Hazen

MASC Municipal Association of South Carolina℠

Qualifications for Engineering Services for

Various Projects and On Call Services

Municipal Association of South Carolina | October 17, 2022

Hazen and Sawyer
124 Verdae Blvd., Suite 403
Greenville, SC 29607 • 864.867.1088

October 17, 2022

Municipal Association of South Carolina
Attn: Jake Broom
Chief Operating Officer
Colombia, SC
jbroom@masc.sc

Re: Engineering Services for Various Projects and On Call Services

Dear Mr. Broom:

Enclosed are Hazen and Sawyer's qualifications to provide engineering services for the Various Projects and On Call Services. As you review our qualifications, please consider the following assets that our Team and Firm bring to this Project.

Demonstrated Wastewater and Water Focus. Since our beginning in 1951, Hazen has grown and expanded solely within the water and wastewater field. *This focus helps us continue to develop and maintain deep technical staff resources and competence, enabling us to stay abreast of the latest developments and trends in the water and wastewater industry.*

Implementation Experience. You see in our qualifications that our team members have demonstrated success *leveraging implementable solutions, keeping the client informed along the way though dashboard solutions, and using local field staff that have worked in the area and completed difficult, similar projects successfully.*

Funding Strategy Experience. Hazen has extensive experience with projects involving SRF loans, federal appropriations from the EPA, Community Development Block Grants (CDBGs), and funding from the USDA. We understand this project will be funded by American Rescue Plan Act funding. Our relationship with the SC Rural Infrastructure Authority and other funding agency staff will help streamline the funding process. *We are committed to a schedule that meets the requirements of your funding sources.*

Strong Project Management. As our Resource Manager, I will make certain that each project is assigned the appropriate team members based on their areas of expertise. *Our proposed project managers have demonstrated their leadership abilities, attention to detail, and commitment to our clients.*

Hazen brings the "best of both worlds" – quality team members who have a long history performing successful projects, and the expertise to plan and design implementable solutions to ensure the most economical path forward for these upcoming projects. We look forward to your favorable consideration. Please contact me at (864) 867-1089 or kbair@hazenandsawyer.com if you have any questions or need additional information.

Very truly yours,

1011-496

Kevin M. Bair, PE, PLS
Associate

Section 1

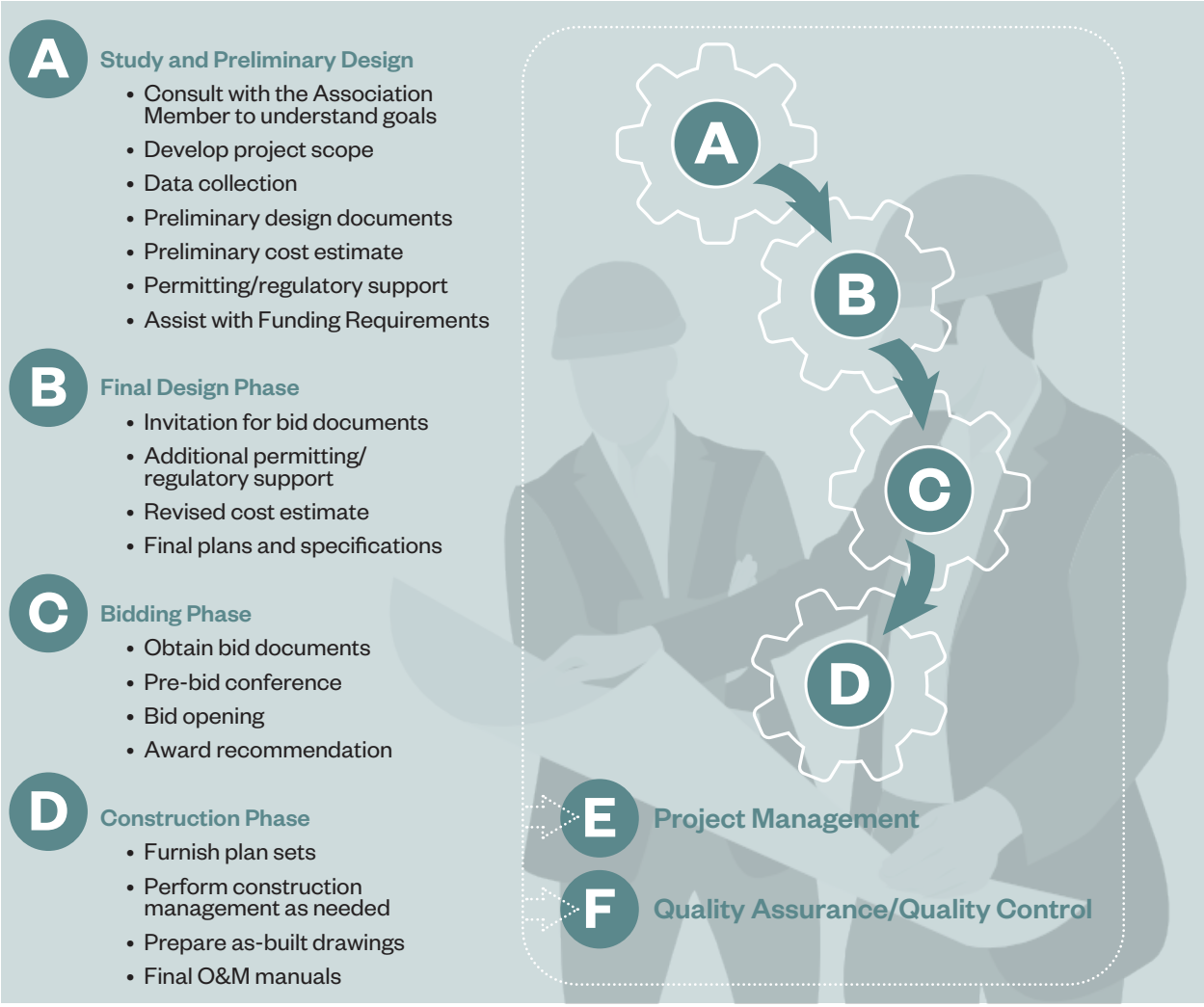
Technical Approach/Understanding

Hazen's approach to term contracts has been refined through years of working with Utilities under similar "on-call" and "as-needed" type contracts.

Hazen and Sawyer understands that this is a term contract for engineering services and we are available and ready to respond to whatever needs the Association Members may have. We understand that the work is typically task-order driven and diverse, and that specific project commitments may not be available at this time.

Project task assignments will consist of professional engineering services including conceptual design/studies/analyses, detailed design, permitting, and construction phase services.

