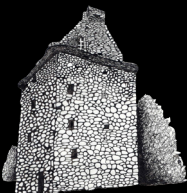


Statement of Qualifications For Engineering Services for Various Projects and On-Call Services

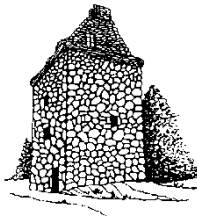


Presented To: Municipal Association of South Carolina



Presented by:
Armstrong Glen, P.C.

October 17, 2022



Armstrong Glen, P.C.

454 Anderson Road South
STE 126, BTC 503,
Rock Hill, SC 29730

Phone (803) 327-1919
Fax (803)329-9798
www.armstrongglen.com

October 17, 2022

Jake Broom
Chief Operating Officer
Municipal Association of South Carolina
P.O. Box 12109
Columbia, SC 29211

**RE: Statement of Qualifications
Engineering Services for Various Projects and On Call Services**

Dear Mr. Broom,

This proposal presents a team of veteran utility engineers for Various Projects and On Call Services. William H. Armstrong, president of Armstrong Glen, will serve as contact for this submittal. ***He has accumulated 46 years of experience in civil engineering and has served as a licensed professional engineer for 42 years.*** His contact information follows.

William H. Armstrong, P.E., P.L.S.
Phone: 704-529-0345
Email: warmstrong@armstrongglen.com

Mr. Armstrong has participated in projects funded by state grants, state loans, and Farmer's Home Administration funded grants and low interest loans. Under a USDA Forest Service contract, Mr. Armstrong served as project manager for a water system renovation, water line extensions, outdoor amphitheater, trout pond reconstruction, LEED certified research lab, eleven trail bridges, and a road bridge. A current City of Lancaster water main replacement project is funded by an SC Rural Infrastructure Authority grant. The firm also recently contracted with Gaston County, North Carolina to engineer two ARPA funded water main extension projects.

A senior level engineer of our firm walks every project route several times during the preparation of construction drawings, in order to look for conflicts. On a current City of Mount Holly project, William Armstrong walked the water main route one last time, prior to finalizing water main drawings for bidding. He came upon a large new telephone vault right on the water main route. The new vault filled up the entire DOT Right-of-Way and forced the water main onto private property. A new permanent easement was then required to move the water main outside of NCDOT right-of-way. Without our final field check, ***the project would have been delayed, and a construction change order would have been required.***

Various studies conducted by professional liability insurers have shown that one trait, above all others, is credited with correcting errors and minimizing insurance claims. That one trait is the checking of calculations, quantity estimates, cost estimates and bidding documents by an

experienced senior-level professional engineer. No matter what quality control procedures were followed by the insured engineering firms, the final step to bid document refinement consisted of senior level checking prior to bidding. At Armstrong Glen, all bid documents are thoroughly checked by a veteran senior engineer prior to publication for bidding.

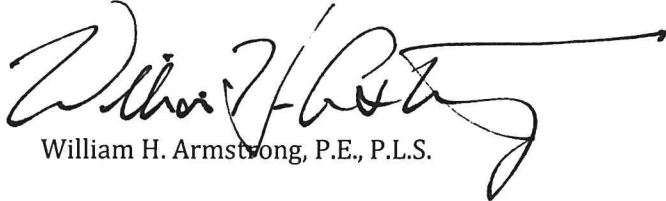
Armstrong Glen places a great deal of importance on meeting deadlines. Planning schedules, complete with milestones, are made at the beginning of each project, and monitored weekly by the project manager. If schedule slippage occurs due to unforeseen conditions, the schedule is revised to include acceleration of the work, so that the final completion deadline is met.

Being a smaller firm, we are very flexible. We are organized in a manner that allows us to bring extra manpower, if necessary to accelerate work. We have an additional design team with utility experience to assist, if needed. The larger engineering firms are much more structured, with distinct department lines. Big firms have a much more difficult time moving personnel to cover critical schedules. The department managers balk of allowing their personnel to be loaned to other departments.

Finally, Armstrong Glen opened for business on April 2, 1997, 26 years ago. Since that date, we have experienced very little staff turnover. Josh Letourneau, our most senior engineer, has been with the company for twenty-four years. Will Armstrong has been with the company for fifteen years, Russell Parker for fourteen years, and Emily Pettigrew for eight years. Josh, Russell, and Emily were hired right out of college, and have never worked anywhere else. ***The absence of staff turnover provides a continuity to our in-house design teams, that many other design firms are not able to duplicate.*** Armstrong Glen, P.C. was incorporated in South Carolina. We have offices in Rock Hill and Charlotte. We have completed scores of projects in the piedmont region of South Carolina.

We appreciate your serious consideration of this proposal, and we look forward to working with cities in South Carolina on Various ARPA Projects and On Call Services.

Sincerely,

A handwritten signature in black ink, appearing to read 'William H. Armstrong', with a long horizontal flourish extending to the right.

William H. Armstrong, P.E., P.L.S.

TECHNICAL APPROACH/UNDERSTANDING

Armstrong Glen has, over a span of many years, developed an approach to making projects successful to the degree that we control. Although it is extremely difficult to reign in a troublesome contractor during construction, there are measures within our control which will help.

