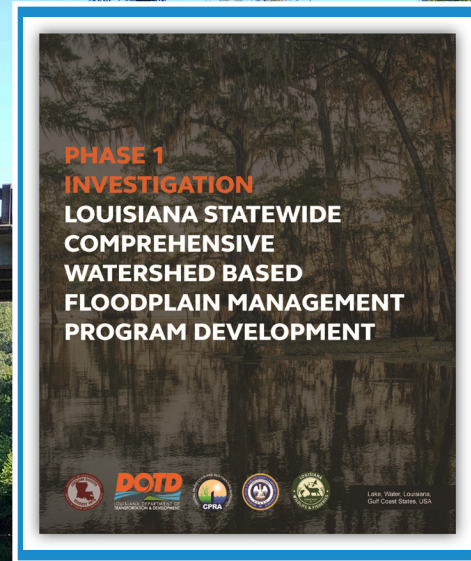
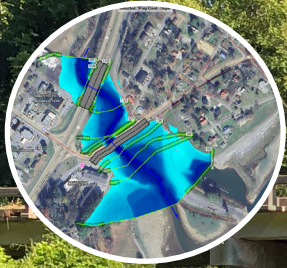




CONTRACT NO. 4400031035

April 15, 2025

IDIQ CONTRACT FOR HYDRAULICS SECTION SUPPORT, STATEWIDE



Tuesday, April 15, 2025

Louisiana Department of Transportation and Development
1201 Capitol Access Road, Room 405-E
Baton Rouge, LA 70802-4438

6100 Corporate Blvd, Suite 325
Baton Rouge, LA 70808
Phone: 225 292 1004
Fax: 225 218 9677
www.arcadis.com

Subject: **Contract No. 4400031035**
IDIQ Contract for Hydraulics Section Support
Statewide, Louisiana

Dear Project Evaluation Team,

Arcadis would like to express an interest in the above-mentioned advertisement. The Arcadis drainage, roadway, bridge and traffic design teams have provided dedicated and dependable support to the Louisiana Department of Transportation and Development (LADOTD) through our intimate knowledge of design policies and practices and extensive project experience. Arcadis has shown its commitment to LADOTD by continuing organic growth of our multidisciplinary design teams to complement our more well known traffic group, who are a leader in the state.

Arcadis has been a partner to the State of Louisiana since the 1970s, deeply ingrained in flood risk management and resilience. We have witnessed the challenges and triumphs that Louisiana has faced in the wake of major flood events like Hurricane Katrina. We have actively contributed to **landmark initiatives such as the Louisiana Coastal Master Plan and the inception and early implementation of Louisiana Watershed Initiative (LWI), which is recognized as a gold standard in frameworks for state-level floodplain management.**

Our staff has been developing H&H studies for multiple State DOTs including LADOTD, TDOT, GDOT, MDOT, ALDOT, TxDOT, NCDOT, and FDOT - to name a few. We have a national and well-rounded H&H practice, and we can apply lessons learned from other State DOTs and various drainage manuals across the country. Additionally, over the past 15 years, we have been contracted to train internal DOT employees, consultants, and contractors and to **develop guidelines and guidebooks for the DOTs to publish.**

This team of diverse and experienced engineers will bring a deep bench of talent to support our local hydraulics staff. Our ability to combine innovative ideas and lessons learned from other DOTs allows us to anticipate and quickly overcome delivery challenges with flexibility.

With the combined understanding of the contract needs, national expertise in managing similar IDIQs and On-Call contracts and **local Louisiana subject matter experts,** the Arcadis Team will provide unparalleled level of service on this contract for LADOTD.

Perhaps most importantly, the Arcadis Team lives, works, and travels through the communities that will be served by projects from this IDIQ. We are committed to **improving quality of life** for these communities and the Louisiana traveling public. We look forward to the opportunity to continue partnering with LADOTD to improve the safety, service, and reliability of Louisiana's transportation system through sustainable solutions. Thank you for your time and consideration.

Sincerely,
Arcadis



Akhil Chauhan PE, PTOE, PTP, PMP
Senior Vice President, Transportation Services



Colin Sarratt, PE
Project Manager, South Gulf Regional H&H Lead



Our staff has been developing **H&H studies** for multiple State DOTs including, **LADOTD, TDOT, GDOT, MDOT, ALDOT, TxDOT, NCDOT, and FDOT** - to name a few. We have a national and well-rounded H&H practice, and we can apply lessons learned from other State DOTs and various drainage manuals across the country. This team of diverse and experienced engineers will bring a deep bench of talent to support our local hydraulics staff. Our ability to combine innovative ideas and lessons learned other DOTs allows us to anticipate and quickly overcome delivery challenges with dexterity.

“Arcadis has been a very knowledgeable, even tempered, and overall good company to work with. I appreciate working with you, Anwer.”

- Brad McManus, PE, GDOT

Sections 1-11

DOTD FORM: 24-102

(Revised December 12, 2024)

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	IDIQ CONTRACT FOR HYDRAULICS SECTION SUPPORT - STATEWIDE
2. Contract Number(s) as shown in the advertisement	CONTRACT NO. 4400031035
3. State Project Number(s), if shown in the advertisement	N/A
4. Prime consultant name (name must match exactly as registered with the Louisiana Secretary of State (SOS) where such registration is required by law; including punctuation; include screenshot from SOS at the end of Section 20)	 ARCADIS ARCADIS U.S., INC.
5. Prime consultant license number (as registered with the Louisiana Professional Engineering and Land Surveying Board (LAPELS) if registration is required under Louisiana law)	EF.0002808 DUNS 057690414
6. Prime consultant mailing address	6100 Corporate Blvd., Suite 325 Baton Rouge, LA 70808
7. Prime consultant physical address (existing or to be established, if location is used as an evaluation criteria)	6100 Corporate Blvd., Suite 325 Baton Rouge, LA 70808
8. Name, title, phone number, and email address of prime consultant's contract point of contact	Colin Sarratt, PE Project Manager, South Gulf Regional H&H Lead P. 770-384-6633 E. colin.sarratt@arcadis.com
9. Name, title, phone number, and email address of the official with signing authority for this proposal	Akhil Chauhan, PE, PTOE, PTP, PMP Principal Engineer P. 225 368 6563 E. akhil.chauhan@arcadis.com
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.

Pursuant to Act No. 581 of the 2024 Louisiana Legislature Regular Session, proposer further certifies that it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association based solely on the entity's or association's status as a firearm entity or firearm trade association. In addition, proposer certifies it will not discriminate against a firearm entity or firearm trade association during the term of the contract based solely on the entity's or association's status as a firearm entity or firearm trade association.

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.

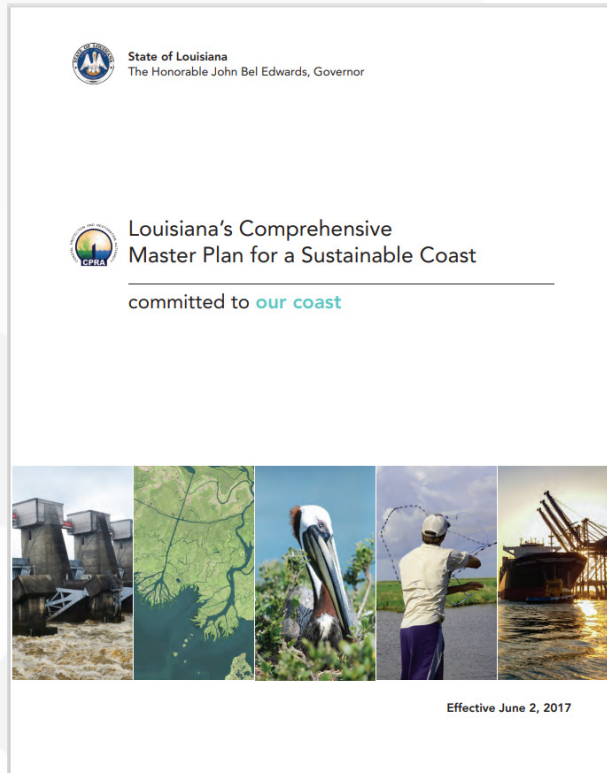


Signature above shall be the same person listed in Section 9:

Date: April 15, 2025

Firm(s):

Firm(s)' %:



2017 Louisiana Master Plan, Flood Risk and Resilience Program

Coastal Protection and Restoration Authority (2016-2017)

Arcadis (with staff proposed for this project) provided strategic guidance, materials and policy advisement and development, application process development, and pilot program facilitation for the development of the CPRA's new non-structural grant program, the Flood Risk and Resilience Program (FRRP). Additionally, provided detailed program process recommendations related to IT solutions and standard operating procedures for payment and financial management, document controls, and project management. Integrated FEMA and CDBG-DR requirements for program compatibility. QAQC and strategic guidance for non-structural program. Tasks include review of Flood Risk and Resilience Program Framework document and appendices, Review of the RAND CLARA Report, Review of the RAND Planning Tool report, development and pilot of Nonstructural Grant Application Forms, consideration of alternate fund sources for project and program implementation, intergovernmental coordination and cooperation, and review of IT solutions.

Over the past 14 years, Arcadis has been contracted to train internal DOT employees, consultants, and contractors and to **develop guidelines and guidebooks for the DOTs to publish**. Arcadis understands and appreciates the respect and importance of being in a position to exemplify and communicate the DOT's policies and procedures.

I just wanted to express my gratitude and thanks for your effort working on GDOT's compliance with the MS4 permit. This effort really comes into to focus with the annual report that was just delivered to EPD.

*M. Brad McManus, P.E.
State Roadway Hydraulics Engineer*

Sections 12-14

12 DISCIPLINE TABLE:

As indicated in the advertisement, insert a 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 listed in the drop down in each row (Appraiser, Bridge, CE&I/OV, CPM, Data Collection, Environmental, Geotech, ITS, Other (must specify), Planning, Right-of-Way, Road, Survey, and Traffic). Remove rows as needed.

Discipline(s)	% of Overall Contract	Arcadis	Each Discipline must total to 100%
Other (Hydraulics)	100%	100%	100%
Identify the percentage of work for the <u>overall contract</u> to be performed by the prime consultant and each sub-consultant.			
Percent of Contract	100%	100%	

13 FIRM SIZE:

Firm name	DOTD Job Classification	Number of personnel <u>committed</u> to this contract	Total number of personnel available in this DOTD Job Classification (if needed)
	Engineer	4	10
	Engineer - Other	8	9
	Planner	1	3
	Principal	1	2
	Professional	3	4
	Supervisor - Other	3	3
	Supervisor - Eng	1	3



Legend:
Louisiana PE *
Meeting MPR *



Hydraulics & Hydrology

SMS / Coastal Modeling Support	SRH-2D Modeling	FEMA Regulations	HECRAS 1D & 2D
John Atkinson, PhD Shan Zou, PhD Nick Irza, PE	William Dial, PE Lina Khoury, PE, CPESC, CFM Amanda Check, PE** Antonia Donnelly, PE* Colin Sarratt, PE** Justin Corbitt, PE	Lina Khoury, PE, CPESC, CFM* Walter Baumpy, PE Danica Adams Devin Foil, AICP, CFM* Amanda Check, PE** Eric Reardon, PE, CFM Hilafu Hilafu, PE, CFM	Hilafu Hilafu, PE, CFM Cailyn Youmans, PE* Thomas Lin, PE Colin Sarratt, PE** Justin Corbitt, PE* Antonia Donnelly, PE* Brian Bandy, PE
Guidelines and Manuals			
Anwer Ahmed, PE Colin Sarratt, PE** William Dial, PE Lina Khoury, PE, CPESC, CFM* Justin Corbitt, PE			



Hurricane Storm Damage Risk Reduction System

New Orleans, Louisiana



In the 2012 coastal master plan for the State of Louisiana, Arcadis led the effort to analyze the storm surge and wave reduction potential of all proposed restoration and protection projects in coastal Louisiana. The storm surge and wave attenuation modeling work is a key pillar of the framework of the state's master plan. Our work has ranged from program management to numeric modeling, to development of guidance materials, policy and planning, and more.

Arcadis has been a valued resource in supporting successful execution of the New Orleans District's mission areas. They are capable of providing quality work products within constrained time frames. Their superior support, responsiveness, and creative engineering solutions allow the District to continue to meet the post-Katrina demands of the nation."

*- Durund Elzey, Senior Project Manager,
USACE New Orleans District*

Sections 15-16

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	David Fulks, PE (<i>>29 years' experience</i>)	 ARCADIS	PE	LA	PE. 30151 / 9/2026
2	David Fulks, PE (<i>>29 years' experience</i>)	 ARCADIS	PE	LA	PE. 30151 / 9/2026
3	Colin Sarratt, PE (<i>>10 years' experience</i>)	 ARCADIS	PE	LA	PE. 46542/ 9/2026
	Amanda Check, PE (<i>>15 years' experience</i>)	 ARCADIS	PE	LA	PE. 45736/ 9/2025
4	Colin Sarratt, PE (<i>>10 years' experience</i>)	 ARCADIS	PE	LA	PE. 46542/ 9/2026
	Amanda Check, PE (<i>>15 years' experience</i>)	 ARCADIS	PE	LA	PE. 45736/ 9/2025
5	Lina Khoury, PE, CFM (<i>>16 years' experience</i>)	 ARCADIS	Certified Floodplain Manager (CFM)	USA	CFM. US-19-11213 / 1/31/2026
	Devin Foil, AICP, CFM (<i>>6 years' experience</i>)	 ARCADIS	Certified Floodplain Manager (CFM)	USA	CFM. US-19-11124 / 7/31/2025

16 STAFF EXPERIENCE:

Firm employed by:  **ARCADIS**

Name	William Dial, PE	Years of relevant experience with this employer	11
Title	National H&H Practice Lead	Years of relevant experience with other employer(s)	16
Degree(s) / Years / Specialization	MS / 1997 / Civil Engineering, Auburn University BS / 1995 / Civil Engineering, Auburn University		
Active registration number / state / expiration date	PE030568 / GA / 12/31/2025		
Year registered	2005	Discipline	Civil Engineer
Contract role(s) / brief description of responsibilities	QA/QC & Technical Advisor		
Experience dates	Experience and qualifications relevant to the proposed contract		
	Mr. Dial specializes in the management, review, and design of roadway projects, including design-build project for interstates, urban storm drainage systems, and developing and coordinating complex maintenance of traffic plans and staging with operations staff. <u>As previous program manager for GDOT's MS4 program he developed the current details, report template and assisted in GDOT Drainage Manual updates.</u> His project experience includes conducting field plan reviews, participating in value engineering studies, reviewing MS4 compliance and infeasibility reports, and performing internal <u>QC/QA activities for state and county departments of transportation (DOTs).</u> He has managed and performed hydraulic design and hydrologic studies on numerous projects for both public and private entities in Georgia, Florida, Alabama, and several other states. Work experience includes closed drainage systems, open channel design, storm water retention/detention design, water quality solutions, flood map revisions, and bridge hydraulic & hydrology studies. He is proficient in MicroStation, AutoCAD, StormCAD, Flow Master, Culvert Master, Pond Pack, Hydrologic Engineering Center's (HEC)- River Analysis System (RAS), HY-8, HYDRAIN, WSPRO, ArcGIS SRH2D and numerous other hydraulic/hydrology software packages. He has completed the NHI SRH-2D training course (135095 Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments).		
	02/22 – 04/25	I-10 Calcasieu River Bridge P3, LADOTD, Calcasieu Parish, LA. Drainage QA/QC. William provided QA/QC on the drainage for Segment 1 of the I-10 Calcasieu Bridge Replacement P3 project to replace the existing bridge over Calcasieu River with a new bridge north of I-10. Involves the design of both open and closed conveyance systems between Prater Road and PPG drive, culvert and cross-drain analysis and design, as well as outfall analysis utilizing HYDR design software.	
	1/18 – 12/18	2018 Bridge Design-Build Program, GDOT, Atlanta, GA. Lead Hydraulics Engineer. Bridges task order under the General Engineering Contract (GEC), a program managed by Arcadis to improve the state's overall transportation network. Arcadis prepared costing plans for the design-build solicitations for the replacement of 25 low-impact, off-system bridges across Georgia. The existing bridges were structurally deficient. All crossings were designated as Zone A. Existing and proposed bridges varied from single span to multi-span structures and ranged in length up to a couple hundred feet long. Provided QA/QC for the HEC-RAS models along with the written reports, directed junior staff during the modelling process, and coordinated with the roadway and bridge designers.	
	06/23 – 12/24	TDOT Districts 28 & 29 Special Drainage Project Bundle, TN. Hydraulics QA/QC for Arcadis' TDOT Region 2 project development in researching flooding and erosion problems on several projects in Districts 28 and 29 to provide cost-effective and permittable	

	solutions. Our hydraulic team worked closely with TDOT maintenance in investigating undersized pipes, developed land over the years, residents and commercial development adding to TDOT systems, sinkholes, stream encapsulations, and much more. This bundle includes eight projects that involved H&H analysis and modeling, and a natural design channel to satisfy state and federal environmental permitting requirements. The design implemented HEC-RAS modeling techniques along with advanced corridor modeling in OpenRoad Designer. The implemented solution will satisfy ROW and utilities restrictions and will be let for construction within a year from receiving the project survey.
2021 - 2022	SR-119 Over the Ogeechee River Bridge Replacements, Bulloch and Effingham Counties, GA. <i>Hydraulics QA/QC.</i> The Ogeechee River has three existing bridge crossings within the floodplain that includes the bridge over the main channel and two overflow bridges. Due to the complexity of the existing crossing, a 2D analysis was performed utilizing SMS and SRH-2D to design both proposed bridge crossings. The contributing drainage area at SR-119 measures approximately 2,590 square miles and a nearby USGS gage located south of the project site was selected to generate weighted rural regression flows for the project crossing. The project's modeled reach spanned about 8 miles in length and 2 miles wide. Due to the sheer size of the model, it took nearly 30 days for the model to run. The analysis included the creation of the natural condition, existing condition, and proposed condition models of the floodplain and included all three bridge crossings along SR-119. As this project was the first H&H analysis and report prepared using SRH- 2D for GDOT, Arcadis performed extensive coordination with the GDOT Bridge Office for the 2D models and report. The project will help GDOT in the development of future published guidelines.
1/17 – 12/17	GDOT MS4 Program Management, GDOT, Statewide, GA. <i>Subject Matter Expert/Policy Advisor.</i> Arcadis has assisted GDOT in the management of the MS4 program since the inception of the program in 2013. William assisted in the development of a stand alone section of the drainage manual dedicated to MS4 BMPs use and construction along with developing standards and details, example construction sheets and special provision to aid the engineers and contractors in the design and construction of the waer quality and detention BMPs. In addition, the manuals have been updated on a yearly basis to reflect evolving policy and federal regulations.
4/17 – 2/18	I-85 North Extension, GDOT, GA. <i>Hydraulics Lead Engineer.</i> a 10-mile-long extension of third lane in each direction on I-85 in Gwinnet County, GA. I-85 was widened to add one lane in each direction from Hamilton Mill Road to SR53, a total distance of approximately 11 miles. Performed the QA/QC functions and the project coordination for the design phase,including roadway design, erosion control, utility coordination and culvert extensions.
1/14 – 6/15	I-75 South Managed Lanes Design Build, C.W. Matthews Contracting Co., Atlanta, GA. <i>Lead Hydraulics Engineer.</i> Provided QA/QC for the HEC-RAS models along with the written reports, directed junior staff during the modelling process, and coordinated with the roadway and bridge designers. Lead Hydraulic Engineer for a the design of a reversible managed lane system in Henry County, GA. Directed the preparation of drainage plans and hydraulic studies for the project including the MS4 report, preparation of several bridge hydraulic studies and preparation and permitting of the erosion control plans.
1/16 – 10/16	I-85 Express Lanes Extension Design-Build, C.W. Matthews Contracting Co., Suwanee/Buford, GA. <i>Lead Hydraulics Engineer.</i> A 10-mile-long extension of the managed line system on I-85 in Gwinnet County, GA. I-85 was widened to add one managed lane in each direction from just north of Old Peachtree Road to Hamilton Mill Road, a total distance of approximately 11 miles. Performed the QA/QC functions and the project coordination for the design phase, including roadway design, erosion control, utility coordination and culvert extensions. A pair of double 8x8 culverts that conveyed water under I-85 were connected and an HY8 analysis and a subsequent HEC-RAS analysis were performed. Provided QA/QC for the HEC-RAS models along with the written reports, directed juniorstaff during the modelling process, and coordinated with the roadway and bridge designers.

