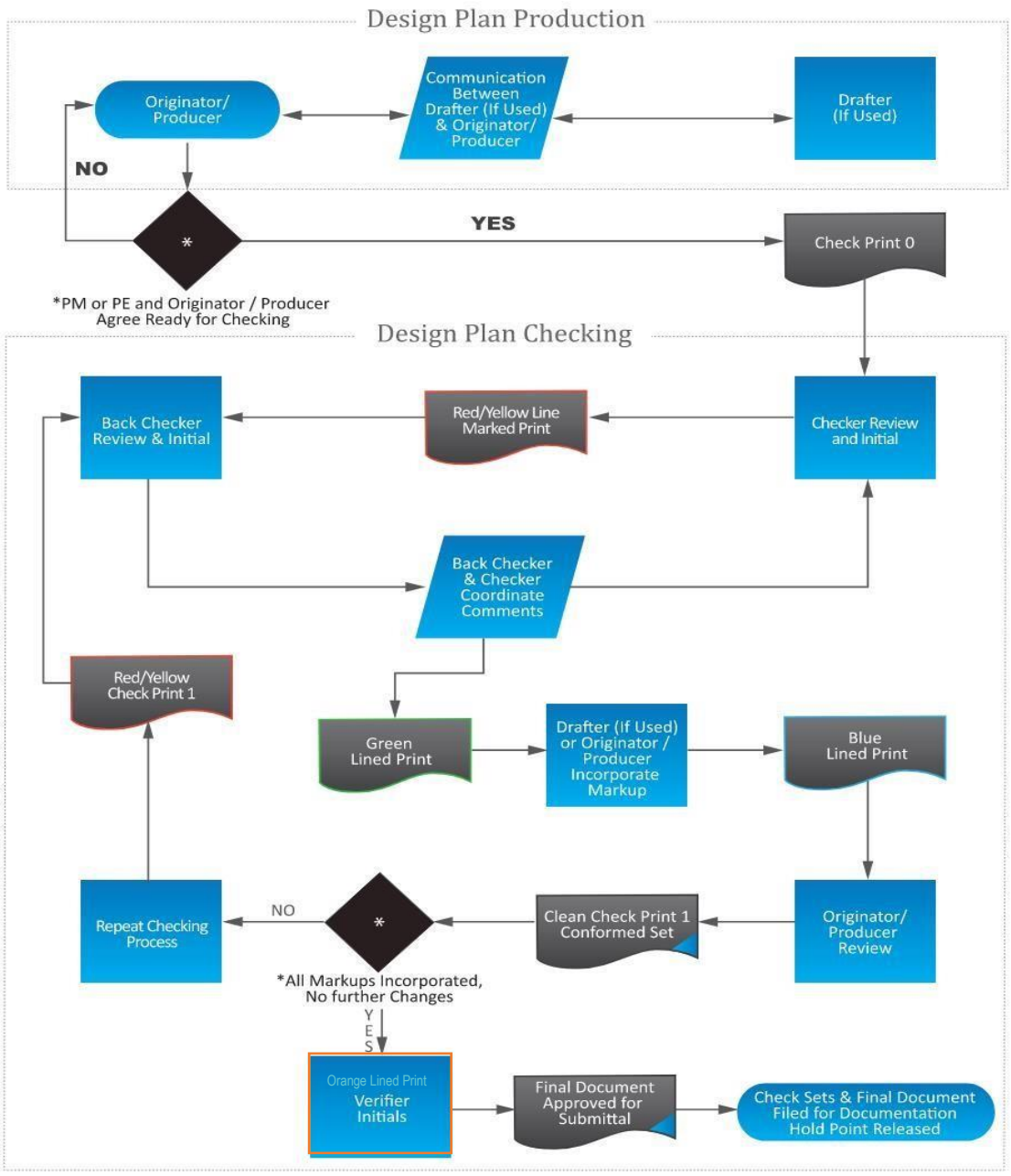

Figure 1

4.1.1 Preparing a Check Print of a Drawing

Once the Originator/Producer and PM have agreed that a drawing contains the appropriate level of detail and information required at the phase submission, or is substantially complete and ready for checking, a Check Print will be prepared, and the PM will assign it to the Checker. Each Check Print shall bear a red Quality Control Stamp as shown in Figure 2 with the Originator/Producer's initials and date in the "Ready for Checking" boxes. The Check Print shall be designated as final or for a specific phase submittal. It is preferred that the QC stamp is applied to each sheet.

However, for electronic files only, if one stamp is applicable to all sheets within a discipline, One stamp may be applied to the first sheet and a note added indicating to which sheets the QC stamp applies.

H&H QC DOCUMENT	PHASE ____ or FINAL ____	
PROCESS	INITIALS	DATE
READY FOR CHECKING		
CHECKED CORRECT (YELLOW) CHANGE (RED)		
BACK CHECKED (GREEN)		
CORRECTED (BLUE HIGHLIGHTER)		
VERIFIED (ORANGE HIGHLIGHTER)		

Figure 2

4.1.2 Checking Drawings

<u>The Checker's colors are YELLOW and RED</u>

The Checker will ascertain that the drawing is consistent with the corresponding checked calculations, design reports, and other related project documents. The Checker is required to perform the following:

a) Ascertain that the document conforms with reliable engineering judgment and practice and is suitable and sufficient to accomplish the required function; the Checker shall review the Check Print in detail for:
   - Technical sufficiency appropriate for the level of design development
   - Conformance with design calculations
   - Conformance to applicable standards and design criteria
   - Coordination with specifications and other design documents
   - Conformance with established CADD formats and styles. The project CADD Standards and project drawing templates are established by the CADD Manager under direction of the PM. Any questions about conformance with the project CADD Standards should be referred to the CADD Manager.

b) Highlight in YELLOW each element or section checked that is found to be correct, and/or with which the Checker agrees on the Check Print. If no corrections are needed, a yellow slash through a sheet or detail or a large yellow check over a sheet or detail signifies that the Checker has reviewed that sheet or detail.

c) Mark in RED on the Check Print any corrections, additions, and/or deletions, mark any questions directed to the Originator/Producer in RED.

d) The Checker initials and dates the Check Print in the appropriate box ("Checked") of the Quality Control Stamp on the Check Print(s) and forwards the document for back checking, unless no changes are required in which case the QC process is complete.

e) If the check is limited to a particular discipline, or component, of the drawing this shall be noted on the Check Print or first sheet of a set of Check Prints.

4.1.3 Back Checking Drawings

The Back Checker's color is GREEN

After the Checker has completed review of the Check Print, the Back Checker (either the Originator/Producer or their appropriate designee), reviews the Checker's marks and agrees to or resolves the Checker's proposed corrections. The Back Checker is required to perform the following:

a) Verifies that the complete drawing has been checked in accordance with the above requirements (i.e., all applicable contents of the drawing are marked in either yellow or red), checkmarks in GREEN each of the Checker's red marked changes to signify agreement with the Checker that the marked changes are to be made or adds in GREEN any additional changes not identified by the Checker. Answers Checker's questions in GREEN and marks up any changes needed to implement the response, also in GREEN.

b) Returns to Checker if necessary. Every modification, including all comments marked STET, responses, or additional changes made by the Back Checker in GREEN must be highlighted in YELLOW by the Checker to signify agreement.

c) Resolves significant differences of opinion with the Checker. If an understanding or agreement cannot be reached, the Checker refers the issue to the Project Engineer, Discipline Chief Engineer, or Project Manager before continuing with the checking process. Upon agreement of the solution:

    1) The Checker marks their concurrence (YELLOW).

