



STRUCTURAL ENGINEERS

**BENNETT ■ MOORE ■ USSERY ■ BURBAGE**

7 Radcliffe Street, Suite 301  
Charleston, SC 29403  
[www.4SEinc.com](http://www.4SEinc.com)

Phone: 843-722-1992  
Fax: 843-722-1211



## Company Profile

**4SE, Inc.** is a roughly 13 person structural engineering firm that provides a wide range of structural engineering services of the highest quality. 4SE focuses on structural engineering for general architectural projects and has particular strengths in two niche markets: historic preservation and communication and broadcast towers. The services provided are in the following fields:

- **Architectural (New and Existing Structures)**  
Schools, Office Buildings, Parking Garages, Churches, Government Buildings, Residential Projects and Health Care Facilities. Provide structural design, drawings and specifications to be used in new construction. For existing structures, provide reports on existing structural conditions and structural design for reuse.
- **New and Existing Communications and Broadcast Towers**  
Provide specifications for bidding purposes and review designs for compliance. Provide quality control to ensure erection of new structures consistent with industry standards. For existing structures, provide inspections for insurance purposes or for purposes of obtaining information for structural evaluation. Provide structural evaluations to ensure tower satisfies requirements of codes for additional loading. Provide design and drawings for structural modifications required.
- **Historic Preservation**  
Evaluate existing buildings for structural safety. Where necessary, design structural upgrades to permit old and historic buildings to continue to function safely well into the future.

**4SE, Inc.** is owned by four professional engineers, Craig M. Bennett Jr., John M. Moore Jr., Dean William Ussery and George Gregory Burbage, who have over 80 years of combined structural engineering experience. We are located in Charleston, S.C. and provide structural engineering services nationwide. We specialize in providing state-of-the-art analysis and design, innovative thinking, and quality services on all projects. We provide these services with a positive attitude and in a timely manner.

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## Resume

**Craig M.  
Bennett Jr.  
PE**

Craig Bennett is a structural engineer with undergraduate degrees in both civil engineering and architecture, and a graduate degree in structural engineering. His experience includes design of new structures of all sizes, including several early years in the design of high-rise hotels and office buildings.

Mr. Bennett's particular strength is in the structural evaluation, repair, rehabilitation, and restoration of existing structures, with a specialization in historic preservation. His work regularly involves assessment of the causes of structural distress or failure and the design of rehabilitative measures, usually in a historic context.

Mr. Bennett is a former faculty member in the College of Architecture and the School of Civil Engineering at Georgia Tech. He is currently Adjunct Faculty in the College of Charleston program in Historic Preservation, is Past-president of the Board of Trustees of the Charleston Museum and serves as Chairman of the City of Charleston's Board of Architectural Review. He is a founding principal of 4SE.

### Professional Experience

- 2002 – present Principal Engineer, 4SE, Inc.
- 1990 – 2002 Cummings & McCrady, Inc., Charleston, SC
- 1985 – 1990 Sheridan Corp., part time
- 1981 – 1985 John Portman & Associates, Atlanta, GA
- 1978 – 1985 Faculty - Georgia Tech School of Civil Engineering & College of Architecture

### Registrations, Professional Affiliations and Presentations

- Registered Engineer: Georgia, South Carolina, Alabama
- American Society of Civil Engineers
- American Concrete Institute
- American Institute of Steel Construction
- The Masonry Society
- Association for Preservation Technology, International
- Regularly gives presentations on structural engineering for historic preservation. Has given numerous other presentations on structural design and on computing in engineering.

### Civic and Community Activities

- City of Charleston Board of Architectural Review, Chairman
- Charleston Museum, Past-President, Board of Trustees
- Charles Towne Neighborhood Association, past Board Member
- Charleston Symphony Orchestra, past Board Member
- St. Philip's Episcopal Church, past Vestry Member
- Charleston Computer Club, past President

### Academic Positions

- Georgia Tech, Faculty of the College of Architecture and School of Civil Engineering, 1978-1985
- College of Charleston, current Adjunct Faculty in the undergraduate program in Historic Preservation
- College of Charleston / Clemson University Joint Program in Historic Preservation, regular lecturer

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## Resume

**Craig M.  
Bennett Jr.  
PE**

### Honors and Awards

- Honor awards by the Palmetto Trust for Historic Preservation for:
  - The Cathedral Church of St. Luke and St. Paul (given 2008)
  - Walker Hall at the South Carolina School for the Deaf and the Blind, Spartanburg (given 2005)
  - St. Philip's Episcopal Church (given 1995)
- Award for Outstanding Support of the Citadel School of Engineering (given 2007)
- Award for Engineering Excellence by Charleston Contractor's Association (given 2006)
- Georgia Trust for Historic Preservation Award for preservation work on St. Luke's Episcopal Church & Tower, Atlanta (given 2001)
- Robert N.S. and Patti Foos Whitelaw Founders' Award for preservation work on St. Michael's Episcopal Church (given 1994)
- Chi Epsilon National Civil Engineering Honor Society
- Work in Charleston has won numerous Carolopolis Awards