We begin each project by learning as much as possible during the startup phase. We will ask many questions, listen intently, and make site visits. We will obtain any record correspondence, reports, and drawings. Our singular goal is to assemble the best possible set of construction drawings and the best possible project manual.

Our approach to perfecting construction drawings is proven over time. Drawings for all projects are checked, in the field and in the office, by a senior professional engineer with forty-six years of experience. This engineer has checked hundreds of drawing sets over his forty-year tenure as a professional civil engineer.

Our approach to perfecting project manuals for bidding is similar to the process stated above. Armstrong Glen employs two engineers who are expert at the preparation of project manuals. They have written, from scratch, technical specifications for scores of new construction items that were not specified elsewhere. They have customized pay item descriptions for hundreds of projects. Before a project manual is released to potential bidders, it will be thoroughly checked by one of our senior level specialists.

Our approach to construction phase is to follow the project as closely as possible during construction. Some owners provide full-time in-house or contract construction inspectors for the duration of construction. This is a reasonable approach to construction inspection, except that it prevents our engineers from having access to the majority of the construction phase. We learn much when we are on the job during construction. Notes are made so that we can correct any unforeseen problems with the drawings or pay items before our next project is bid.

It is understood that the project assigned as a result of this statement of qualifications may include water treatment, water storage, water pumping, water distribution, wastewater treatment, wastewater pumping or wastewater collection. Armstrong Glen's approach to a typical new water line or wastewater trunk line project follows:

- Attend a project kickoff meeting with our client's staff.
- Set up monthly progress meetings to discuss the work.
- Research any record drawing information pertaining to the existing utility lines.
- Walk the proposed preliminary route to confirm its feasibility.
- Coordinate any existing survey information with the team surveyor and gather any additional data needed.
- Perform courthouse research to verify the existing rights-of-way and easements.
- Determine the locations of any existing utilities.
- Perform a full-length control survey to set vertical and horizontal control points.
- Set high visibility panels at each control point for aerial photography, if needed.

- Fly and photograph the project route from end to end, if needed. Aerial photography is not needed for short utility routes, but is very helpful for longer routes.
- Produce full-length strip topography from the photogrammetry.
- Mark subsurface utilities along the project route.
- Survey utility markings and tie utility survey to ground control points. Add utility locations to base topographic mapping.
- Conduct a field walk to check topographic mapping and/or field survey.
- Determine whether existing utilities leave a path to install the new utility lines.
- Arrange for rock location borings if rock is anticipated.
- Prepare a preliminary water or sewer main plan.
- Walk the route to determine feasibility of the preliminary plan.
- Transmit the preliminary water or sewer main plan to the client. Meet with the client to discuss the plan.
- Conduct flow testing for water mains to record flows and pressures.
- Perform a hydraulic study to verify line sizes and pressures.
- Check sewer mains to ensure adequate line size.
- Finalize drawings and details.
- Prepare any easement maps needed.
- Acquire easements needed for construction.
- Prepare an engineering report for SCDHEC permit application.
- Prepare environmental, SCDHEC and SCDOT permit applications.
- Prepare any special details needed.
- Prepare traffic control plans.
- Prepare erosion control plan and specifications.
- Prepare quantity estimates.
- Prepare an engineer's construction cost opinion.
- Prepare a project manual consisting of bidding information, construction specifications and material specifications.
- Meet with client to review all bid documents.
- Conduct a pre-bid conference, if desired by client.
- Assist with bidding
- Attend the bid opening
- Review bids
- Recommend award
- Assist with Owner/Contractor Agreement preparation.
- Attend a preconstruction conference.
- Issue Notice to Proceed
- Check shop and working drawings, schedules, and other submittals.
- Provide construction observation to observe the progress and quality of the contractor's work.
- Address construction questions as they arise.
- Observe testing of the project work.
- Conduct a substantial completion inspection.
- Conduct a final inspection and coordinate inspections with regulatory agencies.
- Provide record drawings when construction is complete.
- Provide periodic reports to ARPA throughout the project duration.
- Close the project out.

WORK MANAGEMENT PLAN/EXPERIENCE OF PROPOSED PERSONNEL

William H. Armstrong will serve as project manager for the proposed projects. **Mr. Armstrong has accumulated a great deal of project management experience throughout his 46 years in civil engineering.** Following is a listing of Armstrong Glen team management procedures and processes which will serve as a foundation for ARPA funded utility projects.