    2) Cross out in GREEN each of the Checker's red marked changes that the Originator/Producer and Checker agree should not be changed. The Back Checker rewrites next to the crossed out red marks the original information that is to remain unchanged or indicates "stet".

d) Confirms that every red marked change made by the Checker now has a GREEN check next to it and that every modification, including all comments marked STET, or additional change made by the Back Checker in GREEN has been highlighted in YELLOW by the Checker to signify agreement.

e) The Back Checker initials and dates the Check Print stamp ("Back Checked") and forwards the reconciled Check Print to the Originator/Producer (if different from the Back Checker) for correction.

f) Note: If the Back Checker is also the person correcting the drawing, the Back Checker should still apply the Green check or highlight to show agreement with the change. Documenting that a change was corrected does not eliminate the need for also documenting agreement with the change. This step should not be omitted.

4.1.4 Correcting Drawings

The Corrector's color is BLUE

a) The Originator/Producer corrects, or supervises the correction of, the original document to implement the changes agreed to by the Checker and Back Checker. As corrections are made the changed item is highlighted in BLUE on the Check Print to document the action.

b) Upon completion of the corrections, the Corrector makes a new print, initials, and dates the Check Print stamp ("Corrected") on the original Check Print and forwards the original Check Print and corrected new print to the Verifier for verification.

c) If the changes are so extensive as to make the first Check Print illegible for use by the Checker, the Originator/Producer makes a new Check Print upon completion of the corrections, labels it Check Print #2,

places a new QC Stamp on the print, and places it on top of Check Print #1, which is then stamped or marked "revised". The Originator/Producer initials and dates Check Print #2 in the appropriate box of the Quality Control Stamp ("Ready for Checking") and forwards the document to the Checker to repeat the process.

4.1.5 Verification of Original Check Print

The Verifier's color is ORANGE

The Verifier compares each of the Back Checker's marked changes on the previous version of the Check Print(s) (Original or Check Print #2), with the revised part of the updated document. If the Verifier concurs that the changes have been properly implemented, the Verifier marks over the changes with ORANGE on the Check Print. The Verifier will also make certain that no inadvertent changes, not noted on the Check Print, have been made.

4.1.6 Verification of New Check Print

When the Verifier is processing a new Check Print (#2, #3, etc.), the Verifier must compare each part of the new Check Print with the corresponding part of the previous Check Print. If the changes have been made accurately on the updated Check Print, the Verifier:

a) Checks that each correction, addition, and/or deletion as well as each new section that has been redrawn, rewritten, retyped, or recalculated has been correctly transferred to the original from the Check Print(s).

b) On the most recent Check Print of the corrected document, marks over all the corrections that were made in ORANGE.

c) Verifies that no inadvertent changes, not noted on the Check Print, have been made to any parts of the drawing and signifies so by striking a YELLOW mark across the drawing.

d) Marks in RED on the new Check Print any corrections, additions, and/or deletions that were overlooked on the backchecked Check Print.

e) Returns the Check Prints to the Back Checker, who checks in GREEN the red marks, if found to be correct, on the new print marked by the Verifier, and sends the Check Prints for correction. When all changes in the most recent Check Print have been marked over in ORANGE, the checking process is complete.

f) The Verifier initials and dates the Check Print stamp on the line designated for the Verifier and signs off in the drawing or calculation sheets as specified and forwards the Check Print to the Originator of the document.

4.1.7 Checking Process for Additional Changes to Drawings

If additional changes or revisions become necessary, following review by the client, for example, they are processed on a new Check Print in the same manner as described previously. Although only the new changes need to be checked, the Originator/Producer and Checker are still responsible for assuring that correct interfacing with the affected changes is checked completely. The Originator/Producer and Checker must verify that any changes or revisions are coordinated throughout the project documents, including calculations, plans, and specifications. They must also ensure changes or revisions are made on CADD files, computer printouts, and contract reports.

4.1.8 Checking Process for Multiple Phase Reviews

Phase Reviews, where required (refer to Section 6.1 Phase Submittals), are processed in the same manner as described previously except as noted herein. Although only the changes, updates and new content not verified on previous Check Prints need to be checked, the Originator/Producer and Checker are still responsible for assuring that the document is checked completely. A yellow slash through a sheet should be used if previously checked and no changes were made since the prior phase submission. If there have been no changes to the entire set or to a discipline specific set, a copy of the prior check set, with a note on the cover sheet indicating no changes from prior check set,

should be placed in the folder for this phase. The Originator/Producer and Checker must verify that any changes or revisions, including changes implemented in prior checking, are coordinated throughout the project documents, including calculations, plans, and specifications. Unless prior Check Prints are affixed to the current Check Print, the Checker shall note the source (e.g., prior phase Check Print) for items that are accepted based on a previously checked set.

4.2 Calculations

Calculations that support final work product shall be checked for technical content, clarity, style, and conformance with design criteria and standards by someone other than the Originator. This process shall be executed and documented as noted below and in the flow chart of Figure 3.