### Education

- Georgia Institute of Technology, Bachelor of Civil Engineering, 1978
- Georgia Institute of Technology, Bachelor of Science, major: Architecture, 1978
- Georgia Institute of Technology, Master of Science in Civil Engineering, major: Structures, 1981
- School year at Ecole des Beaux Arts, Paris, France, 1975-1976

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## Resume

**John M.  
Moore Jr.,  
P.E.**

John Moore, founding principal of 4SE, has over 30 years of experience in structural design and project management. His experience consists chiefly of being a project structural engineer, including structural analysis and design, supervising preparation of drawings, specification and report writing, field investigation and construction administration on a wide variety of projects including:

- New building structures of all types and materials
- Historic structure renovation
- Waterfront structures
- Foundations for all types of structures
- Guyed and self-supporting towers

### Registrations and Professional Affiliations

- Registered Professional Engineer: South Carolina, Michigan
- Member, American Society of Civil Engineers
- Member, City of Charleston Board of Architectural Review, 1994 - 2004

### Education

- North Carolina State University, Raleigh, North Carolina, B.S. in Civil Engineering, 1977.
- University of Washington, Seattle, Washington, graduate studies in structural engineering, 1977-1978.
- Clemson University, Clemson, South Carolina, M.S. in Structural Engineering, 1982.

### Professional Experience

- 2002 – present                      Principal Engineer, 4SE, Inc.
- 1979 – 2002                         Senior Project Engineer  
   Shoolbred Engineers, Inc.

### Project Awards

- Four projects, The Middleton Inn and the Croffead, Reid, and Harmon Residences were awarded National AIA Honor Awards.

### Awards

- 2007 and 2010 Charleston Area General Contractor's Association Engineer of the Year

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## Resume

**Dean  
William  
Ussery,  
P.E.**

Bill Ussery, founding principal of 4SE, has over 35 years of experience in structural design and project management for structural engineering services. As principal engineer, he has been responsible for structural design and management of structural engineering services for numerous projects including schools, churches, health care facilities, parking garages, monumental structures, condominiums and hotels, waterfront structures, office buildings, commercial structures, and residences. He is responsible for coordination of projects including design, drawings, specifications, and construction administration. His experience also includes services related to construction activities including material submittals/shop drawing review, pay request reviews, inspections, etc. Design experience includes structural designs utilizing structural steel, reinforced concrete, post-tensioned concrete, pre-stressed concrete, masonry, and timber on a wide variety of projects for new buildings, foundations, guyed & self support towers and water front projects.

### Registrations and Professional Affiliations

- Registered Professional Engineer: South Carolina, Michigan
- American Society of Civil Engineers

### Education

- B.S.C.E. Structural Engineering, Clemson University, 1975

### Professional Experience

- 2002 – present:: Principal Engineer, 4SE, Inc.
- 1978 – 2002 Senior Project Engineer  
Shoolbred Engineers, Inc.  
Charleston, S.C.
- 1975 – 1978 Structural Engineer – Duke Power Company  
- Responsible for structural design of numerous components of nuclear facilities, including the reactor building exterior structure at the Catawba Nuclear Plant, and two of the nuclear safety related auxiliary buildings at the Cherokee Nuclear Plant.

### Project Awards

- Charleston Maritime Center ... AISC

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## Resume

**George  
Gregory  
Burbage,  
P.E.**

Greg Burbage, founding principal of 4SE, has over 20 years experience in project management, coordination and design of tower-oriented projects including guyed structures, self-support towers, and monopoles. His experience includes structural analyses while coordinating with electrical, civil and mechanical design. Responsible for the coordination of projects including design, drawings, specifications, and construction administration. Experience also includes construction-related services for material submittals/shop drawing review, inspection, contractor coordination, quality assurance, etc. Field experience consists of site visits to obtain required information for structural evaluations. Site visits are also conducted to ensure contractors are providing quality workmanship for the client.

### Registrations and Professional Affiliations

- Registered Professional Engineer: South Carolina, North Carolina, Kentucky, Kansas, Michigan, Iowa, Oklahoma, Vermont, Nebraska, Virginia, Rhode Island, New York, Tennessee, West Virginia, Ohio, Florida, Texas, Pennsylvania, Arkansas, Wisconsin, Massachusetts, New Jersey, Maryland, Louisiana, Mississippi, Colorado
- American Society of Civil Engineers
- American Institute of Steel Construction

### Education

- B.S.C.E. Structural Engineering, Clemson University, 1989

### Professional Experience

- 2002 – present      Principal Engineer, 4SE, Inc.
- 1991 – 2002      Structural Engineer  
Shoolbred Engineers, Inc.  
Charleston, S.C.
- 1990 – 1991      Structural Engineer  
Fikri Saleh & Associates  
Myrtle Beach, SC

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## Resume

**Jerry  
Kevin  
Googe**

Kevin Googe has over 29 years of experience in drafting, CAD operation, CAD management, construction document production and field investigations for all types of structures.