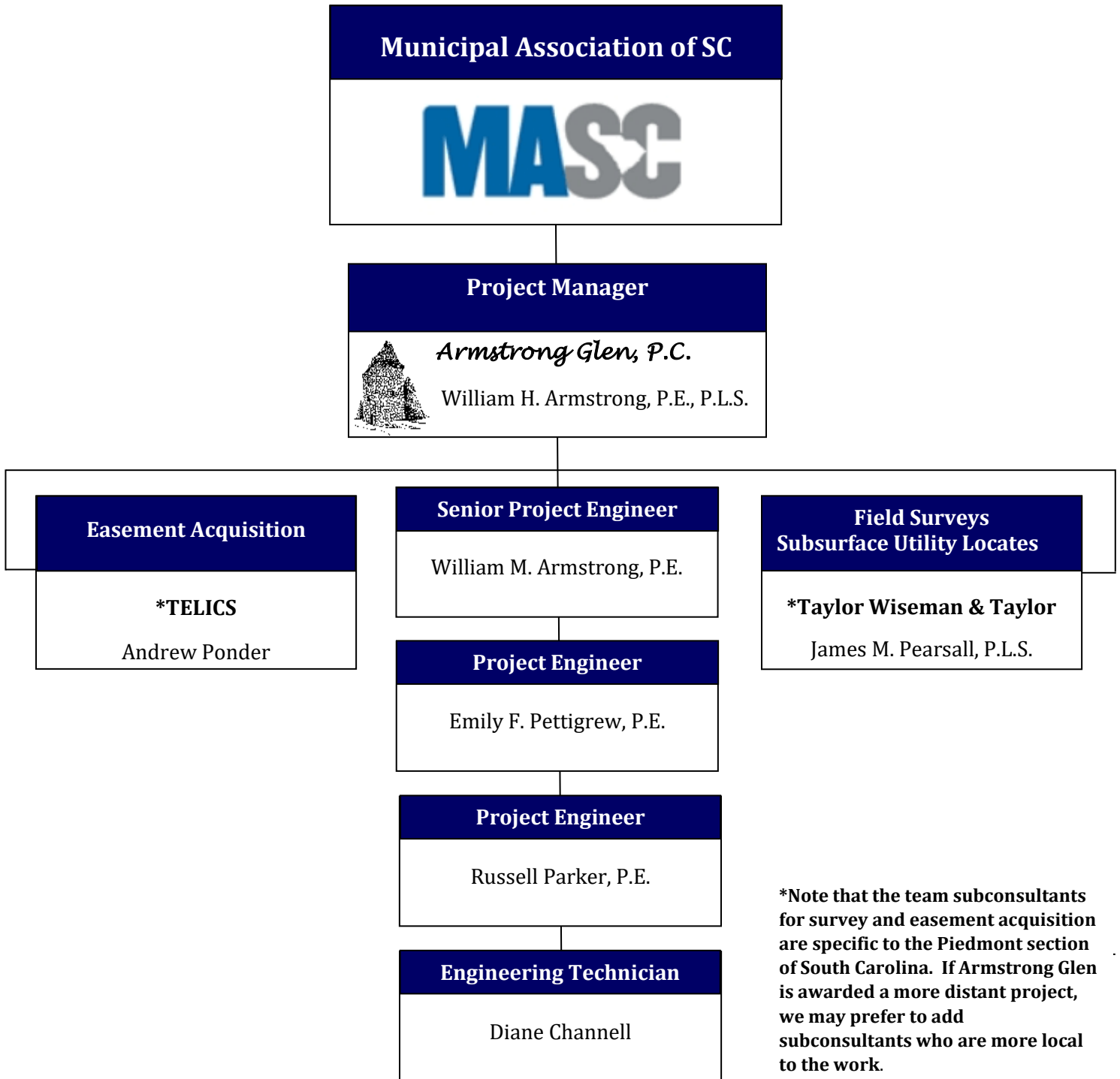
- Armstrong Glen's project manager will meet with the client's project manager at a project kickoff meeting. At this time, we will accomplish the following:
 - Define the scope of services and the initial work program.
 - Acquire an understanding of the needs, concerns, and objectives of the client.
 - Discuss schedule and other projects in the area (both public and private).
 - Discuss project criteria which will influence the overall design, such as the potential for right-of-way acquisition and general approach to above ground conflicts.
 - Create a schedule of future progress meetings (possibly monthly) to ensure that our work is progressing in accordance with the client's wishes.
- The design team will implement schedule monitoring procedures. A planning schedule, with key milestone dates, will be prepared and distributed to members of the project team. This schedule will be monitored weekly by the project manager to assure compliance. Project status will be discussed at project manager meetings. If necessary, additional resources will be identified and assigned to the project. Multiple projects will have parallel schedules, if possible, to maximize team efficiency. **If schedule slippage occurs due to unforeseen conditions, the schedule will be revised to include acceleration of the work so that the final completion deadline is still met.**
- The project manager will distribute schedules and detailed scopes of services to sub consultants. Progress of sub consultants will be monitored regularly to ensure schedule compliance.

Armstrong Glen's project manager will coordinate closely with the client's project manager to ensure that schedules remain on track, and that all needs, and objectives are met. This coordination and steady communication with the client's project manager will minimize redesigns. This will be accomplished through emails and telephone conversations (Client PM's preference) in addition to progress meetings.

The project manager will also distribute schedules and detailed scopes of services to sub-consultants. Progress of subconsultants will be monitored regularly to ensure schedule compliance. Armstrong Glen's project manager will coordinate closely with the client's project manager to ensure that schedules remain on track, and that all needs, and objectives are met. Controlling the quality of a subconsultant's work is not an easy matter. **For this reason, Armstrong Glen uses the same pool of subconsultants on most of our projects.** We have confidence in our subconsultants, and we know that they will deliver quality services on time.