We will approach each task holistically to identify the best project team, and we will work with the Association Member's staff to develop a scope of work, schedule, and quality control requirements to provide a high-quality project that is on time and within budget.



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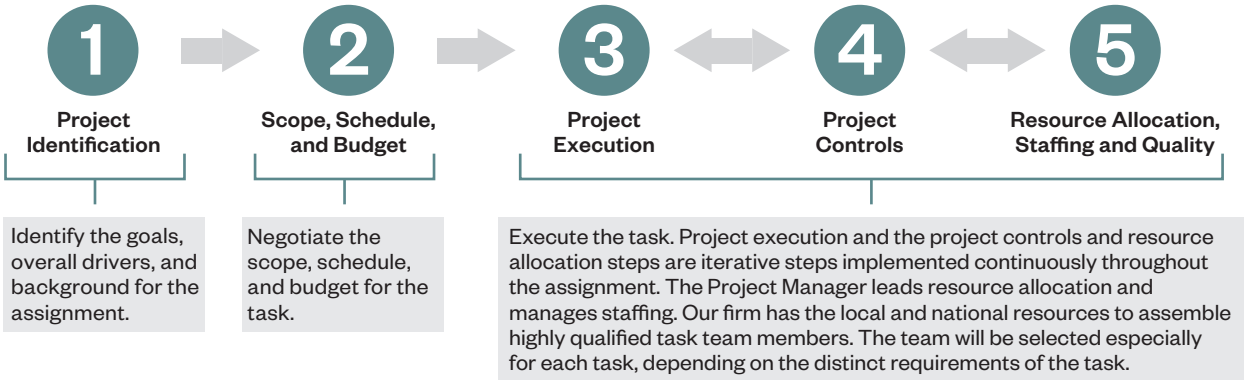
E Project Management

Our general approach to on-call contracts is outlined below. Due to our extensive on-call contract experience, we understand how to execute multiple, concurrent task orders efficiently and with the highest technical quality.

Quality control begins with the selection of the team for each proposed project. For each project, Hazen and Sawyer will identify the right Project Manager and ensure they are present at the initial meeting. Our proposed **Resource Manager**, **Kevin Bair**, will also be present at the initial meeting and will be your resource to track progress.

Project Management Approach



Adaptation of Approach to Project Size

Hazen and Sawyer knows that task order assignments come in various shapes and sizes, and we adapt our delivery approach accordingly. A large assignment will get a full project work plan, whereas a small assignment may entail a simple email relaying relevant details to the project team. Additionally, on smaller assignments, the Project Manager may be the one to execute the assignment, keeping our team small and focused, and keeping engineering costs down.

Hazen and Sawyer is very familiar with the operation, processes, and requirements of local and state agencies as a result of implementing numerous projects for clients in the Carolinas. Our approach to working with regulatory agencies includes the following key components:

Start Early. Early meetings with reviewing agencies greatly facilitate the approval process and reduce the possibility of costly redesign later.

Know the System. We have established relationships and an understanding of submittal requirements that ensure timely review of applications and have developed checklists to ensure compliance.

Maintain Credibility. Staying active in professional organizations allows Hazen to get to know regulators and stay up to date on existing and anticipated regulatory requirements.

F QA/QC

The Project Manager will be responsible for seeing that Hazen QA/QC policies are carried out. Informally, all team members are responsible for checking their work as engineering professionals. The Project Manager checks the deliverables to ensure they satisfy the scope of work, meet the project quality standards and the Association Member's preferences, and clearly define the scope of work for the contractors bidding the project. The Project Manager will also check the deliverables to ensure they are technically sound, are coordinated between disciplines, represent cost-effective approaches to meeting the intent of the project, and are constructible.

Quality assurance is a continuous process and individual mindset throughout the design project, but quality assurance measures will be performed at key project delivery milestones, as appropriate for each individual task order. Hazen's comprehensive experience with on-call contracts, combined with our proven approach to this type of work, ensures the overall economy and effectiveness of this contract. In addition, our suite of in-house support disciplines bolsters our proposed team and ensures we deliver superior service on every task.

Proactive Approach to Managing Risks

The three steps we follow for risk management of tasks for On-Calls are shown below, and they revolve around the Project Manager's attention to the contractual details of each assignment.

STEP 1

Preparation of monthly progress reports, identification of issues and potential scope variances, and discussion of these with the Association Member's Project Manager

STEP 2

Preparation of monthly contract summary tables that summarize the status of all active tasks, with each task addressed in one concise line to provide easy overview

STEP 3

Attendance at quarterly meetings with the Association Member to review key issues and overall On-Call status

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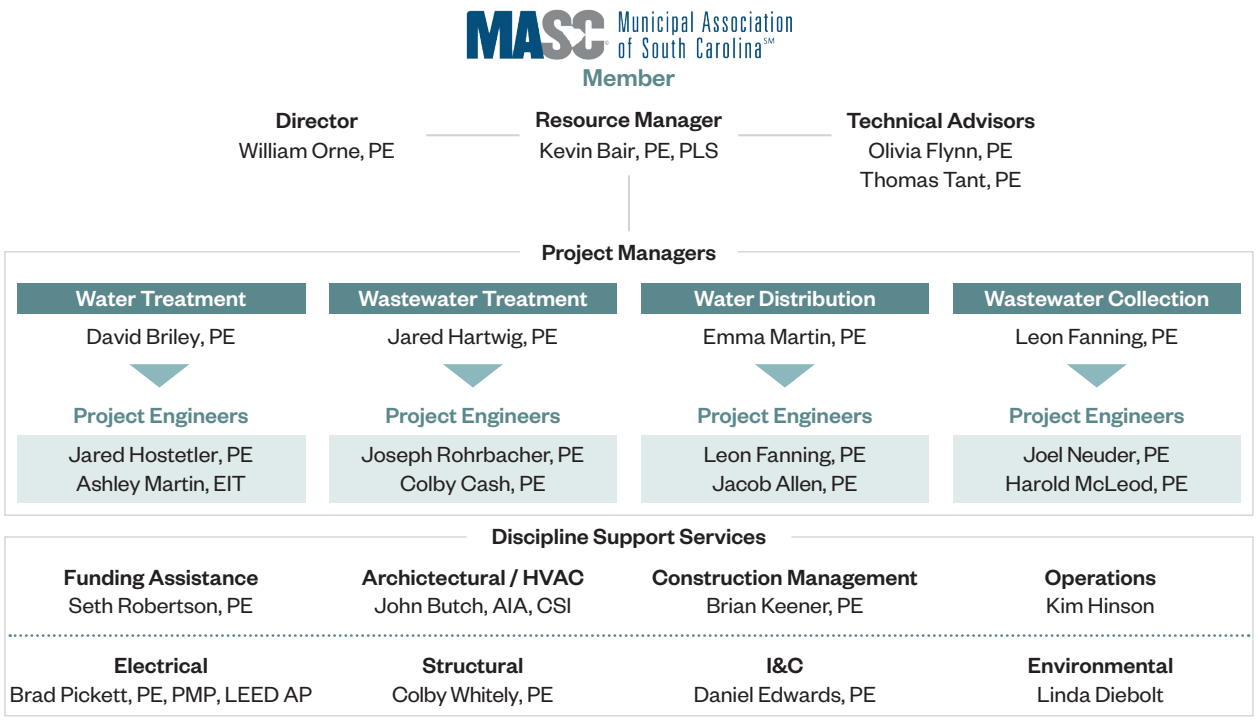
Section 2