### Education and Professional Affiliations

- Trident Technical College, AutoCad Training, 1987
- Garrett High School, North Charleston 1981
- Cooper River Education Occupational Center, 2 year drafting study 1980

### Professional Experience

- 2002 – present                      CAD Manager ,4SE, Inc.,
- 1981 – 2002                            Chief Draftsman, Shoolbred Engineers, Inc.

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## Resume

**Jonathan  
Eric  
Pinto**

In addition to his drafting experience, Eric Pinto has several years experience in light residential construction. He is currently enrolled in a civil engineering transfer program to pursue a bachelor's degree in civil engineering.

### Education

- College of Charleston, 1998-2002
- Trident Technical College, currently attending 2+2 civil engineering program

### Professional Experience

- 2004-present                      Drafter, 4SE, Inc.
- 2000-2004                         Light framing and carpentry, masonry, finish painting

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## Resume

**Russell T.  
Wallace,  
P.E.**

Russell Wallace spent 12 years in all phases of heavy construction before obtaining an engineering degree from the University of South Carolina. He worked for firms in Columbia and Charleston before starting a solo practice in 1991. His general practice for the next 16 years included work in the areas of industrial, light commercial, residential, and light gauge metal framing design. He came to work at 4SE in 2008, having previously worked with two of the founding principals.

### Registrations

- Registered Professional Engineer: South Carolina, North Carolina

### Education

- B.A. Wofford College, 1971
- B.S.C.E. Structural Engineering University of South Carolina, 1985

### Professional Experience

- 2008 - present: Project Engineer, 4SE, Inc.
- 1991 – 2007: Solo Practice, Russell T. Wallace, P.E., Charleston, S.C.
- 1987 – 1990: Project Engineer, Shoolbred Engineers, Inc., Charleston, SC
- 1986 - 1987: Design Engineer, Florence & Hutchenson Engineers, Columbia, SC

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## Resume

### Thomas Morrison

Tom Morrison retains a vibrant enthusiasm for all forms of computer-aided design. He is proficient with many popular CAD interfaces such as AutoCAD, Autodesk Revit, Autodesk Land Desktop, and MicroStation. He is also familiar with 3D parametric modelers such as SolidWorks and Autodesk Inventor.

#### Education

- College of Charleston, 2002-2005
- Trident Technical College, Associate's in Engineering Design Graphics, 2005-2007

#### Professional Experience

- 2007 – present      Drafter, 4SE, Inc.
- 2008 – present      Associate Professor – Engineering Design Graphics, Trident Technical College
- 2007                  Drafter, Inside Sales, Manufacturing Consultant-American Construction Metals
- 2008 – present      Associate Professor, Trident Technical College – Engineering Design Graphics Dept



## Resume

**Felicia  
Lyles  
McBratney**

Lyles McBratney is a graduate of the University of Pennsylvania, where she studied Historic Preservation, focusing on architectural conservation, and received a Master's of Science in Historic Preservation in 2005. As Samuel H. Kress Fellow she additionally obtained an Advanced Certificate in Architectural Conservation from University of Pennsylvania. As an Architectural Conservator, she has assisted the principal engineers on a variety of projects from documentation and monitoring to rehabilitation and conservation of historic buildings and churches.

### Registrations and Professional Affiliations

- Association for Preservation Technology, International
- American Institute for Conservation of Historic and Artistic Works

### Education

- University of Pennsylvania, Advanced Certificate in Architectural Conservation, Samuel H. Kress Fellow, 2006
- University of Pennsylvania, Master's of Science in Historic Preservation, 2005
- College of Charleston, Bachelor's of Art in Historic Preservation and Community Planning, 2002

### Professional Experience

- 2008-Present: Architectural Conservator, 4SE, Inc.
- 2006-2007: Architectural Conservator, Milner + Carr Conservation, LLC
- 2004-2006 Architectural Conservation Intern, University of Pennsylvania, Architectural Conservation Laboratory and Research Center
- 2002-2004 Architectural Conservation Intern, Dorothy Krotzer Conservation  
Architectural Conservation Intern, Fairmount Park Historic Preservation Trust  
Administrative and Research Assistant, College of Charleston, Program in Historic Preservation and Community Planning  
Architectural Conservation Intern, National Park Service, Historic Preservation Training Center

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## Resume

**Hillary  
Nicole  
King**

Hillary King received an MS in Historic Preservation through a collaborative program between Clemson University and the College of Charleston, where her Masters thesis was a comprehensive preservation plan for a 1930 manor house located on the site of a former plantation in the Charleston area. As an undergraduate at Northwestern University, she majored in History and Legal Studies. At 4SE, she is an Architectural Conservator, assisting the principal engineers on a variety of projects including documentation, condition assessment, monitoring, and aiding in design and management of preservation projects.

### Registrations and Professional Affiliations

- National Trust for Historic Preservation

### Education

- Clemson University/College of Charleston, Master of Science, Historic Preservation, 2008
- Northwestern University, Bachelor of Art, History, 2005
- Northwestern University, Bachelor of Art, Legal Studies, 2005

### Professional Experience

- 2008 – Present: Architectural Conservator, 4SE, Inc.
- Summer 2008: Intern, National Trust for Historic Preservation, Southern Office
- 2007-2008: Graduate Assistant, Clemson University

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## Selected Projects

The principals of 4SE, Inc. were the structural engineers in responsible charge of the following projects while employed by Shoolbred Engineers, Inc., Cummings & McCrady, Inc. and John Portman & Assoc., Inc.