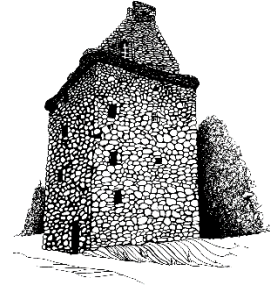
ORGANIZATION CHART

The organizational chart, provided below, identifies our project manager and key personnel on the Armstrong Glen team. These professionals will be directly responsible for design and construction management of the project.



RESUMES OF TEAM MEMBERS

William H. Armstrong, PE, PLS
Project Manager
Armstrong Glen, P.C.



EDUCATION

Bachelor of Science in Civil Engineering, The Citadel, 1976

PROFESSIONAL LICENSING

SC Professional Engineer No. 8384, SC Professional Land Surveyor No. 8384
 NC Professional Engineer No. 16891, NC Professional Land Surveyor No. L-3501

EXPERIENCE

Owner, Armstrong Glen, P.C. (April 2, 1997 – Present)

Following are a few of Mr. Armstrong's utility projects:

North Belmont Park Water Line, Gaston County – Current project will extend a new water main from Old Hickory Grove Road to a park on Hickory Grove Road. This is an ARPA funded project. Approximately 7,000 feet of new water main will be installed at an estimated cost of \$1,200,000. William H. Armstrong serves as project manager and Will Armstrong serves as project engineer.

Charlotte Street Main Extensions, Charlotte Water – Armstrong Glen completed a general services contract to provide design services for gravity sewer extensions, low-pressure sewer systems, and water main extensions. Our engineers completed the following 36 projects:

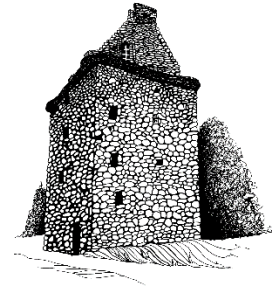
- 12 low-pressure sewer systems totaling 20,495 linear feet of piping
- 15 gravity sewer extensions totaling 9,592 linear feet of piping
- 9 water main extensions totaling 13,185 linear feet of piping

Tools Fork Creek Outfall Phase I, City of Rock Hill, SC – Provided field surveys, layout, design and construction administration for 17,600 linear feet of 24" concrete gravity interceptor along Tools Fork Creek. Problems included quicksand conditions and bedrock at one roadway bore. William Armstrong served as project manager and engineer-of-record.

Tools Fork Creek Outfall Phase II, City of Rock Hill – Design and construction administration for 17,000 linear feet of sewer outfall and 69 manholes to serve a basin of 4.06 square miles. Pipe sizes ranged from 24" down to 8". The work included a 36" roadway bore, 12 creek crossings, and decommissioning of a package wastewater treatment plant. The project was completed at a cost of \$1,410,000. William H. Armstrong served as project manager and engineer-of-record.

Route 9 Water Main Relocation, Chester Metropolitan District – Project consisted of relocating 24" and 30" water main due to the widening of SC Route 9 from the City of Chester to the Catawba River. Fourteen line-stops and major reconstruction were required due to changes in roadway alignment and several bridge replacements. Ultimately, one mile of 24" water main and three miles of 30" water main was relocated without service interruption. Project funded by State Grant. Construction cost: \$4,500,000.

William M. Armstrong, PE
Senior Project Engineer
Armstrong Glen, P.C.



EDUCATION

The Citadel
 Bachelor of Science in Civil Engineering, 2006

PROFESSIONAL LICENSING

South Carolina Professional Engineer No. 29000
 North Carolina Professional Engineer No. 041121

EXPERIENCE

Project Engineer, Armstrong Glen, P.C.
 April 2007 to present

William M. Armstrong serves as project engineer for various water supply and sewage collection projects. Mr. Armstrong has been with Armstrong Glen for fifteen years, and he has sixteen total years of civil engineering experience. While employed at Armstrong Glen, Will Armstrong has participated in engineering of the following utility projects:

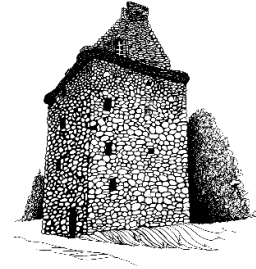
Water Supply for Lowell Elementary School, Gaston County – ARPA funded project will provide a new water supply to an elementary school near Lowell, North Carolina. The existing two-inch water supply line does not provide fire protection to the school. Five hundred feet of new six-inch ductile iron water main will provide additional potable water to the school, as well as fire flow to a new hydrant at the school. Will Armstrong serves as project manager.

Old Hickory Grove Road Water Main Replacement, City of Mount Holly – Project consists of replacement of 6,100 linear feet of six-inch asbestos cement pipe with 12-inch ductile iron water main. Will Armstrong participated in route location, calculations, and flow testing. He will also be in charge of construction administration and construction observation. Construction began in August of 2022.