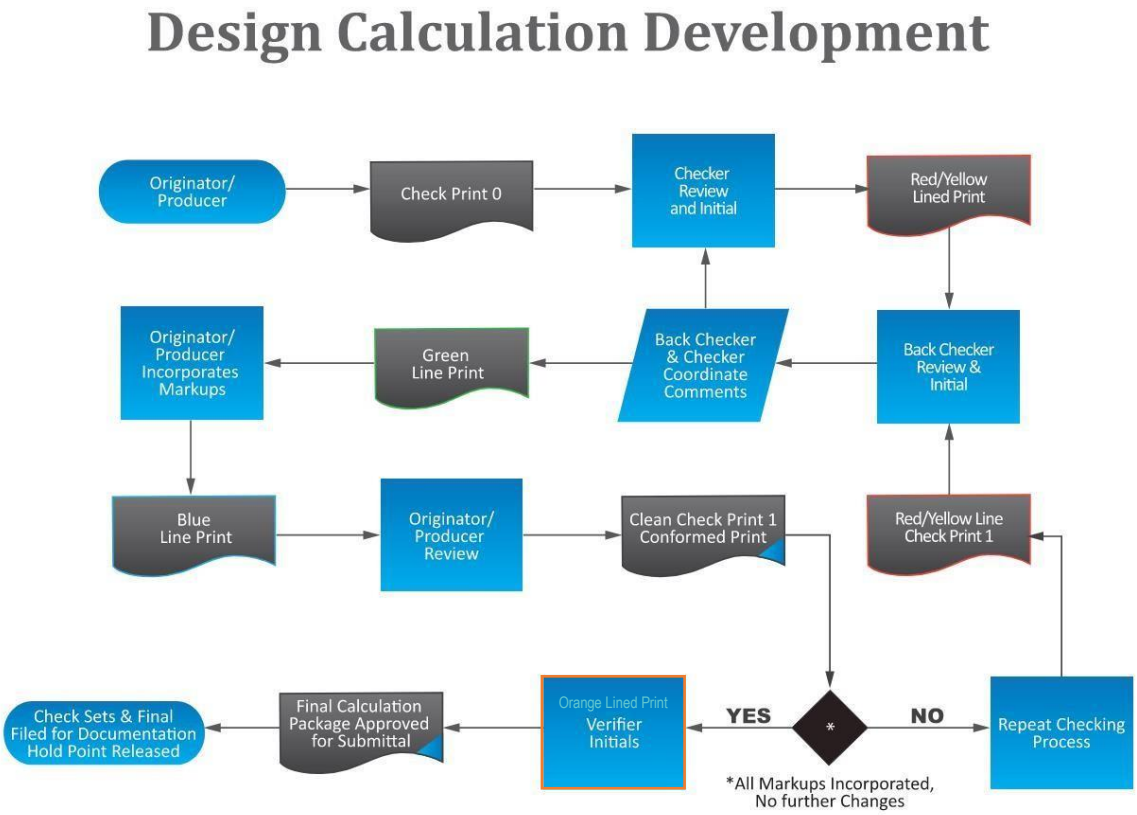

Figure 3

4.2.1 Preparing Check Copies of Calculations

Once the Originator/Producer and PM or PE have agreed that a calculation is substantially complete and ready for checking, a Check Copy will be prepared, and the PM or PE will assign it to the Checker. The Checker will be provided with the design criteria. It is strongly encouraged that a brief narrative for the design element be included as part of the design criteria write up. The first sheet of the calculation must be a Calculation Cover Sheet. Each Check Copy shall

bear a red Quality Control Stamp as shown in Figure 2 on the cover sheet with the Originator/Producer's initials and date in the "Ready for Checking" boxes. In lieu of placing the QC stamp on the cover sheet, a standalone sheet with the QC stamp may follow the cover sheet. The Check Copy shall be designated as final or for a specific phase submittal. Each sheet of the calculation or each cover page of computer analysis output will include the initials of the Originator/Producer and all pages will be numbered.

4.2.2 Checking Calculations[1]

The Checker's colors are YELLOW and RED

The Checker will ascertain that the calculation is consistent with the design reports, design criteria, and other related project documents. The Checker is required to perform the following:

a) Ascertain that the calculation conforms with reliable engineering judgment and practice and is suitable and sufficient to accomplish the required function; the Checker shall review the calculation in detail for:
   - Technical sufficiency appropriate for the level of design development
   - Conformance with related design calculations
   - Mathematical accuracy
   - Conformance to applicable standards and design criteria
   - Coordination with specifications and other design documents.

b) Highlight in YELLOW each element, or section checked, that is found to be correct and/or with which the Checker agrees, on the Check Copy. For software programs which use a color highlighting scheme to designate different types of input, a yellow checkmark or yellow slash down left side of the page may be used in lieu of highlighting each element.

c) Mark in RED on the Check Copy any corrections, additions, and/or deletions.

d) Prepare and attach any independent calculations made by the Checker.

e) Resolve significant differences of opinion with the Originator. If an understanding or agreement cannot be reached, the Checker refers the issue to the Project Engineer, Discipline Chief Engineer, or Project Manager before continuing with the checking process.

f) The Checker initials and dates the cover sheet in the appropriate box of the Quality Control Stamp on the Check Copy and forwards the document for back checking.

[1] The process outlined in this section is intended for calculations that can be checked without generating significant paper waste such as hand calculations, simple Mathcad output, simple Spreadsheets, etc. For computer programs generating voluminous output files the output should not be printed hard copy. The process should be followed electronically on a PDF. Alternately, a summary sheet of the output from the computer program can be prepared and a list of files checked can be appended to the summary sheet with the following information included: file directory / name, timestamp, and list of inputs checked. If the appropriate checked information can be summarized on one screen or input box, screen shots may be appended as appropriate.

4.2.3 Back Checking Calculations

The Back Checker's color is GREEN

After the Checker has completed review of the Check Copy, the Originator/Producer, acting as Back Checker, reviews the Checker's marks and supervises or personally makes the changes required. The Back Checker is required to perform the following:

a) Verifies that the complete calculation has been checked in accordance with the above requirements (i.e., all appropriate contents of the calculation are marked in either yellow or red), checkmarks in GREEN each of the Checker's red marked changes to signify agreement with the Checker that the changes marked are to be made, or adds in GREEN any additional changes not identified by the Checker.

b) Resolves significant differences of opinion with the Checker, if an understanding or agreement cannot be reached, the Checker refers the issue to the Project Engineer, Discipline Chief Engineer, or Project Manager, for resolution.

c) Confirms that every red marked change made by the Checker now has a GREEN check next to it and that every additional change made in GREEN has been highlighted in YELLOW by the Checker to signify agreement. For software programs which use a color highlighting scheme to designate different types of input, a yellow checkmark may be used in lieu of highlighting.

d) Crosses out in GREEN each of the Checker's red marked changes that the Back Checker and the Checker agree should not be changed. The Back Checker rewrites next to the crossed out red marks the original information that is to remain unchanged or indicates "stet". The Checker must mark all such green marks in YELLOW.

e) The Back Checker initials and dates the Check Copy cover sheet in the appropriate box ("Back Checked") of the Quality Control Stamp and forwards the document for correction.

f) Note: If the Back Checker is also the person correcting the calculation, the Back Checker should still apply the Green check or highlight to show agreement with the change. Documenting that a change was corrected does not eliminate the need for also documenting agreement with the change. This step should not be omitted.

4.2.4 Correcting Calculations

The Corrector's color is BLUE

a) The Originator/Producer corrects the original document, or supervises correction of the calculation, to implement the reconciled changes. As corrections are made the changed item is highlighted in BLUE on the Check Print to document the action.

b) The Originator/Producer initials and dates the cover sheet in the appropriate box of the Quality Control Stamp ("Corrected") and forwards the Check Copy and corrected original (or copy) to the Checker for verification.

4.2.5 Verification of Original Check Copy of a Calculation

The Verifier's color is ORANGE

a) The Verifier compares each of the Back Checker's marked changes on the Check Copy, with the revised part of the corrected calculation. If the Verifier concurs that the changes have been properly implemented, the Verifier marks over the changes in ORANGE on the Check Copy. The Verifier will also make certain that no inadvertent changes, not noted on the Check Copy, have been made. For software programs which use a color highlighting scheme to designate different types of input, an orange checkmark may be used in lieu of highlighting.

4.2.6 Checking Process for Additional Changes to Calculations

If additional changes or revisions become necessary, following review by the Client or significant changes during detailing, for example, they are processed on a new Check Copy in the same manner as described previously. Although only the new changes or revisions need to be checked, the Originator/Producer and Checker are still responsible for assuring that correct interfacing with the affected changes is checked completely. The Originator/Producer and Checker must verify that any changes or revisions are coordinated throughout the project documents, including calculations, plans, and specifications.