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### **South Carolina Aquarium**

Location: Charleston, South Carolina  
Owner: South Carolina Aquarium  
Cost of Construction: \$60 million  
Date Completed: 1999

The South Carolina Aquarium is a three story waterfront structure constructed of architecturally exposed cast-in-place concrete and structural steel. The building contains many site built concrete tanks of various sizes and configurations, including the large ocean tank with a depth in excess of 50 feet. At both ends of the building there is a structural steel framed aviary with a glass roof.

### **Repair and Renovation of St. Michael's Episcopal Church**

Location: Charleston, South Carolina  
Owner: The Vestry of St. Michael's Episcopal Church  
Cost of Construction: \$4 million  
Date completed: 1993

St. Michael's Church, on the corner of Meeting and Broad Streets, is the oldest church building in Charleston. Structural work on this 1751 building included straightening of the spire, rebuilding of much of the spire woodwork and supporting masonry, rebuilding and strengthening of the organ gallery, the addition of two new floors within the tower and the strengthening of the tower and complete reinstallation of the bells for English change ringing.

### **Charleston Renaissance Hotel**

Location: Charleston, South Carolina  
Owner: Hardin Capital  
Cost of Construction: \$12 million  
Date Completed: 2001

The Charleston Renaissance Hotel on Wentworth Street is a six story, 165 room, post-tensioned cast-in-place concrete building with stuccoed masonry exterior walls. On the Wentworth Street end of the building there is a third level supported outdoor pool and plaza.

### **Wentworth Street Parking Garage**

Location: Charleston, South Carolina  
Owner: Hardin Capital  
Cost of Construction: \$7 million  
Date Completed: 2001

The Wentworth Street Parking Garage, built at the same time as the Renaissance Hotel, is a five level, 350 car, post-tensioned cast-in-place concrete garage structure with pre-cast concrete, masonry and metal fabricated facades. Retail and office space occupies much of the ground floor.

### **Palmer Campus Library**

Location: Charleston, South Carolina  
Owner: Trident Technical College  
Cost of Construction: \$3.5 million  
Date Completed: 2001

The new library at the Palmer Campus of Trident Technical College is a two story addition to an existing classroom wing. The structure is chiefly structural steel framed with a round, two story cast-in-place concrete and brick entry lobby/reading room.



## Selected Projects

### St. John's High School

Location: John's Island, South Carolina  
Owner: Charleston County Schools  
Cost of Construction: \$14 million  
Date Completed: 2003

The new St. John's High School campus is being built directly behind the existing facility, which will be demolished. The new campus consists of four buildings: a gymnasium/band facility, classrooms, an administrative/media center wing, and a large cafeteria and auditorium facility. The building structures consist of load bearing masonry and steel framing.

### Improvements to The Fireproof Building

Location: Charleston, South Carolina  
Owner: The South Carolina Historical Society  
Cost of Construction: N/A  
Date Completed: 1992, 2001

Robert Mill's Fireproof Building is the first "fireproof" building in America. Structural work in the early 1990s was concerned with the installation of the mechanical systems in the building. Work in 2001 was aimed at determining the appropriate safe approach to space utilization to minimize damage to the building due to excessive loading.

### One Vendue Range

Location: Charleston, South Carolina  
Owner: One Vendue Range Associates  
Cost of Construction: \$35 million  
Date Completed: 2003

One Vendue Range, adjacent to the waterfront park in Charleston, is a four building complex made up of three four-story condominiums and a new City of Charleston art gallery/penthouse facility. The buildings are chiefly structural steel framed and sit on top of post-tensioned cast-in-place concrete elevated platforms which also support plaza areas. Parking is on the ground level.

### Gateway Center

Location: Charleston, South Carolina  
Owner: Rivers Enterprises  
Cost of Construction: \$7 million  
Date Completed: 1997

The Gateway Center is a structural steel framed four story office building with a penthouse and landscaped roof plaza. Pre-cast concrete and glass storefront systems make up the skin of the building.

### Charleston Visitor's Center Parking Garage

Location: Charleston, South Carolina  
Owner: City of Charleston  
Cost of Construction: \$ 12 million  
Date Completed: 1996

The Charleston Visitor's Center Parking Garage is a 5 level parking garage with spaces for 700 cars and ground floor retail space. The parking garage includes interior courtyards. The structural system is made up of predominately precast-prestressed concrete elements; cast-in-place and structural steel lateral load cross-bracing elements and shear walls and a pre-stressed concrete pile and grade beam foundation.



## Selected Projects

### **St. Luke's Episcopal Church**

Location: Atlanta, Georgia  
Owner: The Vestry of St. Luke's Episcopal Church  
Cost of Construction: \$10 million  
Date Completed: 2001

St. Luke's is a 1906 Tudor Gothic building in downtown Atlanta. This project involved tying the split chancel arch back together again, strengthening the truss supports, stiffening the nave floor, raising and resupporting the dropped chancel floor, supporting an additional altar and construction of a new 100' tower for English change ringing bells.