North Market Street Water System Improvements, City of Lancaster – Current project consisted of replacement of an existing network of two-inch water lines which served 62 residences. Replacement consisted of 3,970 linear feet of six-inch pipe, 970 linear feet of two-inch pipe, 62 new water services, four fire hydrants, valves, and appurtenances. Construction cost was \$394,000. Mr. Armstrong was in charge of construction administration and construction observation. He served as Armstrong Glen's contact person with the Rural Infrastructure Authority and prepared quarterly reports to RIA.

Valve Replacement, Chester Metropolitan District – The purpose of the project was to replace an existing 30-inch butterfly valve with a new valve, and to install an additional valve for redundancy. The existing butterfly valve was located on the 30" ductile iron high service line which feeds all potable water to the system. This main is the only means of re-supplying and pressurizing the Chester Metro system. Therefore, line stops with a temporary by-pass were installed to maintain pressure and flow to the Chester Metro distribution system, which serves 25,000 people and multiple industries. Construction cost was \$210,000. Will Armstrong performed construction observation and participated in drawing preparation.

Emily F. Pettigrew, P.E.
Project Engineer, Armstrong Glen, P.C.



Education

B.S. Environmental Engineering, NC State University, 2014

Professional Licensing

South Carolina: Professional Engineer Number 36065

North Carolina: Professional Engineer Number 047079

Experience

Project Engineer, Armstrong Glen, P.C.

June 2014 – Present

Ms. Pettigrew currently serves as Project Engineer with Armstrong Glen. She has been with the firm for a period of eight years. Ms. Pettigrew has participated in the following utility projects:

Mt. Holly Water Main Replacement, City of Mt. Holly – Project requires replacement of 6,100 linear feet of asbestos pipe with 12-inch ductile iron water main. Ms. Pettigrew handled all the permitting and assisted with the design. Construction cost is estimated to be \$1,200,000.

Charlotte Avenue Water Main Replacement, City of Rock Hill – Project will consist of the replacement of 400 linear feet of 8” water main on Charlotte Avenue, and 450 linear feet of 8” water main on Ebenezer Avenue Extension. Ms. Pettigrew served as project engineer and assisted with design and permitting.

Steele Creek Force Main Bores, York County – Project included the study of replacement of five force main bores, and was necessitated by the corrosion of the ductile iron pipe at the bore sites. Ms. Pettigrew served as engineering designer.

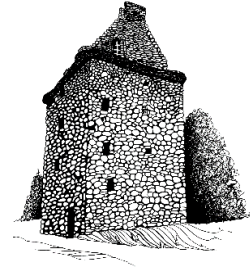
Pump Station Replacements with Sewer Trunks, Charlotte Water – Project consisted of elimination of four submersible sewage pump stations. In total Ms. Pettigrew assisted with the design and permitting of 8,100 linear feet of new gravity sewer.

Langrum Branch Road Utilities, York County - Project consisted of the extension of water and sewer mains. The sewer work consists of 2,000 linear feet of 8-inch sewer and six new manholes. The water main work consists of 3,400 linear feet of 8-inch water line, 700 linear feet of 6-inch water line, 120 linear feet of cased bore and two hydrant assemblies. Ms. Pettigrew handled all permitting and served as engineering designer.

Gold Hill Water Main Extension, York County – Project consisted of 1,900 linear feet of 16-inch ductile iron water main. Project includes an open cut across Steele Creek. Ms. Pettigrew served as project engineer and assisted with design and permitting. Construction cost was \$950,000.

East Main-East White Utility Relocation, City of Rock Hill – Project required relocation of water mains for an SCDOT intersection reconstruction project. The relocation consisted of installing 1,000 linear feet of new 10-inch ductile iron water main, 1,350 linear feet of new 8-inch water main and 200 linear feet of bore under a 24” sanitary sewer force main. Additional care was taken to reposition manhole cones so that lines were outside of the wheel path. Emily Pettigrew assisted with the layout of the water mains. Construction cost was \$1,069,000.

**Charles “Russell” Parker, P.E.
Project Engineer, Armstrong Glen, P.C.**



Education

The Citadel
Bachelor of Science in Civil Engineering, 2008

Professional Licensing

South Carolina Professional Engineer No. 30395
North Carolina Professional Engineer No. 040951

Experience

Project Engineer, Armstrong Glen, P.C. (May 2008 – Present)

Mr. Parker currently serves as a project engineer with Armstrong Glen. He has been with the firm for a period of thirteen years. Mr. Parker participated in field surveys and construction drawing preparation related to the following utility projects.

