



TETRA TECH

June 18, 2010

Board of Directors of the Carrollwood Lakes Home Owners Association
ATTN: Mr. Larry Jordan
Crye-Leike Property Management
890 Willow Tree Circle #1
Cordova, TN 38018

**RE: Proposal for Professional Engineering Design Services Related to
Carrollwood Lakes A/C Dam and Spillway Outlet Works
Cordova, TN**

Dear Larry:

We are pleased to submit this proposal for the design of a re-constructed dam and spillway outlet works at the lower end of Lakes A/C.

Project information was provided by your office in the form of an RFP from the Carrollwood Homeowners Association dated June 2010. In addition, we visited the site of the dam / spillway prior to development of this proposal. We understand that seepage and piping was noted at the spillway by TDEC during a routine inspection prior to the heavy rains that occurred on or about the first of May. The dam / spillway failed on May 7, 2010 due to erosion (piping) of material from beneath the concrete covered spillway. Currently, there is no water within Lakes A or C.

We understand the dam / spillway is approximately 10 feet in depth and 25 feet wide. The structure is an earthen dam that was covered with concrete on both the upstream and downstream faces. We observed that the failure occurred near the west abutment.

This proposal includes design services through completion of bidding phase, surveying and a geotechnical engineering investigation for the primary purpose of developing recommendations for design and reconstruction of the dam and spillway.

The design will consider many important elements, including but not limited to:

- Dam safety and maintenance
- Soil conditions and requirements
- Hydraulic efficiency of new spillway/outlet works
- Lake system hydraulics and reservoir routing
- Erosion and sedimentation control
- Site access and staging
- Constructability
- Construction cost/budget
- Schedule

Following is an outline of our proposed scope of services

SECTION 1. BASIC SCOPE OF SERVICES

I. INVESTIGATION/CONCEPTUAL DESIGN PHASE

The first phase of the project is dedicated to identifying, investigating and analyzing existing conditions. During this phase, Tetra Tech will also explore conceptual design alternatives for the dam and spillway outlet works. This phase will also include coordination of conceptual alternatives with TDEC.

1. Kick-off meeting – After receiving Notice to Proceed, Tetra Tech will attend a kick-off meeting with the Board of Directors of the Carrollwood Lakes Home Owners Association (BCWLHOA) and other representatives as determined. The meeting will provide the BCWLHOA an opportunity to further discuss the project goals, expectations, as well as to discuss any issues and concerns that they may have.
2. Preparation – Gather, review and compile available utility maps and record plans provided by the City of Memphis and MLG&W for the project area, as well as available dam inspection reports.
3. Geotechnical Investigation – Soil borings and associated geotechnical investigation with recommendations are a critical component of the project design.
 - a. To explore the subsurface conditions for this project, we propose to drill 2 soil test borings to depths of about 50 and 100 feet below grade at the abutments of the dam. Some adjustments in the boring depths may be necessary depending upon the subsurface conditions encountered.
 - b. Upon completion of the field exploration, laboratory testing will be performed on selected samples to define plasticity and strength characteristics of the soils. The in-situ moisture content will be determined on all samples.
 - c. At the conclusion of field and laboratory work, the data will be analyzed by experienced geotechnical engineers at PSI and a report will be prepared.
4. Survey – Prepare a topographic survey of the project area based on the following:
 - a. Survey limits – Basic services:
 - i. Existing Lake C failed dam/spillway area (detailed topo). Cross-sections of outfall stream to approx. 200' south of dam are recommended for purposes of Lake A/C/D hydraulic calculations as needed for permitting.
 - ii. Existing box culvert connecting Lakes A and C, and Grandbury Place road in the area of the box culvert, for purposes of Lake A/C/D hydraulic calculations.
 - iii. Existing Lake D spillway (detailed topo) for purposes of Lake A/C/D hydraulic calculations.