### **Charleston Maritime Center**

Location: Charleston, South Carolina  
Owner: City of Charleston  
Cost of Construction: \$ 2 million  
Date Completed: 1997

The Charleston Maritime Center is a multipurpose facility used both as an entertainment center and as a facility for the commercial fishing industry. Built on the waterfront, it has won several architectural awards. The structural system includes a curved bar joist roof, an exposed and architecturally detailed structural steel frame and a pre-stressed concrete pile and cast-in-place concrete structural slab foundation.

### **Charleston County Public Services Building**

Location: North Charleston, South Carolina  
Owner: Charleston County  
Cost of Construction: \$20 million  
Date Completed: 1999

The Charleston County Public Services Building is a three story, 165,000 SF government office building and emergency operations center. It features courtrooms, data processing and office spaces and communications areas. The structural system includes a steel frame structure with composite steel beams and concrete deck and a pre-stressed concrete pile and grade beam foundation.

### **Charleston County Judicial Center**

Location: Charleston, South Carolina  
Owner: Charleston County  
Cost of Construction: \$35 million  
Date Completed: 2002

The Charleston County Judicial Center is a 180,500 SF facility which includes 14 courtrooms, assorted office space, prisoner holding facilities, and offices for county service facilities. It includes a 17,600 SF basement and a 7500 SF mechanical penthouse. The structural system is made up of a steel frame structure with composite steel beams and concrete deck, a cast-in-place concrete structural slab and grade beam ground floor and basement floor, cast-in-place concrete basement walls and an auger cast pile foundation.

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## Selected Projects

### **Singapore Oriental Hotel**

Location: Marina Square, Singapore  
Cost of Construction: under \$100 million  
Date Completed: 1984

The Oriental Hotel is the luxury hotel in a three hotel complex on the harbor in Singapore. This 23 story hotel has two of its three exterior walls as conventional vertical walls. The third side, spanning a 90 degree arc, steps in as it goes up so that the structural shear walls lean at a 55 degree angle. Particularly interesting was the necessity that the building be built slightly out of position so that under load, it would be in its correct position.

### **Burke High School**

Location: Charleston, South Carolina  
Owner: Charleston County School District  
Cost of Construction: \$23 million  
Date Completed: 2004

The Burke High School Project consists of 188,500 SF of new construction with two story classroom space, a gymnasium, an auditorium, a media center and a two story, 20 foot wide, 400 foot long central mall corridor. The structural system includes ground modification using vibro-replacement and compaction grouting, footing foundation, masonry, steel and concrete structural elements, concrete floor slabs on bar joist and metal deck, and a metal deck and bar joist roof.

### **WPXI TV-11 Analysis**

Location: Pittsburgh, Pennsylvania  
Owner: WPXI-TV  
Cost of Construction: N/A  
Date Completed: 1999

Conducted structural analysis to ensure broadcast tower could support new digital antenna and transmission line under current code provisions. Provided detail drawings of new tower section needed to interface between existing tower and new antenna.

### **State of SC ETV**

Location: Various, South Carolina  
Owner: South Carolina ETV  
Cost of Construction: N/A  
Date Completed: 2000

The South Carolina ETV provided 23 transmission towers located at existing schools in the state. We provided specifications to obtain competitive bids from several tower companies, evaluated the bids to ensure total compliance before accepting the bid and performed site inspections to ensure contractor provided quality installation.



## Selected Projects

### Cannon Street Medical Office Building

Location: Charleston, South Carolina  
Owner: The Beach Company  
Cost of Construction: \$7 million  
Date Completed: 2002

The Cannon Street Medical Office Building is a four story office building to serve primarily medical office needs. It has a parking area on the ground floor level. The structural system consist of a cast-in-place concrete post-tensioned floors and roof with a cast-in-place concrete ground floor slab and a pre-stressed concrete pile and grade beam foundation.

### Stella Maris Bell Installation

Location: Sullivan's Island, South Carolina  
Owner: The Catholic Diocese of Charleston  
Cost of Construction: N/A  
Date Completed: 1995

Stella Maris was built in 1845 and its bell tower was completed in 1895. In 1995, the church added a ring of eight English change ringing bells to the tower. Strengthening and stitching of the tower permitted the bells to be installed and rung without opening the pre-existing cracks.

### Dockside Harborwalk

Location: Charleston, South Carolina  
Owner: City of Charleston  
Cost of Construction: \$3 million  
Date Completed: 1999

The Dockside Harbor Walk is a concrete pier and bulkhead complex that not only serves the Dockside condominiums but also continues the City of Charleston's harbor walk concept. It extends from the Charleston Maritime Center to near the site of the Fort Sumter Tour Boat facility. The structural system consists of pre-stressed concrete piles and cast-in-place concrete pier and bulkhead structures.