Firm employed by:  **ARCADIS**

Name	Mark Dennis, PE	Years of relevant experience with this employer	23
Title	Principal Hydraulics Engineer	Years of relevant experience with other employer(s)	3
Degree(s) / Years / Specialization	JD / 2003 / Law Degree / BS / 1998 / Civil Engineering /		
Active registration number / state / expiration date	Professional Engineer (Civil) – OH (#69260)		
Year registered	2004	Discipline	Civil Engineer
Contract role(s) / brief description of responsibilities	QA/QC & Technical Advisor		
Experience dates	Experience and qualifications relevant to the proposed contract		
	Mr. Dennis brings over 26 years of experience in civil engineering and transportation, specializing in infrastructure design and hydraulics management. His expertise includes drainage analysis, sewer systems, watershed studies, and stormwater infrastructure improvements. He has designed culverts, storm sewers, detention basins, energy dissipaters, and roadway drainage systems incorporating post-construction BMPs, with a thorough knowledge of OEPA stormwater requirements. Mark has conducted complex drainage studies, developed stormwater management plans for multiple communities, and provided support for NPDES MS4 Phase II programs. Mark is very familiar with FEMA floodplain requirements and has prepared numerous LOMRs and CLOMRs for several northeast Ohio communities. He is proficient in stormwater modeling software such as HEC-HMS, HEC-RAS (steady-state and unsteady-state), SWMM, HY-8, CDSS, and USGS National Streamflow Statistics. He has also presented on hydraulics topics at the Ohio Floodplain Management Conference, Ohio Stormwater Conference, and OTEC.		
04/21 – 04/23	Bull Creek Bridge Replacement, Columbiana County, Ohio. Drainage Lead. The project consisted of the replacement of an existing 221-foot long, four span concrete box beam bridge over Bull Creek. A Structure Type Study was performed to determine the preferred structure type evaluating construction cost, maintenance cost, constructability, phased construction, hydraulics and scour. An important component of the study was the bridge hydraulic analysis which evaluated the skew of the existing bridge piers. While the proposed bridge was shorter than existing and had one fewer spans, the HEC-RAS analysis demonstrated no increase in upstream flood elevations adjacent to a house in the floodplain. Arcadis recommended and designed a 3-span reinforced concrete deck and prestressed concrete I-beam superstructure on wall type abutments and piers, on spread footings		
04/21 – Ongoing	MOVEBR Lee Drive (Highland Road to Perkins) Final Design Study Report, MOVEBR Baton Rouge, LA. Project Manager for Study Phase up to Design Phase. Responsible for coordinating and developing concept drawings to evaluate the geometric feasibility of different roadway alternatives, proposed improvements, and anticipated right-of-way needs. Assisted in the implementation of Complete Street principles for the corridor. During the alternative's selection process, participated in stakeholder and public involvement to evaluate and select the preferred alternative.		
03/08 – 02/10	Maca Ditch watershed in Tallmadge, OH. Hydraulic Engineer for a hydrologic and hydraulic analysis for approximately 2 miles of the Maca Ditch watershed in Tallmadge, OH. The watershed has a history of flooding yards, buildings and Roads. During the May 2004 100-year storm event, Eastwood Avenue had flooding up to car windows, Washburn Road was overtopped, and Beechwood Drive was overtopped. The project included creating a hydrologic model of the existing watershed using HEC-HMS and creating an existing hydraulic model using HEC-RAS. The existing hydraulic model includes unsteady flow calculations to model the effects of		

	in-line regional detention basins, lateral detention structures, and storage in the Maca Ditch floodplain. Based on the results of the existing analysis and observed flooding along Maca Ditch, proposed alternates were developed using the HEC-HMS and HEC-RAS models to alleviate the flooding were possible. A detailed narrative and a preliminary opinion of probable cost for the feasible alternates were submitted as part of the final report.
03/06 – 03/08	City of Hudson, Ohio FEMA Map Revision. Project manager for hydraulic study and Letter of Map Revision to re-map the FEMA floodplains in downtown Hudson. During severe storm events in 2003 and 2004, the City's downtown experienced significant flooding, which the City has tried to mitigate through two new regional detention basins and modifications to two additional stormwater ponds. The City hired Arcadis to evaluate the aggregate benefits of the detention improvements and to determine whether the 100-year flow rates in the Brandywine Creek Tributary should be reduced resulting in lower Base Flood Elevations. A SWMM model was created for the hydrologic analysis to provide peak flows that were input into the HEC-RAS model of the stream. Arcadis prepared LOMRs for both the Tributary and its Overflow, which significantly reduced FEMA flood zone limits along this small headwater stream.
09/10 – 12/10	Cleveland Avenue/6th Street Hydraulic Study, Canton, Ohio. <i>Project Manager</i> for this SWMM study of a small urban watershed, which has experienced persistent flooding in two locations for many years. The SWMM model developed for this study included the sewer network as well as overland flow paths and above ground storage areas. Our analysis identified deficient storm sewer capacity in certain pipes and offered three alternative improvements to address the flooding. The City has selected one of the alternates and intends to move forward with final design.
12/19 – 06/22	AES Towpath Trail Hydraulic Study, Akron, Ohio. <i>Project manager</i> responsible for overall project execution, coordination with City of Akron, and securing approval from ODNR. The proposed AES Towpath Trail was a segment of the Ohio and Erie Canal trail, which required filling in a portion of the Canal to construct the adjacent trail due to its tight urban setting. For previous City of Akron projects, Arcadis had created a HEC-RAS model of the Ohio and Erie Canal from Summit Lake to the Little Cuyahoga River 15,000 feet downstream. This model was utilized and updated to determine the hydraulic impacts from the AES Trail project and identify and evaluate mitigative efforts to offset a rise in the 100-year flood elevation.
03/08 – 02/10	Hike/Bike Trail Culvert Replacement, Stow, Ohio. <i>Project Engineer</i> for a culvert replacement of an existing bridge structure on an abandoned rail line that was converted to a hike/bike trail within the City of Stow. The existing bridge carries the hike/bike trail over a major tributary to Powers Brook and was failing. The bridge was replaced with a 12' x 8' 4-sided box culvert. The size of the structure was determined as part of the recommendations from a watershed study of Powers Brook performed by Arcadis.
07/07 – 03/18	East Maple Street Enhancements at Walsh University, North Canton, OH. <i>Project Manager</i> The City hired Arcadis to conduct a study of E. Maple Street which included a series of meetings with the City and officials of adjacent Walsh University to better understand current concerns and future aspirations for the one-mile corridor. Walsh University recently completed a conceptual plan envisioning a 'vibrant, innovative neighborhood' surrounding the campus with pedestrian friendly streets and a distinctive University District that identifies the campus area. Arcadis worked with Walsh and the City to incorporate Walsh's preferences into streetscaping elements such as decorative crosswalks and street lights. Arcadis assisted the City with securing federal Transportation Alternatives funding for the final phase. Improvements included a new traffic signal, modifications at an existing signal to add pedestrian signal heads, three decorative intersections with brick crosswalks, two decorative mid-block crosswalks with rapid flash beacon crosswalk signs, and a one-mile shared use path with decorative lighting connecting to the Stark Park's Hoover Trail.

Firm employed by.  **ARCADIS**

Name	Seth Magden	Years of relevant experience with this employer	3
Title	Expert Management Consultant	Years of relevant experience with other employer(s)	15
Degree(s) / Years / Specialization	MA / 2011 / Latin American Studies/International Development/Global Health; BS / 2001 / Political Science & Spanish		
Active registration number / state / expiration date	N/A		
Year registered	N/A	Discipline	N/A
Contract role(s) / brief description of responsibilities	Technical Advisor		
Experience dates	Experience and qualifications relevant to the proposed contract		
	Mr. Magden brings more than 18 years of experience working with federal funds supporting state and local government, community groups, nonprofit organizations, and private sector partners in developing, implementing, and leading planning, visioning, recovery and community development program initiatives. His work has <u>predominantly involved FEMA (IA, PA, HMGP, BRIC) and HUD (CDBG-DR/MIT) funded programs as well as initiatives funded under the American Rescue Plan Act (ARPA).</u> Seth was heavily involved in the HUD-funded National Disaster Resilience Competition with multiple (awarded) clients in the planning and visioning competition, as well as implementation. He has served the States of California, New York, Louisiana, Florida, and the Puerto Rico Department of Housing, where he led the team to design and implement \$20.2 billion in recovery funding, providing full support on grant management and regulatory compliance. For the State of Florida Department of Economic Opportunity (DEO), he served as Principal/Program Director, leading the successful start-up and launch of the Rebuild Florida Michael Housing Repair and Replacement Program (HRRP) from 2020-2021 in the Florida Panhandle. From 2021-2022 he led the start-up and launch of the Homeowner Assistance Fund (HAF) program for the State of Louisiana Office of Community Development. Since 2022 Mr. Magden has <u>supported the State of Louisiana with Program Management as a Principal and Subject Matter Expert on the HUD CDBG-MIT funded \$1.2B Louisiana Watershed Initiative across nine watershed regions, involving resilience planning, modeling, and flood risk reduction infrastructure project development and implementation.</u>		
10/23 – 03/25	HUD Capacity Building and Technical Assistance, Multiple Engagements. Arcadis is supporting HUD on multiple engagements to support grantee and subrecipient capacity building for two webinar series, Community Disaster Preparedness focused on CDBG-DR/MIT grantees, and Group Learning which focuses on HUD-assisted housing properties. Mr. Magden is the Principal and Lead for this engagement. Topics include the <i>Unified Federal Review (UFR) Process, tiered environmental review, extreme temperatures, mitigation of historic properties in flood zones, how to conduct a vulnerability assessment</i>, among others. Arcadis is responsible for all content creation for webinars, handouts, and for delivering the webinars. In addition, Mr. Magden has provided HUD TA support as a subcontractor for a Florida county impacted by Hurricane Ian, with an emphasis on integration of Nature Base Solutions into program and project design components. Mr. Magden also has led the development of HUD's Extreme Heat Quick Guide and Playbook, which are in-depth resources to support grantees with understanding community risks and planning, funding, and implementing solutions.		

10/24 – Ongoing	DEQ Flood Resiliency Blueprint Phase III – Professional Services, Statewide North Carolina, North Carolina Department of Environmental Quality. The North Carolina Flood Resiliency Blueprint (the Blueprint) is the State’s science-based and stakeholder-driven initiative designed to support the planning, evaluation, and implementation of flood resilience strategies. <i>Serving DEQ as part of the Arcadis Resiliency Leadership Council, Mr. Magden provides the agency with his expertise on management of large-scale statewide flood resilience planning and infrastructure project development and implementation programs, and coordination and alignment of federal programs and funding streams</i> with state and local needs. Seth also provides PMO support and subcontractor management and also supported the content and design development of the Spring 2025 Blueprint Update.
10/23 – Ongoing	Program Management - Louisiana Watershed Initiative (LWI) Program, Statewide Louisiana, Louisiana Office of Community Development. Mr. Magden serves as Principal as part of the State’s PMO team. Funded through the State’s 2016 HUD allocation, the LWI program <i>has a \$1.2 Billion budget of HUD CDBG-MIT dollars and focuses on transitioning Louisiana to watershed-based planning and floodplain management.</i> LWI involves both resilience planning components, conceptualization, design, and implementation of resilient infrastructure projects, as well as conducting extensive modeling <i>across nine watershed regions.</i> Involves extensive stakeholder engagement, coordination, and consensus building across multiple disciplines, and with state, federal, local, private, and not-for-profit groups, including Louisiana Department of Transportation and Development (LADOTD) and the Office of the Governor.
04/22 – Ongoing	Strategic Advisory Support – Resilience Sector, Multiple Locations. <i>National Program Management Lead</i> providing subject matter expertise across a variety of initiatives including resilience planning, infrastructure, hazard mitigation, economic development, housing, and <i>emergency management, including FEMA</i> PA, HMGP, BRIC; HUD CDBG-DR/MIT. Jurisdictions include state and local clients in Louisiana, Florida, Texas, Puerto Rico, New York, California, Kentucky, Washington, DC, and others.
06/23 – 12/24	Queens Flood Mitigation Program - Study of Flood Mitigation for Repetitive Loss Properties in Hamilton Beach, Howard Beach, and Lindenwood, NYC Emergency Management and Housing Preservation & Development, New York, NY <i>Project Manager</i> for <i>FEMA-funded study connecting flood-vulnerable</i> property owners in the Howard Beach, Hamilton Beach, and Lindenwood communities with resiliency specialists to create tailored flood mitigation plans for residential properties and provide guidance for future funding applications.
06/22 – 08/24	Plumas County, California – Federal Grants Advisory Services, Plumas County, Plumas, CA Federal Funding Lead. Plumas County was devastated by the 2021 Dixie Fire, which was the single-largest non-complex wildfire in state history and the second-largest complex wildfire in state history. Arcadis is supporting the county with ensuring the county is reimbursed for all possible and potential insurance claims, as well as ensuring <i>reimbursement and compliance with FEMA</i> PA project worksheets. Responsible for this engagement, wherein guides county staff and grants management team supporting Plumas County with ensuring all eligible costs are captured and reimbursed, review of project worksheets, research and formulation of appeals and extension requests, and quality assurance on grant compliance. Seth also leads the team in supporting the county with <i>FEMA BRIC application development and identifying and pursuing additional grant funding opportunities.</i>

Firm employed by: 			Meets MPR No. 3 & 4
Name	Colin C. Sarratt, PE	Years of relevant experience with this employer	10
Title	Louisiana Hydraulics Lead / South Gulf Regional H&H Lead	Years of relevant experience with other employer(s)	0
Degree(s) / Years / Specialization		BS / 2015 / Civil Engineering	
Active registration number / state / expiration date		PE.0046542 / LA / Exp. 09/30/2026	
Year registered	2022	Discipline	Civil Engineer
Contract role(s) / brief description of responsibilities		Project Manager	
Experience dates	Experience and qualifications relevant to the proposed contract		
	Mr. Sarratt has 10 years of experience on transportation projects with a focus on stormwater hydrology and hydraulics and roadway engineering. His expertise includes hydraulic analysis and hydrologic feasibility studies, open and closed conveyance system design, culvert and cross-drain design, post-construction stormwater and water quality best management practices (BMP) design, and 2D bridge hydraulic bridge analysis. He has been responsible for leading hydrology and hydraulics design for schematics, design build, and complete plans, specifications, and estimate (PS&E) plan sets. He is proficient in Microstation, GEOPAK Subsurface utilities, Inroads, OpenRoads, StormCAD, SMS, and SRH2D.		
06/17 – 03/22	Ogeechee River Bridge Replacement (Effingham County, GA). <i>Drainage Lead</i> for the roadway realignment and bridge replacement for 2 bridges at the SR 119 and Ogeechee River bridge crossing (1 main channel and 1 of 2 overflow bridges) in Effingham County, GA. The project involved the creation of a 2D hydraulic model utilizing SMS and SRH-2D in order to design the proposed multiple bridge configuration along SR 119 in order to determine proposed bridge lengths and elevations in order to meet both GDOT bridge design standards and GDOT hydraulic design studies requirements for the proposed configuration.		
02/22 – 04/25	I-10 Calcasieu River Bridge P3 (Calcasieu Parish, LA). Drainage Lead Segment 1 of the I-10 Calcasieu Bridge Replacement P3 project to replace the existing I-10 bridge over the Calcasie River with a new bridge north of I-10. The project also includes the construction of several new bridge structures within the project limits, both inside and outside widening of I-10, improvements and modifications to existing interchanges, and improvements to other associated roadways within the project limits. Project involves the design of both open and closed conveyance systems for Segment 1 between Prater Rd and PPG drive, culvert and cross-drain analysis and design, and outfall analysis utilizing LADOTD HYDR design software.		
12/15 – 04/25	GDOT MS4 Permit Compliance (State-wide, GA). <i>Drainage Lead</i> for an ongoing contract to provide program assistance and help GDOT provide public education and outreach on stormwater impacts, public involvement/participation, illicit discharge detection and elimination, construction site stormwater runoff control, post-construction stormwater management, pollution prevention/good housekeeping for municipal-type operations, and water quality monitoring and total maximum daily load. Responsibilities include the research and development of GDOTs post-construction stormwater BMP details and example plan sheets for state-wide, creation and development of MS4 related standards and specifications, assisting with the development of GDOT MS4 policy, and MS4 related GDOT Drainage Report revisions.		
11/16 – 04/18	FY-17 Bridge Bundles (Polk County, GA). <i>Drainage Lead</i> for replacement at Mountain Loop Road over Little Cedar Creek in Polk County, GA as part of the GDOT FY-17 Bridge bundles project. The project involved the creation of a 2D hydraulic model utilizing SM and SRH-2D in order to design the proposed bridge crossing due to the sever skew of the creek under the existing bridge. Responsibilities		

	included the design of the proposed bridge lengths and elevations in order to to meet GDOT Bridge design standards and GDOT hydraulic design study requirements for the proposed configuration, H&H report creation, and a bridge deck drainage analysis.
10/16 – 10/18	SR 166 @ SR 92/SR 154 Roundabout (Douglas County, GA). <i>Drainage Engineer</i> and <i>MS4 Design Lead</i> for an Intersection and safety improvement project located at the intersection of SR 166/Duncan Memorial Highway and SR 70/SR 92/SR 154. Project consists of construction of a roundabout within the existing undeveloped triangle intersection. Responsibilities included both the open and closed drainage system design, water quality and post-construction stormwater design, culvert and cross drain design with dynamic tailwater conditions due to Chattahoochee River floodplain conditions, performed a FEMA no-rise analysis , and a no net fill design for local permitting and floodplain ordinance requirements.
02/23 – 05/23	Shelby Avenue Off-System Bridge Replacement (Hunt County, TX). <i>Drainage Lead</i> for the Shelby Avenue Bridge Replacement Project located in Hunt County Texas to replace the existing bridge over Faber Creek as part of the Paris District Off-System bridge PS&E replacement project. Responsibilities included leading the H&H analysis for the bridge crossing for both the existing and proposed conditions, determined and verified peak flows at the existing crossing, performed an impact assessment due to changes in water surface elevations, developed HEC-HMS and HEC- RAS models , and prepared a comprehensive drainage report to document findings.
06/21 – 12/22	TDOT I-65 Widening (Sumner & Robertson Counties, TN). <i>Drainage Engineer</i> for Segment 2 of the I-65 widening project located in Sumner and Robertson Counties to widen I-65 to three lanes from Highway 31w to south of New Hall Rd that included both inside and outside widening. Project involved the design of numerous closed drainage systems in OpenRoads due to proposed inside widening, determining pre-developed and post-developed peak flows for project outfalls, open conveyance system design, and the design and analysis of multiple culvert and cross-drains crossings throughout the project.
03/22 – 04/24	FM 1209 at FM 969 Intersection Improvements (Bastrop County, TX). <i>Project Manager</i> and <i>Drainage Lead</i> for the FM 1209 at FM 969 Intersection Improvements Project located in Bastrop TX to reconstruct the existing Y-intersection into a T-intersection, provide full depth reconstruction for both roadways within the project limits, construction of a right-hand turn lane along FM 1209 EB with additional widening for a future left-hand turn lane, and the construction of a flashing beacon with the anticipation of a future signalized intersection and through lane. Project involved the multiple planning considerations due to future developments adjacent to and within close proximity to the project site including SpaceX and The Boring Company. The drainage design primarily included both cross-drain and open channel design.
07/22 – 04/25	Grant Rd Widening – Segment 4 (Harris County, TX). <i>Project Manager</i> for the study phase of the Grant Road Widening Segment 4 project to widen Grant Rd from a 2 lane rural roadway to a 4 lane urban roadway with a raised median between Cypress Rose Hill Rd and Telge Rd. A sidewalk will also be constructed on the south side of Grant Rd within the project limits. Project involved the coordination of a comprehensive agreement between Harris County and two adjacent shareholders for the design and construction of a shared outfall from Grant Rd and the expansion of the L113 Stormwater Channel to Little Cypress Creek, detention mitigation between the Grant Rd 4 project and the two stakeholders, and the coordination and development of an individual permit for the L113 outfall channel widening. As project manager, Colin kept close coordination between multiple subconsultants throughout the study phase, a traffic warrant signal study, development of a comprehensive study phase report, and coordination for proposed ROW maps.
09/21 – 04/25	Calton Road Overpass (Webb County, TX). <i>Project Manager</i> and <i>Drainage Lead</i> for the Calton Road Overpass project located in the City of Laredo Texas to construct a railroad overpass over Santa Maria Avenue, the Union Pacific Railroad mainline, and turnaround tracks. The project also includes widening of Calton Rd to maintain access to Santa Maria Avenue due to the proposed overpass. As project manager, Colin kept close coordination between multiple design disciplines and stakeholders including the City of Laredo, TxDOT, and UPRR. The project also included the design of a closed drainage system with additional storage capacity in order to mitigate impacts to the existing drainage system downstream of the project site and still meet hydraulic grade line requirements.

Firm employed by. ARCADIS			Meets MPR No. 1 & 2	
Name	David Fulks, PE		Years of relevant experience with this employer	18
Title	Principal Hydraulics Engineer		Years of relevant experience with other employer(s)	12
Degree(s) / Years / Specialization		MS / 2019 / Engineering Management, The George Washington University BS / 1997 / Civil Engineering, Portland State University		
Active registration number / state / expiration date		PE.030151 / LA / Exp. 09/2026		
Year registered	2002	Discipline	Civil Engineering	
Contract role(s) / brief description of responsibilities		Principal-in-Charge		
Experience dates	Experience and qualifications relevant to the proposed contract			
	Mr. Fulks has more than 30 years of experience in the analysis and design of site hydrology and hydraulics, and geometric design of levees, floodwalls, and roadways. Responsibilities include preparing engineering designs, reports, plans, and specifications; preparing and managing project schedules and cost estimates; and providing engineering support during construction. Led engineering teams in the development of documents for multiple USACE Districts including Galveston, New Orleans, Memphis, and Omaha using MicroStation/InRoads, SpecsIntact, DrChecks, and MCACES (MII). Mr. Fulks meets Minimum Personnel Requirement Number 1 & 2.			
06/12 – 03/13	Post-Flood Emergency Dam Spillway Assessments, Repair and Design, ND, SD – USACE Omaha. <i>Civil Engineer:</i> Prepared plans and specifications, and managed design team progress and quality. Drawings (95% BCOE and 100%) were developed in MicroStation and InRoads. Specifications were developed in SpecsIntact starting with UFGS specifications tailored to project requirements with Contract Line Item Bidding Schedule and Measurement and Payment section developed per I standards. Collaborated with estimator in preparing construction cost estimates as current working estimate (in MCACES Second Generation (MII)). Designs were prepared in accordance with the applicable USACE publications (i.e. Ems, Ers, ETLs). Responsibilities included pre-inspection planning and preparation; coordination of inspection staff and confined entry video inspection subcontractors during field deployments; post-inspection report coordination and client debriefing presentations; and, coordination of rehabilitation design staff and construction document preparation. Scope: Assessed and prepared rehabilitation design and specifications for damage repairs at five flood control structures along the Missouri River, including deficiency identification and structural integrity of downstream paving and stilling basin of each spillway through.			
10/11 – 04/12	Gulf Intracoastal Waterway (GIWW) West Closure Complex Design, New Orleans, LA – USACE New Orleans. <i>Civil Engineer:</i> Led drawing and specifications development using MicroStation and SpecsIntact for Pump Station Keel Cooler and Fuel Storage Tank modifications during performance of engineering during construction services. Specifications were developed in SpecsIntact starting with MVN guide specifications (12 suffix), supplemented with UFGS specifications tailored to project requirements. Scope: Alternatives and innovation studies for 225 ft long sector gate and pump station. Design included preparing EARs, DDRs, and P&S and providing EDC.			
04/08 – 02/09	St. Bernard Parish Comprehensive Coastal Storm Risk Management Protection Design, USACE New Orleans, St. Bernard Parish, LA. <i>Civil Engineer:</i> Developed conceptual drawings of engineering alternatives using MicroStation and InRoads for the reconstruction of levees from Empire to Buras (NOV-16); floodwalls at Point Michel, Duvic, and Venice (NOV-15); and fronting protection at Grand Liard and Duvic pumping stations. Addressed design milestone review comments in DrChecks.			

	Collaborated with subconsultants in the preparation of construction cost estimates developed in MCACES Second Generation (MII). Designs were prepared in accordance with the MVN HSDRRS Guidelines and applicable USACE publications (i.e. EMs, ERs, ETLs). Scope: Conceptual design and alternatives analysis to upgrade a portion of the New Orleans to Venice levee system to HSDRRS requirements. Included hurricane and river levees and floodwalls.
02/09 – 4/10	US 90 – WBV 73 Western Tie-In Crossing Lake Cataouatche Area, United States Army Corps of Engineers (USACE) – New Orleans District, Jefferson Parish & St. Charles Parish, LA. Deputy Project Manager and Lead Roadway / Drainage Engineer. Development of preliminary and final design P&S for a 2,540-foot PPC girder / column bent bridge, highway approaches, and frontage roadways.
04/13 – 07/14	US 11 Environmental Assessment, Bridge Replacement, and Roadway Improvements, LADOTD, St. Tammany Parish, LA. Lead Roadway Engineer. Geometry and roadway design, line and grade study development, and cost estimates for the replacement of an historic railroad overpass bridge and upgrading an existing two-lane rural highway to a four-lane divided highway with access control. Early coordination with Norfolk Southern Railroad.
08/11 – 09/13	Chef Menteur Bridge and Approaches Replacement EA and Line and Grade Study, LADOTD, Orleans Parish, LA. Lead Roadway/Bridge Geometrics and Cost Engineer. Responsible for preparing the proposed geometric configurations of a bridge replacement at Chef Menteur Pass . Investigated four alignments as well as both low-level moveable and high-level fixed span bridge configurations. Performed detailed geometric layouts of the mainline highway, bridge, and adjacent roadways to mitigate impacts to environmentally sensitive resources and local residential, commercial, and historical interests.
01/14 – Ongoing	Pete's Highway Interchange Alternative and Environmental Assessment, LADOTD, Livingston Parish, LA. Lead Roadway / Bridge Geometrics and Cost Engineer. High-priority project completing an environmental assessment and traffic engineering services related to improving congestion and operations along Range Avenue in the vicinity of the I-12 interchange. Design alternatives included two split diamond interchange options with roundabout, partial clover leaves, and collector-distributor road components at both Range Avenue and the next existing, eastern overpass at Pete's Highway (LA 16) and a diverging diamond interchange alternative at Range Avenue. Developed roadway geometry, line and grade , construction sequencing strategies, and construction cost estimate .