- iv. Perimeter of dry Lakes A/C as needed to establish stage-storage data needed for Lake A/C/D hydraulic calculations. Obtain existing top of bank and toe of slope elevations at appropriate spacing to adequately define horizontal and vertical geometry.
 - v. Perimeter of Lake D as needed to establish stage-storage data needed for Lake A/C/D hydraulic calculations. Obtain existing top of bank and ground elevation at water surface, at appropriate spacing to adequately define horizontal and vertical geometry.
 - b. Tennessee Category 1 Boundary and Topographic Survey, tied to Tennessee State Plane Coordinate system and City of Memphis Vertical Datum benchmark.
 - c. Establish lot and parcel boundary lines and existing rights-of-way in the area of the failed dam/spillway based on existing property corner monuments; and research of deeds, easements and plats available in the public record. Also include the right-of-way for the existing electrical power transmission line south of the dam/spillway.
 - d. Perform topographic locations of all visible natural and man-made features within project limits (as defined in 4a above). Along the lake perimeters, the survey will be limited to features as needed to establish lake stage-storage data for hydraulic calculations. It is assumed that surrounding building finished floors and yard features will not be needed.
 - e. Visible electrical distribution, gas, water and telecommunications structures will be field located and known underground and overhead lines will be shown as per MLG&W maps.
 - f. All survey mapping will be prepared in AutoCAD format, and signed and sealed by a professional land surveyor registered in the State of Tennessee.
- 5. Project area assessment - After receipt of the draft survey, Tetra Tech will conduct a field visit to visually assess the project area and confirm existing conditions. In addition, the project area will be documented photographically. The survey will be refined as needed and a final survey issued to the BCWLHOA for review.
- 6. Hydraulic Analysis - Tetra Tech will perform a hydraulics and hydrologic analysis of the pre-existing dam/spillway design in order to establish the baseline criteria. Subsequently, Tetra Tech will perform preliminary hydraulic analysis for each alternative to assess and determine alternatives meeting the baseline criteria.
- 7. Conceptual Design Alternatives - Design team will explore conceptual design alternatives for the re-constructed earthen dam and spillway / outlet works.
 - a. Prepare conceptual design plans and typical sections for each of the primary alternatives.
 - b. Prepare order-of-magnitude construction cost opinions for each of the primary alternatives.
 - c. Coordinate conceptual alternatives with TDEC to assure feasibility of alternatives prior to permitting process.
 - d. Submit conceptual drawings and cost opinions to BCWLHOA for review at 10% and 25% stage of design for this phase.

8. Meetings

- a. Review meeting – Tetra Tech will attend a progress meeting with BCWLHOA to review the geotechnical investigations, hydraulic analysis and conceptual design drawings and cost opinions.

II. PRELIMINARY CONSTRUCTION DOCUMENTS PHASE

Based on the consensus direction arrived in the Investigation/Conceptual Design Phase, Tetra Tech will prepare Preliminary Construction Documents for the proposed improvements based on the preferred alternative. This phase will proceed once the Tetra Tech receives written acceptance of the preferred alternative from BCWLHOA.

- 1. Preliminary Plans will be prepared to include:
 - a. Title/cover sheet with vicinity map and sheet index
 - b. Survey
 - c. Preliminary site plan
 - d. Preliminary grading plan
 - e. Preliminary erosion/sedimentation control plan
 - f. Typical dam cross-sections
 - g. Preliminary spillway/outlet works details
 - h. Preliminary phasing, staging and access plan
- 2. Preliminary Project Manual, will be prepared to include “front end” bidding documents, conditions of the contract, general requirements and other technical specifications pertinent to the project scope. Tetra Tech will work closely with BCWLHOA for preparation of the preliminary Project Manual - especially the bid form, conditions of the contract and form of construction contract.
- 3. Preliminary Opinion of Construction Cost - The conceptual phase cost opinion will be refined to reflect the preliminary design plans (75% documents) for the preferred alternative.
- 4. Review Meetings – Tetra Tech will attend a progress meeting with the BCWLHOA and to review the 75% preliminary construction documents.

III. FINAL CONSTRUCTION DOCUMENTS

The final construction will proceed once the BCWLHOA accept the progress of preliminary construction documents.

