



Qualifications - Civil and Structural Engineering

George Barbour has over 21 years of structural engineering, civil engineering and construction observation/administration experience. He has prepared plans, specifications, and bid documents for a variety of projects including bridges, parking decks, and commercial and residential buildings and cellular communication sites. For many of these projects, He provided construction administration services on behalf of the owner. He provides comprehensive engineering and forensics investigation services for a variety of building systems. He has performed construction/design defect assessments, building condition studies, OSHA and building code compliance reviews, insurance damage assessment studies, and personal injury and traffic accident reconstruction studies and provided expert testimony concerning his investigations. In addition, Mr. Barbour served on a joint committee of ASCE and the ABA compiling the *Manual of Forensic Engineering Practice*.

Relevant Experience

The following is a representative list of projects Mr. Barbour has completed.

2003, 2004, 2005 On-call Civil/Structural Service Agreement, University of North Carolina at Wilmington. Mr. Barbour was selected to provide civil and structural engineering service for projects with construction costs under \$300,000.

Cinema Park and Ride Facility, University of North Carolina at Wilmington. Mr. Barbour was selected to provide planning and design of this park and ride facility serving the university.

Empy Park Fire Station Structural Slab on grade Replacement, City of Wilmington, NC, Designed the replacement slab for the existing fire station. Increased loads from newer heavy equipment damaged the existing slab.

Wrightsville Avenue Improvements, City of Wilmington, NC: Engineer of record for this roadway improvements project for the City of Wilmington. The project included conversion of this 2-way public street into a 1-way street with curb side parking and sidewalks. The project included water, sanitary sewer and storm sewer improvements.

Legion Stadium Improvements, City of Wilmington, NC: Assisted in the development of a multi-phase master plan for the improvement of this valued City facility. As structural engineer of record, designed structural improvements to the stadium and provided structural design of several buildings added to the site.

Alliance Credit Union, Wilmington, NC: Feasibility analysis and preliminary design of parking additions and automated teller machine site for this existing bank site.

CVS Site, North Myrtle Beach, SC: Civil design of site improvements related to this new drug store.

Long Leaf Creek Hurricane Floyd Repairs, City of Wilmington, NC: Design of repairs related to this urban storm water conveyance related to flood damage caused by an estimated 500-year storm.



Pedestrian Tunnel Feasibility Study, City of Winston Salem, NC: Performed a feasibility study for the installation of a pedestrian tunnel to be installed under Martin Luther King Boulevard. The tunnel was intended to provide access between student housing and the main campus for Winston Salem State university students.

Fire Station 2 Garage Slab Replacements, City of Wilmington, NC: Designed a replacement slab for the fire station garage necessary to supported increased wheel loads of modern equipment.

Northside Baptist Church Sanctuary and Parking Addition, Wilmington, NC: Engineer of record for civil and structural engineering for the sanctuary addition and related site improvements.

Northgate Mall Expansion, Durham, NC: Structural design of this 79,000 square foot expansion to Northgate Mall.

Southern Middle School Additions and Renovations, Roxboro, NC: Structural design of additions and renovations to the existing Southern Middle School. The project included a 37,000 square foot 2-story classroom building, 23,000 square foot 2-story gymnasium addition, 12,000 square foot vocational building and various smaller additions totaling 87,000 square feet.

Person County Senior High Additions and Renovations, Person County, NC: Structural design of 77,800 square feet of additions and 40,000 square feet of renovations to the existing Southern Middle School. Typical construction consisted of load bearing masonry walls and steel bar joist supported roof and floor structures.

Siemens Systems Medical Training Center, Cary, NC: Structural designed a 65,000 square foot, 4-story horseshoe shaped structural steel training center. The building program included high live loads and point loads for wheel mounted equipment, dropped computer floors and precast exterior panels.

Caterpillar Assembly Plant, Clayton, NC: Provided construction observation and construction administration services for this fast track project. Construction included renovation of existing 320,000 square foot facility and the addition of a 44,000 square foot facility with a 35 foot roof height. The project included the addition of 23 runway cranes, 4 jib cranes, a bulk fluids storage and dispensing facility and extensive site improvements.

John Morrell & Company Meat Packing Renovations, Wilson, NC: Analyzed and provided repair design for the existing monorail system and designed a new monorail system converting 2 dry bulk storage areas into refrigerated storage space.

Bellemeade Street Parking Deck, Greensboro, NC: Assisted in the structural design of this 8-story, 1275 car parking garage. Designed an 8-story reinforced concrete spiral exit ramp and associated bridge structure. Provided construction administration and on-site project representation during construction.

SouthChem Material Packaging Building, Durham, NC: Performed a condition survey of this multi-wythe masonry wall structure with a heavy timber queen post truss roof and designed repairs to the structure necessary to bring it into compliance with the building code and to allow installation of a new roof covering.