4.2.7 Independent Check in Lieu of Detailed Checking

With approval of the PM, or if required by the Contract, the Checker may perform an Independent Check in lieu of following the detailed checking procedure outlined above. The Independent Check shall consist of a standalone set of calculations that produce results similar enough to the original calculation to confirm its accuracy and adequacy. An Independent Check is most commonly used to check the results of analysis produced using proprietary software or in-house computer applications. An Independent Check may be done by hand calculations or using a software application other than the original calculation.

To implement an Independent Check, apply the QC Stamp to the cover sheet of the calculations and write “Independent Check” across the Checked box in GREEN pen.

As part of an Independent Check, the Checker is required to perform the following:

a) Ascertain that the calculation conforms with reliable engineering judgment and practice and is suitable and sufficient to accomplish the required function.

b) Review the original calculation for:

- Technical sufficiency
- Conformance to applicable standards and design criteria
- Conformance with related design calculations
- Coordination with specifications and other design documents.

c) Prepare independent check calculations to confirm the results of the original calculation.

d) Mark any review comments regarding the original calculations and/or the independent verification on the cover sheet of the original calculations, initial and date the QC stamp.

e) Provide the original and independent calculations to the Originator/Producer for Back Checking.

As part of an Independent Check, the Back Checker is required to perform the following:

a) Respond to all comments made by the Checker, either agreeing to or resolving the comments.

b) If corrections are necessary, correct the original calculation and provide to the Checker for additional review.

c) Once all review comments are reconciled, or if no corrections are necessary initial and date the QC stamp.

d) Forward to the Checker for verification.

4.3 Reports & Specifications

Similar to drawings and calculations, all reports and specifications will pass through a quality control process prior to submittal. This process will verify that the document’s technical contents are accurate, that the spelling and grammar

contained in the document are correct, that the format and style of the document are in conformance with project standards, and that the appropriate disclaimers and assumptions are conspicuously defined.

4.3.1 Preparing Check Copies of Reports & Specifications

Once the Originator/Producer and PM have agreed that a report or specification is substantially complete and ready for checking, a Check Copy will be prepared, and the PM will assign it to the Checker. The first sheet of the Check Copy shall bear a red Quality Control Stamp as shown in Figure 2 with the Originator/Producer's initials and date in the "Ready for Checking" boxes. The Check Copy shall be designated as final or for a specific phase submittal. If not included on the first sheet, the Originator/Producer will write "prepared by" and sign his/her initials on the sheet.

4.3.2 Checking Reports & Specifications

The Checker's colors are YELLOW and RED

The Checker will ascertain that the report or specification is consistent with the supporting calculations, plans, and related project documents. The Checker's colors are RED and YELLOW. The Checker is required to perform the following:

a) Ascertain that the report or specification contents are technically and grammatically correct; the Checker shall review the Check Copy in detail for:
   - Technical sufficiency
   - Conformance to applicable standards and design criteria
   - Correct grammar
   - Correct spelling
   - Appropriate disclaimers and assumptions
   - Conformance with supporting design calculations

b) Coordination with other design documents

c) For specifications, the Checker shall ascertain that the format of the specification is consistent with the format of the remaining project documents and project standards for specifications, including the following:
   - Proper titles, headers, footers, date formats, etc.
   - Correct article, section, and paragraph identification and sequence
   - Proper format and sequence of contents (i.e., materials, construction, submittals, payment, etc.)

d) Each word does not need to be highlighted in YELLOW. One YELLOW slash shall be applied across or down the page to indicate the page was checked. The exception is all numerical values including referenced specification numbers, e.g., ASTM, shall be verified and fully marked in YELLOW if correct.

e) Mark in RED on the Check Copy, any corrections, additions, and/or deletions, mark any questions directed to the Originator/Producer in RED.

f) Resolve significant differences of opinion with the Originator. If an understanding or agreement cannot be reached, the Checker refers the issue to the Project Engineer, Discipline Chief Engineer, or Project Manager before continuing with the checking process.

g) The Checker initials and dates the first sheet of the copy in the appropriate box of the Quality Control Stamp and forwards the document for back checking and correction unless no changes are required in which case the QC process is complete.

h) If a check is limited to a particular discipline, or component of the report or specification, this shall be noted on the first sheet of the Check Copy.

4.3.3 Back Checking Reports & Specifications

The Back Checker's color is GREEN

After the Checker has completed review of the Check Copy, the Originator/Producer, acting as Back Checker, reviews the Checker's marks and supervises or personally makes the changes required. In addition, the Back Checker:

a) Verifies that the complete report or specification has been checked in accordance with the above requirements (i.e., all contents of the report or specification are marked in either yellow or red), checkmarks in GREEN each of the Checker's red marked changes to signify agreement with the Checker that the changes marked are to be made, and adds in GREEN any additional changes not identified by the Checker.

b) Resolves significant differences of opinion with the Checker, if an understanding or agreement cannot be reached, the Checker refers the issue to the Project Engineer, Discipline Chief Engineer, or Project Manager, for resolution.

c) Crosses out in GREEN each of the Checker's red marked changes that the Back Checker and the Checker agree should not be changed. The Back Checker rewrites next to the crossed out red marks the original information that is to remain unchanged or indicates "stet". The Checker must mark all such green marks in YELLOW.

d) The Back Checker supervises or personally corrects the original document. If the Back Checker is also the person correcting the document, the Back Checker should still apply the Green check or highlight to show agreement with the change. Documenting that a change was corrected does not eliminate the need for also documenting agreement with the change. This step should not be omitted.

e) The Originator/Producer initials and dates the cover sheet in the appropriate box of the Quality Control Stamp and forwards the Check Copy (preferably a redlined print) and a new clean copy of the revised document to the Checker for verification.

4.3.4 Correcting Reports or Specifications

The Corrector's color is BLUE

f) The Originator/Producer corrects the original document, or supervises correction of the document, to implement the reconciled changes. As corrections are made the changed item is highlighted in BLUE on the Check Print to document the action.

g) The Originator/Producer initials and dates the cover sheet in the appropriate box of the Quality Control Stamp ("Corrected") and forwards the Check Copy and corrected original (or copy) to the Checker for verification.

4.3.5 Verification of Corrections to Reports & Specifications

The Verifier's color is ORANGE

The Verifier compares each of the Back Checker's marked changes on the Check Copy, with the revised part of the corrected report or specification. If the Verifier concurs that the changes have been properly implemented, the Verifier marks over the changes in ORANGE on the Check Copy. The Verifier will also make certain that no inadvertent changes, not noted on the Check Copy, have been made.

4.3.6 Checking Process for Additional Changes to Reports or Specifications

If additional changes or revisions become necessary, following review by the client or significant changes to content, for example, they are processed on a new Check Copy in the same manner as described previously. Although only the new changes need to be checked, the Originator/Producer and Checker are still responsible for assuring that correct interfacing with the affected changes is checked completely. The Originator/Producer and Checker must verify that any changes or revisions are coordinated throughout the project documents, including calculations, plans, and specifications.