Firm employed by: 			Meets MPR No 5
Name	Lina Khoury, PE, CPESC, CFM	Years of relevant experience with this employer	3
Title	Senior Hydraulics Engineer	Years of relevant experience with other employer(s)	16
Degree(s) / Years / Specialization		MS / 2013 / Environmental Engineering / Tennessee State University BS / 2008 / Civil Engineering / Jordan University of Science and Technology	
Active registration number / state / expiration date		Professional Engineer 117663 / TN / 06/30/2025 (Also licensed in NC, SC, AR, MS, GA, IN, and TX); Certified Professional in Erosion and Sediment Control No. 9267 Certified Floodplain Manager/ US-19-11213 / Exp. 1/31/2026	
Year registered	2015	Discipline	Civil Engineer
Contract role(s) / brief description of responsibilities		FEMA Regulations, SRH-2D Modeling, Guidelines and Manuals	
Experience dates	Experience and qualifications relevant to the proposed contract		
	Ms. Khoury brings over 19 years of experience in hydrology and hydraulics, roadway drainage design, erosion prevention and sediment control design, and state and federal water quality permitting. Lina has a diverse and well-rounded project background since she worked in multiple disciplines related to roadway projects. She is licensed in multiple states and is <u>familiar with different state and DOT manuals and guidelines</u>. She has been a trusted client resource for supporting as an owner representative and provide training for the TDOT drainage staff. While reviewing <u>I-10 drainage design</u>, Lina gained <u>familiarity with LADOT manuals and drainage tools</u>. She is experienced with multiple design software including, HEC-RAS, HEC-HMS, HY-8, SMS-SRH-2D, FHWA Hydraulic Toolbox, MicroStation, Geopak Drainage, OpenRoads, StormCAD and ArcGIS.		
02/22 – 04/25	I-10 Calcasieu River Bridge P3 (Calcasieu Parish, LA). <i>Drainage Engineer</i> Segment 1 of the I-10 Calcasieu Bridge Replacement P3 project to replace the existing I-10 bridge over the Calcasie River with a new bridge north of I-10. The project also includes the construction of several new bridge structures within the project limits, both inside and outside widening of I-10, improvements and modifications to existing interchanges, and improvements to other associated roadways within the project limits. Project involves the design of both open and closed conveyance systems for Segment 1 between Prater Rd and PPG drive, culvert and cross-drain analysis and design, and outfall analysis utilizing LADOTD HYDR design software.		
06/24 – Ongoing	SR107/SR81 Progressive Design Build Bridge Replacement (Greene and Washington Counties, TN). <i>Hydraulics, Drainage and Permits Engineer Lead</i> on the emergency progressive design build as an owner representative to review H&H modeling, scour analysis, deck drain design, TVA requirements, roadway stormwater design, water quality permits, environmental compliance plan, and EPSC plans. These projects are considered emergency projects since hurricane Helene washed both bridges and their approaches out. The review included continuous collaboration with the TDOT team and the Design-Build.		
03/21 – Ongoing	Bridge Bundle Design Build, GDOT, Multiple Counties, GA. <i>Lead Hydraulics Engineer</i> on the bridge bundle design build to provide owner representation for reviewing and commenting on bridge hydraulics submitted by the design build team. The bundle included six bridge hydraulics studies. One of the bundles is the replacement of the existing bridge (Structure ID 037-5013-0) on County Road (CR) 134/Rice Road over Falling Creek 6.5 miles north of Morgan in Calhoun County, Georgia. Existing right-of-way (ROW) varies between approximately 100-200 feet. No ROW would be required as part of the proposed project. The length of the proposed project would be approximately 1,000 feet.		

06/24 – Ongoing	I-55 From South of Mississippi River to North of Mississippi River -CMCG (Shelby County, TN). <i>Hydrology and Hydraulics Lead Engineer- Owner Representative</i> for the replacement of the I-55 bridge over the Mississippi River in Shelby County. The scope of work includes preparing two-dimensional H&H analysis in SMS-SRH2D and HEC-RAS2D and provide preliminary scour analysis to FHWA to assist in developing scour analysis through new and updated methodologies. This bridge is in FEMA AE zone, Coast Guard jurisdiction, and Army Corps jurisdiction . Arcadis is also in charge of obtaining a no-rise solution and assist TDOT with Coast Guard application. The project is a reconstruction and widening of I-55 for 1.65. The bridge length is 1.01 miles
02/24 – Ongoing	SR-30 (Old Washington HWY) from Near SR-29 (US-27) to West of New Union Rd./ White Oak Rd., Rhea County, TN. <i>Project manager and lead H&H QC</i> responsible for reviewing and providing design guidance for the hydraulic modeling of the bridge over Richland Creek. The project is in FEMA zone AE and TVA reservoir. H&H study was completed for the no-structure, existing and proposed bridges. The bridge span arrangement was set to provide vertical and horizontal clearances for TVA in addition to an arrangement to obtain a no-rise solution.
06/2024- Ongoing	SR67 Bridge over the Doe River Emergency Repair Carter County,TN. <i>Hydraulics and Scour Engineering Lead</i> responsible for owner representation for reviewing H&H study and scour analysis for the bridge . Flooding from Hurricane Helene severely damaged the SR-67 concrete arch bridge (Bridge Number 10SR0670029) over the Doe River. The flood caused undermining of the footings, settlement, cracking of the structure along with widespread channel bank erosion and flood debris. This Project includes the repair of the existing bridge by stabilization of the substructure, strengthening of the undermined foundations, restoration of the bridge to its original elevation, and bridge repairs.
04/21 –09/24	Buckner Road Interchange Design-Build Owner’s Representative Services, Williamson County, TN. <i>Hydraulics and Drainage Engineer Lead</i> on the Buckner Road Interchange to provide owners’ representative services for the largest transportation infrastructure improvement project in the history of the City. The project includes an extension of Buckner Road from its current terminus at Buckner Lane to U.S. 431/Lewisburg Pike. The new roadway will provide a direct connection between two major US highways, US 31 and US 431, and will include a new interchange at I-65.
05/22 - Ongoing	Blue Oval G2 Segments, SR-194, New Route from Northern Interchange to SR-1 & New Route connecting I-40 to SR-59, TDOT, Fayette, Haywood & Tipton Counties, TN. <i>Lead Stormwater Engineer</i> responsible for culvert design, ditch design, erosion prevention and sediment control design, permit sketches, coordination between drainage, roadway and structures, and assisting with water quality permit requirements on plans for the Blue Oval G2 Roadway Improvements. G2 South is approximately 3.3 miles and consists of extending SR-194 from the existing termini at SR-59 to the proposed SR-194/I-40 interchange in Fayette County. G2 South includes three bridges and the design of multiple box culverts. G2 North is approximately 2.1 miles and consists of extending SR-194 from the proposed SR-194/Blue Oval Connector (Proposed SR-468) Interchange in Haywood County to existing SR-1(US-70) in Tipton County. G2 North contains three bridges, including a new structure over an active rail line. All designs and plan development are being done with Bentley OpenRoads Designer (ORD) design software. Arcadis is providing roadway design services and assisting with public involvement, while working in conjunction with other team members providing survey, geotech, material testing, hydraulic design, bridge design, and traffic engineering services.

Firm employed by. 			Meets MPR No. 3 & 4	
Name	Amanda Check, PE		Years of relevant experience with this employer	10.5
Title	Senior Transportation Engineer		Years of relevant experience with other employer(s)	6
Degree(s) / Years / Specialization		BS / 2008 / Civil Engineering		
Active registration number / state / expiration date		PE 45736 / LA / Exp. 09/2025; PE 37554 / GA / Exp. 12/2025; PE 76344 / FL / Exp. 02/2027; PE 044869 / NC / Exp. 12/2025; PE 121879 / TN / Exp. 09/2026; PE 35900 / SC / Exp. 06/2026; PE 136453 / TX / Exp. 09/2025; PE 32002 / MS / Exp. 12/2025; PE 0402056784 / VA / Exp. 09/2026; PE 50821 / AL / Exp. 12/2025 GA Level II Certified Design Professional ES&PC / Exp. 03/2026		
Year registered	2012	Discipline	Civil Engineering	
Contract role(s) / brief description of responsibilities		SRH-2D Modeling, FEMA Regulations, & Training		
Experience dates		Experience and qualifications relevant to the proposed contract		
		Ms. Check has experience in drainage and hydraulic design, Municipal Separate Storm Sewer Systems (MS4), erosion control, roadway design, and geographic information systems (GIS). She has <u>completed hydrologic and hydraulic modeling and studies on culverts, bottomless culverts, and bridges, including adhering to FEMA requirements on FEMA studied waterways.</u> She has designed horizontal and vertical alignments, roadway drainage, MS4, and erosion control on projects ranging from rural roadways to interstates. Her knowledge and experience with GIS provide a valuable supplement to her design capabilities. Ms. Check has knowledge in <u>multiple software programs including MicroStation, StormCAD, InRoads, OpenRoads, HEC-RAS, HEC-2, SRH-2D, HY-8, Hydraflow, FlowMaster, PondPack, SWMM, WinTR-55, WMS, and ArcGIS.</u> She has completed the <u>NHI SRH-2D training course (135095 Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments)</u> and <u>1D/2D Modeling with HEC-RAS training course.</u> Ms. Check is a member of the American Society of Highway Engineers and the American Council of Engineering Companies.		
07/18 – 01/21		I-40 Bridge Replacement over the Buffalo River Tennessee Department of Transportation (TDOT), Humphreys County, TN. Hydraulic Engineer. The project replaced the existing eastbound and westbound bridges of I-40 over the Buffalo River with a new bridge constructed on the same horizontal alignment. Each existing bridge was 1,765 feet long, comprised of 42 spans and the proposed bridge is 1,775 feet long, comprised of 11 spans. Federal Emergency Management Agency (FEMA) has not established a regulatory floodplain or floodway for the project site, designated on the FIRM as Zone A. Responsible for the hydrologic calculations, Hydrologic Engineering Center - River Analysis System (HEC-RAS) hydraulic modeling, scour calculations, abutment riprap calculations, deck drainage calculations, and report preparation.		
12/15 – 03/23		FY 2016 - FY 2022 Bridge Design-Build Program Georgia Department of Transportation (GDOT), Various Counties, GA. Hydraulic Engineer. Program included costing plans for over fifty low impact, low volume, off system bridge replacements across Georgia where existing bridges were structurally deficient. Provided senior Quality Assurance and Quality Control (QA/QC) review of the hydrologic calculations, HEC-RAS hydraulic modeling, scour calculations, abutment riprap calculations, deck drainage calculations, and report preparation.		
01/21 – 03/23		CR-122/Humpback Road over Little Satilla River GDOT, Brantley County, GA. Hydraulic Engineer. The project replaced the existing 132 feet long 11 span bridge with a 180 feet long 4 span proposed bridge constructed on the same horizontal alignment. FEMA has not established a regulatory floodplain or floodway for the project site, designated on the FIRM as		

	Zone A. The floodplain is very wide (approximately 8,000 feet) and the site and roadway are flooded during typical/non-extreme rain events throughout the year. Responsible for the <i>hydrologic calculations, HEC-RAS hydraulic modeling, scour calculations, abutment riprap calculations, deck drainage calculations, and report preparation.</i>
01/18 – 02/21	SR-38 over Little McMillan Creek Bridge Replacement GDOT, Wayne County, GA. <i>Hydraulic Engineer.</i> The project replaced the existing SR-38 twin bridges over Little McMillan Creek with new bridges constructed on the same horizontal alignment. The existing bridges are 200 and 208 feet long (eight spans each bridge) and the proposed bridges are 255 and 265 feet long (six spans each bridge). The hydraulic model also includes a downstream existing CSX railroad bridge (136 feet long, 14 spans). The project site is <i>located in FEMA Zone AE without a designated floodway, and the FEMA effective model</i> was in Water Surface Profiles (WSPRO). Directly upstream/at the westbound bridge, Millikin Bay and Coleman Branch converge to create Little McMillan Creek. A minimal rise resulted but was within FEMA and GDOT allowable rise of one foot. Responsible for the <i>hydrologic calculations, FEMA and GDOT hydraulic modeling in HEC-RAS, scour calculations, abutment riprap calculations, deck drainage calculations, report preparation, and community coordination.</i>
03/20 – 03/21	I-285 Westbound Ramp Extension GDOT, DeKalb County, GA. <i>Hydraulic Engineer.</i> The project extended an I-285 westbound off-ramp, with the widening occurring over existing box culverts at North Fork Nancy Creek and North Fork Nancy Creek Unnamed Tributary 2. The project site is located in <i>FEMA Zone AE and has a designated floodway.</i> The extensions of the two box culverts resulted in a minimal rise in Base Flood Elevations (BFEs). Responsible for the <i>hydraulic analysis and associated Conditional Letter of Map Revision (CLOMR) application package, FEMA coordination,</i> and community coordination. After the initial <i>CLOMR submittal to FEMA the HEC-RAS modeling</i> and extension design was revised to obtain a no-rise by lining one of the culvert barrels.
02/21 – Ongoing	I-285 at I-20 East Interchange Reconstruction GDOT, DeKalb County, GA. <i>Hydraulic/Drainage Engineer.</i> The Design-Build project reconfigured the I-285/I-20 eastern interchange, widened and reconstructed approximately 6 miles of I-20, and reconstructed and improved approximately 2 miles of side roads. Responsible for the <i>drainage and MS4 design</i> and respective reports preparation, in addition to the erosion and sedimentation control design, calculations, and plans. One of the project's bridge replacements was a hydraulic crossing (I-20 over Snapfinger Creek) and is designated as <i>FEMA Zone AE with a designated floodway.</i> Responsible for the <i>hydrologic calculations, HEC-RAS hydraulic modeling, scour calculations, abutment riprap calculations, deck drainage calculations, and report preparation.</i> The bridge replacement resulted in no increase in BFEs, however, the floodway width was revised at one published cross section. Responsible for the associated <i>CLOMR and LOMR application packages, FEMA coordination,</i> and community coordination with DeKalb County and the City of Stonecrest.
07/23 – Ongoing	I-285 at I-20 West Interchange Reconstruction GDOT, Cobb and Fulton Counties, GA. <i>Hydraulic Engineer.</i> The Design-Build project reconfigured the I-285/I-20 western interchange, widened and reconstructed approximately 6 miles of I-20, and reconstructed and improved approximately 2 miles of I-285. One of the project's bridge widenings was a hydraulic crossing (I-20 over Chattahoochee River) and is designated as <i>FEMA Zone AE</i> with a designated floodway. Initial <i>modeling of bridge</i> widening resulted in a minimal rise in BFEs. However, with the excavation/regrading of one overbank under the bridge a no-rise was achieved. Responsible for review of the <i>hydraulic analysis and associated No-Rise Certification</i> and community coordination with Cobb and Fulton Counties and the City of South Fulton.

Firm employed by. 

Name	Justin Corbitt, PE	Years of relevant experience with this employer	2
Title	Hydraulics Engineer	Years of relevant experience with other employer(s)	6
Degree(s) / Years / Specialization	BS / 2017 / Civil Engineering / Tennessee State University MS / 2020 / Civil Engineering / University of Tennessee Knoxville		
Active registration number / state / expiration date	PE. 0049018 / LA / Exp. 09/2026; PE. 125113 / TN / Exp. 04/2026 (Also licensed as a PE in AL, AR, GA, MS) TN EPSC Level 2 Design Certified Professional Cert. # 150190-D2		
Year registered	2024	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities	Training, SRH-2D Modeling, HECRAS 1D & 2D		
Experience dates	Experience and qualifications relevant to the proposed contract		
	Mr. Corbitt has over 8 years of experience in hydrology and hydraulics, roadway drainage design, and erosion prevention and sediment control design. Justin has multi state licensure and provides design & training services to numerous DOT clients throughout the southeast for linear transportation projects. He is experienced with multiple <u>design softwares including, HEC-RAS 1D, HEC-HMS, HY-8, SMS / SRH-2D, Hydraulic Toolbox, MicroStation, Geopak Drainage, OpenRoads Designer, StormCAD and ArcGIS Pro.</u> He also has a TDEC Level 2 EPSC Certification and SMS SRH-2D Training (Aquaveo & FHWA).		
08/24 – Ongoing	I-55 From South of Mississippi River to North of Mississippi River – CMCG, Shelby County, TN. <i>Hydraulic Design Lead</i> - Owner Representative for the replacement of the I-55 bridge over the Mississippi River in Shelby County. Justin is leading the preparation two-dimensional H&H analysis in SMS SRH2D and HEC-RAS2D and provides preliminary scour analysis to FHWA to assist in developing scour analysis through new and updated methodologies. This bridge is in FEMA AE zone, Coast Guard jurisdiction, and Army Corps jurisdiction. Arcadis is also in charge of obtaining a no-rise solution and assist TDOT with Coast Guard application. The project is a reconstruction and widening of I-55 for 1.65. The bridge length is 1.01 miles and the model includes approximately 6.5 miles of channel modeled, with the model domain covering 10,000 acres for the SMS SRH-2D model, and the 1% AEP flood event exceeding 1.96 million CFS.		
07/24 - Ongoing	TDOT Region 2 ORD Drainage Design Training, Hamilton County, TN. <i>Drainage Design Lead</i> – Responsible for working with TDOT Region 2 staff and train them on new design procedures and model parameters in ORD. Providing design guidance and support on project in dense urban area that involves widening of the roadway, and reconstruction of many existing drainage systems to the new roadway curb and gutter sections. Providing training, design recommendations, design review, and design services & guidance for detention pond design within the project limits to limit the increase in surface water discharges from the pre and post conditions. Also assisting with plans production in various phases of design and guidance on generating quantities from the model utilizing the tools available within the software. Responsible for troubleshooting technical issues with the software and recommending workflows to improve modeling efficiency.		

03/24 - Ongoing	SR-30 (Old Washington HWY) from Near SR-29 (US-27) to West of New Union Rd./ White Oak Rd., Rhea County, TN. <i>Hydraulic Design Lead</i> - Responsible for creating hydrologic & hydraulic design models for proposed roadway realignment and replacing bridge over Little Richland Creek. The project is in FEMA zone AE and TVA reservoir. H&H study was completed for the no-structure, existing and proposed bridges. The bridge span arrangement was set to provide vertical and horizontal clearances for TVA in addition to an arrangement to obtain a no-rise solution. Also worked with TVA and roadway design consultant to mitigate net roadway fill within the TVA reservoir and identified areas to create an offset basin plan.
09/21 – 03/23	Old Lebanon Dirt Road, Wilson County, TN. Hydraulic Design & Drainage Lead. This project was a roadway widening and alignment project with complex flooding issues throughout the corridor. The client asked to develop multiple alternatives to alleviate flooding and overtop the mainline roadway. Developed a Surface-water Modeling System (SMS) Sediment and River Hydraulics - Two Dimensional (SMS SRH-2D) to show the client different design options that would eliminate flooding and overtopping the roadway as well as reduce flooding to several residential properties. The preferred design included approximately 1300 feet of new channel design with seven total structures, all designed in SMS SRH-2D. The new channel rerouted floodwaters into a ZONE AE, which it had previously reached by way of residential property flooding. With the SRH-2D model we were able to demonstrate a no-rise in the design and create a 2D informed 1D Hydrologic Engineering Center - River Analysis System (HEC-RAS) model for regulatory compliance.
09/21 – 03/23	TDOT ORD Design Training Manuals and Drainage Manual, Statewide, TN. H&H Technical SME – Part of the technical services team responsible for creating ORD training manuals and guidance for statewide use by TDOT and their consultants. Created numerous trainings and workflows for design processes in ORD for both roadway design elements and drainage design elements, including updated training guidance for creating HEC-RAS components in ORD that could be exported and used as a base 1D georeferenced model in HEC-RAS. Helped develop updated survey guidelines and checklists for use by project surveyors to make sure the correct information was being captured and represented for streamlined H&H models. Also worked with TDOT technical staff to review and update portions of the TDOT drainage manual pertaining to design of hydrology, culverts, stormwater drainage, stormwater storage, roadside ditches, and plans production guidance to include applicable updated federal guidance as well as inclusion of new approaches to modeling with updated design software.
07/20 – 09/21	I-40 & Donelson Pike Interchange Reconstruction, Davidson County TN. Hydraulic Design Engineer – This project consisted of a completed redesign and reconstruction of the I-40 and Donelson Pike Interchange in Nashville TN, which is a key interchange for the Nashville International Airport. Due to the new design of the intersection, it was determined that the project would need a conditional letter of map revision (CLOMR) due to a backwater increase in the FEMA floodway at the project location. I took the proposed model design and began preparing the CLOMR package starting with the required hydraulic model scenarios (per FEMA; an effective, duplicate effective, corrected effective, existing, and proposed model would be required). After completing the necessary hydraulic modeling scenarios for the CLOMR package, I also filled out all of the necessary paperwork (MS-1, MS-2, finance charge, etc.) and put the paperwork together for review by FEMA, TDOT leadership, TDOT finance, and Metro Nashville. I also completed all of the updated floodplain mapping using GIS software, which will be developed for use the flood insurance rate maps (FIRM) and flood insurance studies (FIS).

Firm employed by. 

Name	Cailyn Youmans, PE	Years of relevant experience with this employer	4
Title	Staff Transportation Engineer	Years of relevant experience with other employer(s)	5
Degree(s) / Years / Specialization	BS / 2014 / Civil Engineering		
Active registration number / state / expiration date	PE # 48536 / LA / Exp 06/26, # 51439 / GA / Exp 12/25, #150758 / TX / Exp 09/25		
Year registered	2023	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities	FEMA Regulations, HECRAS 1D & 2D		

Experience dates	Experience and qualifications relevant to the proposed contract
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Ms. Youmans is a civil engineer with over nine years of experience specializing in water resources and hydraulics engineering. Her extensive background includes hydrologic and hydraulic modeling, open and closed roadway and site development drainage design and construction, modeling of FEMA and non-FEMA regulated waterways, and stormwater water quality. She has continually demonstrated competent design for a multitude of projects for private and state clients.

09/23 – 06/24

Caddy Drive & Sauvage Ave over Ames Canal No.1, Jefferson Parish, LA. *H&H Design Engineer.* Two bridge replacements over a canal in Zone AE prepared for DOTD. Project classified as an Off-System Bridge Replacement. The replacement included widening of the bridges as well as widening of creek adjacent to the bridge to meet requirements. Waivers were necessary due to geometric constraints. Responsible for drainage calculations, bridge modeling, and hydraulic report. ***Calculations done using LADOTD's HYDR2009. Modeling included HEC-RAS. Received files processed using EPA SWMM.***

02/22 – 04/25

I-10 Calcasieu River Bridge P3 (Calcasieu Parish, LA). *Hydraulics Engineer* Segment 1 of the I-10 Calcasieu Bridge Replacement P3 project to replace the existing I-10 bridge over the Calcasie River with a new bridge north of I-10. Project involves the design of ***both open and closed conveyance systems for Segment 1 between Prater Rd and PPG drive, culvert and cross-drain analysis and design, and outfall analysis utilizing LADOTD HYDR design software.***

11/21 – 05/24

Blounts Creek Study, Cumberland County, NC. *H&H Design Engineer.* Study aimed to create various solutions and improvements to Blounts Creek and the secondary system to reduce amount of flood impacted areas. Design elements included open channel, culvert, bridge, closed drainage, and detention. Responsible for primary system hydraulic and hydrologic modeling/design of bridges improvements, channel improvements, detention improvements, and reports of the influences of each proposed improvement. ***Modeling included Hydrologic Engineering Center - River Analysis System (HEC-RAS) and Hydrologic Engineering Center - Hydrologic Modeling System (HEC-HMS).***

09/24 – Ongoing

Russell – Person Blounts Bridge & Stream Restoration, Cumberland County, NC. *H&H Design Engineer.* Two bridge replacements and stream grading/restoration were approved from the various Blounts Creek proposals and funded through multiple federal and state grants. The designing includes grading of 4000 linear feet of Blounts Creek. One of the bridges is a CSX railroad bridge. The project required a ***2D model to analyze the complex storage that occurs throughout the project limits. Modeling includes HEC-RAS, HEC-HMS, and RAS2D.***

10/21 – 04/22	FY22 Bridge Bundle, GDOT, Various Counties, GA. <i>H&H Design Engineer.</i> Six bridge replacement costing plans. Design elements included hydraulic study and subsequent bridge hydraulic reports. Responsible for hydraulic modeling, determining recommended bridge length, chord, span, and placings, scour and deck drainage calculations and writing the report. Modeling included HEC-RAS.
10/23 – Ongoing	SR-20, Cherokee County, GA. <i>H&H Design Engineer.</i> 17-mile-long road improvement. Design elements culvert design, bridge design, and open and closed drainage design. Responsible for the bridge modeling and culvert modeling of the project as well as the H&H report. Bridge located in a FEMA Zone AE with floodway with abnormal stages located where the Etowah River enters Lake Allatoona. Modeling includes HEC-RAS.
01/19 – 08/19	Newport Business Park, Mansfield, Tarrant County, TX. <i>Pond and Hydraulic Engineer.</i> Office development site design along a regulatory floodway Zone AE creek. Design elements included water quality ponds, site design, and flood study with grading. Responsible for the water quality ponds and the flood study with grading which included adding two frontage roads missing in the effective model along with our site grading changes which required a Letter of Map Revision based on Fill (LOMR-F) report with the flood study for Federal Emergency Management Agency (FEMA). Modeling included HEC-RAS for hydraulics and AutoCAD for grading.
02/20 – 09/20	Villas at Long Branch, Rowlett, Dallas County, TX. <i>Hydraulic Engineer.</i> Neighborhood development site design along a regulatory floodway Zone AE creek. Design included residential site design and flood study with a Conditional Letter of Map Revision (CLOMR). Responsible for modeling the proposed site design and updating the adjacent bridge, providing corrected effective, and revised plan along with preparing the report and then as built CLOMR for FEMA. Modeling included HEC-RAS.