Work Management Plan/Personnel Experience

Hazen brings a proven local team with exceptional relevant experience delivering water and wastewater projects and securing funding for our clients.

Our proposed organizational chart is presented below. Our team is led by **Bill Orne, PE**, an owner in the firm with full authority to allocate resources to your projects, and **Kevin Bair, PE**, an expert in the modeling, analysis, design, and replacement/rehabilitation of water and wastewater conveyance projects and an experienced manager. This strong management team is supported by engineers with expertise in the areas of service necessary to deliver superior projects for the Association Members.



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William Orne, Jr, PE, Senior Associate

Mr. Orne is an experienced manager, with over 20 years of experience directing and managing projects in the Carolinas.

His comprehensive experience includes sanitary sewer evaluation studies; collection system design, rehabilitation, and replacement; and sanitary sewer modeling. Mr. Orne has served as Project Director, Manager, or Technical Advisor for some of the largest utilities in the state. He is an owner in the firm with authority to allocate resources to your projects; he will ensure you receive the exceptional service that characterizes Hazen and Sawyer.

- McDonald School Force Main Project, Georgetown County, SC
- SSES Crane Creek 02 and 04 Basins, City of Columbia, SC
- Rock Creek Interceptor Upgrade, ReWa, SC
- Water and Sewer Relocations, City of Columbia, SC
- Force Main Condition Assessment Program, ReWa, Greenville, SC

Experience: 30 years
Location: Columbia, SC
Education
MEnvE, BSCE
Certification/License
Professional Engineer: SC, GA, VA

Kevin Bair, PE, PLS, Associate

Mr. Bair will serve as Resource Manager and will be the primary point of contact for the Association Members.

He will be responsible for schedules and budgets, providing technical advisory services, coordinating the project team, and ensuring all project deliverables undergo Hazen's QA/ QC process. He is a seasoned and adept Project Manager with a commitment to good communication and attention to detail. Mr. Bair is an expert in the modeling, analysis, design, and replacement/rehabilitation of water and wastewater conveyance projects. He is located in our Greenville, SC office and is easily available for meetings and site visits.

- Pump Station Renovations, Berkeley County, SC
- Lake Marion Regional Water System, Santee, SC
- CDBG Eastwood Acres Sewer, City of Orangeburg, SC
- Hanahan Wastewater Improvements, Berkeley County, SC
- Lower Crane Creek Equalization Storage, Columbia, SC
- Lake Moultrie Regional Water System, Moncks Corner, SC

Experience: 31 years
Location: Greenville, SC
Education
MSCE, BSCE
Certification/License
Professional Engineer: SC, NC, FL
Professional Land Surveyor: SC
Occupational Safety & Health Administration

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Thomas Tant, PE, Vice President

Experience: 34 years
Location: Raleigh, NC
Education
MCE, BSCE
Certification/License
Professional Engineer: NC, NY, VA, MD, TX, DC

Mr. Tant is the Mid-Atlantic Conveyance Group Lead for Hazen and Sawyer and an expert in the planning, routing, design, rehabilitation, and construction of water and wastewater conveyance systems.

He has served as Technical Advisor for our most complex conveyance projects in the region. His experience ranges from planning and designing pipes and mains in urban and environmentally sensitive environments to designing and installing large force mains over miles of terrain. His projects have included rehabilitation; trenchless railroad crossings; jack-and-bore crossings of railroads, highways, and streams; directional drills; siphons; and subaqueous terminations. He has extensive experience in both water and wastewater pumping and has designed everything from small booster pumps to large raw, finished, and wastewater pumping stations, as well as elevated storage.

- Outfall A and G Sewer Rehabilitation, Roanoke Rapids Sanitary District, Roanoke Rapids, NC
- Army Base 24-Inch and 20-Inch Transmission Main Replacements HRSD, Norfolk, VA
- East Durham Water, Sewer, and Stormwater Rehabilitation and Replacement, City of Durham, NC
- Occoquan River Crossing, Fairfax Water, VA
- Hillsborough Street Water Transmission Main, Raleigh Water, NC

Olivia Flynn, PE, Senior Associate

Location: Charleston, SC
Experience: 17 years
Education
MSEnvE, BSCheE
Certification/License
Professional Engineer: SC

Ms. Flynn is an expert in the assessment, planning, permitting, and design of water and wastewater treatment, storage, and conveyance projects.

She is the Operations Manager for Hazen's Charleston Branch Office and has managed projects or served as Technical Advisor for several of Hazen's large local clients, including Berkeley County Water & Sanitation, Charleston Water System, and Dorchester County. Her experience includes collection and distribution, pumping, and treatment facilities for water and wastewater systems; storm water drainage and pollution prevention plans; and various civil site projects.

- Plum Island WPCP Phase 3 Improvements, Charleston Water System, SC
- Pump Station 094 Upgrade, Berkeley County, SC
- Lower Dorchester WWTP Expansion and Improvements, Dorchester County, SC
- Chelsea WTP Optimization Study, BJWSA, SC

David Briley, PE, Associate Vice President

Mr. Briley is an expert in water quality and water treatment design; he has worked on over 50 WTPs throughout the country.

Experience: 24 years
Location: Raleigh, NC
Education
MSCE, BS
Certification/License
Professional Engineer: NC

He specializes in conventional and advanced treatment technologies and is one of Hazen's leads on PFAS contaminants and treatment technologies. His experience includes process design, hydraulic design, condition assessment, and physical and chemical processes.