### James Island High School Additions

Location: James Island, South Carolina  
Owner: Charleston County School District  
Cost of Construction: \$7 million  
Date Completed: 2003

The James Island High School project consists of a two story classroom addition and an extension to the existing cafeteria. The structural system includes ground modification using vibro-replacement and compaction grouting, footing foundation, masonry, steel and concrete structural elements, concrete floor slabs on bar joist and metal deck, and a metal deck on bar joist roof.

### Consumers Energy 800 Mhz System

Location: Various, Michigan  
Owner: Consumers Energy  
Cost of Construction: N/A  
Date Completed: 1997

The Consumers Energy 800 Mhz System provides communication for Michigan's power company with over 65 sites in the lower peninsula. Provided specifications to obtain competitive bids from several tower companies, evaluated the bids to ensure total compliance before accepting the bid, and performed site inspections to ensure contractor provided quality installation.

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## Selected Projects

### **E. Craig Wall Building**

Location: Conway, South Carolina  
Owner: Coastal Carolina University  
Cost of Construction: \$10 million  
Date Completed: 1992

The E. Craig Wall Building is a three story, 100,000 SF class room building designed to be the focal point for Coastal Carolina University. It contains classrooms, offices, a boardroom, and a campus recreation center. The structural system consists of a structural steel frame with composite steel beams and concrete deck, a steel truss and joist roof system, and a pre-stressed concrete pile and grade beam foundation.

### **State of Michigan System**

Location: Various, Michigan  
Owner: State of Michigan Police  
Cost of Construction: \$180 million  
Date Completed: 2002

The State of Michigan System provides communication for Michigan's State Police with over 180 sites in the lower and upper peninsulas. Provided specifications to obtain competitive bids from several tower companies, evaluated the bids to ensure total compliance before accepting the bid, and performed site inspections to ensure contractor provided quality installation.

### **UNC-TV Public TV**

Location: Various, North Carolina  
Owner: North Carolina Public Television  
Cost of Construction: N/A  
Date Completed: N/A

Provided new tower specifications, bid evaluation and quality control for erection of several new television towers for the State of North Carolina Public Television.

### **Empire State Building Tower**

Location: New York, New York  
Client: Dielectric Communications  
Cost of Construction: N/A  
Date Completed: 1998

Designed and detailed an antenna mounting bracket for a new Television antenna on the existing tower located at the top of the Empire State Building. The mount was designed to fit around several existing TV & FM antennas and it was designed in sections so that it could be transported to the building top via a cargo elevator.

### **WCBD TV Tower**

Location: Charleston, South Carolina  
Client: WCBD TV  
Cost of Construction: N/A  
Date Completed: 2002

Provided third party check for a broadcast tower located in Awendaw, SC since two previous studies conducted by other firms resulted in conflicting results.

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## Selected Projects

### WSB Tower

Location: Atlanta, Georgia  
Owner: WSB TV  
Cost of Construction: N/A  
Date Completed: 1997

Provided a structural analysis for the WSB tower located in Atlanta. This tower is one the first in the country to accommodate a Digital Television antenna. The increase in loading due to the additional antenna and transmission line mandated significant structural modifications. The required modifications were designed and detailed so that the tower would comply with the applicable wind loading codes.

### Sigonella Tower

Location: Sicily  
Owner: US Navy  
Cost of Construction: N/A  
Date Completed: 1988

This 850 ft, double and 12 top radial guyed tower was designed for the US Navy for Low Frequency communication with submarines. The design conforms to the stringent wind and seismic requirement of the US Navy and the Italian codes. The design and drawings were completed in the metric system and the tower was fabricated in Italy,

### Alabama ETV

Location: Various, Alabama  
Owner: Alabama ETV  
Cost of Construction: N/A  
Date Completed: 2000

Conducted feasibility studies on seven broadcast towers owned by the state of Alabama to determine if they could be structurally upgraded to support digital antenna loading.



## Categorized Projects

The principals of 4SE, Inc. were the structural engineers in responsible charge of the following projects while employed by Shoolbred Engineers, Inc., Cummings & McCrady, Inc. and John Portman & Assoc., Inc.

## Government Buildings

- South Carolina Aquarium, Charleston, SC, 1992
- Charleston Maritime Center, Charleston, SC, 1993
- Sewee Visitor Center, Awendaw, SC, 1993
- Charleston County Judicial Center, Charleston, SC, 2002
- Charleston County Public Services Building, North Charleston, SC, 1999
- Engineering Services Building, Kings Bay, GA, 1984
- Hobcaw Barony Laboratory, Georgetown, SC, 1988
- Pipe Shop, Charleston Naval Shipyard, North Charleston, SC, 1980
- James Island Fire Station, Charleston, SC, 1984
- Building Ten Renovations, Philadelphia Naval Shipyard, Philadelphia, PA, 1985
- Pinehaven Post Office, North Charleston, SC, 1985
- Physical Fitness Center CAFB, North Charleston, SC, 1990
- John's Island Fire Station, John's Island, SC, 1997
- O.T. Wallace Renovations, Charleston, SC, 2002
- City of Charleston Daniel Island Municipal Building, Daniel Island, SC, 2003
- Mt. Pleasant Fire Station, Mt. Pleasant, SC, 2003