Firm employed by.



Name	Antonia Donnelly, PE	Years of relevant experience with this employer	12
Title	Senior Hydraulic Engineer	Years of relevant experience with other employer(s)	15
Degree(s) / Years / Specialization	BS/ Civil Engineering / New Mexico State university / 1995		
Active registration number / state / expiration date	PE. 66100 / FL		
Year registered	2007	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities	FEMA Regulations, HECRAS 1D & 2D		

Experience dates	Experience and qualifications relevant to the proposed contract
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Antonia has a broad range of civil engineering experience and has led the design efforts on several private and public engineering projects in the Southeast US. Antonia's specialty is stormwater system design and permitting for transportation projects. She has extensive, relevant experience in hydraulic analysis, drainage systems design, and stormwater permitting through the Florida St. Johns River and the Suwannee River Water Management Districts. Her responsibilities include analysis, design, and permitting for various paving and drainage projects. Antonia has extensive knowledge in computer applications pertaining to hydraulics, water quality and quantity, and design of stormwater control systems.

07/17 – 04/18

I-20 over Augusta Canal/Savannah River, Georgia Department of Transportation, Richmond County, GA. Senior Hydraulics Engineer: This project involved the replacement of the existing Interstate 20 (I-20) bridges over the Augusta Canal and Savannah River in Richmond County, Georgia. The Federal Emergency Management Agency (FEMA) designated the Augusta Canal as Zone A, and established the regulatory floodplain and floodway (Zone AE) for the Savannah River through the project area. The Augusta Canal is designated a natural, historic and economic resource which attracts many recreational uses. This Savannah River bridge spans two states (Georgia and South Carolina) and the study area covers four counties. The affected Georgia counties (communities) include Richmond and Columbia, while the South Carolina counties (communities) include Aiken and Edgefield. Based on the historic nature of the Augusta Canal, the goal of the improvement project was to cause no adverse impact to the Augusta Canal capacity, towpath, or the floodplain (the low lying swamp area situated between the Canal and Savannah River), while providing the required GDOT clearance and meeting backwater limits. The goal for the hydraulic modeling of the Savannah River was to ensure no increase in the base flood elevations (a no-rise condition). The GDOT and FEMA hydraulic modeling was performed in accordance with the guidance of the GDOT Drainage Manual.

05/22 – Ongoing

Bethlehem Road Interchange I-75 at CR 312 Design-Build, Georgia Department of Transportation, Henry County. H&H lead: Responsible for reviewing HEC-RAS modelling associated with the Bethlehem Bottoms bridge, and Tributaries to Bethlehem Bottoms culvert replacements. The project included realignment of Bethlehem Road to four lanes, constructing new bridges across I-75 and Bethlehem Bottoms, and providing additional access points to and from Bethlehem Road.

08/17 – 07/18	SR 53 over Chattahoochee River/Lake Lanier, Georgia Department of Transportation, GA. This project involved improvements to SR 53 and the replacement of the existing west-bound bridge over Lake Sidney Lanier in Hall County, Georgia. The Federal Emergency Management Agency (FEMA) has designated the Chattahoochee River/ Lake Lanier and its surrounding floodplains as Zone A. Lake Lanier was constructed by the U. S. Army Corps of Engineers (USACE) in the 1950's with in-flows controlled at Buford Dam, which is located approximately 18.5 river miles upstream of the SR 53 crossing. The USACE generated state-storage curve for Buford Dam was used to establish the boundary conditions for the HEC-RAS model for this project. The hydraulic modeling was performed according to the guidance provided in the GDOT Drainage Manual. A detailed hydrologic and hydraulic study was prepared to detail the design methodology used to prove that no adverse impacts would result to Lake Lanier/Chattahoochee River, based on the proposed improvements.
06/17 – 11/17	Buena Vista Road Corridor and Spiderweb, City of Columbus, GA. The project improved the Buena Vista Road corridor and included widening of the existing bridge over Lower Bull Creek. The Federal Emergency Management Agency (FEMA) Lower Bull Creek and its surrounding floodplains were designated Zone AE Special Flood Hazard Area. Antonia was responsible for the hydrologic and hydraulic analysis to demonstrate that the proposed bridge widening at the crossing of Buena Vista Road over Lower Bull Creek would not result in an increase in the BFEs, resulting in a No-Rise condition.
06/18 – 01/19	FY2018 Design-Build Bridge Costing Plans, Georgia Department of Transportation, Statewide, GA. Senior Engineer. Costing plans were prepared for the Design-Build solicitation of the replacement of eight low impact, low volume, off system bridges across Georgia. The existing bridges were structurally deficient. All crossing were designated FEMA Flood Hazard Zone A. Existing and proposed bridges varied from single span to multi-span structures and ranged in length up to approximately two hundred feet long. HEC-RAS modeling was performed in accordance with the GDOT Drainage Manual to ensure the conceptual layouts met clearance and backwater criteria, and technical memorandums drafted to provide the data, approach and design methodology for each hydrologic and hydraulic model.
06/17 – 01/18	FY2017 Design-Build Bridge Costing Plans, Georgia Department of Transportation, Statewide, GA. Senior Engineer. Project included preparation of costing plans and RFP package for replacement of 14 bridges. Antonia was responsible for the hydraulic modeling of 9 existing bridges in Districts 2, 4 and 6. Submittal documentation included technical memorandums summarizing the model results to accompany the design-build request for RFP packages.

Firm employed by. 

Name	Brian Bandy, PE	Years of relevant experience with this employer	19
Title	National Technical Manager	Years of relevant experience with other employer(s)	7
Degree(s) / Years / Specialization	BS / 1995 / Civil Engineering		
Active registration number / state / expiration date	PE. 027014/ GA / Exp. 12/31/2025		
Year registered	2001	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities	HECRAS 1D & 2D		
Experience dates	Experience and qualifications relevant to the proposed contract		
	Mr. Bandy serves as a <u>Lead Hydraulic Engineer and Quality Reviewer for water resources-related projects and programs</u> across the US. He manages Arcadis' national river basin/watershed program and specializes in floodplain management, watershed planning, and stormwater management studies. He has <u>hydrologic and hydraulic modeling experience that includes FEMA floodplain/floodway modeling, urban collection system and modeling, and roadway design projects</u> . Other experience includes watershed assessments; countywide water distribution system modeling and design, countywide sanitary sewer modeling and lift station design, landfill design and permitting, dike rehabilitation design for settling lagoons; surface mining design and permitting; structural design of walls, beams, slabs and steel trusses for stormwater pump stations and wastewater treatment plants; dredging design and inspection.		
10/22 – 5/24	SELA #76 Pump Station #13 Design, USACE New Orleans District, Orleans Parish, LA. Hydraulic Engineer. Performed hydraulic engineering for design of the pump station including Donner Canal entrance channel delivering water to the pump station and exit channel that discharges to the Intracoastal Waterway. Designed pump on/off operating scheme. Incorporated hydraulic design recommendations from physical model test to optimize performance of pump station. Utilized 2D HEC-RAS to perform hydraulic modeling of Donner Canal and Intracoastal Waterway System. Scope: Design of an 1,800-cfs addition to the 4,650-cfs Pump Station 13 and associated work that will be a part of the SELA Project in Orleans Parish. The project is an integral element of the HSDRRS developed to protect the metropolitan New Orleans area from storm-induced flooding.		
06/25 -06/26	Comite River Diversion Project, USACE New Orleans District, Baton Rouge, LA. Hydraulic Engineer. Responsible for CFD modeling and hydraulic design of the Comite diversion entrance channel, RAS modeling of the main Comite Diversion channel and drop structures for support in channel and structure design, sediment transport analysis, and Delft modeling of the Brooks Lake area to Profit Island Chute for scour analysis. Scope: Construction of a 12-mile-long diversion channel from the Comite River to the Mississippi River, a diversion structure at the Comite River, guide levees, a control structure, four drop structures at channel intersections, and an earthen closure.		
02/25 – 08/25	Periodic Levee Inspections for Memphis and Vicksburg Districts, USACE Memphis District, Mississippi River Valley, MS. Hydraulic Engineer. Performed earthen embankment levee and hydraulic structure inspections in accordance with USACE standards. Collected inspection report data using the Corps Levee Inspection System (LIS) which stores field data (points, lines, descriptions, photographs) in a database for easy export and reporting. Scope: Hydraulic structures inspected included culverts, spillways, impact basins, and bridges. Assisted team in reviewing information collected and organizing field data.		
02/18 – 04/19	Stormwater Drainage System Hydrologic and Hydraulic Modeling, City of Portsmouth, Portsmouth, VA. Technical Leader providing oversight and review of hydrologic and hydraulic model development to evaluate the City's stormwater		

	conveyance capacity and support the Portsmouth-Chesapeake Joint Land Use Study (JLUS), which includes the following areas: Norfolk Naval Shipyard including the Scott Center Annex, Portsmouth Naval Hospital, Lincoln Military Housing including New Gosport and Stanley Court, Naval Supply Center – Craney Island, and the United States Coast Guard Base. Developed a PCSWMM 2D model for the tidally influenced study area to inform the JLUS about current and future impacts of rainfall and sea level conditions. The 10-year and 100-year simulated to assess the current stormwater conveyance capacity. Identified areas with insufficient conveyance capacity under current and projected sea-level rise conditions. Provided recommendations for future study to develop solutions to mitigate flooding.
02/04 – 05/06	North Carolina Floodplain Mapping Program, State of North Carolina, Caswell County, NC. Managed and assisted in development of detail and limited detail hydraulic models of rivers and streams in Caswell County. Managed field surveys and formatting for model input of 286 miles of river channels and dozens of hydraulic structures including bridges, culverts, levees and dams, HEC-RAS modeling of 73 miles for detailed study in riverine reaches, HEC-RAS modeling of 213 miles for limited detail study in riverine reaches and re-delineation of 281 miles of riverine reaches. Also managed production of Digital Flood Insurance Rate Maps for 567 miles of riverine reaches in accordance with FEMA standards These studies included use of Light Detection and Ranging (LIDAR) information, aerial imagery, and other geographic information system (GIS) data. Based on survey data developed HEC-RAS models to determine base flood elevations(BFEs) for the 2-, 10-, 50-, 100-, and 500-year floods. In addition, the regulatory floodway was computed. Tabulated results showing base flood elevations and generated hydraulic profiles of the floodplain. Generated floodplain shape files for mapping. Provided support for public meetings and workshops to review updated mapping.
07/08 – 6/09	Brooklyn Creek, Hunnicutt Creek, and West Fork Trail Creek Physical Map Revision (PMR), Athens-Clarke County, GA. <i>Engineer of Record</i> leading detailed study and limited detail study of three previously studied streams and their tributaries per FEMA requirements for a Physical Map Revision. Led development of HEC-HMS and HEC-RAS models of these water bodies. Applied GeoRAS to developed mapping. Associated tasks include preparation of work maps and LOMR package for submittal to FEMA.
02/13 – 11/13	Wateree Swamp Bridge Replacements FEMA Permitting, Wateree River and Swamp, SC. Led submittal of a Certified Letter of Map Revision resulting from replacement of three existing bridges in Wateree swamp with new bridge openings and railroad embankment modifications. Led HEC-RAS model development to determine change in Base Flood Elevations with proposed project in place. Prepared MT-2 application forms, workmaps, annotated FIRMS and submitted to FEMA. Coordinated with FEMA to address comments during the FEMA review.
04/04 – 02/05	North Fork Peachtree Creek Physical Map Revision, Department of Public Utilities, Gwinnett County, GA. Performed field reconnaissance and coordinated survey for heavily urbanized watershed located in the Atlanta metro area. Study included use of LIDAR information, aerial imagery, and other GIS data. Developed HEC-HMS model to calculate discharges for the 2-, 10-, 50-, 100-, and 500-year floods for existing and future conditions. Developed HEC-RAS floodplain model to determine base flood elevations and model floodway in accordance with FEMA standards. Developed HEC-HMS and HEC-RAS models for existing and future land use conditions. Delivered mapping in DFIRM format.

Firm employed by: 

Name	Thomas Lin, PE	Years of relevant experience with this employer	1
Title	Senior Hydraulics Engineer	Years of relevant experience with other employer(s)	17
Degree(s) / Years / Specialization	BS Civil and Environmental Engineering /2006/Georgia Institute of Technology		
Active registration number / state / expiration date	PE. 0348048 / GA / Exp. 12/31/2025		
Year registered	2013	Discipline	Civil Engineer
Contract role(s) / brief description of responsibilities	HECRAS 1D & 2D		
Experience dates	Experience and qualifications relevant to the proposed contract		
	Thomas has 18+ years of experience that specializes in complicated large scale roadway transportation design as a project manager, contract manager, lead reviewer, and technical water resource lead. Project experience includes hydraulic design, leading large design teams, MS4 compliance, BMP Design, and cross discipline coordination for DOT and Municipal clients. Technical work include <u>drainage maps, hydraulic analysis, drainage calculations, profiles, rural and urban drainage design, Hydrological & Hydraulic Reports, Bridge Coordination, HEC-RAS models, 1D/2D, SRHD-2D, FEMA No Rise Reports, MS4 Compliance, MS4 Infeasibility Reports, and Water Quality Treatment</u>. Project Management Experience includes task orders greater than \$3 million, program manager who directed multiple GEC firms on the I-24 Choice Lane Program, and lead reviewer of entire plan sets as well as water resource deliverables.		
02/22 – 06/23	GDOT District 1 Office of Alternative Delivery GEC Services. <i>Water Resource Discipline Lead</i> responsible for technical delivery, quality control and design of stormwater design, MS4 compliance, and H&H design for five SR 316 Interchanges and I-85 widening Phase 3 & 4. Lead multiple design teams to complete projects on concurrent schedules. Lead reviewer and technical development of OpenRoads Drainage Database, MS4 development, and HEC-RAS models.		
01/22 – 12/23	GDOT Region 3 GEC Services. <i>Water Resource Discipline Lead</i> responsible for \$45 Million GEC services contract, technical lead, quality control and review of stormwater, MS4 compliance, and H&H deliverables for GDOT's Roadway Design Group. Responsible for leading the technical delivery of over 90 projects and two I-75 Interchanges. Design was completed in Openroads Drainage Design, HEC-RAS, and SRHD-2D SMS.		
03/19 – 05/23	GDOT Roadway Menu Statewide Contract, GEC Services. <i>Water Resource Discipline Lead</i> responsible for \$2 million GEC services, technical lead, quality control and review of stormwater, MS4 compliance, and H&H deliverables for GDOT's Roadway Design Group.		
04/19 – 07/23	GDOT Bridge Support Services Contract, Statewide, GA. <i>Water Resource Discipline Lead and Contract Manager</i> responsible for \$15 million Statewide on H&H Bridge reviews and design. Completed over 75 H&H reviews and 15 H&H reports in less than a year. Deliverables were a mix of H&H reports that included HEC-RAS and SRHD-2D models. Lead contact for GDOT on the contract.		
08/23 – 09/24	I-24 Express Lanes Inner Loop TDOT, Davidson County, TN. <i>Segment Design Manager Lead and Hydraulic Engineer Lead</i> responsible for the design delivery of the Inner Loop Section of the I-24 Express Lane Project. Part of a \$3 billion funding act to help relieve congestion in Metro Nashville, TN. Inner Loop Section is composed of I-440/I-40/I-24/I-65, over 20 miles of Interstate Express Lane widening. In charge of design of the entire segment and hydraulic lead for pre-let plans.		

11/19 – 05/23	I-285 Eastside Express Lanes, GDOT, Dekalb County, GA. Senior Water Resources Engineer responsible for <i>quality control and review of stormwater, MS4 compliance, BMP, and Hydraulic design for over 45 crossings</i> . This design-build project is part of the Major Mobility Investment Program (MMIP) connecting the I-285 corridor from Top End (Inverted T) to I-20 East Interchange, spanning over 20 miles.
07/21 – 10/23	SR 144 Spur along Ogeechee River, GDOT, Savannah, GA Project Manager , responsible for quality control over erosion/stream migration countermeasure design and report. The project involves the study of revetment options to stabilize and protect the stream bank and roadway. The embankment slope and shoulder have eroded in some places to within a few feet of the edge of pavement, so timeline of construction is a concern in addition to cost and efficacy. <i>Model was completed in Aquaveo SMS Coastal Circulation and Wave Modeling.</i>
12/23 – 04/24	I-285 Westside Express Lanes, GDOT, Fulton & Cobb County, GA. Senior Water Resources Engineer responsible for quality control and review of <i>stormwater, MS4 compliance, BMP, and Hydraulic design for over 30 crossings</i> . This design-build project is part of the Major Mobility Investment Program (MMIP) connecting the I-285 corridor from Top End (Inverted T) to I-20 West Interchange, spanning over 11 miles.
09/19– 04/23	SR 316 at Hi Hope Road & Winder Hwy, Georgia Dept of Transportation (GDOT), Lawrenceville, GA. Lead Water Resources Engineer responsible for managing & training staff on <i>roadway drainage design, drainage construction staging, MS4, and hydraulic culvert modeling. Responsible for quality control and MS4 Permit compliance of deliverables</i> . This project involves adding collector distributors to the outside of SR 316 and grade separation of Hi Hope Road and Winder Hwy. Gwinnett County's future flood models require detailed hydraulic analysis and water balance considerations.

Firm employed by.  **ARCADIS**

Name	Danica Adams	Years of relevant experience with this employer	4
Title	National Funding and Program Management Practice Lead	Years of relevant experience with other employer(s)	15
Degree(s) / Years / Specialization	MS / 2013 / Sustainable Design MS / 2013 / Community and Regional Planning BS / 2006 / Environmental and Sustainable Resources		
Active registration number / state / expiration date	N/A		
Year registered	N/A	Discipline	N/A
Contract role(s) / brief description of responsibilities	FEMA Regulations		
Experience dates	Experience and qualifications relevant to the proposed contract		
	Danica has extensive experience translating resilience and climate adaptation needs into planning objectives and policy initiatives and specializes in securing and maintaining <u>federal compliance for strategic funding</u> going to key capital projects. She worked in the public sector for over a decade, including managing CDBG-DR funds for the Louisiana Office of Community Development, before moving into the private sector for federal funding and compliance support. Danica <u>leads the Arcadis National Funding and Program Management Practice</u> and brings with her a <u>deep understanding of state and local government processes</u> .		
05/22 – Ongoing	Louisiana Watershed Initiative, Louisiana Office of Community Development, Statewide, LA. Program Manager. For Arcadis, Danica provides executive-level program management and oversight for the Louisiana Office of Community Development (LA OCD) in managing the Louisiana Watershed Initiative (LWI). Provides hands-on support to nine watershed regions in aligning their program activities with FEMA Community Rating System activities , analyzing community risk in comparison to project proposals, and supporting potential updates to FEMA Risk Maps . Provides analysis, recommendations, and programmatic support for the integration of state-level Hydrologic and Hydraulic modeling into state and local decision-making. Analyzes FEMA flood risk maps to consider project relevance and implementation efficacy, as well as community-level flood risk. Provides federal compliance services to LA OCD.		
05/17 – 05/19	Louisiana Watershed Initiative, Louisiana Office of Community Development, Statewide, LA. Program Manager. While employed by the Louisiana Office of Community Development, Danica led the planning and early implementation of the Louisiana Watershed Initiative (LWI), a high-profile, state-wide, floodplain management and flood risk reduction framework funded through leveraged assets from five participating state agencies. She collaborated daily with program partners across multiple state and federal agencies, including the Department of Transportation and Development (DOTD) and the Office of the Governor, and with various local, private, and not-for-profit groups . Established and managed working groups and technical advisory committees, staffed by five state agencies, to help solve key problems. Hired and supervised Local Disaster Recovery Managers in eight Planning Districts. Collaborated with federal entities such as the National Weather Service (NWS), the National Oceanic and Atmospheric Administration (NOAA) and the United States Geologic Survey (USGS), local practitioners, and state agencies in Louisiana to understand local data collection and flood stage monitoring efforts and flood mitigation and harm reduction requirements for consistent, high accuracy		

	<i>hydrologic monitoring and measuring, and incorporated these requirements into the LWI Monitoring, Measuring, and Modeling program.</i>
07/21 – Ongoing	FEMA Grant Application and Compliance Support, multiple clients, multiple locations. <i>Application Expert Consultant and Quality Control.</i> Employs unique Fit-For-Funding development process to maximize BRIC, HMGP, and FMA project scores and provide quality control from pre-application conceptual design to application submission. Acts as grant management and compliance <i>Subject Matter Expert for FEMA funding</i> , ensuring audit-ready files and alignment with 2 CFR 200 Uniform Administrative Requirements.
07/21 – 07/23	Florida Department of Emergency Management Grant Management, Tallahassee, FL. <i>RFR Reviewer and Team Manager.</i> Supported <i>Florida Department of Emergency Management (FDEM)</i> in reviewing and verifying sub-applicant requests for reimbursement (RFRs).
07/21 – 07/23	Community Development Block Grant - Mitigation (CDBG-MIT) Grant Management, Florida Dept Economic Opportunity, Tallahassee, FL. <i>Program Manager.</i> Supported Florida Department of Economic Opportunity (DEO) in dispersal and administration of U.S. Department of Housing and Urban Development (HUD) CDBG-MIT funds. Supported development of compliant Standard Operating Procedures and workflows and performs project reviews.
05/19 – 07/21	Puerto Rico Programmatic Planning Lead, Puerto Rico Department of Housing, San Juan, Puerto Rico. <i>Programmatic Lead.</i> Drew on best practices in disaster mitigation and regional planning to design and administer four effective and responsive island-wide <i>planning programs in Puerto Rico's post-Hurricane Maria recovery</i> environment, leveraging more than \$260M in federal Community Development Block Grant - Disaster Recovery (CDBG-DR) funds. Performed team and workflow management, and reviewed portfolio activities for compliance with 2 CFR 200 Office of Management and Budget (OMB) Uniform Administrative Requirements and with the Puerto Rico CDBG-DR Action Plan.

Firm employed by. 