- Robert E. Hemphill WFP Expansion, Chester Metro District, SC
- GUC WTP Phase 1 Upgrades, Greenville Utility Commission, NC

Jared Hartwig, PE, Senior Associate

Mr. Hartwig serves as the Mid-Atlantic Lead for Preliminary Treatment and specializes in the planning, hydraulic analysis, and design of wastewater treatment facilities.

Experience: 17 years
Location: Charleston, SC
Education
BSCE
Certification/License
Professional Engineer: SC

He has worked for major clients throughout the region. His experience includes hydraulic analysis, preliminary treatment facility design, solids handling, filtration, and construction administration.

- Plum Island WPCP Phase 4 Improvements, Charleston Water System, Charleston, SC
- Lower Dorchester WWTP Expansion and Improvements, Dorchester County, SC

Emma Martin, PE, Associate

Ms. Martin specializes in the modeling, analysis, design, permitting, and construction of water and sewer conveyance projects.

Experience: 16 years
Location: Charleston, SC
Education
BSCE
Certification/License
Professional Engineer: SC

Her experience also includes condition assessment, facility planning, life cycle cost and alternatives analyses, CIP development, and construction administration.

- Water Distribution Modeling, Lake Marion Regional Water Agency, Santee, SC
- Wastewater System Model and Master Plan Update, Renewable Water Resources, Greenville, SC

Leon Fanning, PE, Associate

Mr. Fanning is experienced in the design and construction administration of wastewater treatment and conveyance projects.

Experience: 39 years
Location: Charleston, SC
Education
BSCE
Certification/License
Professional Engineer: SC

His experience includes preliminary engineering, detailed design, and construction management for the Pump Station 060 Replacement project for Berkeley County, His experience also includes pipeline design, grading and drainage plans, pipeline inspection, permitting, and surveying.

- Crane Creek Wet-Weather Storage, City of Columbia, SC
- Pump Station 060 Replacement, Berkeley County, SC

Jared Hostetler, PE - Water Treatment Project Engineer

Experience:	Location:	Education:	Certification/License:
10 years	Raleigh, NC	BSCE	Professional Engineer: NC, SC

- Chelsea and Purrysburg WTPs Taste and Odor Study, BJWSA, SC
- Hanahan WTP-Filter Rehabilitation, Charleston Water System, SC

Ashley Martin, EIT - Water Treatment Project Engineer

Experience:	Location:	Education:	Certification/License:
2 years	Greenville, NC	MSE, BSEnvE	N/A

- Robert E. Hemphill WFP Expansion, Chester Metro District, SC
- Lake Marion Regional Water System, Santee, SC

Joseph Rohrbacher, PE - Wastewater Treatment Project Engineer

Experience:	Location:	Education:	Certification/License:
23 years	Charleston, SC	MEE, BSEnvE	Professional Engineer: NC, SC, FL, NY

- Plum Island WWTP Expansion, Charleston Water System, SC
- Lower Berkeley WWTP Aeration Systems Improvement Project, Berkeley County, SC

Colby Cash, PE - Wastewater Treatment Project Engineer

Experience:	Location:	Education:	Certification/License:
8 years	Greenville, SC	MSEnvE, BSCE	Professional Engineer: SC

- Plum Island Phase 4 Improvements, Charleston Water Systems, SC
- Lower Reedy WRRF NPW Pump System Replacement, ReWa, SC

Jacob Allen, PE - Water Distibution Project Engineer

Experience:	Location:	Education:	Certification/License:
5 years	Greenville, SC	BSCE	Professional Engineer: SC

- Lake Marion Regional Water System, Santee, SC
- James E. Quarles Plant 1 Replacement Project, Cobb County-Marietta Water Authority, GA

Joel Neuder, PE - Wastewater Collection Project Engineer

Experience:	Location:	Education:	Certification/License:
5 years	Greenville, SC	MSEnvE, BSCE	Professional Engineer: SC

- Rock Creek Interceptor Upgrade, ReWa, Greenville, SC
- Pelham WRRF Primary Sludge Pumping Station Improvements, ReWa, SC

Harold McLeod, PE - Wastewater Collection Project Manager

Experience:	Location:	Education:	Certification/License:
18 years	Columbia, SC	BSCE	Professional Engineer: SC

- Hwy 301 water and sewer relocation project, Orangeburg DPU, SC
- Sewer Systems Rehab, Blue Granite Water Company, Various Locations, SC

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Seth Robertson, PE - Funding Assistance

Experience:	Location:	Education:	Certification/License:
24 years	Raleigh, NC	BSEE	Professional Engineer: NC

- Hazen's Corporate Infrastructure Funding Leader
- Managed submittal of 54 successful applications for funding for water infrastructure projects in 2019-2021

John Butch, AIA, CSI - Architectural / HVAC

Experience:	Location:	Education:	Certification/License:
43 years	Greenville, SC	MArch, BPreArch	Licensed Architect: SC, OH

- Manchester Creek WWTP Headworks Replacement Project, City of Rock Hill, Rock Creek, SC
- Robert W. Hemphill WTF, Chester Metropolitan District, SC

Brian Keener, PE - Construction Management

Experience:	Location:	Education:	Certification/License:
32 years	Charleston, SC	MSCE, BSCE	Professional Engineer: SC

- Lower Dorchester WWTP Improvements, Dorchester County, SC
- West Ashley Sewer Tunnel Replacement, Charleston Water System, SC

Kim Hinson - Operations

Experience:	Location:	Education:	Certification/License:
40 years	Charlotte, NC	BS	NC Grade IV WW Operator

- Metro WWTP Operations Assistance, City of Columbia, SC
- Wastewater Treatment Operations Assistance, Union County, NC

Brad Pickett, PE, PMP, LEED AP - Electrical

Experience:	Location:	Education:	Certification/License:
17 years	Raleigh, NC	BSEE	Professional Engineer: NC, SC, VA, FL, CA

- Plum Island WPCP Phase 3 Improvements, Charleston Water System, SC
- GUC WTP Phase 1 Improvements, GUC, Greenville, NC

Colby Whiteley, PE - Structural

Experience:	Location:	Education:	Certification/License:
16 years	Charlotte, NC	MSCE, BSCE	Professional Engineer: NC, SC

- Lower Reedy WRRF Digester Improvements, ReWa, SC
- Chelsea WTP Raw Water Intake, BJWSA, SC

Daniel Edwards, PE - Instrumentation & Control

Experience:	Location:	Education:	Certification/License:
37 years	Raleigh, NC	ME, BSCE	Professional Engineer: NC, VA, FL, DC, MD, GA, MI, OH, TX, TN, MA, AZ