- 1. Final Construction Documents will be prepared and will include plans, specifications and bid documents.
 - a. Title/cover sheet with vicinity map and sheet index
 - b. Survey
 - c. Final site plan
 - d. Final grading plan

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- e. Final erosion/sedimentation control plan
 - f. Typical dam cross-sections
 - g. Final spillway/outlet works details
 - h. Final phasing, staging and access plan
5. Final Project Manual will be prepared based on final design and any review comments from the BCWLHOA.
 2. Final Opinion of Construction Costs - The preliminary cost opinion will be refined to reflect the final construction documents for bidding.
 3. Permitting
 - a. Based on preliminary discussions with TDEC, it is our understanding that this will be considered an Alteration/Repair project and not construction of a new dam. We believe this will greatly alleviate the review/approval process.
 - b. The Design Team will prepare all permitting documents in accordance with state, local and federal regulations; and submitted to appropriate agencies for review.
 - c. Design Team will prepare the final permitting documents based upon any agency review comments, and re-submit for review and approval.
 - d. An Application for Certificate of Approval and Safety Under the Safe Dams Act of 1973 will be submitted to TDEC for review and approval.
 - e. A Storm water Pollution and Prevention Plan (SWPPP) will be prepared and will be submitted to TDEC for review and approval.
 4. Review Meetings – Tetra Tech will attend a progress meeting with the BCWLHOA and to review the 90% construction documents prior to finalizing for bidding.
 5. It is expected that the BCWLHOA will be responsible for the payment of agency review and permitting fees.

IV. BIDDING / AWARD PHASE

Tetra Tech will assist the BCWLHOA with bidding services, up to Notice of Award. During the Final Construction Documents phase, we will assist the BCWLHOA in determining the construction period duration. Once set, we will be able to provide a detailed scope and fee for the construction period(s). The advertisement for bids can commence once TDOT issues a Notice to Proceed for the construction phase of the project.

1. Bidding
 - a. Confirm bidding procedures with BCWLHOA.
 - b. Attend pre-bid conference with BCWLHOA.

- c. Respond to questions from prospective bidders, and issue addenda as needed.
- d. Attend the bid opening and assist BCWLHOA with evaluation of bids.
- e. Attend pre-award meeting with the qualified low bidder and the BCWLHOA.

SECTION 2. ADDITIONAL/ OPTIONAL SERVICES

In addition to the above Basic Services, Tetra Tech can provide Additional Services that are requested by the BCWLHOA. Fees for additional services will be mutually agreed to in writing between the City and Tetra Tech prior to their performance. Those services may include, but are not limited to, the following:

- ✓ 1. Assessment and geotechnical investigation of the existing Lake D dam/spillway is not included but can be provided as an additional service.
- 2. It is anticipated that substantial additional soil fill will be needed to re-construct the Lake A dam. As an alternative to importing fill from off-site, the existing dry lakes A and C could potentially be over-excavated for use of on-site borrow material. Geotechnical investigation of the lake interior(s) is not included but can be provided as an additional services.
- ★ 3. Construction phase services are not included but can be negotiated into contract at a later date.

SECTION 4. PROPOSED FEES

The proposed fees for the above scope of services is included in a separate attached sealed envelope scope

SECTION 5. SCHEDULE

We understand that the BCWLHOA would like to begin design as soon as possible. Working towards the BCWLHOA's desired construction schedule will be a priority for Tetra Tech. Specific schedules of completion are dependent on the agency review and approval process for this work. Early coordination with TDEC will provide a clearer understanding of the proposed schedule that can be implemented.

Should Tetra Tech be selected for this project, we will develop a preliminary project schedule for review, and can be further discussed with the BCWLHOA at the Project Kick-Off meeting. We can begin the project within one week of written authorization by the BCWLHOA to proceed.

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SECTION 6. CLOSURE

The above scope of services represents our best estimate of our understanding of the project requirements and expectations. We are glad to revise the scope and negotiate a revised fee with you as needed, and can meet with you at your convenience.

If this proposal meets with your approval, we will coordinate with you on a mutually acceptable contract format for execution.

We are very excited about the possibility of working with you on this project. Please feel free to call if have any questions or concerns.

Sincerely,

Tetra Tech, Inc.