Name	Walter Baummy, PE	Years of relevant experience with this employer	6
Title	O&M Manuals / Resiliency Engineer	Years of relevant experience with other employer(s)	37
Degree(s) / Years / Specialization	MS / 1981 / Civil Engineering; BS / 1976 / Civil Engineering		
Active registration number / state / expiration date	PE. 0020067 / LA / Exp. 1/2026; Other PE License in NY, TX		
Year registered	1982	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities	FEMA Regulations		

Experience dates	Experience and qualifications relevant to the proposed contract
	As the Arcadis national technical manager, Mr. Baummy's responsibilities include senior client interaction, project delivery of engineering products and quality management for planning, design and construction of water resource-related projects. He is responsible for early project interaction to shape conceptual designs, technical approach and establishment of design standards, performance of quality reviews, overall quality management and input on available acquisition strategies. His relevant project experience includes the East Side Coastal Resiliency project, LaGuardia Airport floodwall design report, plans and specifications; Rockaway Inlet to East Rockaway Inlet and Jamaica Bay reformulation study; Bay Park Sewerage Treatment Plant levee and floodwall; Grand Prairie pump station design, plans and specifications; South Central Louisiana hurricane protection planning study; Mississippi River and tributaries program prioritization planning; and a variety of levee inspection reports including berms, floodwalls and pump stations.
	10/18 – 12/25 East Side Coastal Resiliency, New York City Dept. of Design and Construction, New York City, NY. <i>Design Manager</i> for a multi-disciplined team in the development of feasibility, coastal hydraulics, conceptual design reports, MM1 and MM2 stage plans and specifications. Responsibilities included senior customer interaction, establishment of design standards and integration of design components into a resilient system, development of O&M program requirements including the O&M Manual. Performed substantial coordination with City agencies in developing implementation plans. Designs were coordinated with city agencies, FEMA, utility providers and community groups to achieve project goals of enhanced community connectivity and access to the waterfront while simultaneously achieving resiliency goals. Certified design, maintenance and operations project aspects as Certifying Engineer for the \$ 1.5 billion flood projection project as part of the Conditional Letter of Map Revision submission by the City to FEMA. Aligned project technical and FEMA requirements, advised City agencies on requirements including those for maintenance, operations and emergency response. Led project update sessions with FEMA and the City teams in identifying and finding solutions to complex design and operational aspects of the project.
	01/06 – 12/06 Task Force Guardian, USACE Mississippi Valley Division, New Orleans, LA. <i>Quality Assurance/Quality Control.</i> Developed and managed the Quality Program for design and preparation of P&S for 61 projects including resolution of comments by independent reviewers. Established requirements for quality control plans, approved comment resolutions and rendered decisions or required actions. Served as the senior civilian employee responsible for restoring the New Orleans Hurricane Protection System in 2005-2006. Program managed the \$800 million design and construction program which was executed in

	276 days, prior to the 2006 hurricane season. Scope. Preparation of design and development of P&S for 61 construction contracts to repair and restore 169 miles of flood protection works including 68 pump stations and 4 navigable floodgates.
09/16 – 06/24	Flood Protection at Hugh L. Carey and Queens Midtown Tunnels Triborough Bridge and Tunnel Authority, New York City, NY. <i>Project Manager.</i> Led a multidisciplinary design build team in design, preparation of P&S and construction support services. Project included 4 major floodgates, retrofitting or new retaining/floodwalls, street and tunnel modifications to include roadways and drainage and a deployable wall system requiring interface with the construction contractor, client and their agent.
09/16 – 06/24	Hugh L. Carey Tunnel and Queens Midtown Tunnel, Tri-borough Bridge and Tunnel Authority, NY. <i>Quality Assurance/Quality Control Manager.</i> Served as the project's Quality Manager leading development of the Quality Management Plan, coordinating and conducting technical reviews for designs and contract plans and specifications for the project contracted under design-build. Responsibilities also included interfacing with the construction contractor, the owner and their engineering agent in resolving critical design or construction issues. Prepared monthly Quality Program Reports for the client to capture reviews conducted each month, deviations from client standard design requirements and lessons learned. Scope: Project was a design-build acquisition and included 4 major floodgates for sealing tunnel entrances, retrofitting or providing new retaining/floodwalls, street and tunnel modifications.
07/15 – 12/20	Dallas Water Utilities (DWU) Professional Services Contract: Emergency Action Plan Dam Safety Support Services, Dallas Water Utilities (DWU), Dallas, TX. <i>Technical Reviewer</i> for Dallas Water Utilities. Performed quality reviews during <i>development of an updated Emergency Action Plan (EAP)</i> for high and significant hazard dams as part of updating the dam safety program for 24 multipurpose reservoirs owned and operated by the City. In addition, performed reviews of updated operations and maintenance manuals, including support for the table-top and functional exercises of the updated EAP.
01/12 – 12/12	Greater New Orleans Hurricane Storm Damage Risk Reduction System, USACE Mississippi Valley Division, New Orleans, LA. Engineer of Record for the \$14.9B Greater New Orleans Hurricane Storm Damage Risk Reduction System program. Responsible for establishing surge levels, system-wide design criteria and design methodologies, providing engineering services and support for project and program execution, establishing inspection requirements for works under construction, as well as the completed feature, establishing individual project and system-wide operations and maintenance requirements, establishing requirements for and <i>completion of a National Flood Insurance Program Levee System Evaluation Report for FEMA acceptance of the completed works.</i>

Firm employed by. 

Name	Eric Reardon, PE	Years of relevant experience with this employer	2
Title	Principal Hydraulics Engineer	Years of relevant experience with other employer(s)	18
Degree(s) / Years / Specialization	Graduate Certificate / 2015 / Watershed Assessment and Restoration; BS / 2002 / Civil Engineering; AAS / 1990 / Civil Engineering Technology		
Active registration number / state / expiration date	NC-14-0546 / North Carolina; 029911 / NC		
Year registered	2004	Discipline	Professional Engineer
Contract role(s) / brief description of responsibilities	FEMA Regulations		
Experience dates	Experience and qualifications relevant to the proposed contract		
	Eric is a stormwater engineer with a focus in handling transportation hydraulic needs related to interstates, highways, airport, railroad, container terminal, multi-use pathways and sidewalks. He has <u>designed culverts and sized bridges to meet the needs of FEMA CLOMR/LOMR and the NCDOT SFC process</u> . Eric is adept to new construction as well as existing municipal street improvements while meeting erosion control requirements for either NCDOT or NC DEMLR. Skilled in providing stormwater control measure (SCM) design within linear transportation constraints.		
04/24 – Ongoing	North Carolina Turnpike Authority (NCTA): R-2829B-I 540 Design, Infrastructure Consulting & Engineering, Raleigh, NC. <i>Senior Hydraulic Engineer</i> for the design-build project for a 2-mile portion of the new construction divided highway of NC-540 in Wake County, NC. Project included design of two multi-barrel culverts, closed and open channel storm sewer, erosion control and pre-post hydraulic analysis.		
08/24 – Ongoing	TO- North Carolina Department of Transportation (NCDOT) South West Project Development and Environmental Study 2020–Division 9, NCDOT, Raleigh, NC. <i>Senior Hydraulic Engineer</i> who was responsible for the design of closed and open channel storm sewer, erosion control and pre-post hydraulic analysis. TO-01 involved widening two lane road to provide left turn lane; TO-02 involved realigning a secondary road to remove offset intersections; TO-03 involved widening two lane road to provide left turn lane and TO-04 involved interchange improvement from I-40 to a diverging diamond.		
10/24 – Ongoing	Russell-Person Saint Bridge & Stream Improvement, City of Fayetteville, Fayetteville, NC. <i>Senior Hydraulic Engineer</i> responsible for the hydraulic opening of several new bridges to reduce impacts along a Federal Emergency Management Agency stream and the design of closed and open channel storm sewer, erosion control and pre-post hydraulic analysis associated with the roadway improvements.		
05/23 – 01/24	I-26 Capacity, Compliance, and Reliability Phase III - Bid Tender Phase, Infrastructure Consulting & Engineering, Columbia, SC. <i>Senior Hydraulic Engineer</i> who conducted hydraulic analysis and design for a design-build pursuit along I-26/I-20 in Columbia, SC. Scope included two 1-mile portions of the widening of the existing interstate and interchanges and the associated stormwater impacts. Analysis included pre-post analysis, storm sewer detention analysis to reduce impacts to existing culverts. Bridge spread analysis and alternative storm sewer alignments.		

Firm employed by. 

Name	Anwer Ahmed, PE, D.WRE	Years of relevant experience with this employer	23
Title	National Technical Manager	Years of relevant experience with other employer(s)	10
Degree(s) / Years / Specialization	MS / 1987 / Water Resource Engineering, Iowa State University BS / 1984 / Civil Engineering, Iowa State University		
Active registration number / state / expiration date	PE. 023604/ GA / Exp. 12/2025; PE. 062046977 / IL / Exp. 11/2025		
Year registered	1997 (GA) / 1991 (IL)	Discipline	Civil Engineering
Contract role(s) / brief description of responsibilities	Guidelines and Manuals		
Experience dates	Experience and qualifications relevant to the proposed contract		
	Anwer Ahmed serves as a national expert for Arcadis' stormwater and watersheds practice. His expertise includes stormwater and watershed management and green Infrastructure. Anwer has over 37 years of experience in developing and implementing large stormwater programs. His experience includes multi-objective stormwater master planning, watershed protection, green infrastructure, manuals, ordinances, and funding. He is a co-author of the WEF/ASCE O&M of Stormwater Controls Manual that was released in September 2022. He was a member of the Water Environment Federation (WEF) ENVISION Task Force, Stormwater subgroup, that prepared manual of guidance for municipalities on implementation of the Envision™ Rating System to make informed decisions on sustainability of their infrastructure projects by evaluating the planning, design, construction, and maintenance elements from a triple bottom line standpoint. He has authored many papers and presentations, including a peer-reviewed article in an AWWA Journal on "Maximizing Stormwater Program Effectiveness Through Risk-Based Stormwater Asset Management". Additionally, he is certified by the American Academy of Water Resources Engineers as a Diplomate, Water Resources Engineer (D.WRE).		
	02/ 13 – Ongoing	Stormwater MS4 Program Implementation and Assets Operations and Maintenance, Georgia Department of Transportation (GDOT), Statewide, GA. <i>Program Manager</i> to assist Georgia DOT in developing a statewide stormwater management program to comply with all aspects of the MS4 permit. Services include preparation and implementation of GDOT's Municipal Separate Storm Sewer System (MS4) Permit mandated requirements and managing the workflows to maintain compliance with the Permit. The Arcadis team performed a comprehensive review of other DOT stormwater asset management and O&M programs and developed the recommendations based on lessons-learned in adapting the program to GDOT's organization structure, integrating the program into the present business practices to gain buy-in from management and staff, projecting long- term needs, and controlling cost. A series of comprehensive stormwater manuals and respective training courses were developed for Drainage Design, Inspection & Maintenance (I&M), Facilities Stormwater Pollution Prevention, Illicit Discharges Elimination, and Asset Management among others. The overall Stormwater MS4 program is designed to integrate with GDOT's day-to-day operations and its asset management system.	
	03/24 – 10/24	Virginia Stormwater Handbook Development, Virginia Department of Environmental Quality. <i>Technical Reviewer</i> for Arcadis' work with Virginia Department of Environmental Quality (VDEQ) to consolidate, update, and replace its current handbook, technical memorandums, and Stormwater and Erosion & Sediment Control BMP specifications to produce a new Virginia Stormwater Handbook that streamlines and standardizes the process. Arcadis worked directly with VDEQ staff and a Stakeholder Advisory Group. Arcadis updated and/or developed over 50 erosion and sediment control and stormwater BMPs for the Handbook and updated chapters including ones on Erosion and Sediment Control.	

07/12 – 07/14	Green Infrastructure Manual, Chattanooga, Tennessee. <i>Project Manager</i> for the Arcadis Team to develop runoff reduction and volume control standards and development of site design standards for new development and redevelopment projects to manage the first inch of rainfall with no discharge to surface waters. A comprehensive stormwater and Green Infrastructure design manual was developed with standards that included consideration for long- term maintenance for the stormwater and green infrastructure assets.
06/01 – 06/15	Watershed-Based Stormwater Master Plan and Manuals, Athens-Clarke County, GA. This project involved development of a comprehensive watershed and stormwater management plan for the entire county. A separate manual was developed for each of the major watersheds in the County specific to the flooding and water quality concerns in that watershed. quality problems was prepared and linked to a GIS. Recommendations were made to address these problems and their implementation was prioritized in accordance with input from the public and the regulatory requirements. A funding action plan was prepared to fund the stormwater program. The recommendations included a mix of funding options including stormwater service fees, development fees, and SPLOST revenues.
01/11 – 01/14	Comprehensive Stormwater Program and Utility, Henry County, GA. Arcadis conducted a stormwater funding feasibility study and prepared a funding action plan. The recommendations included raising development fees for the plan review, permitting, inspection, and enforcement services related to construction of new stormwater infrastructure and implementation of a stormwater utility. For set up of the utility, the services included a comprehensive fee rate study, public outreach, a GIS database of impervious surfaces, rectification of billing and parcel databases, a Master Account File with the stormwater bills, and a stormwater management utility ordinance.
06/12 – 06/15	County-Wide Stormwater Master Plan – Phase One, Monroe County Department of Environmental Services (MCDES), NY. <i>Technical Advisor</i> for the development of a comprehensive master plan framework with the objective of assessing MS4 program, identify ongoing changes in federal, state and local requirements, develop and update policy and program requirements, evaluate and prioritize areas of impact, collaborative strategies and municipal partnering opportunities, and program funding and financing strategy for the long-term capital improvements. The framework helped establish and define the activities for Phase Two which included CIP development, O&M, and green infrastructure strategic direction.
02/23 – Ongoing	Stormwater Master Plan, DeKalb County, GA. <i>Program manager</i> for this multi-year effort to develop the first comprehensive stormwater master plan for the County . The County first developed a strategic “10,000 foot” plan that laid out a phased approach to conduct more detailed watershed-scale plans including modeling and assessments to develop a county-wide CIP and an accompanying funding strategy. The strategic plan includes standards by which the detailed watershed-scale master plans will be developed. The initial effort also included a detailed assessment of the County’s stormwater infrastructure using the data already collected for MS4 Permit compliance. This included analyzing risk for system components and a systematic approach to CIP planning for system renewal, upgrades, and management. This work forms the basis for developing a comprehensive countywide CIP as the individual watershed-based master plans are completed.

Firm employed by: 

Name	Hilafu Hilafu, PE, CFM	Years of relevant experience with this employer	1
Title	Senior Hydraulics Engineer	Years of relevant experience with other employer(s)	8
Degree(s) / Years / Specialization	MS / 2019 / Water Resources Engineering, University of Tennessee, Knoxville BS/2013/ Agricultural Engineering, Hamelmalo College of Agriculture, Eritrea		
Active registration number / state / expiration date	PE. 055419 / NC / 12/31/2025		
Year registered	2023	Discipline	Civil Engineer
Contract role(s) / brief description of responsibilities	FEMA Regulations and HECRAS 1D & 2D		
Experience dates	Experience and qualifications relevant to the proposed contract		
	Mr. Hilafu specializes in Hydrologic and Hydraulic (H&H) studies and urban drainage design for roadway projects. His professional experience includes <u>bridge H&H studies, scour analysis, closed drainage systems, open channel design, and stormwater retention/detention systems</u> . He has worked on numerous public projects across Louisiana, South Carolina, North Carolina, Virginia, and Georgia. He is proficient in MicroStation, Openroads designer, Geopak Drainage, StormCAD, HY-8, Hydraulic Toolbox, LADOTD Hydr2009, Hydrologic Engineering Center's (HEC)- River Analysis System (RAS). He has completed the NHI SRH-2D training course (135095 Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments) .		
10/24 – 04/25	I-10 Calcasieu River Bridge P3, Calcasieu Parish, LA. Hydraulics Engineer. The Project will provide a new bridge, located north of the Existing Bridge, along with new approaches and modifications to existing interchanges and roadways within the Design-Build (DB) Limits. Reviewed HEC-RAS 2D models developed for the Upper and Lower Calcasieu Watersheds under the Louisiana Watershed Initiative to assess their suitability for the project. Developed preliminary HEC-RAS 2D model for the existing I-10 bridge over the Calcasieu River. Additionally, analyzed and designed cross drain pipes and open channels for segment1.		
09/24 – 04/25	I-285 West Interchange Reconstruction Design-Build, C.W. Matthews Contracting Co., Atlanta, GA. Hydraulics Engineer. The project involves widening the existing Interstate 20 (I-20) bridge over Chattahoochee River, located between Cobb and Fulton Counties, Georgia. Performed Hydraulic modeling for the bridge using HEC-RAS and developed a comprehensive Hydrologic and Hydraulic report. Coordinated closely with roadway and bridge designers.		
01/23 – 09/24	Buncombe 522 Bridge Replacement, NCDOT, Black Mountain, NC. The project involved replacement of the 9th Street bridge over Tomahawk Branch in Buncombe County, NC. Performed hydraulic modeling for the bridge replacement using HEC-RAS and prepared a detailed Hydrologic and Hydraulic report. Calculated scour depths for the proposed bridges and analyzed and designed closed drainage systems and culverts.		
09/21 – 12/22	Ecusta Trail, Henderson County, Asheville, NC. The project involved the design of a greenway (rail-to-trail conversion). Performed hydraulic modeling for the replacement of six existing bridges and a 2.4-mile floodplain along the trail using HEC-RAS. Prepared Hydrologic and Hydraulic report, and calculated scour depths for the proposed bridges. Analyzed and designed closed drainage systems and culverts.		
01/21 – 04/21	S-228 Bridge Replacement, SCDOT, South Bishopville, SC. The project involved Bridge replacement of S-228 over Black River in South Bishopville, SC. Performed hydraulic modeling for the replacement of the existing bridge using HEC-RAS and prepared a detailed Hydrologic and Hydraulic report.		

Firm employed by.  **ARCADIS**

Name		John Atkinson, PhD		Years of relevant experience with this employer		15	
Title		Principal Water Engineer		Years of relevant experience with other employer(s)		7	
Degree(s) / Years / Specialization				PhD / 2002 / Civil Engineering; MS / 1995 / Civil Engineering; BS / 2002 / Civil Engineering			
Active registration number / state / expiration date				N/A			
Year registered		N/A		Discipline		N/A	
Contract role(s) / brief description of responsibilities				SMS and Coastal Modeling Support			
Experience dates		Experience and qualifications relevant to the proposed contract					
		Dr. Atkinson's expertise is in the areas of <u>hydrodynamics, scour and erosion, storm impacts, and the impact of sea level rise and urban development on coastal flooding</u> . He provides <u>numerical modeling</u> in support of flood protection and restoration projects and provides scientific services for the Oil & Gas industry, federal and state agencies, municipalities, and academic institutions. <u>Dr. Atkinson specializes in sophisticated analysis of riverine scour, coastal dynamics, waves, storm impacts, and erosion along continental margins from the Gulf of Mexico to the arctic.</u>					
03/18 – Ongoing		Modeling Hydrodynamics and Sediment Mobility in Newark Bay and Passaic River, Confidential industrial client. Dr. Atkinson is working with industrial clients to design a capping system to prevent the movement of contaminated sediments. This work involves a detailed understanding of the movement of water and fluxes of sediment between Arthur Kill, Kill van Kull, Newark Bay, and Upper Bay. In support of this project, John has <i>developed state-of-the-art computer models to evaluate bed shear stress, velocities, and sediment transport for a wide range of tidal, wave, and storm surge scenarios</i> to ensure the capping design performs well under all conditions.					
01/16 – 06/20		Development of Coupled Rainfall, Riverine, and Surge Model Department of Homeland Security. Dr. Atkinson is developing improvements to the <i>Federal Emergency Management Agency (FEMA) methodology</i> for assessing flood risk in regions where the combination of coastal and riverine flooding is prevalent. <i>FEMA flood hazard modeling and statistical methods</i> currently include simplifying assumptions for the coincidence of precipitation, riverine, and coastal flooding, which leads to inaccuracies in the flood risk profile between the coast and upland. A <i>coupled numerical modeling</i> is being developed to robustly account for the joint probability of coastal, riverine, and precipitation events. The modeling approach is targeting a balance in accuracy and efficiency such that the methods can be effectively applied to all coastal areas within the US.					
06/17 – 09/18		Hydrodynamic and Wave Assessment for New Bridge Design in Tampa Bay, Florida Department of Transportation (FDOT). Dr. Atkinson developed <i>coupled hydrodynamic and wave modeling of Tampa Bay</i> to guide the design of a proposed replacement of an obsolete section of the Howard Franklin Bridge across Tampa Bay. The <i>models calculated storm surge, wave heights, and water velocities for a range of return periods</i> . Results were used to provide low-chord elevations and wave loads. Potential for scour and erosion was computed for all proposed bridge piers and along the approach causeway following Federal Highway Administration (FHWA) and FDOT procedures.					

02/18 – 04/19	Design of Scour Mitigation at Bridge Abutment, U.S. Army Corps of Engineers (USACE) Memphis District. At a bridge crossing the St. Francis River in Arkansas, a large and permanent debris jam has deflected flows toward the shore and created substantial erosion of the banks downstream. A <i>combination of hydraulic modeling, field data, and empirical relationships were used to compute circulation</i> and flow velocities downstream of the bridge crossing. This information was used to design an appropriate repair and to size rip rap for permanent scour protection.
08/17 – 10/17	Evaluation of Scour Vulnerability for Petroleum Pipelines During Hurricane Harvey, Confidential O&G client, TX. Developed innovative methodology to merge multiple historical data sets to hindcast flow velocities during Hurricane Harvey and estimate possible scour near oil and gas pipeline networks. Provided client with <i>design of scour protection</i> and erosion mitigation plans.

Firm employed by. 