4.3.7 Checking Reports or Specifications Electronically

Checking / Back Checking / Verifying reports or specifications electronically can be accomplished using the Track Changes feature within Microsoft Word (unique colors will be assigned by Word). Each reviewer should have their name set in the program options so that they are shown as the reviewer. The Originator shall also function as Back Checker and Corrector. Electronic checking using Track Changes shall follow this procedure:

a) Checker uses Track Changes to make corrections and saves file as both a Word Doc and as a PDF file which becomes the QC check set

b) The QC Stamp is applied to the PDF QC check set which contains the tracked changes as red markups. The QC stamp is initialed and dated by Originator as Ready for Checking and by the Checker as checked.

c) Originator/Back Checker first agrees with the changes in the QC PDF check set and applies a green check or highlight mark to the QC PDF check set to show agreement

d) Originator/Corrector accepts agreed upon changes with Track Changes in the original Word document and applies blue check or highlight mark to the QC PDF check set to confirm changes were made

e) Checker compares revised Word document, in which tracked changes were accepted, to the QC PDF check set and applies orange check or highlight to the QC PDF check set to verify that all corrections were made

f) QC PDF check set shall be locked to restrict editing and saved in the 400-Delivery\QC folder for that submittal

g) One copy of the Final Word doc shall be saved to the 400-Delivery\Deliverables folder for that submission

4.4 Internal Technical Reviews

Internal Technical Reviews (ITR) are specific purpose reviews of work product performed by an individual that was not involved in the production of the work product. Unlike quality control reviews, ITRs are not a detailed check, but rather a general review of work product for applicability of criteria, assumptions, methodology, concept, compliance with project requirements, constructability, biddability or other specific objectives. ITRs are performed by staff with technical experience related to the specific purpose.

ITRs may be performed at any stage or phase of a project, from design criteria to final biddability. However, ITRs are not a substitute for the quality control review process. Instead, ITRs are intended to supplement the quality control process through additional review of project elements deemed by HQ (or in some cases contractual requirements) worthy of supplementary scrutiny.

4.4.1 Preparing Work Product for ITR

Once the Originator/Producer and PM have agreed that a work product is ready for ITR, a review copy will be prepared. The PM will prepare an ITR Form and submit the request to HQ. The ITR Form will designate the work product to be reviewed and the detailed scope of the ITR. Upon receiving notification from HQ that a reviewer has been assigned, the PM will attach the ITR form to the review copy and pass it to the Internal Technical Reviewer assigned by HQ.

4.4.2 Performing Internal Technical Reviews

The Internal Technical Reviewer's color is RED

The Internal Technical Reviewer is required to perform the following:

a) Review the work product for the specific objective requested.

b) Indicate on the ITR Form if review comments are noted on the ITR Form, marked on the work product, or a combination.

c) Mark in RED any comments that are to be indicated on the work product; and/or type onto the ITR Form any comments.

d) Sign and date the ITR Form and provide it to the PM and PE for review and distribution to the Back Checker.

4.4.3 Reconciliation of Internal Technical Review Comments

The Back Checker is required to perform the following:

a) Respond to all comments made by the Internal Technical Reviewer on the ITR Form, either agreeing to or resolving the comments.

b) If corrections are necessary, correct the work product and provide to the Internal Technical Reviewer for additional review.

c) Once all review comments are reconciled, or if no corrections are necessary, the PM shall sign and date the ITR Form.

d) Return the ITR Form to the Internal Technical Reviewer to sign and date acknowledging that all responses are accepted.

5.0 Checklists

Use of checklists is encouraged in the quality control process. Checklists, containing typical items expected to be included in designs, reports, drawings, specifications, or other documents, may be standard in-house checklists, checklists prepared by the client, checklists included in standard plans preparation manuals, or checklists developed specifically for a project.

Checklists which are used in the quality control process shall be completed and initialed by the Checker and attached to the Check Print or copy. The Checker is responsible for verifying that the checklist used is appropriate for the application.

6.0 Submittals

Document submittals, number, degree of development, and schedule, will be defined for each project either by the client or within the client's standards. In addition to these defined submittals, any work product transmitted to a non H&H entity shall be considered a submittal for purposes of QC and QA and documented with a QAR form. The following procedures for checking of various submittals will be implemented for ALL submittals irrespective of their quantity, degree of completion, and schedule.

6.1 Phase Submittals

Phase submittals are required to be checked, back checked, corrected, and verified prior to submittal. The level of detail of the process may be varied at the discretion of the PM for Witness Points provided that all critical information, either specifically required by the contract or considered fundamental to the development of the design, receives the

full check and back check detailed above for the classification of document and as appropriate for the level of development. Information presented in preliminary documents which is clearly under development, not completed, or subject to change must be reviewed by the Checker but need not be checked as required for final documents or at Hold Points, provided that the document is clearly marked as preliminary and subject to change. For example, in checking of concrete detail drawings to be submitted at the 60% level and required to define the general dimensions of the concrete, the concrete outlines and dimensions must be completely checked, but any rebar details need only be reviewed at this Witness Point.

6.2 Final Submittals

Final submittals are required to be completely checked, back checked, corrected, and verified in accordance with the appropriate procedure defined herein for the type of document. Final submittals are mandatory Hold Points.

6.3 Design Build Submittals

In general, specific requirements for design build submittals will be addressed in the contract and/or the Project Management Plan. Design Build submittals shall be subject the same quality control process as defined herein for design projects. All Issued For Construction (IFC) or Released For Construction (RFC) submittals are mandatory Hold Points and subject to Quality Assurance Review and Certification prior to submittal.

6.4 Miscellaneous Submittals

Any work product transmitted to a non-H&H entity shall be considered a submittal for purposes of QC and QA and documented with a QAR form. This includes but is not limited to work products categorized as progress sets, draft, preliminary or Over- the-Shoulder. The full QC process may not be required but every work product must be reviewed by someone other than the Originator/Producer prior to leaving H&H.

7.0 Post Design Submittal Reviews[2]

Post design submittals include documents prepared by or for the contractor and submitted to the Engineer for review. Typical documents included in the classification are shop drawings, working drawings, falsework drawings, falsework calculations, erection, etc.

In many cases the processing of submittals is defined in the contract or prescribed in the owner's standard procedures. In such cases those procedures will be followed. If procedures are not so prescribed, the procedures below shall be followed or used as a guide in implementing the owner's procedures.

All submittals from the contractor must be numbered and logged prior to review. The numbering and logging process will be established and coordinated by the PM or their designee. All logs shall be maintained throughout the Post Design Phase. Separate logs should be kept for RFIs, Shop Drawings and Submittals.

[2] Electronic review of submissions is encouraged and may be required by the Client. Electronic review shall conform to the appropriate document controls specified in the proceeding sections. All comments shall be made in RED, all checked details shall either be highlighted or boxed over with YELLOW (use transparency so that the details are not obscured). All comments shall be tabulated as required by the appropriate document controls.