♦ E. Lee Wilson, PE
Senior Civil Engineer

Enc. As noted

cc: Frank Gianotti, David Hill

901- 523- 9500.
LEE.Wilson@tetra tech.com.
Front 3' UNION.
65 Union Avenue.
Suite 340
Memphis, TN. 38103



Project Highlights:

- Award-winning multi-disciplined project that included master planning, transportation engineering, stormwater engineering, parking, public access, public walks, and recreation

Project Value:

\$26,000,000

Project Duration:

2003 (Completion)

Project Staff:

Adam Brown, PE
Project Manager

Frank Gianotti, PE
Principal-in-Charge

Mark Mazzone, PE
Civil / Structural Engineer

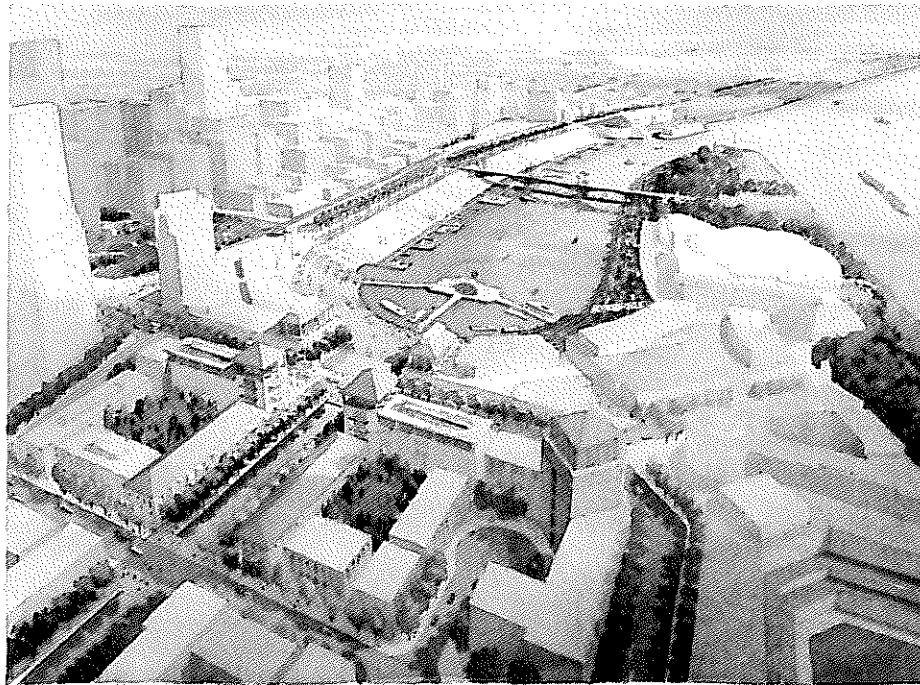
Reference:

Ken Murphree
Tunica County
P.O. Box 639,
1058 S. Court Street
Tunica, MS 38676
(662) 363-1465

The Tunica Riverpark is located on a 170-acre site on the banks of the Mississippi River and creates an experience that gives visitors a better understanding of the Mississippi River and its history. The park includes a harbor & docking facility, visitor's center, museum and aquariums, boat launching ramp, ecological park, and nature trails. The museum and ecopark offer a unique historical experience for visitors wanting to see the "Mighty Mississippi" up close and understand the role the river has played in the nation's heritage. It focuses on the legend and life of the Mississippi River, from the early explorers such as Hernando de Soto and Robert LaSalle to the modern-day engineers who designed management systems that tamed the river. The museum mixes artifacts and high-tech multi-media to tell the river's story and includes four large aquariums full of native aquatic life.

Tetra Tech was responsible for site selection evaluations, programming, establishing project budgets, special wetland and navigational permitting, design, construction administration, and field supervision and support. Special design considerations and challenges included establishment of flood levels, statistical evaluation of historical river data, design of site elements to resist flood damage, design of a docking facility to accommodate 50-foot river fluctuations while maintaining Americans with Disabilities Act (ADA) accessibility, bank stabilization and erosion protection, and wetland mitigation. Tetra Tech's work with the Memphis Corps of Engineers included section 404 permitting and special navigational permits.

The docking facility is a 300-foot long floating dock with elevated superstructure designed to accommodate large river vessels such as the 500-foot American Queen, 150-foot excursion boats, and smaller pleasure craft. The dock is connected to the shore by a 200-foot arch-truss gangway designed to accommodate the extreme river fluctuations.