Name	Shan Zou, PhD	Years of relevant experience with this employer	14
Title	Principal Water Engineer	Years of relevant experience with other employer(s)	8
Degree(s) / Years / Specialization	PhD / 2007 / Civil Engineering MCE / 2003 / Civil Engineering BS / 1993 / Physical Oceanography		
Active registration number / state / expiration date	N/A		
Year registered	N/A	Discipline	N/A
Contract role(s) / brief description of responsibilities	SMS and Coastal Modeling Support		
Experience dates	Experience and qualifications relevant to the proposed contract		
	Shan Zou has a strong background and extensive research experience in coastal and ocean engineering, sediment transport, and morphodynamics in coastal and riverine regions. He has gained firsthand knowledge of nearshore hydrodynamics, sediment transport, and water quality modeling by providing support to numerous federal agencies including the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Service (USFWS), state agencies, port authorities, and private industry. He has experience with wave models (CGWAVE, REFDIF, FUNWAVE, SWAN, STWAVE, WHAFIS); tide and storm surge models (ADCIRC, RMA2, DELFT3D); sediment transport models (HEC-RAS, HEC-6, EFDC, FVCOM, ADH, SED2D); water quality models (EFDC, FVCOM, RMA); propwash and scour analysis; floodplain analysis (HEC-HMS, HEC-GeoHMS, HEC-RAS, HEC-SSP, SEDCAD, Link-Node); and computational fluid dynamics (CFD) (Flow3D, SPHYSICS). He also has developed many in-house codes such as 3D particle tracking for sediment transport analysis.		
02/24 – Ongoing	C-18W Impoundment Preliminary Design, West Palm Beach, FL (South Florida Water Management District). <i>Coastal Engineering Lead and Modeler.</i> C-18W components include a 9,500 acre-feet storage above ground impoundment. STWAVE , wind setup, and wave run-up were developed to assess the freeboard, overtopping, and erosion protection for embankments under different conditions of storage levels and precipitations.		
10/09 – 05/12	Comite River Diversion Project Hydraulic Modeling and Design (USACE-New Orleans District, New Orleans, Louisiana) <i>Hydraulic modeler and design engineer.</i> A hydrologic analysis of the Comite River Basin was first completed. The Comite River Basin was delineated by using Arc-GIS and Arc-Hydro software and the most recent Light Detection and Ranging (LIDAR) data. The 72-hr 50% to 0.2% annual chance exceedance rainfall events were analyzed using HEC-GeoHMS to produce stage-duration and frequency curves. The hydrographs produced from the hydrologic were utilized to produce the water surface profiles along the Comite River and Comite River Project diversion channel. HEC-GeoRAS was utilized in order to perform the hydraulic analysis for the purpose of designing the diversion structure, bridges along the diversion channel, and drop structures to the intercepting Bayous. Additionally, utilizing the HEC-RAS model, a sedimentation study was performed to evaluate the impacts of the long term sedimentation trends of river reach affected by the diversion.		
02/16 – 08/17	Mecca Farms Flow Equalization Basin Design Documentation Report, West Palm Beach, FL (South Florida Water Management District) <i>Coastal Engineering Lead and Modeler.</i> The proposed Mecca flow equalization basin (FEB) at the Mecca Farm site is located on property owned by the South Florida Water Management District. DELFT3D, SWAN, STWAVE were developed to assess the proposed FEB under the conditions of extreme drought and hurricanes, investigate the		

	practical operational alternatives. The <i>models were also used for different phases to provide the design parameters for the pump station, wind waves, currents, wind setup and flow diversion.</i>
08/13 – 01/17	Florida Flood Impacts and Assessment, FEMA Public Assistance (FEMA-4138-DR, FEMA-4084-DR) FEMA, Florida. <i>Coastal Engineering Lead and Modeler.</i> <i>Hydraulic and hydrology analysis and models</i> were used to estimate the flooding that occurred because of either the July 2013 severe storms or Hurricane Isaac for counties in Florida Panhandle and Southern Florida region. The estimates of flood depth calculated from this methodology were subsequently used to estimate cost-savings from prior drainage and acquisition projects.
05/12 – Ongoing	Coastal Restoration 2012, 2017, 2023 Master Plan Prioritization Coastal Protection & Restoration, Baton Rouge, LA (Authority of Louisiana) <i>Hydrodynamic Modeler.</i> Analyzed the protection potential of <i>hundreds of proposed coastal restoration and protection projects in coastal Louisiana</i> , including levee alignments, barrier island restorations, ridge restorations, and various types of marsh restoration efforts. This effort required applying statewide topographic, bathymetric and land use/ land class (LULC) data to include in the <i>ADvanced CIRCulation (ADCIRC) and Simulating WAVes Nearshore (SWAN) hydrodynamic and wave models.</i> The project also included analysis of potential future scenarios such as sea level rise, subsidence, and marsh degradation.
10/09 – 05/12	Northwest Florida FEMA Flood Map Development, Orlando, FL (University of Central Florida) <i>Hydrodynamic Modeler.</i> Assisted with FEMA map modernization program for the Northwest Florida Water Management District (NFWFMD), as a subcontractor of UCF. This work centered on the <i>creation of an ADCIRC storm surge model covering the gulf coast shoreline</i> of Franklin, Jefferson, and Wakulla Counties and portions of Gulf County. Responsibilities included support in the construction of the <i>ADCIRC finite element meshes, calibration, and validation with four historical hurricanes</i> that made landfall in or near Northwest Florida. Completed production simulations of hundreds of synthetic hurricanes and tropical storms, followed by statistical analysis of surge and wave return periods to define FEMA coastal flood mapping values in the region.
05/16 – 08/18	GDOT Bridge Hydraulic Modeling and Scour Analysis (Georgia Department of Transportation) <i>Hydraulic modeler and design engineer.</i> Review, QAQC and recalibrate the bridge hydraulic model and erosion analysis for bridges over the State of Georgia. The study includes site inspection, setting up <i>new model or using existing FEMA model, hydrological analysis, FEMA no-rise analysis, bridge design and bridge scour mitigation design</i> based on Georgia Department of Transportation (GDOT) guidelines.

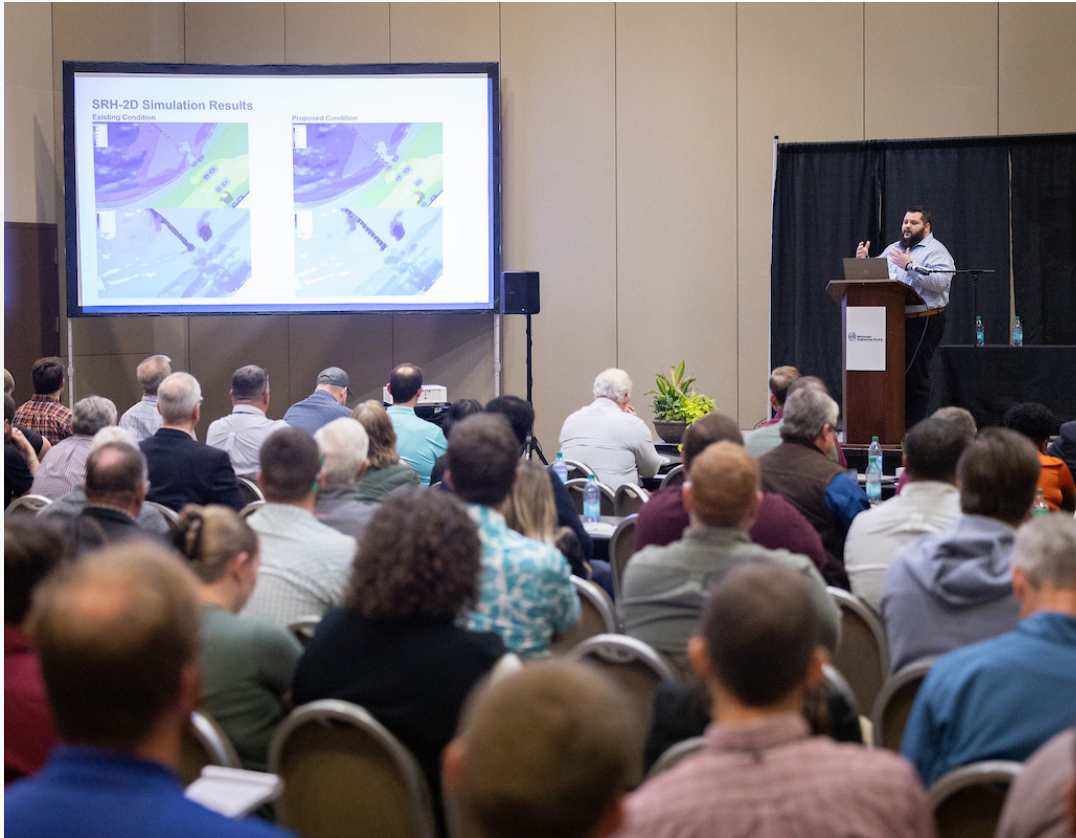
Firm employed by. 

Name	John “Nick” Irza, PE		Years of relevant experience with this employer	
Title	Project Water Engineer		Years of relevant experience with other employer(s)	3
Degree(s) / Years / Specialization		MS / 2017 / Environmental Engineering, BS / 2014 / Civil and Environmental Engineering,		
Active registration number / state / expiration date		PE.139428 / TX / Exp 09/2025; PE.105802 / NY / Exp 07/2027		
Year registered	2020	Discipline	Professional Engineer	
Contract role(s) / brief description of responsibilities		SMS / Coastal Modeling Support		
Experience dates		Experience and qualifications relevant to the proposed contract		
		Nick Irza has nine years of experience in <u>coastal modeling</u>, <u>resiliency</u>, <u>water resource engineering</u>, and <u>climate risk assessments</u> for both public and private clients. His expertise spans hydrologic and hydraulic analyses, storm sewer design, flood forecasting, FEMA map revisions, stormwater planning, development impact studies, data analysis, and climate vulnerability assessments. Additionally, he specializes in <u>coastal engineering</u>, including <u>hydrodynamic and wave modeling</u>, <u>floodplain remapping</u>, and <u>scour analyses for bridges and pipelines</u>. Proficient in software such as <u>ADCIRC</u>, <u>SWAN</u>, <u>Delft 3D</u>, <u>SMS</u>, <u>HEC-RAS</u>, <u>Python</u>, and <u>ESRI</u>, he delivers comprehensive solutions tailored to diverse projects.		
03/23 – Ongoing		North/West Battery Park City Coastal Resiliency, Battery Park City Authority, New York, NY. Oversaw the coastal no-rise analysis for a <i>coastal resiliency flood project</i> to protect Battery Park City from coastal storm surge events. Developed pre- and post-project conditions versions of an ADCIRC mesh using SMS. Developed Python script to identify representative 100-year storm tide events from the <i>NYC FEMA synthetic storm suite</i>. Performed <i>storm surge simulations using ADCIRC+SWAN</i>. Developed post-processing Python library to map model results for engineering report and <i>CLOMR documentation</i>.		
11/24 – Ongoing		City of Portsmouth Operational Forecast Platform, City of Portsmouth, VA. Technical lead for the development of a flood forecasting system for the City of Portsmouth. The system, known as the <i>Actionable Stormwater Platform (ASP)</i>, features a <i>cloud-based digital twin of Portsmouth’s stormwater drainage infrastructure, represented using an EPA-SWMM model</i>. Developed the Python codebase to transform the <i>EPA-SWMM model</i> into a real-time model, which included acquiring and pre-processing forecast model inputs, dynamically running simulations, and post-processing outputs. Additionally, developed a dashboard interface to effectively communicate the ASP outputs to City stakeholders.		
08/19 – Ongoing		Seaport and Financial District Climate Change Master Plan, New York Economic Development Corporation, New York, NY. Oversaw the wave and <i>hydrodynamic modeling for a proposed plan</i> to provide coastal protection to the Seaport/Financial District of lower Manhattan. Evaluated the impact of proposed shoreline protection concepts on storm surge elevation and tidal circulation patterns using <i>ADCIRC and D-Flow FM (Delft 3D) modeling</i>. Used SWAN to characterize the present-day and future 100-year wave climate in the study area and used the results to perform an overtopping analysis to determine the design flood elevation of the proposed coastal protection.		

09/19 – 02/22	Southern Mississippi FEMA Coastal Remapping Study, Southern Mississippi Planning and Development Corporation, Coastal Mississippi, MS. Validated an ADCIRC+SWAN computational mesh to observed data for five historical storm events, including the studying the effect of different wind speed multipliers and wind-drag coefficient formulations. Managed the production <i>model runs of the suite of 282 synthetic tropical cyclones used to compute updated FEMA coastal</i> return period elevations for the study area. Developed a post-processing script library to remove spurious water surface elevations from the production run maximum water surface elevation model output. L-31E Levee Protection Level of Service Study
08/20 – 06/22	South Florida Water Management District, Biscayne Bay, FL. Evaluated the level of protection provided by the L-31E levee system against tropical cyclone storm surge for present-day conditions and with <i>projected sea level rise using a coupled ADCIRC+SWAN and 2D D-Flow FM modeling system</i> . Developed a post-processing scripting library to aggregate model output from several model runs into composite water surface elevation profile plots that were used to assess the performance of the levee.
09/19 – Ongoing	Coastal Pipeline Scour Assessments, Confidential Private Clients, Coastal TX and LA. Performed a screening-level scour vulnerability assessment of two pipeline networks along the <i>Texas and Louisiana coasts</i> . Developed a scripting library to parse <i>hydrodynamic and wave model data</i> to generate a database of hydrodynamic data for the pipeline networks. Used the resulting data to perform a scour assessment of the pipeline networks and to develop a vulnerability scoring system to prioritize locations most at risk to scour during tropical cyclone storm events.
08/20 – Ongoing	Darien Bridge Replacement, Georgia Department of Transportation, Darien, GA. Conducted a hydrologic, hydraulic and scour analysis for the replacement of the US-17 bridge in Darien, GA. <i>Developed a HEC-RAS 2D model simulate both storm surge and riverine design storms</i> . The model was calibrated against observed water surface elevations and discharge value over a three-day tidal cycle. Used <i>HEC-SSP to perform statistical analysis</i> of stream flows to develop the riverine design flows. Performed a scour analysis using the HEC-18 methodology.
09/20 – 11/20	Hurricane Sandy Storm Surge Forensic Analysis, Confidential Private Client, New York, NY. Developed stage hydrograph boundary conditions for Hurricane Sandy storm surge using the <i>ADCIRC+SWAN model for a modeling analysis</i> to determine water ingress to a facility during the storm. Adjusted model parameters to achieve favorable validation and developed a Python script to post-process validation hydrograph plots.
02/18 – 08/19	Flood Forecasting System, Harris County Flood Control District, Houston, TX. Helped develop a pilot flood warning system for the <i>Brays Bayou Watershed using HEC-HMS and Real-Time Simulation (HEC-RTS)</i> . <i>Developed a Python library to acquire and pre-process multi-radar/multi-sensor system rainfall data</i> for the system and helped develop a scripting library in HEC-RTS to run the system. Reviewed and revised the effective HEC-HMS and HEC-RAS models for two watersheds, including revising the modified pulse stream routing, checking runoff transformation parameters and revising detention basin storage discharge relationships and control structures. Then calibrated revised HMS models to observed events for use in the flood forecasting system.

Firm employed by. 			Meets MPR No. 5	
Name	Devin Foil, AICP, CFM		Years of relevant experience with this employer	1
Title	Water Resources Planner		Years of relevant experience with other employer(s)	5
Degree(s) / Years / Specialization		MURP / 2018 / Planning; BA / 2011 / Asian Studies		
Active registration number / state / expiration date		Certified Planner - American Institute of Certified Planners (AICP) / 2022; US-19-11124 / Certified Floodplain Manager (CFM) / 07/31/2025		
Year registered	CFM 2019, AICP 2022	Discipline	Planning	
Contract role(s) / brief description of responsibilities		FEMA Regulations		
Experience dates		Experience and qualifications relevant to the proposed contract		
		Mr. Foil is a seasoned climate adaptation planner with extensive experience in climate resilience urban planning, and sustainable development. He excels in leading complex planning projects that integrate sustainability into urban growth, <u>securing competitive funding, and driving the successful implementation of climate action strategies</u>. Devin's expertise in stakeholder engagement and policy development consistently translates into impactful project outcomes. His strong analytical skills, coupled with strategic communication, empower him to deliver customized, high-quality solutions that effectively address the unique needs of his clients and the communities they serve.		
07/24 – 04/25		Louisiana Watershed Initiative, LA. Associate Planner. Contributed to Funding Strategy Workshops, guiding regional members on developing strategies for securing funding (including FEMA) for climate adaptation and resilience programs. These workshops provided insights into aligning local projects with federal and state grant opportunities. Additionally, contributed to Plan Development Workshops, helping regional coordinators devise watershed-scale plans that adhered to best practices and aligned with local sustainability goals and state objectives.		
03/23 – 06/24		City of Carencro Comprehensive Master Plan, Carencro, LA. Senior Planner. Led the development and execution of the comprehensive master plan, aligning city growth with sustainability and resilience objectives. Managed a multidisciplinary team, verifying that project milestones and deliverables were met on schedule. Coordinated with city officials, stakeholders, and community members to reflect diverse perspectives in the master plan. Conducted in-depth analysis of demographic, economic, and housing data to inform strategic urban development decisions. Facilitated public meetings and workshops to gather community input and build consensus on the master plan's vision.		
04/22 – 06/24		Calcasieu Parish Watershed Master Plan, Calcasieu Parish, LA. Senior Planner. Contributed to the development of policy frameworks within the Watershed Master Plan, focusing on sustainable urban development and enhancing community preparedness for climate resilience. Analyzed parish demographics, economy, and housing to inform the flood risk assessment process. Integrated nuanced policy and program recommendations into the master plan report, synthesizing complex information to create a cohesive policy and project-focused document.		
06/21 – 03/22		Bus Rapid Transit (BRT) Feasibility Study for New Orleans Regional Transit Authority (RTA), New Orleans, LA. Planner III. A comprehensive feasibility analysis for implementing a Bus Rapid Transit (BRT) system in New Orleans, focusing on route optimization, cost estimation, and infrastructure requirements. Engaged with communities and stakeholders in New Orleans East and Algiers to gather input and build consensus through in-person workshops. Analyzed data and prepared		

	detailed reports to inform decision-making by the New Orleans RTA, ensuring alignment with the city's long-term transportation and resilience goals.
03/21 – 03/22	East Baton Rouge Parish Stormwater Master Plan, Baton Rouge, LA. Planner III. Collaborated closely with engineers to develop development ordinances for the City-Parish, strategically focused on mitigating current and future flood risks. Utilized regional and watershed-level hydrologic & hydraulic models to inform decision-making . Communicated the strategic vision of the Stormwater Master Plan, translating technical findings into actionable insights for policymakers and the public, supporting citywide resilience initiatives.
06/21 – 03/21	I-10 Calcasieu River Bridge Environmental Impact Statement, Louisiana Department of Transportation and Development (DOTD), LA. Planner III. Developed an effective public engagement strategy for mandatory public hearings, producing active participation and valuable feedback. Cultivated strategic partnerships with local community leaders to enhance outreach efforts in targeted neighborhoods. Facilitated logistics for public hearings by coordinating with venue managers and successfully organized virtual "Context Sensitive Solutions" meetings, adapting to stakeholders' evolving needs. Contributed to drafting specific sections of the Environmental Impact Statement, synthesizing complex information into a clear and coherent format.
02/19 – 03/21	St. John the Baptist Parish Climate Adaptation and Resilience Strategy, St. John the Baptist Parish, LA. Coastal & Water Management Division Lead. Pioneered a comprehensive climate adaptation and resilience strategy for St. John the Baptist Parish, integrating environmental, social, and economic considerations to advance municipal sustainability and equity objectives. Led the adoption of key ordinances, including the Stormwater Management Ordinance and the Environmental Conservation Zoning District. Managed over \$10M in capital projects and strategic initiatives , such as the Lake Pontchartrain Shoreline Protection and the Belle Terre Streetscape and Stormwater Enhancements. Collaborated with local, state, and non-profit partners to advance coastal and water management goals and served as a key representative in regional floodplain management and watershed initiatives.
06/18 – 12/18	Post-Disaster Redevelopment Plan for the Town of Jean Lafitte, Jean Lafitte, LA. Planner. Conducted stakeholder engagement and data collection to identify resilience and sustainability challenges for the Post-Disaster Redevelopment Plan. Analyzed interview transcripts qualitatively to interpret local perceptions of risk and resilience capacity. Developed an annotated bibliography encompassing relevant literature to support the development of community-driven disaster recovery strategies.
01/17 – 06/18	Louisiana Strategic Adaptation for Future Environments (LA SAFE), Office of Community Development, LA. Planner. Performed qualitative and quantitative analysis of over 250 interview transcripts from SE Louisiana residents across six parishes. Evaluated the year-long planning process for coastal adaptation and resilience, capturing community-identified opportunities and challenges. Researched and organized existing community master plans, climate adaptation plans, hazard mitigation plans, and coastal plans in six Coastal Louisiana parishes, and transcribed community-driven adaptation planning discussions.



At Arcadis, we strive to stay current on evolving technology in the industry and **serve as your partner** through transitions and integrations. Our team can investigate complicated problems and provide cost-effective alternatives based on solid hydraulic analysis.

“Arcadis is very knowledgeable about DOTD policy and procedures regarding design and submittals. Every submittal has been thorough and timely, with proper documentation.”

*Lea Smith, LADOTD Project Manager for US 90:
Ramps & LA 88 Roundabouts
100% Preliminary Plans*

17 FIRM EXPERIENCE:

Firm name			Past Performance Evaluation Discipline(s)*	Other (Hydraulics)
Project name	I-285 at I-20 East Interchange Reconstruction		Firm responsibility (prime or sub?)	Sub
Project number	0013915	Owner's name	East Interchange Builders / Georgia Department of Transportation	
Project location	DeKalb County, GA		Owner's Project Manager	Marlo Clowers
Owner's address, phone, email	One Georgia Center 600 West Peachtree Street NW Atlanta, GA 30308			
Services commenced by this firm (mm/yy)	02/21	Total consultant contract cost (\$1,000's)		\$250,000
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm (\$1,000's)		\$16,000

Firm's Role: Arcadis provided multi-discipline design engineering services on the project including hydrologic and hydraulic expertise for a bridge replacement on a FEMA detailed studied stream.

Firm Members Involved: Amanda Check, William Dial

The I-285 at I-20 East Interchange Reconstruction project is part of the Georgia Department of Transportation (GDOT) Major Mobility Investment Program (MMIP), projects advancing across the state in an effort to yield significant reduction in congestion along key freight and passenger corridors. The projects will create additional capacity, improve the movement of freight, provide operational improvements and efficiencies, enhance safety, and decrease travel times.

The Design-Build project reconstructed the interstate system-to-system ramps at the I-285/I-20 east interchange and added a combination of collector distributor (CD) lanes and auxiliary lanes along I-20 east of the interchange, totaling approximately 6 miles of widening and reconstruction of I-20 and approximately 2 miles of reconstruction and improvements to side roads. The project also included construction of replacement bridges along I-20 to accommodate the new auxiliary and CD lanes. One of the project's bridge replacements was a hydraulic crossing, I-20 over Snapfinger Creek which is designated as FEMA Zone AE with a regulatory floodway. The replacement bridge was 175 feet long.

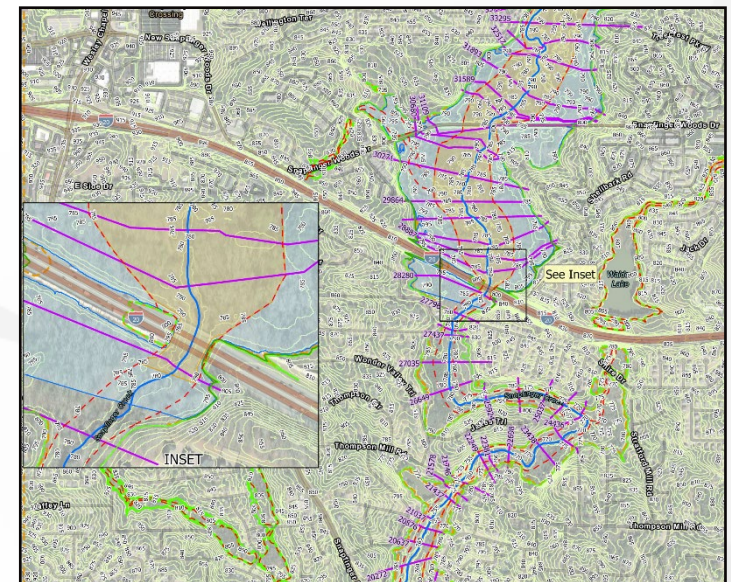
One of Arcadis' many roles on the project included providing hydrologic and hydraulic expertise for the bridge replacement. Arcadis was responsible for the hydrologic calculations, HEC-RAS hydraulic modeling, scour calculations, abutment riprap calculations, deck drainage calculations, and report preparation. For the proposed conditions model, the bridge replacement decreased BFEs along Snapfinger Creek, however, the floodway width was changed at one published cross section triggering the need for a map revision.

Arcadis performed extensive community coordination with both DeKalb County and the City of Stonecrest, **developed the CLOMR and LOMR application packages**, and worked closely with FEMA to get the CLOMR approved in an expediated timeframe so the project's construction schedule would not be delayed given the construction of the bridge was on the schedule's critical path.

Construction is ongoing, and Arcadis is providing direct support as needed.

Key Services

- HEC-RAS 1D Modeling
- FEMA Regulations
- CLOMR and LOMR Applications for Interstate Bridge Replacement



17 FIRM EXPERIENCE:

Firm name	ARCADIS	Past Performance Evaluation Discipline(s)*	Other (Hydraulic)
Project name	GDOT Municipal Separate Storm Sewer System (MS4) Permit Compliance Program On-Call	Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	Georgia Department of Transportation (GDOT)
Project location	Statewide, Georgia	Owner's Project Manager	Mr. Dan Pass
Owner's address, phone, email	600 W Peachtree St NW, Atlanta, GA 30308, 404.631.1605, dpass@dot.ga.gov		
Services commenced by this firm (mm/yy)	03/13	Total consultant contract cost (\$1,000's)	\$17,000
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm (\$1,000's)	\$17,000

Firms Role: Arcadis has provided Program Management for this MS4 contract since 2013.