- Plum Island Phase 4 Improvements, Charleston Water Systems, SC
- Manchester Creek WWTP Expansion, Rock Hill, SC

Linda Diebolt - Environmental

Experience:	Location:	Education:	Certification/License:
35 years	Raleigh, NC	BS	N/A

- Harleyville Reach Water Transmission Main, Lake Marion Regional Water Agency, Harleyville, SC
- Plum Island Transmission Line Relocation, Charleston Water System, SC

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Section 3

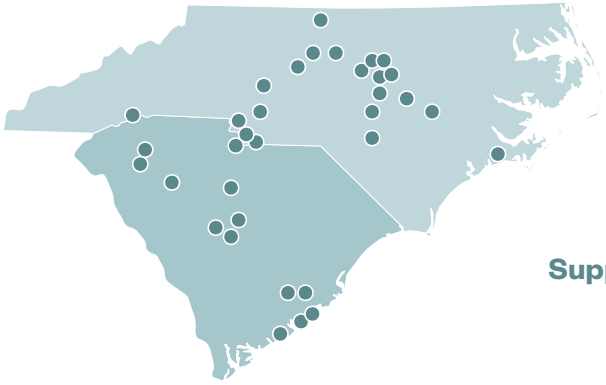
Experience of the Firm

Our extensive experience with on-call engineering contracts will allow us to efficiently serve the Association Members for this program.

Hazen currently has "on-call" type engineering service agreements with many large and small municipalities and authorities in the Carolinas. The majority of theses agreements have been in place for some time and have been renewed multiple times.

The figure below illustrates the extent of our on-call contract experience in the Carolinas, headquartered in Raleigh. We understand the diverse nature of assignments under on-call contracts and have the breadth of resources to respond effectively to any needs that arise. Hazen's extensive experience with on-call engineering contracts will allow us to efficiently serve the Association Members for this program.

Hazen's Carolina On-Call Service Agreements



Hazen's significant on-call experience means we understand how to execute multiple, concurrent task orders efficiently and with the highest technical quality.

Supporting Over **30 On-Call Contracts** in the Carolinas

Tables and Graphics demonstrating our significant experience in relevant areas of service follows.

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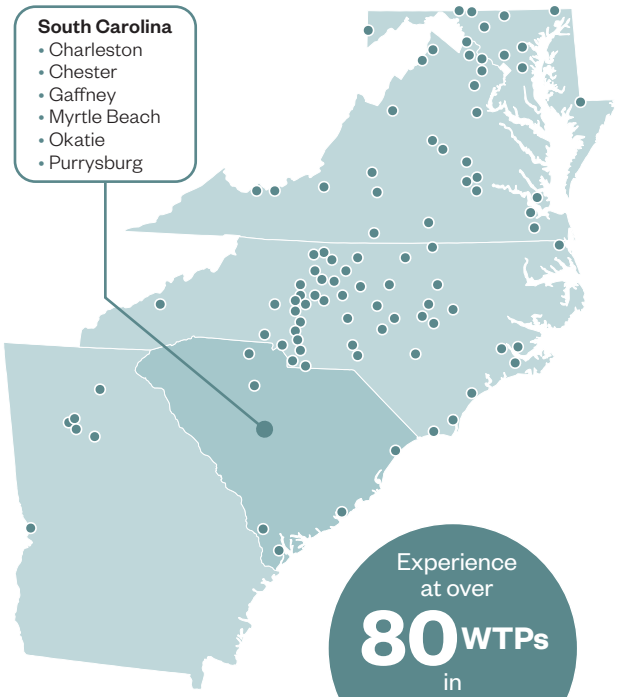
Water and Wastewater Treatment

Our services for clients range from process and hydraulic modeling, studies, and preliminary engineering reports to detailed design and construction administration of wastewater plant improvements and upgrades. Some of our South Carolina clients include Beaufort-Jasper Water and Sewer Authority, Renewable Water Resources (ReWa), Charleston Water System, City of Columbia, Grand Strand Water and Sewer Authority, City of Rock Hill, and Dorchester County.

Wastewater Treatment Plant Experience

Facility	Location	Capacity
Columbia Metro WWTP	Columbia, SC	60 mgd
Lower Berkeley WWTP	Goose Creek, SC	18 mgd
Upper Berkeley WWTP	St Stephen, SC	3 mgd
Plum Island WPCP	Charleston, SC	34 mgd
Daniel Island WWTP	Charleston, SC	1 mgd
Grove Creek WWTP	Greenville, SC	2 mgd
Gilder Creek WRRF	Greenville, SC	11.3 mgd
Marietta WRRF	Greenville, SC	0.7 mgd
Lower Reedy WRRF	Greenville, SC	11.5 mgd
Piedmont Regional WRRF	Greenville, SC	4 mgd
Mauldin Road WRRF	Greenville, SC	29 mgd
Lower Dorchester WWTP	Dorchester Co., SC	8 mgd
Cherry Point WRF	Beaufort, SC	7.5 mgd
Wilson Creek WWTP	Greenwood, SC	12 mgd
West Alexander WWTP	Greenwood, SC	2.2 mgd
Lancaster WWTP	Lancaster, SC	7.5 mgd
Summerville WWTP	Summerville, SC	10 mgd
South Tyger River RWFT	Spartanburg, SC	1 mgd
Conway WWTP	Conway, SC	4 mgd
Manchester Creek WWTP	Rock Hill, SC	20 mgd
Schwartz WWTP	Myrtle Beach, SC	19.35 mgd
Mallard Creek WWTP	Charlotte, NC	12 mgd
Sugar Creek WWTP	Charlotte, NC	20 mgd
Tallwood PTP	Union County, NC	50K gpd
Grassy Branch PTP	Union County, NC	50K gpd
North Durham WRF	Durham, NC	20 mgd
South Durham WRF	Durham, NC	20 mgd
High Point Eastside WRF	High Point, NC	26 mgd
T.Z. Osborne WWTP	Greensboro, NC	40 mgd