Project Highlights:

- Development of a land bridge and the formation of a large lake.
- Preliminary engineering services
- Creation of riprap containment dams
- Hydraulic Design
- Bank stabilization
- Grading and Drainage

Project Value:

\$100,000,000

Project Duration:

2006 (Study Only)

Project Staff:

Scott Polzin, P.E.
Project Manager

Frank Gianotti, P.E.
Principal-in-Charge

Tetra Tech was requested to provide preliminary engineering services for the Memphis Corps in conjunction with the Memphis Riverfront Development Corporation for the development of a land bridge linking downtown Memphis to Mud Island and the formation of a large lake.

There are two possible approaches for construction of the Land Bridge – wet or dry construction. The latter, although a more controllable method of fill, would require extremely expensive cofferdams (cost could be approx. 2x greater than wet construction) to build. Therefore, the wet approach has been deemed the more feasible.

Construction would have to begin in low water with the creation of riprap containment dams at either end of the Land Bridge. Hydraulic fill would be pumped into the annular space until the grade level reached the top of the dams. A stabilization mat and granular drainage/work course would be installed and a sheet pile cut-off wall would be driven at the center of the bridge to minimize seepage. This procedure would be repeated in approximate 10' lifts (riprap at ends, hydraulic fill, drainage/ work course, extension of sheet pile cut-off wall) until the Land Bridge was brought to final grade.

Construction will probably take at least one year, and it could take anywhere from six months to three years before the fill material consolidates to the extent where development could begin.

Reference:

Memphis Corps of
Engineers & Riverfront
Development Corp
Mr. David L. McNutt
(CEMVM-ED-C)
US Army Corps of
Engineers - Memphis
District
167 North Main Street
Room B-202
Memphis, TN 38103-1894



Located on the historic Beale Street, FedEx Forum is a 250 million dollar multi-use sports and entertainment arena that is home to the NBA's Memphis Grizzlies. To date, it is the largest public building construction project in Memphis history.

Tetra Tech, Inc, teamed with LRK, Inc., was the largest single consultant on the job, and was responsible for all civil engineering for the arena and parking garage site.

Of particular consequence on the project was the dewatering system, which was very complex and high risk. The arena is sited above an underground aquifer, with the event floor located 35 feet below grade and the total site located 45-50 feet below grade. The implication of the system not working would be the failure of the facility.

Tetra Tech was responsible for 100% design of the permanent dewatering system, which is designed to handle up to 1 million gallons per day without affecting the area around the arena, which includes Historic Beale Street.

The passive dewatering system is designed to handle the groundwater with three pump stations that each have two submersible pumps with the capacity of 250 gpm. The concept of the pump station operation is that the pumps will kick on intermittently to pump out the water collected in the wet wells. When the aquifer is heavily charged by heavy rainfall, the pumps may operate more or less continuously until a steady state is reached. The pumps within each station will be set to cycle to distribute pump usage evenly. The pumps will kick on when the water reaches a certain level in the wet well and will shut down when the water reaches a minimum level. The three pumps operating continuously with one pump each will be able to discharge approximately 1million gallons per day; two-pump operation will have the capacity to discharge 2 million gallons per day.

Project Highlights

- Site Drainage Design
- Selective Demolition
- Rough Grading & Earthwork
- Storm Sewer Relocation
- Street Design & Grading
- Site Utility Plan
- Traffic Control Plan
- Site Lighting
- Shoring Design
- Plat Development
- Final Plan Coordination

Project Value

\$250,000,000

Project Duration

2002-2004

Project Staff

Adam Brown, P.E.
Project Manager

Frank Gianotti, P.E.
Principal-in-Charge

Reference

Public Building Authority
Contact: David Bennett
901.577.5450
195 Linden Avenue
Memphis, TN 38103



Mr. Gianotti's experience is in Project Management of Multi-disciplined projects as well as Civil, and Environmental Engineering. His experience includes the management and design of numerous projects including open end contracts for Corps and Navy districts at Memphis, Nashville, Mobile, Little Rock, Huntsville, Charleston, Louisville, Norfolk, Baltimore, and other federal agencies including GSA, Veteran Administration, and the USDA. Other engineering/architectural projects include institutional projects such as schools, hospitals, computer facilities and laboratories, industrial facilities, environmental studies, wastewater and water supply, urban, rural park and recreational facilities, traffic and transportation facilities, airport rehabilitation's, renovations, and pavement projects, industrial, manufacturing maintenance, and other varied public works projects and improvements.