- **River Pines Water System Replacement, York County**
Layout and design for 6104 linear feet of 6” water main and 998 linear feet of 2” water main to replace an existing neighborhood water system with a new system that ties into York County’s water system.
- **Pendleton-Pickens Sanitary Sewer Replacement, City of Rock Hill**
Layout and design for the replacement of 860 linear feet of 8” decomposed vitrified clay sewer main and installation of a 540 linear feet sewer extension in order to redirect flow.
- **India Hook Sanitary Sewer Replacement, City of Rock Hill**
Layout and design for the replacement of 1415 linear feet of 8” decomposed vitrified clay sewer main along the center of India Hook Road.
- **India Hook-Glendale Sewer Crossing, City of Rock Hill**
Layout and design the replacement of 670 linear feet of 8” decomposed vitrified clay sewer main and installation of a 338 linear feet of sewer extension in order to redirect flow. Approximately 140 linear feet of the proposed sewer will be bored under India Hook Road.
- **Albright Road Utility Study, City of Rock Hill**
Assisted in the layout of water and sewer infrastructure and cost analysis, to serve parcels along Albright Road. Seventy parcels were included and the cost to serve was estimated to be \$3,500,000.
- **Gaynor Storm Drain Improvement Project, City of Charlotte**
Layout and design for utilities to avoid conflicts with the new proposed storm drainage system.
- **Kenilworth-Romany Storm Drain Improvement Project, City of Charlotte**
Layout and design for utilities to avoid conflicts with the new proposed storm drainage system.

ANDREW PONDER, SR/WA
Senior Manager, Right of Way Services
TELICS



EDUCATION

Bachelor of Science - Business Management
 Liberty University

OFFICE LOCATION/YEARS OF EXPERIENCE

Fort Mill, SC – 13 Years

REGISTRATION

NC Broker in Charge
 Real Estate License # 248990
 IRWA Member # 7898040
 APWA Member # 667443
 Notary Public

EXPERIENCE

Andrew is a Senior Manager in TELICS Right of Way Services Division. He has over 15 years of management experience in multiple fields and is knowledgeable in all phases of Right of Way Acquisition and Relocation Assistance. Andrew has successfully completed acquisitions and provided project management oversight for numerous local and state projects including roadway, airport, utility, storm water, infrastructure development, public transportation, and telecommunication projects. Andrew currently manages projects for the City of Charlotte and numerous other government and private sector clients. He possesses a SR/WA designation and a FTA Real Estate Requirement Certification. He is also a Licensed Real Estate Broker-in-Charge and a Certified Notary Public.

RELEVANT PROJECTS/SPECIFIC ROLE

- SC 321/Barrett/West Gate (Pennies for Progress) Project – Project Manager
- City of Rock Hill, SC, Mt. Gallant Road Utility Relocation – Project Manager
- City of Rock Hill, SC, Mt. Gallant Transmission Water Main – Project Manager
- City of Mauldin, SC – Forrester Woods Stormwater – Project Manager
- York County, SC, Van Wyck 12-Inch Natural Gas Line Project – Project Manager
- City of Rock Hill, SC, Eden Terrace 24-Inch Waterline Project – Project Manager
- Lancaster Natural Gas Authority – Riverside Drive – Project Manager
- Lancaster Natural Gas Authority – Edgewater Business Park – Project Manager



JAMES M. PEARSALL, PLS
Southeast Region Operations Manger

SUMMARY:

As the Southeast Region Operations Manager of the firm's Apex and Charlotte, NC offices, Mr. Pearsall is responsible for all surveying and subsurface utility engineering operations originating from these offices, as well as interoffice coordination on survey/sue-related efforts. With more than 32 years in the land surveying field, he has experience with a variety of large and small projects, including boundary retracement surveys on three water supply reservoirs for the City of Columbus, Ohio; boundary and topographic surveys for Huntington Field, home of the Columbus Clippers, the AAA affiliate of the Cleveland Indians; and boundary and topographic surveys for the land developed around Nationwide Arena, home of the NHL Columbus Blue Jackets. Mr. Pearsall has managed survey projects in the counties of Mecklenburg, Iredell, Gaston, Catawba, Buncombe, Wake, Union, Rowan, Cabarrus and Guilford in North Carolina and York, Lancaster, Richland, Dorchester, Greenville, Spartanburg and Charleston in South Carolina.

RELATED EXPERIENCE:

Mr. Pearsall's experience includes boundary surveys, easement surveys, legal description preparation, ALTA/ACSM Land Title Surveys, topographic surveys, preparation of annexation and zoning documents, subdivision and condominium plats, DOT right-of-way determinations, physical surveys and construction layout. His responsibilities have included performing boundary resolution, staking coordinate sheets, survey plat preparation, construction staking, drafting and quality control/quality assurance. He also has experience in large development projects requiring location design and construction surveys for roadways, supplemental surveys for photogrammetric base mapping, subsurface utility location, water, sewer, power, floodplain reclamation, subdivision and GPS.

Prior to his employment with TWT, Mr. Pearsall gained extensive experience in project management where he was responsible for QA/QC, business development and client relations, and the management and coordination of multiple field crews and office staff.

Mr. Pearsall is experienced and efficient with the following programs and surveying equipment; AutoCAD, Land Development Desktop, Carlson Civil/Survey, Microstation V8 (NCDOT L&SV8), Trimble Business Center, MicroSoft Office Suite, Topcon Total Stations, Trimble Robotic Total Stations and Trimble GPS equipment.