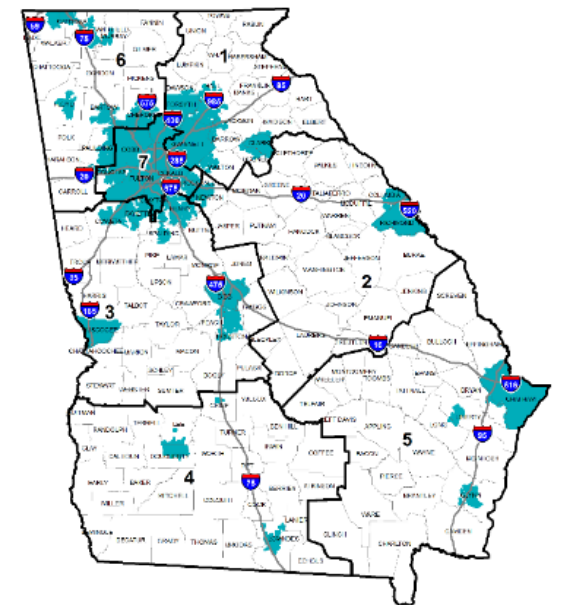
Firm Members Involved: William Dial, Colin Sarratt, Amanda Check, Antonia Donnelly, Thomas Lin

Arcadis has served as a trusted partner to GDOT from successfully assisting them in negotiating the MS4 Permit with Georgia EPD, obtaining coverage through NOI approval, developing a comprehensive compliance plan to guide the implementation of the overall MS4 permit program, and developing all major policies, manuals, and training courses. We provide GDOT with assistance for day-to-day program administration by serving as an extension of staff. On-call services include preparation and implementation of all MS4 Permit mandated plans and managing the workflows to maintain compliance with the permit including preparation of the annual report. Compliance services include Permit Guidance and Training; Inspections and Corrective Action Plans; Asset Management; Compliance Reports, EPA Audit, and Corrective Action Plan; Database/ IT Systems for Tracking; and Staff Augmentation.

Experience Utilizing GDOT Specific Processes, Manuals or Guidance: GDOT's PDP, Design Policy Manual, Electronic Data Guideline, Plan Presentation Guide, Environmental Procedures Manual, General Facility Environmental Guidelines, Integrated Roadside Vegetation Management Herbicides Standards Manual, Environmental Compliance Requirements for GDOT Maintenance Activities and Operations, Preventative Maintenance Manual, Biennial Drainage Inspections/ Illicit Discharge Detection and Elimination/Drainage Maintenance Manual.

Key Services

- Drainage Section Manual Updates
- Consultant Report and Plan Reviews
- Program Management
- Technical Review
- FEMA Coordination



17 FIRM EXPERIENCE:

Firm name	ARCADIS	Past Performance Evaluation Discipline(s)*	Other (Hydraulics)
Project name	SR-25 at Darien River Bridge Replacement DB Owner's Representative		Firm responsibility (prime or sub?) Prime
Project number	0013599	Owner's name	Georgia Department of Transportation (GDOT)
Project location	McIntosh County, GA	Owner's Project Manager	Toan Nguyen
Owner's address, phone, email	600 West Peachtree Street NW, One Georgia Center, Atlanta, GA 30308, 404-631-1867, bridgeoffice@dot.ga.gov		
Services commenced by this firm (mm/yy)	7/17	Total consultant contract cost (\$1,000's)	\$6,000
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm (\$1,000's)	\$4,000

Firms Role: Arcadis is providing DB GEC Pre-Let support services for GDOT for this fracture critical bridge replacement over a navigable waterway in GA's coastal area. These services include developing and managing P6 and CTD schedule, identifying risks and risk mitigation strategies, developing costing plans (including staging narrative and bridge plans), coordinating with multiple stakeholders, developing the RFP TPs, conducting geotechnical investigations, and completing technical studies and the environmental document (NEPA Categorical Exclusion (CE) with Individual Section 4(f) Evaluation).

Key Services

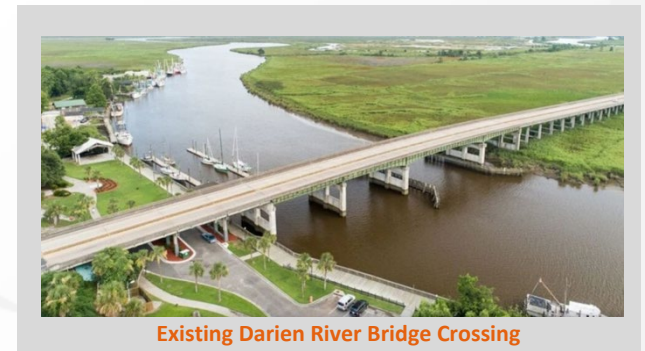
- Fracture critical bridge over navigable water in Georgia.
- Design allows for SR-25 to remain open throughout construction.
- Complex HEC-RAS 2D model required for riverine analysis in tidal zone.



Darien Bridge 2D Model

Firm Members Involved: William Dial, Colin Sarratt, John Atkins, Nick Irza

Given the project's location in an environmentally constrained coastal area, extensive agency coordination has been required with numerous agencies, including FHWA, U.S. Army Corps of Engineers (USACE), U.S. Coast Guard, U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA) Fisheries, GA Department of Natural Resources (DNR), and State Historic Preservation Office (SHPO).



To provide the hydraulic design of the 1441-foot proposed bridge, it was necessary to complete a complex 2D riverine model. The crossing is located in a FEMA coastal Zone AE zone and is tidally influenced. Based on the study condition, HEC-RAS 2D was selected for the 2D model. The model was required to simulate the complex, multi-directional flow patterns in the Altamaha River, including significant overflow between adjacent channels (Darien River) as floodwater flows downstream to the ocean and storm surge propagates inland. A variability of boundary conditions was applied to the model and allowed for a design that met both riverine and coastal hydraulic design requirements.

17 FIRM EXPERIENCE:

Firm name	 ARCADIS		Past Performance Evaluation Discipline(s)*	Other (Hydraulics), Other (Program Management), Environmental
Project name	Louisiana Watershed Initiative		Firm responsibility (prime or sub?)	Prime
Project number	N/A	Owner's name	Louisiana Office of Community Development-Disaster Recovery Unit and the Louisiana Coastal Protection and Restoration Authority	
Project location	Baton Rouge, LA		Owner's Project Manager	Genea Lathers
Owner's address, phone, email	PO Box 94245, US, Baton Rouge, LA, 70804-9245			
Services commenced by this firm (mm/yy)	10/17	Total consultant contract cost (\$1,000's)	\$3,500	
Services completed by this firm (mm/yy)	Ongoing	Cost of consultant services provided by this firm (\$1,000's)	\$3,500	

Firms Role: In response to the catastrophic Louisiana floods of 2016 and Senate Resolution 172, the state engaged Arcadis beginning in 2017 to coordinate with a committee of five state agencies (incl. LADOTD) to define a path forward for effective cross-jurisdictional, watershed-based floodplain management.

Firm Members Involved: Danica Adams, Seth Magden, Carly Foster, Devin Foil, John Atkinson

In drafting the Phase I Investigation: Louisiana Statewide Comprehensive Watershed Based Floodplain Management Program Development report, Arcadis developed a multiphase implementation program through dozens of interviews and extensive research, defining a path forward for the Louisiana Watershed Initiative. The Arcadis team was then retained and reprocured to continue support to the initiative.

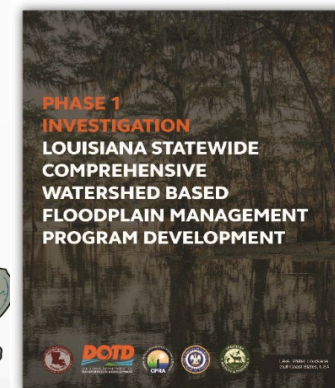
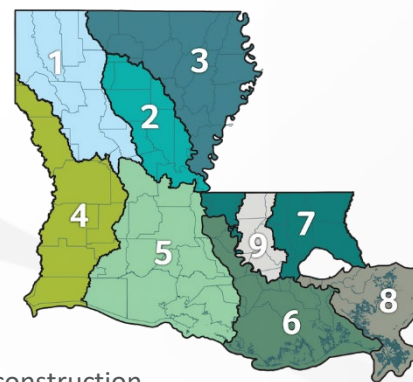
Arcadis provided program development and implementation support in the early stages of this groundbreaking initiative, providing technical, planning, policy, grants, and engagement expertise and services to support several concurrent sub-initiatives through the new Watershed Initiative's six Technical Advisory Groups: Data, Planning, Policy, Projects, Engagement, and Public Relations.

Arcadis supported the development and implementation of areas including, but not limited to, a statewide listening tour, a data gap analysis, a modeling implementation plan, evaluation criteria and application materials for project funding, pathways forward for developing uniform standards for state agencies, and pathways forward for statewide watershed-based planning. Work is ongoing, and in Q3 2024, Arcadis provided direct support to all nine watershed regions in addition to the Project Management Office (PMO) support of the Louisiana Office of Community Development (LA OCD) and implementation of Round 1 and Round 2 Projects into construction.

Watershed region support includes regional plan development, project development and prioritization, funding strategies, capacity building, and modeling. Support of PMO tasks contains direct support for LA OCD staff in managing program components related to watershed region coordinators and deliverables, **inclusive of robust dashboarding and reporting, Hydrologic and Hydraulic (H&H) modeling**, statewide plan, operational guidance for partner agencies, technical and feasibility reviews, and more. Arcadis is providing H&H modeling support for LA OCD for local governmental LWI grant applicants and subrecipients, and in support of each of the nine watershed regions. This modeling support involves a variety of flood mitigation and stormwater management control infrastructure project typologies.

Key Services

- Program Design/Management
- H&H Modeling
- Resilience Planning
- Funding & Financial Analysis
- Implementation/Design Support
- Watershed Management
- Stakeholder Engagement



17 FIRM EXPERIENCE:

Firm name			Past Performance Evaluation Discipline(s)*	Other (Hydraulic)
Project name	Hydraulic Bridge Design Consulting Assistance (On-Call)		Firm responsibility (prime or sub?)	Prime
Project number	E2545	Owner's name	Tennessee Department of Transportation (TDOT)	
Project location	Statewide, TN		Owner's Project Manager	Mr. Wesley Peck
Owner's address, phone, email	James K. Polk Bldg., 505 Deaderick Street, Nashville, TN 37243-0338			
Services commenced by this firm (mm/yy)	09/23	Total consultant contract cost (\$1,000's)		\$4,000
Services completed by this firm (mm/yy)	Ongoing 08/28	Cost of consultant services provided by this firm (\$1,000's)		\$3,000

Firms Role: On-call hydraulic design assistance and related support services. Detailed services include, but not be limited to, project management, site assessments, scour analysis / counter-measure design, hydraulic design / studies including one-dimensional hydraulic design using HEC-RAS and two-dimensional hydraulic design using Surface-water Modeling System with SRH model, QA/QC reviews, deck drain placement and spread analysis, technical document preparation, preparation of "no rise certification" or "Conditional Letter of Map Revision" for FEMA impacts, and other related technical services. Traditional or alternate delivery methods are utilized on this contract.

Firm Members Involved: Lina Khoury, Justin Corbitt, Hilafu Hilafu, Cailyn Youmans, John Atkinson, Nick Izra, Shan Zou, William Dial.

I-55 Bridge replacement over Mississippi River Arcadis performed 2D hydraulic modeling of existing and proposed I-55 bridges using SMS-SRH2D and HEC-RAS 2D. The modeling included two adjacent railroad bridges and all existing overflow bridges on the Mississippi River floodplain. Modeling also included the upstream I-40 bridge and its overflow. Scour analysis was performed and submitted to TDOT and the FHWA as a case study for the new HEC-18 publication.

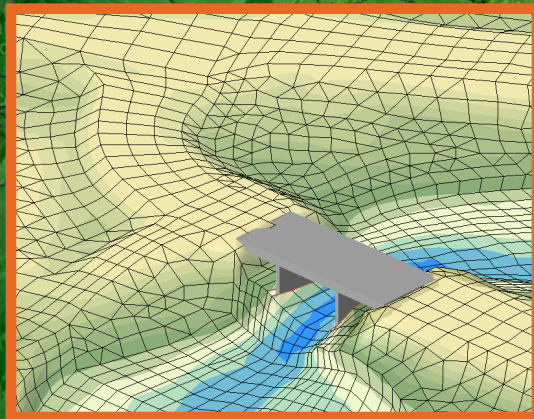
SR-30 Bridge replacement over Richland Creek. Arcadis performed 1D and 2D hydraulic analysis for the bridge over Little Richland Creek replacement project. The modeling included the existing and proposed bridge in a FEMA AE zone, with cut/fill impacts to TVA reservoir Chickamauga Lake. Arcadis also coordinated with TVA regarding navigation limits for recreational use of Little Richland when the lake is up.

Ralston Road bridge replacement over North Fork Obion River. Arcadis managed and performed quality control over the design and modeling of the bridge over North Fork Obion River. The modeling was completed in SMS-SRH-2D and included existing, natural, and proposed bridge modeling with scour analysis of the proposed structure. Scour analysis of the other existing structures was completed for both pre and post project to make sure replacing one bridge on the floodplain does not adversely affect the others.

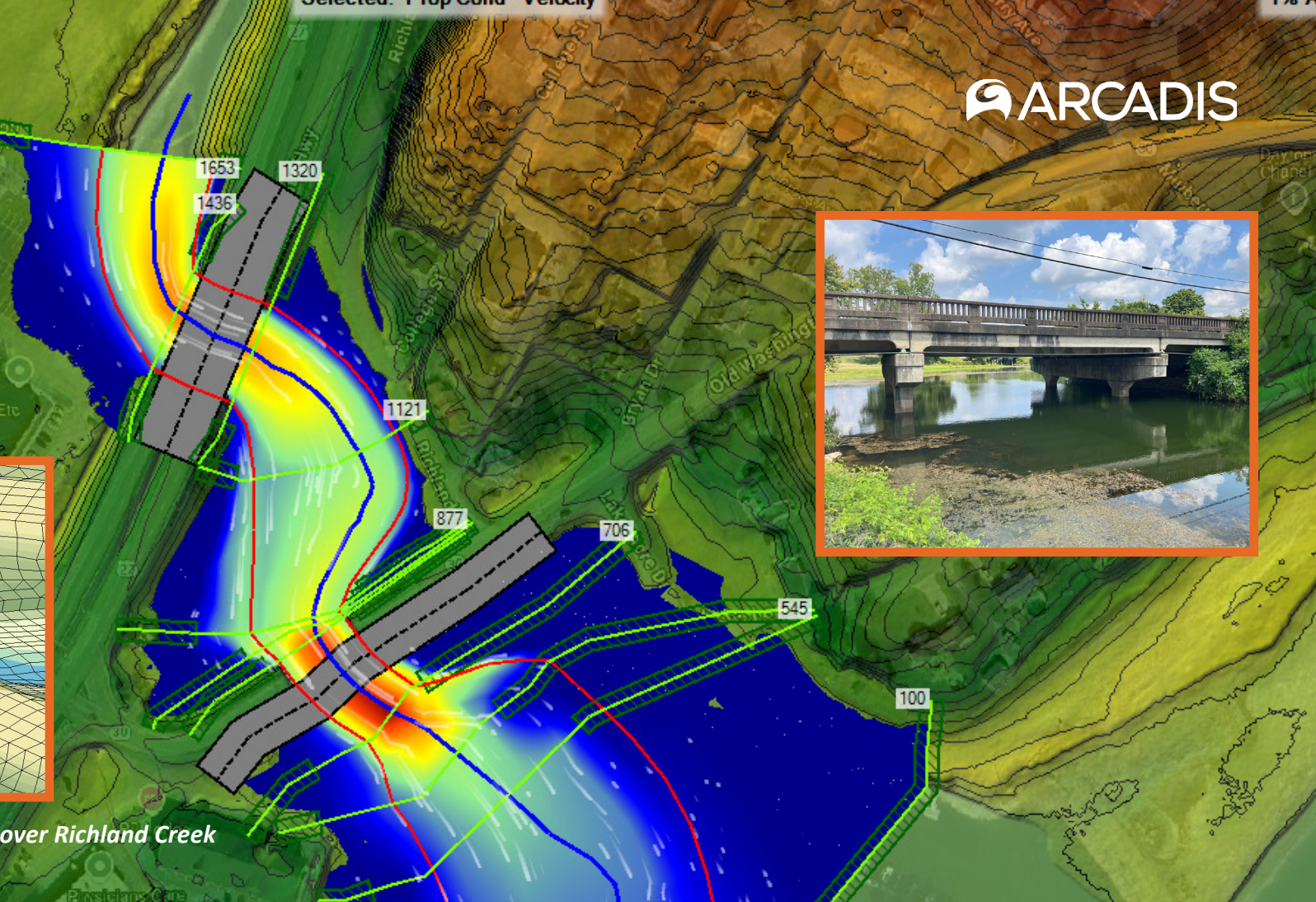
Key Services

- Project Management
- Complex H&H in 1D and 2 D
- FEMA compliance
- Scour analysis
- Deck Drains





TDOT SR 30 Bridge Replacement over Richland Creek



Arcadis has had the opportunity to work on complex hydraulic design projects. We also know not to underestimate projects that appear simple and straight forward because challenges can arise. We thoroughly evaluate the site, hydrologic, and hydraulic conditions and rely on our team of experts to arrive at the best solution. **Picking the appropriate modeling approach and program for each site is important to achieve the most reliable model.**

Thanks for a thorough and concise response. After reviewing the annual report and discussing with Brad, I agree with the 100%. Your team and the Hydraulics Section has done an excellent job.

*Daniel G. Pass, PE
Assistant State Design Policy Engineer, GDOT*

18 APPROACH AND METHODOLOGY:

Our team has solid, diverse, and comprehensive hydraulic experience and has provided similar services throughout the asset lifecycle for several DOTs. With our professional engineers, certified floodplain managers, FEMA experts and SMS specialists, Arcadis has the resources available to successfully deliver any project on compressed timeline. We have developed our approach and methodology below to follow *the approach we successfully implemented on similar contracts* we currently have with other DOTs.

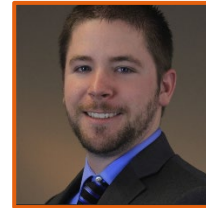
ORGANIZATIONAL CHART AND PROJECT MANAGEMENT

The organizational chart presented in Section 14 represents all service areas expected under this contract including subject matter experts in areas like coastal modeling, training and guidelines and manuals. Arcadis understands that hydraulic engineering tasks are essential parts of the roadway project life cycle. The involvement of hydraulic engineers at appropriate project phases minimizes design changes and sometimes accelerates project schedules.



At Arcadis, our project managers are trained to administer and evaluate project schedules, tasks, staff availability, budgets, and deliverables. They are trained to coordinate frequently with our clients and monitor project schedules.

Arcadis has selected **Colin Sarratt, PE**, to be the **Project Manager** and point of contact for this contract as we believe he has the skills and experience needed to deliver excellent hydraulic product.



Colin serves as Arcadis' Regional Stormwater Lead for Louisiana and Texas, the South Gulf Regional H&H Lead, and has served as a Project Manager for several drainage and hydraulic projects throughout his career. He has a diverse portfolio of projects and clients which has given him a deep understanding of our client's needs and sensitive schedules. Colin worked with Georgia DOT to update their drainage manual and develop their MS4 program specifications, standard details, and policy. He is familiar with the drainage and hydraulic requirements outlined in the *LADOTD Hydraulics Manual, the LADOTD Hydraulic Design Guidelines for Off-System Bridge Replacement and Rehabilitations Manual, and LADOTD Erosion Control Guidelines*. Additionally, Colin and this team are experienced with 2D modeling software such as HEC-RAS and Aquaveo SMS software and has experience utilizing LADOTD's HYDR drainage software for the design and analysis of open channels, culverts and cross drains, and closed drainage systems.

The Arcadis Team anticipates work under this on-call contract to be divided into three categories. In general, our approach and methodology will follow the workflow and delivery process in the LADOTD Project Delivery Manual per type of project.

A. Hydraulics Section Manuals Updating

Updating manuals is a crucial process for ensuring accuracy, relevance, and usability at LADOTD. Manuals serve as essential guides for users, employees, and technicians, offering step-by-step instructions or detailed information about processes, systems, or products. Over time, as technologies evolve, policies change, or new practices emerge, outdated manuals can lead to misunderstandings, inefficiencies, or errors. *Regularly reviewing and revising manuals ensure they reflect the most current information and comply with industry standards or regulations.* Additionally, incorporating user feedback during updates can improve clarity and usability, making the

manuals more effective tools for their intended audience. Ultimately, keeping manuals up-to-date fosters consistency, supports productivity, and helps maintain organizational credibility.

Our structured approach to update LADOTD hydraulic manual is as follows: By following these steps, you can ensure that the updated guideline is accurate, user-friendly, and aligned with current requirements.

1. **Identify the Need for Updates:** Arcadis Team along with the LADOTD team will assess the guideline to determine why an update is necessary. Common triggers include policy changes, technological advancements, regulatory updates, process improvements, or feedback from users.
2. **Review the Existing Content:** Our team will go through the current guideline to identify outdated information, redundancies, or gaps giving special attention to areas that may require clarification or enhancement.
3. **Gather Input from Stakeholders:** Consult relevant stakeholders, such as subject matter experts, team members, or end-users, to gather insights and suggestions. Their feedback can help identify specific areas that need improvement. This can be established by having an online survey distributed to LADOTD Hydraulic Manual users.
4. **Research and Verification:** Ensure that any new or revised content is accurate and aligns with current FHWA standards, regulations, or best practices. Cross-check facts, procedures, or policies to avoid errors.
5. **Compare with other DOTs:** Comparison between different DOTs Hydraulic manuals to judge if there is specific content to include that will enrich the LADOTD Manual.
6. **Update the Content:** Revise or rewrite sections of the guideline as needed ensuring the formatting, structure, and tone align with LADOTD standards.
7. **Incorporate Visuals:** Add or update diagrams, charts, or images to

improve comprehension, especially for complex processes or instructions.

8. **Final Steps** include proofread the updated guideline for errors, inconsistencies, or unclear content. Seek approval and feedback from LADOTD and stakeholders.
9. **Distribute and Train (if applicable):** Share the updated guideline with the appropriate audience. If the updates are substantial, our team is equipped with trainers to help users understand the changes.
10. **Monitor and Review Periodically:** Establish a schedule for regular reviews to ensure the guideline remains up-to-date and continues to meet LADOTD needs over time.

B. Hydraulic modeling and scour analysis (HEC-RAS and Aquaveo SMS)

Hydraulic studies for standard bridges and scour analysis will be completed in accordance with the *LADOTD Hydraulics Manual*. Off-system bridge replacements will be completed in accordance with *LADOTD Hydraulic Design Guidelines for Off-System Bridge Replacement and Rehabilitation Program*

APPROACH

Our Team envisions the workflow and delivery process to follow the LADOTD hydraulics delivery method per type of project.



Arcadis assigned to project team-DOTD PDP Stage 1

Once the need is identified, Arcadis will work with LADOTD within the project delivery process established to scope the design needs and deliverables



Arcadis PM assigns the project to Team-DOTD PDP Stage 3

Depends on the complexity of the project and the type of analysis needed. Arcadis PM will assign the project to a Senior-Junior team



Kickoff Meeting

The assigned team will have a kick-off, risk assessment, and scoping meeting with LADOTD to identify critical or specific project items.



Complete hydraulic design – final plan submittal

Team will submit the final package per Chapter 2 of the 2011 LADOTD Hydraulic Manual



Site visit and PIH submittal

Site visit will be conducted to pick up missing or questionable information, as well as verify hydraulic factors used in analysis. Arcadis will provide a hydraulic site inspection report following site visit, providing any site variances noted from original design.