Prior to return of the Contractor Submittal, the PM or PE should review the comments and disposition of the submission with the reviewer(s). Upon concurrence between reviewers and the PM or PE, the PM or PE shall return the submittal in accordance with the owner's standard procedures.

7.1 Shop drawings

All shop drawing submittals from the contractor, including drawings and catalog cut sheets, must bear the contractor's stamp of approval. This is necessary to assure that the contractor has noted his or her responsibility to coordinate the submittal with the project requirements and other submittals. Any submittals containing details of construction methods and/or procedures will not be processed as a shop drawing. Such submittals will be reviewed as noted in Article 7.2 below. Once the shop drawings are logged, one copy shall be designated as the "Office Copy" and forwarded to a designated Reviewer.

The Reviewer shall apply a shop drawing review stamp to each drawing, catalog cut, or table of contents of packaged submittals. The stamp will indicate that the Reviewer has "reviewed the contents of the submittal in accordance with appropriate industry standards for general conformance with the design concept of the project and general compliance with the information given in the contract documents." On the Office Copy, the Reviewer will mark in YELLOW information which is acceptable and in RED information which is not acceptable. Once the review is complete the Reviewer will determine a disposition and mark the appropriate box on the shop drawing review stamp. Dispositions will be selected from the following unless Client specific dispositions are required:

Approved This signifies that the Reviewer has determined that the submittal meets the stated requirements as is and that revision and resubmission is not required

Approved as Noted This signifies that the Reviewer has determined that the submittal meets the stated requirements if minor corrections are made as noted on the submittal in red and that revision and resubmission is not required

Revise and Resubmit This signifies that the Reviewer has determined that the submittal is lacking on one or more areas and must be revised and resubmitted for further review

Not Approved This signifies that the Reviewer has determined that the submittal is not in general conformance with the design concept and that a different concept must be prepared and submitted for review

The Reviewer's comments will be checked for conformance to design criteria and standards by the PM or their designee. Approved comments shall be transcribed in RED onto the copy to be returned to the contractor by the Reviewer or their designee. The Reviewer will verify the transcribing, mark the disposition, initial, and date the copy prior to return of the submittal to the contractor.

7.2 Review of Construction Methods and/or Procedures

Submittals containing details of construction methods and/or procedures will be reviewed as noted herein. Any submittals requiring design calculations performed by the Contractor's engineer shall be rejected if they do not contain the signature and seal of such registered professional engineer in the appropriate jurisdiction.

The Reviewer will review the construction methods and/or procedures submittal and note in RED any exceptions taken to the information provided. The Reviewer's comments will be checked for conformance to design criteria and standards by the PM or their designee. The Reviewer will apply a "Reviewed" stamp containing the following notation to each:

> "This submittal contains information regarding construction methods and/or procedures which are solely the responsibility of the Contractor. Review is only for the general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor retains

sole responsibility for dimensions which shall be confirmed and corrected at the job site; fabrication means, methods, techniques, processes, procedures, and sequences of construction; coordination of his work with that of all other trades; and the satisfactory performance of his work.

If the exceptions taken require extensive description, a letter containing the comments shall be prepared by the Reviewer, and the submittal shall be marked with a note to see the transmittal letter for additional comments.

8.0 Owner's Engineer or Peer Review Role

Hardesty & Hanover is not responsible for Quality Control of work produced by others. Review of design documents prepared by a firm other than Hardesty & Hanover, when acting in the role of Owner's Engineer or providing Peer Review, shall be in accordance with the contract requirements.

Check Prints shall be initialed and dated by the reviewer. The reviewer shall verify incorporation of all prior comments for each submittal. For digital files, each reviewer shall save an independent copy of the file in the project working directory with their initials and the date in the file name. All comments shall be recorded on a Comment Response Form which shall be submitted to the PM or PE for quality assurance review prior to submittal. The PM or PE must review all comments to confirm technical appropriateness and adherence to standards prior to submittal. Copies of comments and responses should be saved in the project files. Reviews done within a Bluebeam session shall have comments and responses exported to an Excel form. Calculations performed as part of the review shall be checked in accordance with the standard H&H QC plan and a QC check copy shall be saved in the project files.

All Peer Review submittals shall be documented with a Quality Assurance Review (QAR) Form.

Owner's Engineer submittals shall be documented with QAR forms at a schedule or frequency agreed upon by the Project Manager and Quality Manager for the specific project.

Appendix D

H&H QA/QC Forms

QUALITY ASSURANCE REVIEW & CERTIFICATION FORM

Project Name		**Project Manager**	
Project Location		**Client Name**	
H&H Project Number		**Client Project Number**	

1 - DOCUMENT INFORMATION

(TO BE FILLED OUT BY THE PROJECT MANAGER)

Level of Development (Check all that apply)

☐ Concept ☐ Preliminary ☐ Phase: _____ ☐ Final

☐ Release For Construction ☐ Other: _____

Documentation reviewed (attach complete list of all items / files reviewed):

☐ Design Criteria ☐ Design Plans ☐ Calculations / Computer Solutions ☐ Reports ☐ Specifications

☐ Interdisciplinary Coordination Documentation ☐ Prior Audit Documentation ☐ External Comment Responses

☐ Other, Specify: _____

2 – SUMMARY OF FINDINGS

I have reviewed the above documentation for conformance with Hardesty & Hanover Quality Control Standards. My Conclusions are as follows (if more space required attach additional sheet, indicate format and location of any additional comments):

3-RECOMMENDED ACTIONS

In consideration of the findings above I recommend the following actions be taken for the continued conformance of future work with the Hardesty & Hanover Standards (if more space required attach additional sheet, indicate format and location of any additional comments):

Developed by: _____ _____

Project Quality Assurance Lead **Date**

4 APPROVED FOR SUBMISSION

The recommended actions as noted above are in conformance with Hardesty & Hanover Standards and have been completed. The undersigned, as Project Manager, certifies that the noted submittal for the referenced project meets the requirements of the project Quality Management Plan, is complete for the level of development, meets the requirements of Hardesty & Hanover and is ready for submittal

_____ _____

Project Manager **Date**

INTERNAL TECHNICAL REVIEW FORM

Project Name		**Project Manager**	
H&H Project Number		**Client Name**	

☐1 - DOCUMENT INFORMATION

(TO BE FILLED OUT BY THE PROJECT MANAGER)

Level of Development (Check all that apply)

☐ Concept ☐ Preliminary
☐ Phase: _____ ☐ Other:_____
☐ Final ☐ Release For Construction

Discipline Reviewed (Check all that apply)

☐ Overall / Policy ☐ Structural ☐ Geotechnical
☐ Mechanical ☐ Electrical ☐ Highway/Civil
☐ Constructability ☐ Other, Specify: _____

Document type reviewed: ☐ Design Plans ☐ Calculations ☐ Report ☐ Specification
☐ Other, Specify:

Prepared by: _____ Document Date / Version: _____

QC STAMP

☐ Document contains Incomplete QC stamp, specify completed steps: _____
☐ Document contains Completed QC stamp

2 – DETAILED ITR SCOPE

Submitted by: _____ _____
Project Manager **Date**

3 – REVIEWER COMMENTS

(TO BE FILLED OUT BY THE INDEPENDENT REVIEWER)

I have reviewed the above referenced document in accordance with Hardesty & Hanover and Industry Standards. My Conclusions are as follows (if more space required attach additional sheet, indicate format and location of any comments):

Reviewed by: _____ _____
Internal Reviewer **Date**

4 – VERIFIED

All Reviewer comments have been addressed, either satisfactorily resolved or incorporated into the document. This document is complete.