REGISTRATIONS:

Professional Land Surveyor:	North Carolina	L-4650	2007
	South Carolina	27458	2009
	Tennessee	2632	2008
	Ohio	7840	1997

AFFILIATIONS:

Mecklenburg Surveyors Society
North Carolina Society of Surveyors

EDUCATION:

College	Degree	Specialization	Date
Ohio University	Bachelor of Science	Industrial Technology	1990
	Associates of Applied Science	Industrial Technology - Design	1988

Continuing Education:

GPS Training – Static/Rapid Static Post Process & Real-Time Kinematic (RTK)
2021 ALTA/ACSM Land Title Survey Standards
CSX Contractor Safety & Roadway Worker Protection
E-Rail Safety Training
40 HOUR OSHA "HAZWOPER" TRAINING
"LPS" Loss Prevention Systems Training

EXPERIENCE OF THE FIRM

SIMILAR PROJECTS

North Belmont Park Water Extension, Gaston County

Cary Rodriguez, EI, (704) 862-6791, cary.rodriquez@gastongov.com

150 S. York Street | Gastonia, NC 22105

Armstrong Glen has been awarded this task of bringing a new ARPA funded water main extension to North Belmont Park on Hickory Grove Road, just west of the town of Mount Holly. Currently, an on-site well supplies potable water to the park. The new Belmont Park water main will tie onto a proposed City of Mount Holly water main located on Old Hickory Grove Road. The new 12-inch ductile iron water main will extend 3,000 linear feet along Old Hickory Grove Road, 3,800 linear feet along easements, and 1,000 linear feet along Hickory Grove Road to North Belmont Park. Twelve easements are required, and easement acquisition is included in Armstrong Glen's contract. Construction cost for the North Belmont Park water main is estimated to be \$1,200,000. William H. Armstrong serves as project manager, Will Armstrong serves as senior project engineer and Emily Pettigrew serves as design engineer.



Water Supply for Lowell Elementary School, Gaston County

Cary Rodriguez, EI, (704) 862-6791, cary.rodriquez@gastongov.com

150 S. York Street | Gastonia, NC 22105

This current ARPA funded project will provide a new water supply to an elementary school near Lowell, North Carolina. The existing two-inch water line, supplied by the Town of McAdenville, does not provide fire protection to the school. Five hundred linear feet of new six-inch ductile iron water main will provide additional potable water to the school, as well as fire flow to a new hydrant at the school. Construction cost is estimated to be \$70,000. Construction will begin in April of 2023.



Charlotte Water Pump Stations, City of Charlotte

Ryan Leblanc, P.E., (704) 391-5151, Ryan.LeBlanc@ci.charlotte.nc.com
5100 Brookshire Blvd. | Charlotte, NC 28216

This recent Charlotte Water (CLTW) project provided designs to eliminate four existing CLTW submersible sewage lift stations, and to replace all four with gravity sewer outfalls. Two of the lift stations are near the Town of Matthews, and two are located several miles east of Charlotte. An abandonment procedure was specified for each lift station. The outfall lengths for the four projects are as follows:

- Bristol Farms Outfall – 3,500 FT
- Win Hollow Outfall – 3,700 FT
- Williams Station Outfall – 700 FT
- Brandywine Outfall – 200 FT



All outfalls consisted of either 8-inch or 10-inch diameter C900 PVC pipe. Obstructions include many backyard fences, retaining walls, roadway fills and wetlands. Sewer was routed around wetland areas. Construction cost was in the range of \$1,500,000. William H. Armstrong served as project manager. Design was provided by William M. Armstrong, Russell Parker, and Emily Pettigrew. William M. Armstrong provided periodic construction observation.

North Market Street Water Main Replacement, City of Lancaster

Rendell Mingo, (803) 248-0475, kmingo@lancastercitysc.com
916 15th Street | Lancaster, SC 29720

This recent project consisted of the replacement of an existing network of two-inch water lines which serve 62 residences. The North Market Street area was plagued by low pressure and low flow. New construction consisted of six new six-inch taps, 3,970 linear feet of six-inch C900 pipe, 965 linear feet of two-inch DR21 PVC pipe, 62 new water services, four new fire hydrants, valves, and appurtenances. Construction cost was \$394,964, and financing was by a Rural Infrastructure Authority Grant. William H. Armstrong served as project manager. William M. Armstrong served as project engineer.



Old Hickory Grove Road Waterline Improvement, City of Mount Holly

*Jonathan Wilson, (704) 951-0074, jonathan.wilson@mtholly.us
400 East Central Ave. | Mount Holly, NC 28120*

This current utility project was awarded to Armstrong Glen by the City of Mount Holly. Due to the increase in water demands in the area, Armstrong Glen designed 6,100 linear feet of a new 12-inch water main to bring additional capacity to new developments. The project will parallel an old six-inch asbestos cement line and allow it to be taken out of service. All service taps will be moved from the old asbestos line to the new main. A challenge with this project is navigating the new water main around the various existing utilities at the location. Another challenge was right-of-way acquisition. Armstrong Glen is contracted to provide bid assistance, cost estimating, permitting, and construction administration. William H. Armstrong serves as project manager and Emily Pettigrew serves as project engineer. Construction cost is estimated to be around \$1,200,000. Construction is expected to start in fall of 2022.