## Schools

- Palmer Campus Library, Charleston, SC, 1998
- St. John's High School, John's Island, SC, 2002
- McClellanville Middle School, renovation and addition, McClellanville, SC, 1989
- Sottile Theatre, renovation and addition, Charleston, SC, 1991
- E. Craig Wall Building, Coastal Carolina College, Conway, SC, 1992
- Burke High School Additions, Charleston, SC, 2003
- Vandiver Hall, The Citadel, Charleston, SC, 1988
- Baptist Hill High School Additions, Charleston, SC, 1982
- Baptist Hill High School Stadium, Charleston, SC, 1982
- Schroeder Middle School, Charleston, SC, 1982
- Stall High School Additions, North Charleston, SC, 1984
- Sottile Theatre Orchestra Pitt, Charleston, SC, 1985
- Whitesides Elementary School Additions, Mt. Pleasant, SC, 1987
- Garrett High School, North Charleston, SC, 1993
- James Island High School Additions, Charleston, SC, 2002
- Ft. Johnson Middle School Additions, Charleston, SC, 2002
- Mary Ford Elementary Additions, North Charleston, SC, 2003
- Hursey Elementary Addition, North Charleston, SC, 2003
- Lucy Daniels Foundation Facility, Cary, NC, 1990
- Derry Patterson Wing School of Nursing, Charleston, SC
- Cario Middle School, Mt. Pleasant, SC, 1999
- Pinckney Elementary School, Mt. Pleasant, SC, 1999
- St. James/Santee Elementary School Additions, McClellanville, SC, 1998

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## Categorized Projects

### Parking Garages

- Wentworth Street Parking Garage, Charleston, SC, 1999
- Charleston Visitor Center Parking Garage, Charleston, SC, 1993
- Duke Power Parking Garage Precast Elements, Charlotte, NC, 1994
- Courtland Street Parking Garage, Conceptual Design, Atlanta, GA
- Charleston County Health Center Parking Garage Evaluation, Charleston, SC

### Commercial / Office Buildings / Condo / Industrial

- One Vendue Range, Charleston, SC, 2000
- Gateway Center, Charleston, SC, 1996
- Wappoo Center, Charleston, SC, 1984
- Canterbury House East, Charleston, SC, 1997
- 441-446 King Street, renovation and new construction, Charleston, SC, 1998
- Turtle Point Villas, Kiawah Island, SC, 1983
- Exxon Pipe Bridge and Dock, Charleston, SC, 1983
- Jackson Davenport Building, Charleston, SC, 1998
- Cannon Street Medical Office Building, Charleston, SC, 2002
- Pertama Office Tower, Conceptual Design, Kuala Lumpur, Malaysia
- Marquis I & II Office Towers, Frame Design, Atlanta, GA
- Maersk Offices, Mt. Pleasant, SC
- Atlanta Apparel Mart Addition, Conceptual Design, Atlanta, GA
- Advising on High Rise Projects in Tampa and Chicago
- Cable Jacketing Plant and Warehouse, Orangeburg, SC
- Berchtold Industrial Facility, North Charleston, SC, 1992
- Ocean Drive and Crescent Beach Waste Water Treatment Plant, Myrtle Beach, SC, 1995
- Lexington Pump Station, Lexington, SC, 1996

### Hotels

- Middleton Inn, Charleston, SC, 1983
- Charleston Renaissance Hotel, Charleston, SC, 1999
- Mt. Pleasant Holiday Inn, Mt. Pleasant, SC, 1988
- Hampton Inn, Charleston, SC, 1986
- Planters Inn, Charleston, SC, 1984
- Singapore Oriental Hotel, Singapore
- Hotel, Office and Retail Complex, Conceptual Design, Shanghai, China
- Francis Marion Hotel Renovation, Charleston, SC
- Hampton Inn, North Charleston, SC, 1997

### Health Care Facilities

- Ambulatory Care Facility, Charleston, SC, 1991
- Roper Hospital Seismic Evaluation, Charleston, SC, 1998
- Bishop Gadsden Retirement Community Additions, Charleston, SC, 2003
- Charleston County Health Center, Charleston, SC
- Medical Office Building, North Charleston, SC, 1995
- Macedonia AME Assisted Living Facility, Charleston, SC
- MUSC Indefinite Delivery Contracts, Charleston, SC

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## Categorized Projects

### Historic (Large Projects)

- Aiken-Rhett House, partial renovations, Charleston, SC, 1988-1997
- Powder Magazine, renovation, Charleston, SC, 1995
- 8 Bedon's Alley, renovation and addition, Charleston, SC, 1995
- Avery Institute, renovation, Charleston, SC, 1997
- Middleton Plantation Springhouse, renovation, Charleston, SC, 1998
- Rose Hill Plantation Renovation, Bluffton, SC, 1988
- Blake Tenement Addition and Renovation, Charleston, SC, 2002
- Gaineswood Historic House, Demopolis, AL
- The Fireproof Building, Charleston, SC
- Market Hall Roof, Charleston, SC
- The Confederate Home, Charleston, SC
- The Old City Jail, Charleston, SC
- St. Luke's Episcopal Church, Atlanta, GA
- St. Philip's Episcopal Church, Charleston, SC
- St. Michael's Episcopal Church, Charleston, SC
- First (Scots) Presbyterian Church, Charleston, SC
- Holy Cross Episcopal Church, Stateburg, SC
- Grace Episcopal Church, Charleston, SC
- Bell Tower Upgrade, Stella Maris Catholic Church, Sullivan's Island, SC
- Cathedral of St. John The Baptist, Charleston, SC
- St. Mary's Catholic Church, Charleston, SC