EXPERIENCE

Nonconnah Creek Project Review for Memphis COE, Memphis, Tennessee, 2005 - Project Manager- responsibilities included overseeing project review. The project review took into account the intent of the authorized plan, including flood damage prevention, protection of infrastructure, and reduction in sediment transfer. The project review included the authorized project limits (Mile 0.0 to 18.2, from the mouth of Nonconnah Creek at McKellar Lake to one mile upstream of Winchester Road) and also the contributing main channel and tributaries upstream of Mile 18.2.

IDIQ Contract for Multidisciplinary planning, engineering and environmental services, Memphis District Corps of Engineers, Memphis, Tennessee, 2000-2003 - Program manager for an Indefinite Delivery Type Architect-Engineer Contract for Multidisciplinary planning, engineering and environmental services for projects within the limits and assignments of the Memphis District. Tetra Tech is providing A-E services for multidisciplinary planning, engineering and environmental services and project web site design and other communications products. Included are tasks related to civil works projects involving flood control; navigation; recreation; fish and wildlife resource protection and enhancement; water quality management; socioeconomic analyses; and other water resources related problems and needs.

IDIQ Contract for Planning and Design Program, Mobile District Corps of Engineers, 2000-2007 - Program manager for contract with the MCOE to perform Planning and Design Program for the Mobile District & the South Atlantic Division Great Lakes and Ohio River Division. Project work and services under this contract include, but are not limited to the following: general engineering studies; design of flood control and bank protection projects; initial assessment, reconnaissance, and feasibility studies with supporting engineering, economic and environmental documentation and report preparation; planning, engineering, and design including development of plans and specifications; planning and design of large navigation projects; planning and design of shore protection projects; metropolitan or local flood studies for flood protection by structural measures, such as levees, channel improvements, detention basins, pump stations, etc.; bioassays conducted for toxicity and other tests related to aquatic environment, water quality data collection, including remote sample and data collection and laboratory analyses; macroinvertebrate and algal taxonomy, enumeration and data analysis; water quality modeling, including calibration of

Project Role:
Principal-in-Charge

Education:
M.S., Civil / Environmental Engineering, University of Tennessee, 1970

B.S., Civil Engineering, University of Tennessee, 1963

Research Assistant, College of Engineering, University of Tennessee

Registrations/Certifications:
Professional Engineer, Alabama, 1977, No.11699
Mississippi, 1981, No.8387
Michigan, 1975, No. 22665
Missouri, 1971, No.18710
Illinois, 1976, No.062-035998
Georgia, 1985, No.11120
Arkansas, 1997, No.8235
Florida, 1980, No.29907
Indiana, 1994, No.19300548
New York, 1975, No.52914
Tennessee, 1963, No.7377

Professional Affiliations:
(see last page)

Office:
Memphis, Tennessee

Years of Experience:
Since 1963

Years with Tetra Tech:
Since 1992



ce-qual-w2; computer services, including programming in support of database management activities, GIS, and other computer and database related services; construction cost estimating using micro-computer aided cost estimating system (m-caces) software; specifications developed using corps of engineers guide specifications (cegs); drawing development readily translatable to intergraph microstation format; geotechnical exploration in conjunction with planning and engineering studies of potential projects.

Greers Ferry Lake Environmental Impact Statement, Little Rock Corps of Engineers, 2000-2000 - Project Manager responsible for coordination of data gathering for the watershed, land use data, researching existing plans and maps as needed to develop base maps for the EIS, researching current regulatory requirements, researching existing water quality data & reports and researching other data as required for the EIS assembly.

Memphis Riverfront Development, Memphis, Tennessee, 2003 - Principal-in-Charge. Served as principal liaison to the Corps of Engineers Memphis District on the 1st phase of this project. Project consisted of feasibility analysis for the introduction of two dams to form a 36-acre lake. One dam is to be located at the southern tip of Mud Island, connecting the terminus of Beale Street with Mud Island. The second would be located adjacent to the Tennessee Welcome Center, to provide direct access from that facility to the island and to complete the lake impoundment.