Water Treatment Plant Experience



Experience at over **80 WTPs** in **VA, MD, DC, NC, SC, GA**

Designed upgrades at **25 WTPs** in last **5 Years** alone

Over **1.1 BGD WTP CAPACITY**

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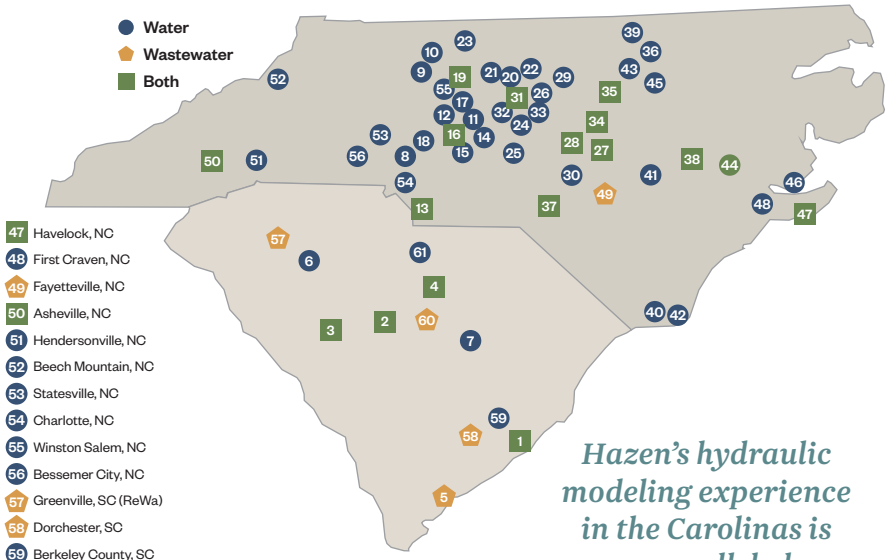
Water Distribution and Wastewater Collection

Hazen and Sawyer brings demonstrated success in the planning, modeling, design, rehabilitation, and construction of water and wastewater conveyance facilities. Hazen's experience in conveyance systems covers the full range of services. This experience includes initial planning, hydraulic modeling, preliminary and detailed design, and construction management.

Modeling Experience in the Carolinas

1 Georgetown County, SC
2 Columbia, SC
3 Lexington, SC
4 Fairfield County, SC
5 Beaufort Jasper, SC
6 Laurens County, SC
7 Santee Cooper, SC
8 Landis, NC
9 Yadkin County, NC
10 Mount Airy, NC
11 Jamestown, NC
12 Davidson Water, NC
13 Union County, NC
14 Archdale, NC
15 Lexington, NC
16 Highpoint, NC
17 Thomasville, NC
18 Salisbury, NC
19 Greensboro, NC
20 Elon, NC
21 Gibsonville, NC
22 Burlington, NC
23 Reidsville, NC
24 Sanford, NC
25 Fort Bragg, NC
26 Graham, NC
27 Garner, NC
28 Cary, NC
29 Mebane, NC
30 Holly Springs, NC
31 Chapel Hill, NC
32 Hillsborough, NC
33 Durham, NC
34 Raleigh, NC
35 Wake Forest, NC
36 Henderson, NC
37 Harnett County, NC
38 Goldsboro, NC
39 Roanoke Rapids, NC
40 Brunswick County, NC
41 Johnston County, NC
42 Wilmington, NC
43 Rocky Mount, NC
44 Greenville, NC
45 Halifax, NC
46 Pamlico County, NC
47 Havelock, NC
48 First Craven, NC
49 Fayetteville, NC
50 Asheville, NC
51 Hendersonville, NC
52 Beech Mountain, NC
53 Statesville, NC
54 Charlotte, NC
55 Winston Salem, NC
56 Bessemer City, NC
57 Greenville, SC (ReWa)
58 Dorchester, SC
59 Berkeley County, SC
60 East Richland Public Service District, SC
61 Chester Metropolitan District, SC



Hazen's hydraulic modeling experience in the Carolinas is unparalleled.

Gravity Sewer/Force Main Design Experience

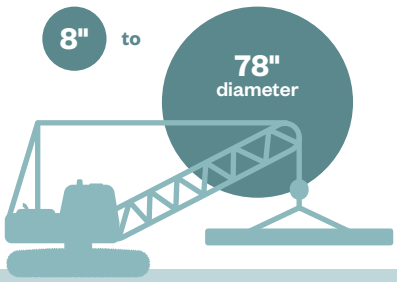
Client/Location	Diameter (in)	Total Length (LF)
BCWS, Summerville, SC*	16	160
BCWS, Moncks Corner, SC*	24	12,500
BCWS, Goose Creek, SC	18	9,200
GCWSD, Georgetown, SC*	16	1,500
CWS, Charleston, SC*	8 - 48	8,900
City of Columbia, SC	36	950
ReWa, Greenville, SC	12-42	22, 500
Union County, NC	8-30	51,900
Brunswick County, NC*	12 - 24	20,000
Charlotte Water, Charlotte, NC	18 - 36	112,450
City of Durham, NC	30	15,000
City of Greensboro, NC	24 - 54	62,100
GUC, Greenville, NC	20 - 48	88,300
Johnston County, NC	8 - 24	40,000
City of Raleigh, NC	16 - 30	24,400
Western Wake Partners, NC	24 - 54	109,000
WSACC, Concord, NC	30 - 78	155,000

Hazen's team of highly responsive professionals has performed sewer assessment and rehabiliation

of over **730,000 LF**

0 100 200 300 400 500 600 700

of sewer ranging from



** Denotes projects with sand and corrosive soils with a high water table*

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Wastewater Pump Station Design Experience

Client/Location	Project	Capacity (mgd)
BCWS, Berkeley County, SC	Pump Station 060 Replacement Pump Station 094 Upgrade Mount Holly Commerce Park Improvement - Phase 1	5.0 8.0 7.5
City of Columbia, SC	Metro IPS	150
ReWa, Greenville, SC	Ravenwood Pump Station Marietta WRF Improvements	3.6 2.4
City of Columbia, SC	Crane Creek Storage Pump Station	25
Charleston Water System, SC	Plum Island (WPCP) Pump Station Thomas Island Pump Station	13 1.7

Water Transmission/Distribution Main Design Experience

Client	Project	Length / Size
GCWSD, SC*	REB III Water Transmission Main	19,000 LF - 18"
Santee Cooper, SC* +	7 Separate Construction Contracts	238,500 LF - 16"/36"
City of Concord, NC	Downtown Water Main Replacement	2,200 LF - 12"/18"
Davidson Water, NC	Hasty Level Road Water Main Replacement	30,000 LF - 12"/16"
City of Greensboro, NC	Randleman Feeder Main	45,000 LF - 24"/30"
PWC Fayetteville, NC* +	Fort Bragg Water Line	30,000 LF - 12"/16"
City of Raleigh, NC+	Falls of Neuse Road Water Main	15,000 LF - 24"
Union County, NC+	Potters Road Water Line Improvements	34,000 LF - 12"/16"
Charlotte Water, NC+	Vest WTP Yard Piping Arrowood/Sulkirk Water Main Replacement	1,000 LF - 8"/48" 27,000 LF - 24"