### Historic (Residential Scale Projects)

- 26 Meeting Street, Charleston, SC
- 45 Church Street/14 Water Street, Charleston, SC
- 19 Tradd Street, Charleston, SC
- 115 Church Street, Charleston, SC
- 58 South Battery, Charleston, SC
- 31 Meeting Street, Charleston, SC
- 9 Limehouse Street, Charleston, SC
- 38 Hasell Street, Charleston, SC
- 10 Gillon Street, Charleston, SC
- 3 Legare Street, Charleston, SC
- Aiken-Rhett House, Charleston, SC
- Edmonston-Alston House, Charleston, SC
- 14 Legare Street, Charleston, SC
- 32 Legare Street, Charleston, SC
- Edisto Presbyterian Church Renovation, Edisto Island, SC
- Alston House, East Cooper relocation, Berkeley County, SC
- Governor Thomas Bennett House, Charleston, SC
- William Aiken House, Charleston, SC
- Grove Plantation, Adams Run, SC

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## Categorized Projects

### Churches

- KKBE Synagogue, renovation and addition, Charleston, SC, 2001
- All Saints Educational Facility, Pawley's Island, SC, 1994
- Beaufort Baptist Church, renovation and addition, Beaufort, SC, 1995
- Mt. Pleasant Presbyterian Church, Mt. Pleasant, SC, 1997
- Christ Episcopal Church, Mt. Pleasant, SC
- Grace Episcopal Church Columbarium and Bell Tower, Charleston, SC
- Heritage Presbyterian Church, Mt. Pleasant, SC, 1988

### Water Front / Marine Projects

- Barge Docking Facility, Charleston, SC
- USS Slater Berthing Study, Mt. Pleasant, SC
- Hydrographic Surveys, Various Locations
- Liquid Storage Tanks and Loading Facilities, Tampa, Baltimore & Odessa, Ukraine
- Dockside Harborwalk, Charleston, SC, 1999
- Dewes Island Bulkheads, Dewes Island, SC, 1992

### Residential

- Croffead Residence, Charleston, SC, 1987
- Brilliant Residence, Sullivan's Island, SC, 1990
- Reid Residence, John's Island, SC, 1986
- 8 Bedon's Alley, Charleston, SC, 1998
- Menefee Cabin, Green River, NC, 1992
- Harmon Residence, Mt. Pleasant, SC, 2003
- River Oaks, James Island, SC, 2002
- Parkside Villas, Kiawah Island, SC, 1982
- Heron Pond Villas, Kiawah Island, SC, 1985
- Turtle Point Villas, Kiawah Island, SC, 1986
- McDevitt Street Residence, Kiawah Island, SC, 1985
- Garonzik Residence, Spring Island, SC, 1999
- Colt Residence, Spring Island, SC, 2003
- Yost Residence, Dewees Island, SC, 1998
- Draisin Residence, Isle of Palms, SC, 1990
- Finley Residence, Columbia, SC, 2003
- Willis Residence, Wadmalaw Island, SC, 2002
- 69 Ashley Ave., Charleston, SC, 2003
- Thompson Residence, Columbia, SC, 2003
- Day Residence, Cashiers, NC, 2003
- Taft-Paulsen Residence, Kiawah Island, SC, 1997

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## Categorized Projects

### Towers

- Sigonella LF Tower, Sigonella, Sicily, Italy, 1988
- Cajun Electric Communication Tower System Review, LA, 1981
- Big Rivers Communication Tower System Review, KY, 1982
- Parachute Jump Towers, Ft. Benning, GA, 1984
- Consumers Energy 800 Mhz System, Michigan. Quality control for design and erection of 65 tower sites for Power Company in Michigan. (1992 – 1997)
- State of Michigan Police, Michigan. Quality control for design and erection of 182 tower sites for Michigan State police Communications system. (1995 – 2002)
- UNC-TV, North Carolina, Quality control for design and erection of several new television towers for the State of North Carolina Public Television.
- Allegheny Power Microwave Tower System Review, Maryland & West Virginia, 1985
- Network DTV structural studies. Conduct studies on transmission towers for major networks Broadcast companies (NBC, ABC, CBS, FOX, Paxson, Pegasus) to determine adequacy of existing structures for new equipment associated with High Definition Television. (1994 – 2002)
- Several hundred PCS Studies. Conduct studies on transmission towers for cellular and paging companies to determine adequacy of structures in supporting new equipment for system upgrades.