Submitted by: _____ _____
Project Manager **Date**

5 - APPROVAL

This review is complete.

Submitted by: _____ _____
Internal Reviewer **Date**

Hardesty & Hanover

[Project]

[Type of Review]

Comment / Response Form (CRF)

DOCUMENT NAME:				
REVIEWER:		**RECEIVED DATE:**		
REVIEW DATE:		**REVIEW STATUS:**		

RESPONSE CODES: **A -** Team Member agrees and will take action; **D** - Team Member does not agree and will pursue resolution, comment has not been resolved; **F** - Follow up required

No	Page	Section	Comment	Comment By	Response	Response By	Response Code	Comment	Comment By	Change Incorporated
1										
2										
3										
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11										
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16										
17										

Distribution:

SUBCONSULTANT DESIGN QUALITY CERTIFICATION

PROJECT INFORMATION

Project Name:	[Project Name]	H&H Project No.:	[Project Number]
Client:	[Client Name]		

PROJECT SUBMITTAL LEVEL OF DEVELOPMENT

☐ Concept ☐ Preliminary ☐ Development ☐ Final

PROJECT LEADERSHIP CERTIFICATION

Project Manager

The undersigned, as Project Manager, certifies that the noted submittal for the referenced project has been completed and met the requirements of the project-specific quality management plan, is complete for the level of development and meets the requirements of LADOTD, and Hardesty & Hanover.

Name [Project Manger Name]

Date [Date]

Project Engineer

The undersigned, as Project Engineer under the direction of the Project Manager, certifies that the noted submittal for the referenced project has been completed and met the requirements of the project-specific quality management plan, is complete for the level of development and meets the requirements of LADOTD and Hardesty & Hanover.

Name [Project Engineer Name]

Date [Date]

Subconsultant Quality Assurance Checklist Design Projects

Project Name:	
Sub-consultant Name:	
Project Status/Phase:	
Date:	

YES	NO*	N/A*	* = ATTACH EXPLANATION
☐	☐	☐	1. Design calculations have been checked and back checked
☐	☐	☐	2. Geometry calculations have been checked and back checked
☐	☐	☐	3. Computer program input has been checked and results have been determined to be reasonable
☐	☐	☐	4. Quantity estimates have been checked
☐	☐	☐	5. Engineer's estimate has been checked
☐	☐	☐	6. Pay items have been reviewed to ensure that all work is included
☐	☐	☐	7. Specifications have been reviewed
☐	☐	☐	8. Designers have checked plan sheets
☐	☐	☐	9. Plan details and specifications have been checked for conformance with client standard details and specifications
☐	☐	☐	10. Plan details and specifications have been coordinated with design calculations
☐	☐	☐	11. Drawing layout, preparation, and CADD standards meet current client specifications
☐	☐	☐	12. Designers have checked interdisciplinary interfaces
☐	☐	☐	13. Discipline Leaders, Project Engineer, and Project Manager have verified design coordination
☐	☐	☐	14. Utility coordination is complete and details comply with standards
☐	☐	☐	15. Constructability review has been made
☐	☐	☐	16. Design has been coordinated with adjacent construction or abutting facilities
☐	☐	☐	17. Technical Policy review has been made
☐	☐	☐	18. Permit and Agency Sign offs have been obtained (as applicable)
☐	☐	☐	19. Client's comments have been addressed
☐	☐	☐	20. Client and H&H QA/QC requirements have been satisfied

Project Manager	*Signature*	*Date*
Project Quality Lead/QA Reviewer	*Signature*	*Date*

Appendix E

LADOTD QA/QC Forms & Checklists

LADOTD

BDEM Chapter 3, Part I, Appendix D

QC/QA Certification

Project No.:

Project Name:

We, the undersigned designers, detailers, checkers and reviewers for this project, have reviewed and accepted the calculations, plans, quantities, special provisions, and cost estimate prepared for the project. We certify that the work for which we are responsible has been completed in accordance with the LADOTD Bridge Design Section policy on QC/QA.

Team Members	Name	PE Registration No.	Responsible Plan Sheets	Responsible Special Provisions	Construction Cost Estimate	Signature
Designers						
Design Checkers						
Detailers						
Detail Checkers						
Reviewers						
Peer Reviewer						
Geotechnical Engineer						
Hydraulic Engineer						
EOR						

LADOTD

BDEM Chapter 3, Part I, Appendix I

Consultant Submittal QC/QA Certification

Project No.:

Project Name:

I, the undersigned Supervisor or Team Leader for this project, certify that the information included in this submittal has been prepared in accordance with the QC/QA plan documents and LADOTD Bridge Design Section policy on QC/QA and the information presented is accurate and meets the requirements of this submittal. All CAD drawings meet LADOTD CAD standards.

_____

Submittal Description

_____	_____	_____
Supervisor or Team Leader Name	Signature	Date

LADOTD

BDEM Chapter 3, Part I, Appendix A

Design Criteria Checklist

Design criteria for each project shall include, but not limited to, the following sections:

__ **Cover sheet**

The following information must be included on the cover sheet:

- LADOTD project number
- Project name
- Revision date
- The Supervisor or Team Leader's signature and date

__ **Governing Design and Construction Specifications and Other References**

A list of governing design and construction specifications and other references used for the project shall be included in this section. The edition number, interim revisions, and/or publication date must be specified for each reference.

__ **Design Assumptions and Design Exceptions**

All design assumptions and design exceptions received must be included in this section along with supporting documents.

__ **General Information**

The general information as listed below should be included in this section:

- Bridge information (no. of bridges, bridge clear width, length, no. of lanes, lane width, shoulder width, etc.)
- Road information (roadway classifications, design speed, traffic data, etc.)
- Vertical datum
- Vertical and horizontal clearances
- Other relevant information

__ **Hydraulic Design Criteria**

All hydraulic design criteria (design year, design water elevations, scour depth and scour elevation, etc.) shall be included in this section and the information shall be provided by the Hydraulic Engineer.

__ **Design Factors**

The ductility factor η_D, redundancy factor η_R, and operational importance factor η_I shall be listed in this section.

__ **Design Loads**

All design loads (dead load, live load, wind load, thermal loads, vessel collision loads, seismic load, wave loads, etc.) used for the project shall be included in this section.

- **Limit States**

  All applicable limit states for this project shall be listed in this section.

- **Bridge Barrier Railing**

  The design criteria, types, and test levels for bridge barrier ralings shall be listed in this section. Standard Plans and special details should be listed if they are utilized.