** Denotes projects with sand and corrosive soils with a high water table*
+ Denotes projects with restrained-joint DIP

Booster Pump Station Experience

Project Name	Owner	Pump Type	Capacity
Fairview Area Pump Station	City of Asheville, NC	Horizontal	1 mgd
Rolesville Booster Pump Station	City of Raleigh, NC	Vertical	5 mgd
Highway 55 Booster Pump Station	City of Durham, NC	Veritcal	4 mgd
E.M. Johnson WTP Distribution Pumps	City of Raleigh, NC	Vertical	50 mgd
Brown WTP Distribution Pumps	City of Durham, NC	Horizontal	30 mgd
Spring Lake Booster Pump Station	Fayetteville PWC, NC	Vertical	10 mgd
Clifton Road Booster Pump Station	City of Greensboro, NC	Horizontal	6 mgd
Manassas Soutside Booster Pump Station	Prince William County, VA	Horizontal	8 mgd
Montclair South Booster Pump Station	Prince William County, VA	Horizontal	2.9 mgd
Brambleton Booster Pump Station	Loudoun Water, VA	Horizontal	11.5 mgd
Dulles North Booster Station	Loudoun Water, VA	Vertical	30 mgd
Route 643 Booster Pump Station	Town of Leesburg, VA	Horizontal	2.5 mgd
Forest Park Booster Pump Station	Prince William County, VA	Horizontal	2 mgd

Highlights of 8 projects completed in the last 3 years follow.

Plum Island Water Pollution Control Plant Phase 3 Improvements

Charleston, NC

Reference
Russell L. Huggins, Jr.
Director of Engineering
Charleston Water System
103 St. Philip Street
Charleston, SC 29403
(843) 727.6879
hugginsrl@charlestoncpw.com

Hazen designed the original Plum Island WPCP in 1964 and has served as the engineer of record ever since.

Services provided by Hazen since construction of the original plant include expansion to 36 mgd, master planning, studies, design, permitting, and construction administration and observation. Recent projects include:

Phase 3 Capital Improvements Project: Hazen design and performed CM services for the $61 M project, including a 150-mgd headworks facility, two primary clarifiers, BNR modifications, one final clarifier, and a power generation facility.

Metropolitan WWTP Anaerobic Digester Rehabilitation

Columbia, South Carolina

Reference
Frank Eskridge
Director of Utility Operations
City of Columbia
1136 Washington Street, 7th Floor
Columbia, SC 29217
(803) 476-0958
william.eskridge@columbiasc.gov

Hazen has been working with the City of Columbia at the 60-mgd Metropolitan WWTP for over 15 years, helping the City plan and design wastewater infrastructure to address aging facilities and treat increasing flow.

Services provided by Hazen since construction of the original plant include New 150-mgd influent pump station and preliminary treatment facility, liquid and solids train master plans, an operational assistance. Recent projects include:

Anaerobic Digester Rehabilitation: Hazen designed rehabilitation of the five anaerobic digesters. Improvements included new floating covers, heat exchangers, waste gas flares, and digester mix systems.

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Phase 1 WTP Upgrades

Greenville, North Carolina

Reference
David Springer
Asst. Director for Water Resources / Plants Engineer
Greenville Utilities Commission
P.O. Box 1847
Greenville, NC
(252) 551-1553
springerdw@guc.com

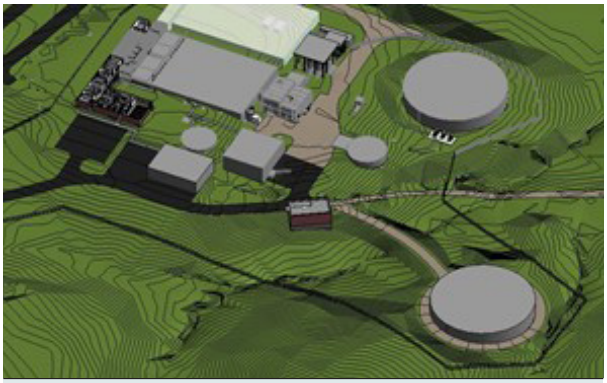
Phase 1 Upgrades expand firm capacity from 19 to 32 mgd and position GUC for future expansion; the project includes SRF and WIFIA funding and is being delivered by CMAR.

Final design includes upgrades to raw water pumping, clearwell pumping, chemical facilities, and high service pumping facilities. The new treatment train includes a new rapid mix facility and a new SuperPulsator. New deep bed filters allow for conversion to BAF.

As part of the WTP expansion project, with an estimated construction cost in excess of $45M, Hazen assisted GUC in identifying, applying for, and obtaining $40M from SRF and $29M from WIFIA.

Robert W. Hemphill WFP Expansion Preliminary Engineering Study

Chester, South Carolina



Reference
Fred Castles, III, PE
Executive Director
Chester Metropolitan District
155 Wylie Street
Chester, SC 29706
(803) 385-5123
fcastles@chestermetrosc.com

Hazen evaluated the 7.2-mgd Robert W. Hemphill WTF and worked with CMD to increase capacity to 10.8 mgd without adding new basins and filters; major improvements to the administrative facilities were also part of the project.

Hazen developed a strategy to achieve 10.8 mgd capacity without major additions by enhancing WTF hydraulics and flocculation. The study included: Regulatory Considerations; Plant Stress Test Evaluation; Raw Water and High Service Water Pump Station Analyses; Emergency Operation Analysis; Clearwell Storage; Chemical Systems; Residuals Management; Electrical System and SCADA Upgrades.

The improved Administrative Building includes additional offices, conference and meeting area, updated laboratory, separate Operator's Control Room, new Break Room, additional storage, and facilities for use during crisis events.

Santee Reach Water Transmission Main

Moncks Corner, South Carolina

Reference
Brian Lynch
Manager – Water Systems
Santee Cooper
817 Water Plant Drive
Moncks Corner, SC 29461
(843) 761-8000, ext. 2801
brian.lynch@santeecooper.com

As part of the LMRWA project, the Santee Reach Water Main project included 8,500 feet of 36-inch diameter and 5,000 feet of 30-inch ductile iron water main.

Hazen designed a regional water system capable of providing finished water to six counties in the South Carolina Lowcountry, along the Interstate 95 corridor.

This project includes a bored crossing of State Highway 6 and CSX Railroad and a 310-foot-long crossing of Interstate 95 through 48-inch diameter steel casing. The pipeline was installed through several wetlands areas using BMPs.