Gold Hill Water Main, York County

*Barry McKinnon, (803) 818-5781, barry.mckinnon@yorkcountygov.com
6 South Congress Street | York, SC 29745*

Recent York County project involved the design of approximately 1,971 linear feet of 16" ductile iron water main, 63 linear feet of 12" ductile iron water main, and 151 linear feet of 10" ductile iron water mains. This project also included an 80 linear foot open cut creek crossing of Steele Creek, 160 linear feet of 16" carrier pipe with 30" steel cased roadway bore, 63 linear feet of 12" carrier pipe with 24" steel cased roadway bore, and 77 linear feet of 10" carrier pipe with 18" steel cased roadway bore; associated appurtenances, valves and fittings; erosion and sediment control measures; and surface restoration. Construction cost was \$953,300. William H. Armstrong served as project manager and engineer of record. Permitting for the Steele Creek open cut was the responsibility of Carolina Wetland Services. William M. Armstrong served as project engineer. Construction was completed in 2020.



Regent Park Sewer By-Pass, York County

*Lisa Hagood, (803) 818-5733, lisa.hagood@yorkcountygov.com
6 South Congress Street | York, SC 29745*

Armstrong Glen was asked to determine the cause of repeated sewer manhole surcharging at manholes near the abandoned Regent Park golf course. A field survey of the area was performed, and the cause of surcharging was narrowed down to one problematic manhole. Deflection in this manhole was greater than ninety degrees and sewer downstream was laid on reverse slope. Our engineers designed a bypass of the surcharge manhole and tie-in to the next downstream manhole. A 165' long bore under a Duke Energy tower line was required. Armstrong Glen provided design, permitting, bidding and construction administration. William H. Armstrong served as project manager.



West Main Street Sewer Investigation, City of Rock Hill

*Rick Carter, (803) 818-5781, Rick.Carter@cityofrockhill.com
757 S. Anderson Road | Rock Hill, SC 29731*

Armstrong Glen was contracted to perform pipe videos, surveys, and soft digs pertaining to sewer surcharging along West Main Street in downtown Rock Hill. A report was prepared, stating our findings, and offering solutions. Topographic maps were prepared based on our field surveys. Sewers in the study area were cleaned and closed-circuit TV videos were performed. Videos identified sags, disjointed pipe, crushed pipe, large rocks, and buried bends. Our recommendation was to construct a parallel line under the West Main Street sidewalk and abandon the old line.



Albright Road Utility Study, City of Rock Hill
Rick Carter, (803) 818-5781, Rick.Carter@cityofrockhill.com
757 S. Anderson Road | Rock Hill, SC 29731

Recent project consisted of a utility study to determine methods and costs to bring water and sewer utilities to all undeveloped parcels along Albright Road/Saluda Street between Black Street and Rambo Road. Seventy parcels of various sizes were included in the study. The purpose of the study was to determine the cost to the City of constructing utilities to all the undeveloped road-front properties.

Armstrong Glen's scope of services consisted of preparing mapping, researching tax information, determining a means of serving utilities to the property and determining a cost to serve the property. Sewer flows were computed using existing zoning classifications and built-out conditions. The sewer study consisted of 3,925 LF of off-site sewer main extensions to provide service for several parcels that are not currently located near a sewer main. The study also estimated costs to extend sewer laterals to undeveloped parcels which have access to existing sewer.

Armstrong Glen prepared spreadsheets delineating the estimated costs of providing each of the **seventy** undeveloped parcels with 2-inch, 6-inch, and 8-inch water service. In addition, Armstrong Glen identified all side roads that do not currently have a water main stub-out and estimated the cost to install a stub-out. Details have been prepared to show the materials required for each service scenario.

Overall cost to serve approximately seventy parcels is in the range of \$3,500,000. William H. Armstrong served as project manager. William M. Armstrong served as project engineer. Emily Pettigrew served as engineering designer.



Intersection of Albright Road (SC 72) and Mt. Holly Road (SC 901)

FAMILIARITY WITH FEDERAL FUNDING REQUIREMENTS

Armstrong Glen is currently under contract with Gaston County, North Carolina for survey, design, drawing preparation, permitting, bidding, easement acquisition and construction administration for the following potable water projects.

- Lowell Elementary School Water Extension
- Belmont Park Water Extension

Both projects are ARPA funded. The two projects are described in the previous section of this statement of qualifications.

Armstrong Glen recently completed a sizable water main replacement project for the City of Lancaster in the North Market Street area. The work was funded by a Rural Infrastructure Association grant. The grant was administered by an RIA project manager and a Catawba COG project manager. Monthly reports were required with our invoices. Detailed quarterly reports were also required.

William H. Armstrong, project manager for this statement of qualifications, previously served as a partner of a civil engineering consulting firm located in Rock Hill, South Carolina. The specialty of that firm (Williams Engineering, Inc.) was serving Farmer's Home Administration financed rural water systems in South Carolina. Williams Engineering served as district engineers for the following rural water companies in South Carolina.

- Rabon Creek Rural Water District
- Jenkinsville Water District
- Cassatt Water District
- David Morgan Water District
- Chesterfield County Water Company

All rural water projects were funded by FMHA loans and grants. Water projects involved water mains, booster stations, commercial wells, hydropneumatics tanks and elevated tanks.