- **Guardrail**

  The design criteria, types, and test levels for guardrails shall be listed in this section. Standard Plans and special details should be listed if they are utilized.

- **Approach Slab**

  Design criteria for approach slab shall be included in this section. Standard Plans and special details should be listed if they are utilized.

- **Deck and Deck Drainage**

  All design criteria for deck and deck drainage design shall be included in this section. Standard Plans and special details should be listed if they are utilized.

- **Bearing**

  All bearing types and design criteria for each bearing type shall be included in this section. Standard Plans and special details should be listed if they are utilized.

- **Joint**

  All joint types and design criteria for each type shall be included in this section. Standard Plans and special details should be listed if they are utilized.

- **Superstructure**

  All superstructure types and design criteria for each type shall be included in this section. Standard Plans and special details should be listed if they are utilized.

- **Substructure**

  All substructure types and design criteria for each type shall be included in this section. Standard Plans and special details should be listed if they are utilized.

- **Piles and Drilled Shafts**

  All pile types, sizes, and structural design criteria shall be included in this section. Standard Plans and special details should be listed if they are utilized.

- **Geotechnical Design**

  All geotechnical design criteria shall be included in this section and the information shall be provided by the Geotechnical Engineer. Standard pPans and special details should be listed if they are utilized.

Mechanical Design

- All mechanical design criteria shall be included in this section if applicable. Standard Plans and special details should be listed if they are utilized.

__ **Electrical/Lighting Design**

All electrical design criteria shall be included in this section if applicable. Standard Plans and special details should be listed if they are utilized.

__ **As-Designed Bridge Rating Criteria**

All as-designed bridge rating criteria shall be included in this section.

__ **Software**

All software used for design and check shall be included in this section.

LADOTD

BDEM Chapter 3, Part I, Appendix B

Final Calculation Book Checklist

The final calculation book for each project shall include, but not limited to, the following sections:

__ **Cover Sheet**

The following information must be included on the cover sheet:

- LADOTD project number
- Project name
- The title of "Final Calculation Book"
- The EOR's seal with signature and date

__ **Final Calculation Book Check List**

__ **QC/QA Certifications**

__ **Peer Review Resolution Agreement (if peer review is performed)**

__ **Design Criteria**

__ **Final Hydraulic Analysis Report from Hydraulic Engineer**

__ **Final Geotechnical Analysis Report from Geotechnical Engineer**

__ **Superstructure Design Calculations**

__ **Substructure Design Calculations**

__ **Quantity Calculations**

__ **Special Provisions/NS-Items**

__ **Construction Cost Estimate**

__ **As-Designed Rating Report**

__ **List of All Final Electronic Design Files and File Locations (ProjectWise directory name)**

Consultants shall submit the final calculation book to LADOTD bridge task managers; the submittal shall be on a CD or Flash Drive or placed to a designated ProjectWise folder including the following information:

__ **A PDF File of the Calculation Book**

__ **All Electronic Design Files**

__ **A PDF File of the As-Designed Rating Report Only**

The final calculation book for in-house projects shall include the same files listed above for consultant projects. The final calculation book and other final design documents for all projects including in-house and consultant projects shall be uploaded to the archiving location designated in the record retention policy within 30 calendar days after the stamped final plans are delivered.

LADOTD

BDEM Chapter 3, Part I, Appendix C

QA Information Package Checklist

Project No.:

Project Description:

_____ Calculation Book

_____ Plans

_____ Special Provisions

_____ Cost Estimate

_____ Other Documents _____

LADOTD

BDEM Chapter 3, Part I, Appendix K

CONSULTANT SUBMITTAL REVIEW CHECKLIST

Items	Submittals												
	Design Criteria	TS&L	30% PP	60% PP	90% PP	100% PP	30% FP	60% FP	90% FP	100% FP	Final Calculation Book	Plan Revisions	Change Orders
Consultant Submittal QC/QA Certification			R	R	R	R	R	R	R	R	R	R	R
Design Criteria	C												
TS&L		C											
Bridge Index			D	D	D	D	D	D	C	S			
General Notes			D	D	D	D	D	D	C	S			
Summary of Estimated Quantities			D	D	C	C	D	D	C	S			
General Plans			D	D	C	C	C	C	C	S			
Typical Sections			D	D	C	C							
Superelevation Diagram				D	D	C	C	C	C	S			
Construction Phasing Details				D	D	C	C	C	C	S			
Traffic Controls Details				D	D	C	C	C	C	S			
Foundation/Pile Layout				D	D	C	C	C	C	S			
Pile Loads/Details					D	D	D	C	C	S			
Pile Data Tables							D	D	C	S			
Bent Details							D	D	C	S			
Fender Details							D	D	C	S			
Girder Details							D	D	C	S			
Span Details							D	D	C	S			
Joint Details								D	C	S			
Bearing Details								D	C	S			
Approach Slab								D	C	S			
Guardrail Details								D	C	S			

Bridge Barrier/Mailing Details								D	C	S			
Bridge Drainage Details								D	C	S			
Detour Bridge Details								D	C	S			
Revetment Details								D	C	S			
Signing/Lighting Details								D	C	S			
Year Plate								D	C	S			
Rebar Support								D	C	S			
Mise. Details								D	C	S			
Project Specific Standard Plans and Special Details								D	C	S			
Electrical/Lighting Details								D	C	S			
Mechanical Details								D	C	S			
As-Built Plans								D	C	C			
Special Provisions/NS-Items							D	D	C	C			
Cost Estimate					D	D	D	D	C	C			
Final Calculations											S		
Revised Plans/Calculations												S	S

Legends:

"R" = The item is required and shall be included in the submittal.

"C" = The item shall be complete and shall be included in the submittal.

"D" = The item shall be in development and shall be included in the submittal. "S" = The item is stamped by the EOR and shall be included in the submittal.

22. Sub-consultant information:

Firm Name (Name must match as registered with Louisiana's Secretary of State)	**Address**	**Point of Contact and email address**	**Phone Number**
Ardaman & Associates, Inc.	316 Highlandia Dr. Baton Rouge, LA 70810	Robert Jewell rjewell@ardaman.com	225.752.4790
APS Engineering and Testing, LLC	1645 Nicholson Dr. Baton Rouge, LA 70802	Sergio Aviles sergio@aps-testing.com	225.456.5714
Chustz Surveying, LLC	211 Richy St. New Roads, LA 70760	James H. Chustz, Jr, PLS jchustz@chustz.com	225.718.7103
Moffat & Nichol, Inc.	301 Main Street, Suite 800 Baton Rouge, LA 70801	Chase Hulon chulon@moffattnichol.com	225.610.1932
Pelican Marine Design, LLC	110 James Drive West, Suite 135 St. Rose, LA 70087	William D. Scherer bill@pelicanmd.com	504.975.2466
Urban Systems, Inc.	2000 Tulane Ave. Suite 200 New Orleans, LA 70112	Alison Michel acmichel@urbansystem.com	504.569.3958

23. Location:

Not Applicable

3850 N. Causeway Blvd, Suite 1625
Metairie, LA 70002
T: 504.962.9212
la@hardestyhanover.com