Air Park Booster Pump Station

Greensboro, North Carolina

Reference
Brian Boyd
Project Manager
City of Greensboro
2602 S. Elm-Eugene Street
Greensboro, NC 27406
(336) 373-2055
brian.boyd@greensboro-nc.gov

Hazen modeling and master planning identified system deficiencies and recommended a new pump station to increase firm capacity and reliability in the pressure zone.

Hazen modeled pressure zone operational scenarios to help plan, size, and site the Air Park booster pump station to overcome deficiencies in the system. The new Airpark Booster Pump Station will boost water from the 1070 to the 1120 pressure zone to overcome deficient pumping capacity in the 1120 pressure zone. Due to the turn down requirements of the pump, Hazen recommended three split case horizontal pumps to provide a range of flow (1.1-1.7 mgd) to meet all system demand curves and to meet the build out requirements. The pump station design includes surge study to protect the distribution piping, a chlorination unit for water quality adjustments and building design to accommodate poor soil conditions.

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Pump Station 094 Upgrade

Moncks Corner, South Carolina

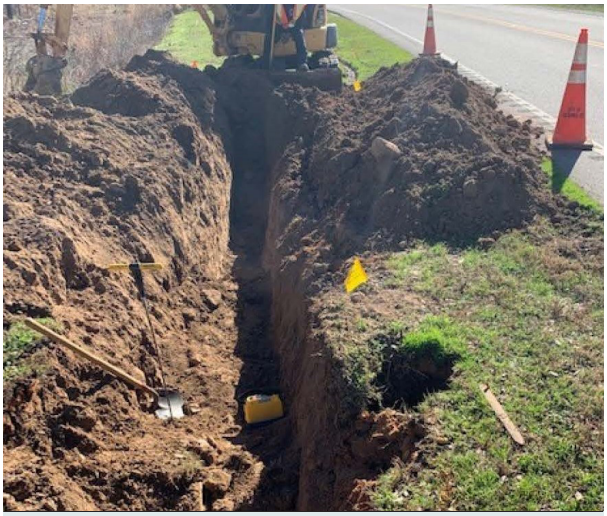
Reference
David Parker
Engineering Manager
212 Oakley Plantation Drive
Moncks Corner, SC 29461
(843) 719-2316
david.parker@berkeleycountysc.gov

Hazen designed a new 8-mgd replacement submersible pump station and configured a new force main route to divert flow to the Central Berkeley WWTP with accommodations for the future growth.

Hazen performed preliminary engineering, detailed design, and CA services to replace Pump Station 094. The project included updated flow projections, evaluation of pumping scenarios, design of a new 8-mgd submersible pump station, and 12,500 lf of new 24" force main. Funding was provided by the SC State Revolving Fund (SRF).

Water and Sewer Utility Relocations

Columbia, South Carolina



Reference
John Hilbert
Utility Location Coordinator
P.O. Box 147
Columbia, SC 29217
(803) 545-3283
jbhilbert@columbiasc.gov

Hazen designed relocated water and sewer lines to accommodate pending roadway projects.

The Hazen Team provided: Site reconnaissance; Route selection; Ground control, route, topographic, easement, boundary, and engineering surveys; Pipeline layout design; and Permitting assistance. Projects included:

- Farrow Road and N. Brickyard Road: Relocation of 1,600 lf of 16" water main
- Columbia Avenue/I-26 widening: Relocation of 6,700 lf of water mains (including 950 lf of new water main)
- Bluff Road: Relocation of 3,400 lf of gravity sewer, 100 lf of force main, and 500 lf of water mains
- Ripley Station Road: Relocation of 400 lf of water mains, 600 lf of gravity sewer, and related appurtenances

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Section 4

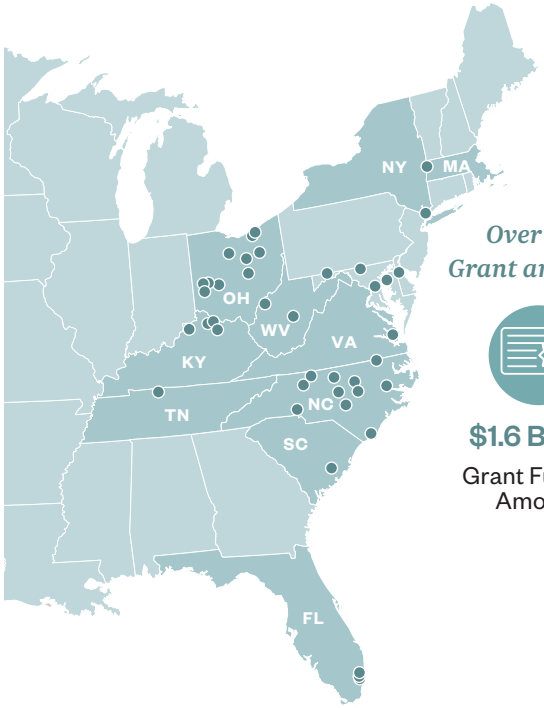
Familiarity With Federal Funding Requirements

Hazen's comprehensive approach to funding assistance for grant and favorable financing programs has enabled utilities to obtain infrastructure funding assistance from over 30 unique funding programs in the last ten years.

Hazen is particularly adept at developing successful applications for new funding opportunities, ensuring that utility partners are immediately able to take advantage of available programs and do not miss out on potential opportunities. One example of this success is the EPA administered WIFIA program, which was established in 2017. In order to provide the best information to clients and ensure the highest opportunity for success, Hazen immediately engaged WIFIA program staff, developed a detailed understanding of program priorities, and assisted clients in determining which capital projects best fit the program priorities. Hazen's proven approach has helped clients receive WIFIA funding in each of the four years the program has existed, with approvals ranging from $29 million to over $400 million and totaling $1.4 billion.

Hazen has also been effective in helping utilities obtain and administer grant and favorable funding for resiliency-based projects. In addition to helping numerous utilities submit competitive applications for the new FEMA Building Resilient Infrastructure and Communities (BRIC) program, Hazen has significant experience helping utilities using FEMA funds build resilient infrastructure.

Funding Assistance



Over the past 10 years, Hazen has secured over $4.1 billion in Grant and Loan Funding to support capital infrastructure projects.

$1.6 Billion
Grant Funding Amount

$4.1 Billion
Total Funding Amount

$2.5 Billion
Loan Funding Amount

$1 Billion+
Resiliency-Based Funding

1011-496

Hazen

www.hazenandsawyer.com