Arcadis will update the H&H accordingly and submit the PIH.



Complete preliminary hydraulic design and report

Project engineer to perform hydrology and hydraulic model using survey and available information from FEMA and published regression equations.

(2005). In addition, applicable policies, and guidance from FHWA and FEMA will be used as needed.

Based on the results of the models, our hydraulics team will collaborate with roadway and structures teams to determine the low chord, length, and pier placement for the proposed bridge that meets hydraulic design criteria and is the most effective design option. For culverts, the appropriate size, type, and length will be determined as well.

For scour analysis, scour will be analyzed for the 500-yr event or the overtopping storm using HEC-18 and HEC-20 equations. Our team is proficient in calculating scour in different scenarios including cohesive and non-cohesive soils.

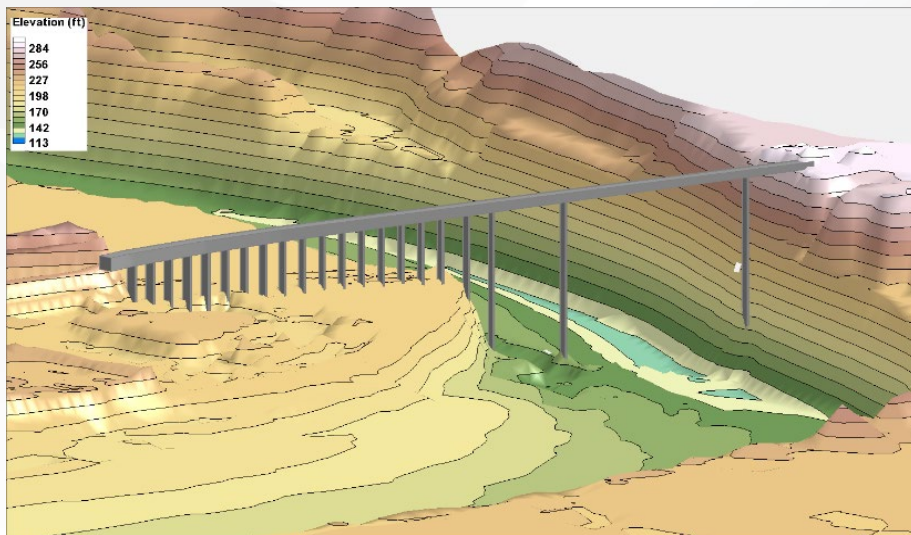


Figure: I-55 was used as one of the case studies by FHWA to update HEC-18

Arcadis will provide monthly progress meetings or reports on the status of all work orders.

For crossings that have FEMA requirements and existing HEC-2 or HEC-RAS models, the team will follow LADOTD and National Flood Insurance Program (NFIP) guidelines for FEMA as follows:

- Effective models will establish the duplicate effective model for the study and conversion to HEC-RAS made if needed. FEMA hydrology will most likely be used for the HEC-RAS analysis.

- Existing bridge/culvert survey and topographic data will be used to update the effective model to a corrected effective model. This also includes any deviation from FEMA hydrology.
- Arcadis will coordinate with roadway and structure groups to establish a bridge concept and proposed conditions model. No-rise assessments or a CLOMR/LOMR will be developed if required by FEMA regulations. See Category C for approach on FEMA Studies.

C. FEMA Technical Reviews

For FEMA technical reviews, our Team is anticipating evaluation of technical documents, plans, or submissions related to FEMA zones and mapping, status of No-Rise and CLOMR/LOMR, and map revisions documents and applications. This review ensures that the submitted materials meet FEMA's NFIP standards, guidelines, and regulations. This also ensures that they are technically sound, compliant with federal requirements, and effective in addressing risks or issues to ensure public safety, promote compliance and improve resiliency.

Led by our Certified Floodplain Managers (CFMs), below are key components of a FEMA technical review that we anticipate:

- Compliance Assessment:** Ensuring the submission adheres to FEMA program requirements, federal regulations, and technical standards.
- Data Accuracy and Validation:** Reviewing the quality and accuracy of technical data (e.g., GIS mapping, engineering calculations, environmental impact assessments).
- Technical Feasibility:** Assessing whether the proposed solution or plan is practical, achievable, and sustainable.
- Risk and Impact Analysis:** Evaluating the potential risks, benefits, and impacts of the submission, including its effect on public safety and community resilience.
- Cost-Effectiveness:** Reviewing the budget and cost analysis to ensure the project provides value for the money.

OUR APPROACH FOR FEMA TECHNICAL REVIEWS

- Submission of Materials:** Applicants submit technical documents, such as plans, maps, or project proposals to the assigned Arcadis Team.

2. **Initial Screening:** Arcadis performs a preliminary assessment to ensure the submission includes all required elements and meets criteria.
3. **Detailed Technical Evaluation:** Arcadis subject matter experts and CFMs review the technical aspects of the submission, including calculations, models, and compliance with FEMA standards.

4. **Feedback and Revisions:** If issues are identified, Arcadis will request clarifications or revisions from the submitting entity.
5. **Approval or Recommendations:** Once the review is complete, Arcadis will submit the revised package to FEMA for approval.

Arcadis' Sample Schedule for this IDIQ contract is below:

		Month																
Scope Category	Task	1	2	3	4	5	6	7	8	9	10	11	12	13				60
Applies to all	Notice to Proceed																	
	Kick-off meeting	★																
Category A: Hydraulic Section Manual Updating	Tasks 1 & 2: Identify the need and review content																	
	Task 3: Gather input from stakeholders																	
	Tasks 4 & 5: Research and verification and compare with DOTD'S																	
	Tasks 6 & 7: Update content and visuals																	
	LADOTD to review draft manual																	
	Arcadis-LADOTD meeting																	
	Task 8: Update manual and submit for LADOTD																	
	LADOTD final review																	
	Tasks 9 & 10: Distribute-Train -Monitor																	
Category B: Hydraulic modeling and scour analysis	Data collection																	
	Preliminary design																	
	LADOTD review																	
	Update and final design																	
	LADOTD review																	
	Final submittal																	
Category C: FEMA Technical Reviews	Task 2: Initial Screening																	
	Task 3: Detailed Technical Evaluation																	
	Task 4: Feedback and revisions																	
	Task 5: Approvals or Recommendations- Submit to LADOTD																	
★	Meeting or a milestone																	
	Performed by Arcadis																	
	Review by LADOTD																	
	By others																	

Firm(s) ALL FIRMS MUST BE REPRESENTED IN THIS TABLE	Discipline	Contract Number and State Project Number	Project Name	Remaining Unpaid Balance
	Traffic	4400029193 / H.004100.5 and H.004100.6	I-10: LA 415 to Essen Lane on I-10 and I-12 (50% of remaining work is complete and invoiced but awaiting payment)	\$1,490,002
		4400019379 / H.013797	LA 30: EBR PL – I-10	\$232,048
		4400024307 / H.015052	I-20: Widening/Ovrly (Vancil Rd-LA 34)	\$43,467
		4400021325 / H.012837.5	I-10 New Orleans Master Plan	\$93,173
		4400023690 / H.015590.5	LA 494: LA 6 To Blanchard Rd	\$194,387
		4400025625 / H.014622.2	St. Nazaire Road Ext: LA 96 – Corne Road	\$190,399
		4400024084 / H.009300.5	CMAR Contract for Hooper Road Widening (LA 3034 – LA 37)	\$12,348
		H.003931	I-10 Calcasieu River Bridge P3 Project (Majority of remaining work to be completed within 1 year)	\$1,800,000
	Road	4400007175 / H.011328.2	I-49 South (Ricohoc to Berwick)	\$269,615
		4400024307 / H.015052	I-20: Widening/Ovrly (Vancil Rd-LA 34)	\$27,459
		4400019010 / H.010116.5	LA 1088: Soult and Trinity Roundabouts	\$33,307
		4400025022 / Multiple State Project Nos	IJJA Off System Bridge Program – Road Task Orders	\$26,082
		H.003931	I-10 Calcasieu River Bridge P3 Project (Majority of remaining work to be completed within 1 year)	\$2,400,000
	ITS	4400025921 / H.015938.1	Transportation Systems Management and Operations (TSMO) Program	\$142,500
		4400029193 / H.004100.5 and H.004100.6	I-10: LA 415 to Essen Lane on I-10 and I-12 (50% of remaining work is complete and invoiced but awaiting payment)	\$335,981
		4400026457 / H.013868.5	ITS MGMT, OPERATIONS, & MAINT	\$504,999
		4400026457 / H.013868.6 (A)	ITS MGMT, OPERATIONS, & MAINT	\$127,748
		4400026457 / H.013868.6 (B)	ITS MGMT, OPERATIONS, & MAINT	\$65,079
		H.003931	I-10 Calcasieu River Bridge P3 Project (Majority of remaining work to be completed within 1 year)	\$420,000

	Environmental	4400009703 / H.000688.2	US 11 Norfolk Southern Railroad	\$3,008
		4400007175 / H.011328.2	I-49 South (Ricochoc to Berwick)	\$926,274
		4400019338 / Multiple State Project Nos	Rural Bridge Replacement Initiative Phase II	\$52,764
		4400009281 / H.009932	US 80 Widening: Vancil Road to Well Road EA	\$5,343
		4400025022 / H.015498.5 Recall 102225	Park Road Over Lagoon	\$35,000
		4400025022 / Multiple State Project Nos	IJJA Off System Bridge Program – Env. Task Orders	\$183,549
		4400025625 / H.014622.2	St. Nazaire Road Ext: LA 96 – Corne Road	\$65,529
		H.003931	I-10 Calcasieu River Bridge P3 Project <i>(Majority of remaining work to be completed within 1 year)</i>	\$480,000
	Bridge	4400029193 / H.004100.5 and H.004100.6	I-10: LA 415 to Essen Lane on I-10 and I-12 <i>(50% of remaining work is complete and invoiced but awaiting payment)</i>	\$730,393
		4400025022 / Multiple State Project Nos	IJJA Off System Bridge Program – Bridge Task Orders	\$20,498
		4400021325 / H.015193.1	LA 22: Tchefuncte Bridge Feasibility	\$4,889
		H.003931	I-10 Calcasieu River Bridge P3 Project <i>(Majority of remaining work to be completed within 1 year)</i>	\$900,000
	CE&I/OV	4400029193 / H.004100.5 and H.004100.6	I-10: LA 415 to Essen Lane on I-10 and I-12	\$365,196
		4400027361 / H.011220.6, H.012901.6, H.010634.6	US 90 Engineering Support	\$261,305
		4400016923 / H.012901.6, H.010634.6	US 90Z (Bodenger Blvd. – Stumpf Blvd.)	\$193,131
		4400025046 / H.013710.6	I-10: US 61 to LaPlace ITS Deployment (CE&I)	\$35,297
		4400025665 / H.013482.6	I-10 WBR Queue Warning System <i>(Waiting on a supplement)</i>	N/A
	Data Collection	4400021325 / H.012837.5	I-10 New Orleans Master Plan	\$5,947
		4400023812 / H.015377.5	Weigh Station Assessment	\$454,079

STAFF CERTIFICATION CHART SUMMARY

Names	Firm	Relevant Certification
Lina Khoury, PE, CPESC, CFM (Meet MPR No. 5)	 ARCADIS	ASFPM Certified Floodplain Manager # US-19-11213 / Exp. 1/2026 Certified Professional in Erosion and Sediment Control No. 9267
Devin Foil, AICP, CFM (Meet MPR No. 5)	 ARCADIS	ASFPM Certified Floodplain Manager # US-19-11124 / Exp. 7/2025
Hilafu Hilafu, PE, CFM	 ARCADIS	ASFPM Certified Floodplain Manager # US-23-12664 / Exp. 7/2025 FHWA-NHI-135095-Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments
Eric Reardon, PE, CFM	 ARCADIS	Certified Floodplain Manager # NC-14-0546 / Exp. 7/2026
Amanda Check, PE (Meets MPR Nos 3 & 4)	 ARCADIS	1D/2D Modeling with HEC-RAS FHWA-NHI-135059-Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments



EnviroCert International, Inc.®
certifies that

Lina S Khoury

Subscribes to the Code of Ethics and Professional Conduct and has met the requirements established for the CPESC® Program as a

**Certified Professional in Erosion and
Sediment Control®**

CPESC® Number: 9267

Certificate Date: February 20, 2019


Jim O'Tousa, EnviroCert Technical Co-Chair


Michael R. Chase, EnviroCert Technical Co-Chair


Robert Anderson, EnviroCert Board President



The CPESC® Certification was established in 1983

**ASSOCIATION OF STATE
FLOODPLAIN MANAGERS, INC.
CERTIFICATION BOARD OF REGENTS**

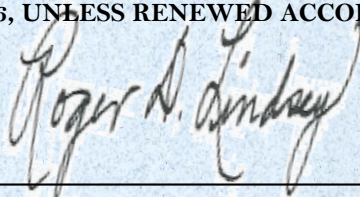
HEREBY CERTIFIES THAT PURSUANT TO THE PROVISIONS OF THE CHARTER FOR THE
CERTIFIED FLOODPLAIN MANAGER PROGRAM

Lina S. Khoury, CFM

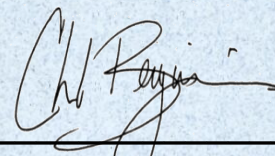
IS DULY REGISTERED AS AN

ASFPM CERTIFIED FLOODPLAIN MANAGER

IN TESTIMONY WHEREOF THIS CERTIFICATE HAS BEEN ISSUED BY THE AUTHORITY OF THE CERTIFICATION
BOARD OF REGENTS, CERTIFICATE NO. US-19-11213, ISSUED 8/2/2019. THIS CERTIFICATE SHALL EXPIRE
1/31/2026, UNLESS RENEWED ACCORDING TO THE RULES OF THIS BOARD.



CERTIFICATION BOARD OF REGENTS
PRESIDENT, ROGER LINDSEY, P.E., CFM



ASSOCIATION OF STATE FLOODPLAIN MANAGERS
EXECUTIVE DIRECTOR, CHAD M. BERGINNIS, CFM



**ASSOCIATION OF STATE
FLOODPLAIN MANAGERS, INC.
CERTIFICATION BOARD OF REGENTS**

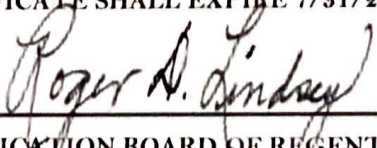
HEREBY CERTIFIES THAT PURSUANT TO THE PROVISIONS OF THE CHARTER FOR THE
CERTIFIED FLOODPLAIN MANAGER PROGRAM

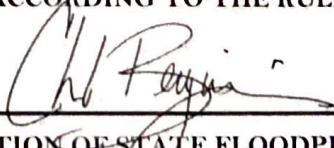
Devin A. Foil, CFM

IS DULY REGISTERED AS AN

ASFPM CERTIFIED FLOODPLAIN MANAGER

IN TESTIMONY WHEREOF THIS CERTIFICATE HAS BEEN ISSUED BY THE AUTHORITY OF THE
CERTIFICATION BOARD OF REGENTS, CERTIFICATE NO. US-19-11124, ISSUED 6/28/2019 THIS
CERTIFICATE SHALL EXPIRE 7/31/2025, UNLESS RENEWED ACCORDING TO THE RULES OF THIS BOARD.


CERTIFICATION BOARD OF REGENTS
PRESIDENT, ROGER LINDSEY, P.E., CFM


ASSOCIATION OF STATE FLOODPLAIN MANAGERS
EXECUTIVE DIRECTOR, CHAD M. BERGINNIS, CFM



**ASSOCIATION OF STATE
FLOODPLAIN MANAGERS, INC.
CERTIFICATION BOARD OF REGENTS**

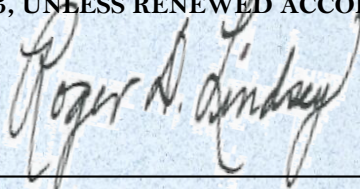
HEREBY CERTIFIES THAT PURSUANT TO THE PROVISIONS OF THE CHARTER FOR THE
CERTIFIED FLOODPLAIN MANAGER PROGRAM

Hilafu T. Hilafu, CFM

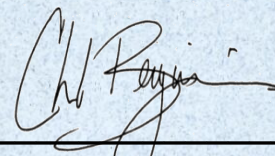
IS DULY REGISTERED AS AN

ASFPM CERTIFIED FLOODPLAIN MANAGER

IN TESTIMONY WHEREOF THIS CERTIFICATE HAS BEEN ISSUED BY THE AUTHORITY OF THE CERTIFICATION
BOARD OF REGENTS, CERTIFICATE NO. US-23-12664, ISSUED 2/18/2023. THIS CERTIFICATE SHALL EXPIRE
7/31/2025, UNLESS RENEWED ACCORDING TO THE RULES OF THIS BOARD.



CERTIFICATION BOARD OF REGENTS
PRESIDENT, ROGER LINDSEY, P.E., CFM



ASSOCIATION OF STATE FLOODPLAIN MANAGERS
EXECUTIVE DIRECTOR, CHAD M. BERGINNIS, CFM





U.S. Department
of Transportation
**Federal Highway
Administration**

National Highway Institute



Certificate of Training

Hilafu Hilafu

has participated in

**FHWA-NHI-135095 Two-Dimensional Hydraulic Modeling of
Rivers at Highway Encroachments**

hosted by

Aquaveo, LLC

Date: November 6-9, 2023

Hours of Instruction: 21

Location: Salt Lake City

Instructor

Instructor

Local Coordinator

Thomas Harman

Thomas Harman, Director
National Highway Institute

NORTH CAROLINA ASSOCIATION OF FLOODPLAIN MANAGERS
NCAFPM



CERTIFIED FLOODPLAIN MANAGER (CFM®) PROGRAM

Accredited by the Association of State Floodplain Managers

IN RECOGNITION OF HAVING MET THE NATIONAL CERTIFICATION REQUIREMENTS, THE BOARD OF DIRECTORS OF THE NORTH CAROLINA ASSOCIATION OF FLOODPLAIN MANAGERS HAS AWARDED THE TITLE OF **CERTIFIED FLOODPLAIN MANAGER** TO

Eric N. Reardon, CFM

IN RECOGNITION THEREOF, THIS CERTIFICATE IS ISSUED THIS DAY 4/30/2014.

This Certificate Shall Expire on 7/1/2026

Certification number NC-14-0546

William R. Tingle

William R. Tingle, CFM
NCAFPM Executive Director

Amit Sachan

Amit Sachan, P.E., CFM
NCAFPM Chair



The logo for Kleinschmidt, featuring the company name in a white, italicized, sans-serif font with a thin white underline, set against a background of overlapping blue, yellow, and green curved shapes.

THIS IS TO CERTIFY THAT:

Amanda Check

Successfully completed **1D/2D Modeling with HEC-RAS**,
the 3 day course that took place September 10 - September 12, 2024.

This course consists of 24 Professional Development Hours.

A handwritten signature in black ink, appearing to read "Chris Goodell", positioned above a horizontal line.

Chris Goodell, PE, D.WRE
Instructor

A handwritten signature in black ink, appearing to read "Ben Cary", positioned above a horizontal line.

Ben Cary, PE, CFM
Instructor





U.S. Department
of Transportation
**Federal Highway
Administration**



National Highway Institute
Certificate of Training

Amanda Check

has participated in

***FHWA-NHI-135059 - Two-Dimensional Hydraulic Modeling
of Rivers at Highway Encroachments***

hosted by

Ohio Department of Transportation

Date: *July 18-20, 2017*

Hours of Instruction: 21

Location: *Columbus, OH*

Instructor

Local Coordinator

Instructor

**Valerie Briggs, Director
National Highway Institute**

21 QA/QC PLAN:

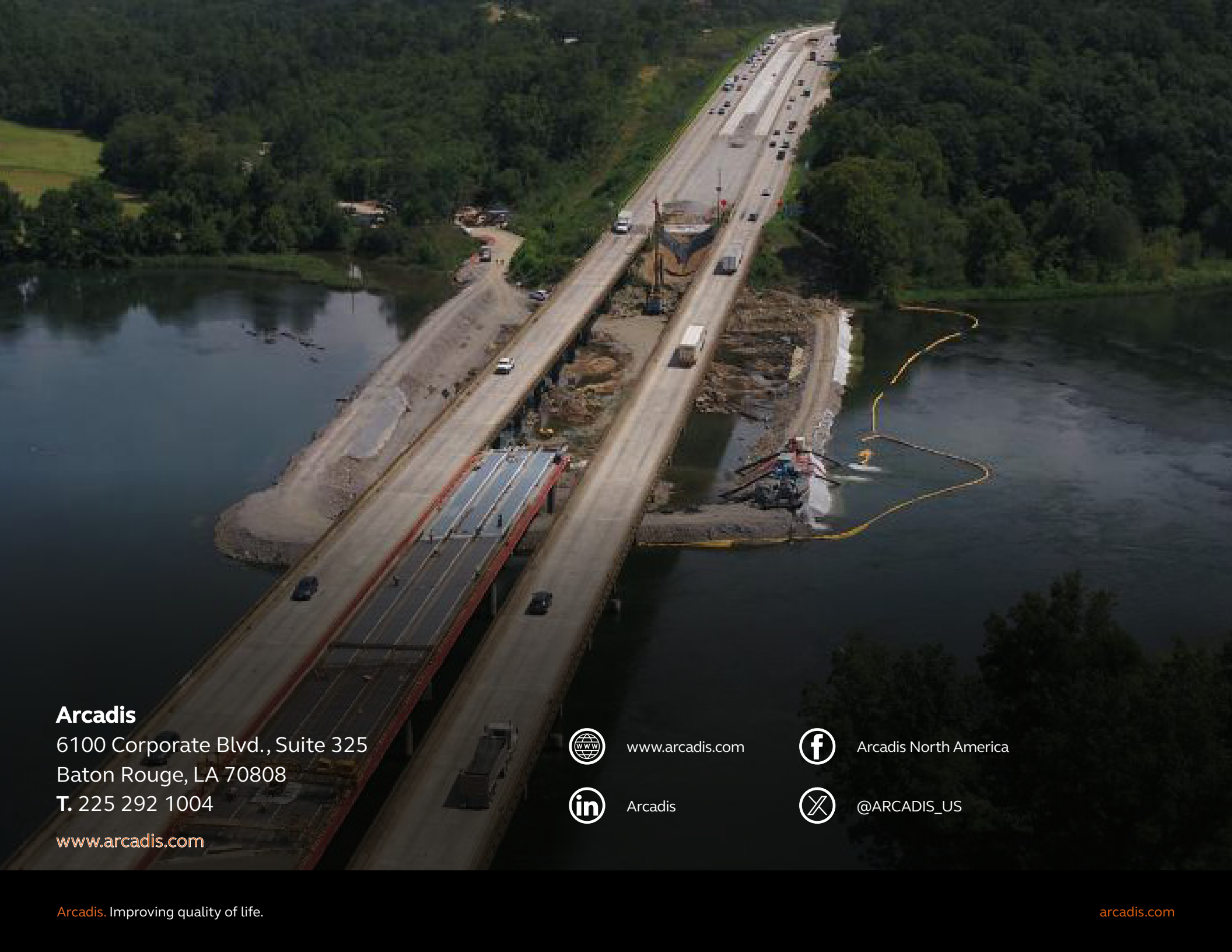
N/A

22 SUB-CONSULTANT INFORMATION:

Firm Name (Name must match exactly as registered with Louisiana's Secretary of State (SOS): including punctuation, include screenshot(s) from SOS at the end of Section 20)	Address	Point of Contact and email address	Phone Number
N/A	N/A	N/A	N/A

23 LOCATION:

N/A



Arcadis

6100 Corporate Blvd., Suite 325
Baton Rouge, LA 70808
T. 225 292 1004

www.arcadis.com



www.arcadis.com



Arcadis North America



Arcadis



@ARCADIS_US