Defense General Supply Center Truss Repairs, Richmond, VA: Designed procedures for the repair of heavy timber roof trusses with split ring connectors for approximately 1.9 million square feet of 1942 vintage military warehouse space. The typical roof truss spanned 60 feet and was 8 feet deep.

Caterpillar Assembly Plant, Clayton, NC: Provided construction administration and observation as the on site engineer for this fast track project. Construction included renovation of an existing 320,000 square foot facility and the addition of a 44,000 square foot facility with a 35 foot roof height. The facility included 23 runway cranes, 4 jib cranes, 2 water cooled 250 Hp air compressors, a bulk fluids storage and dispensing facility, as well as extensive mechanical, electrical and site improvements.

Southern Middle School Additions and Renovations, Roxboro, NC: Designed 77,800 square feet of additions and 40,000 square feet of renovations to the existing school originally constructed in the 1940's. Typical construction consisted of load-bearing masonry walls and bar joist roofs.

American Board of Orthopedics Surgery Building, Chapel Hill, NC: Performed the frame analysis and foundation design of this 4-story steel framed brick veneer office building with below grade parking.

Siemens Systems Medical Training Center, Cary, NC: Designed a 65,000 square foot horseshoe shaped training center. The building program included high distributed live loads and point loads for wheel mounted equipment, dropped computer floors and precise exterior wall panels. The design feathered partially composite floor beams and girders and a combination of braced and rigid steel frames.

Northgate Mall Expansion, Durham, NC: Structural design of 79,000 square feet of additions to Northgate mall.

L. Herman Building Renovations, Danville, VA: Designed a 4-story masonry stair tower on end bearing caisson foundation and assisted in the design for the renovation of this existing 4-story multi-wythe bearing wall, timber-framed building originally constructed in the early 1900's. The project included the evaluation of the existing framing and design of extensive structural enhancements required for anticipated loads.

Capital Area Transit Garage, Raleigh, NC: Investigation of the caused of cracks in the load-bearing reinforced masonry walls in this maintenance facility serving the City of Raleigh bus system.

Gorman Street Bridge, Raleigh, NC: Provided construction observation for this 3-span composite steel girder bridge with reinforced concrete substructure for a railroad overpass. The project included .3 miles of roadway and utility improvements including extensive improvements to the intersection of Gorman and Hillsboro streets.

I77 Southbound Bridge Replacement over Westinghouse Boulevard (NCDOT), Designed the superstructure and substructure for this 181 foot, 3 span bridge. Superstructure featured haunched composite steel beam approach spans with 120 foot composite steel plate girder main span. Substructure featured conventionally reinforced interior bents on spread footings and en bents on point bearing steel piles. Replaced bridge no. 46.



I77 Northbound Bridge Replacement over Westinghouse Boulevard (NCDOT): Designed the superstructure and substructure for this 181 foot, 3 span bridge. Superstructure featured haunched composite steel beam approach spans with 120 foot composite steel plate girder main span. Substructure featured conventionally reinforced interior bents on spread footings and en bents on point bearing steel piles. Replaced bridge no. 45.

NC54 Bridge Widening and Rehabilitation (NCDOT): Designed the widening and rehabilitation of 4 span non-composite steel beam bridge. Project including removal of the existing non-composite slab and modification of the existing beams for composite action. The widening portion of the project included composite steel beams and 2 column conventionally reinforced concrete interior bents on spread footings and end bents on point bearing piles.

Sabraton Avenue Arch over Hartman Run Inspection, City of Morganton, West Virginia: Performed 3 cycles of semi-annual bridge inspections on this multi-span, reinforced concrete arch bridge over Hartman run. Project included extensive and detailed visual inspections of every component and a structural analysis taking into effect the deterioration of components. The bridge rating was determined and this information was used to establish maintenance procedures and loading limits for the structure.

High Street Bridge Inspection, City of Morgantown, West Virginia: Performed 3 cycles of semi-annual bridge inspections on this multi-span, steel truss bridge with lattice truss bents in downtown Morgantown. Project included extensive and detailed visual inspections of every component and a structural analysis taking into effect the deterioration of components. The bridge rating was determined and this information was used to establish maintenance procedures and loading limits for the structure.

Taxiway N Aircraft Bridge, Memphis International Airport, Tennessee: Performed an inspection and load rating analysis of this aircraft bridge related to taxiway improvements and increased aircraft wheel loads. Designed repairs and modifications to the structure necessary for the project.

Fort Hood Military Housing, Fort Hood, Texas: Structural design of framing and foundations on expansive soils for this 200 unit single-family and multi-family project.

Fort Bliss Military Housing, Fort Bliss, Texas: Structural design of framing and foundations on expansive soils for this 170 unit single-family and multi-family project.

Dyess Air Force Base Military Housing, Dyess Air Force Base, Texas: Structural design of framing and foundations on expansive soils for this 179 unit single-family and multi-family project.