Tunica RiverPark, Tunica, MS, 2004 - Principal in Charge for \$25M facility on the banks of the Mississippi River including interpretive center with museum and aquarium, river harbor and docking facility, boat ramp, access roads and parking facilities, extensive site hardscape elements. Responsible for all phases of the project including site selection evaluations, master planning, programming, establishing project budgets, special wetland and navigational permitting, design, construction administration, and field supervision and support. Special design considerations included establishment of flood levels, statistical evaluation of historical river data, design of site elements to resist flood damage, design of docking facility to accommodate 50-foot river fluctuations while maintaining ADA accessibility, bank stabilization, and wetland mitigation. The docking facility is a 300-foot long floating dock with elevated superstructure designed to accommodate large river vessels such as the 500-foot long American Queen, 150-foot excursion boats, and smaller pleasure craft. The dock is connected to the shore by a 200-foot arch-truss gangway designed to accommodate the extreme river fluctuations.

New Memphis Arena, Memphis, Tennessee, 2005 - Principal-in-Charge for \$250M NBA arena in Downtown Memphis. Responsible for overseeing the design and coordination of all surrounding infrastructure including major utility relocations (water, gas, electric, sewer, and communications), improvements to public storm drainage system, roadway closures, traffic control plans, and realignment of major arterial road. Civil design for entire arena site including a large permanent dewatering system with wells, underdrains, and pump stations to keep the groundwater level below the event floor, which is nearly 40 feet below grade and within an underground aquifer. Responsible for design of mass excavation including temporary shoring, dewatering, traffic control, erosion control, and construction site access.

Mid America Mall/Trolley Project, Memphis, Tennessee - Project Manager and Principal Designer responsible for the redevelopment of two miles of Main Street pedestrian mall in Memphis, Tennessee. The project included a unique trench drain system and was designed to create a sheet flow of drainage as opposed to the ponding that occurs with a standard street inlet system. This trench system was installed in such a manner as to not only blend with mall architecture but to enhance the overall design. This drainage system also substantially improved the use of the mall by pedestrians during a heavy rain. The site of the trolley maintenance facility also had to be cleaned up as it turned out to be on the site of a long abandoned coal gas facility and had contained considerable residue from that abandoned enterprise.

Memphis/Shelby County Library, Memphis, Tennessee - Principal-in-Charge responsible for Civil Engineering for \$75 million Central Library on a 10 acre site that required, because of architecture and site requirements, half of all storm water to be pumped. Because of the high value of the facility, the station was design for the 100-year event utilizing 3 pumps, any two of which would pump the designed event.

Germantown Library, Germantown Tennessee - Principle / Project Manager responsible for the total engineering design, structural, MEP and site development for a state of the art library on a six acre park site.



Olmsted Park, Louisville, Kentucky - The City's parkway system, designed originally by Frederick Law Olmsted, consists of three large suburban parks with grand boulevards connecting them. Tetra Tech's (formerly PDR Engineers, Inc.) renovation efforts have included each of Olmsted's three main parks. Iroquois Park improvements cost \$1.1 million and focused on restoring the 45 acre Summit Field near the top of Iroquois Hill. Renovation at Iroquois included extensive work to eliminate long standing drainage problems in the retention basin, creation of a wetlands and prairie habitat, and the planting of 191 canopy trees; 156 smaller trees; 1,850 wetland plants; and 1,750 prairie wildflowers. Tetra Tech also oversaw the application of jute netting for streamside stabilization.

Tom Lee Riverfront Park, Memphis, Tennessee - Principal-in-Charge. This particular project is the expansion of a major Riverfront park on the Mississippi River for the City of Memphis. It will include facilities for multiple types of activities along the Riverfront. The park was expanded from approximately four acres to 24 acres utilizing new fill provided by the Corps of Engineers in its river stabilization program. The park included electrical services for multiple entertainment activities, two miles of jogging trails, overlooks, areas for seating and other activities by the public, restroom facilities, parking facilities and a unique underground sprinkler system to assist the park official in the maintenance of the facility due to expected heavy usage throughout the year.

River Road Park, Louisville, Kentucky - Provided civil, mechanical, electrical, lighting, plumbing, and structural engineering for this 75 acre site. Assisted with the preparation of grading plans; prepared storm water drainage plans and details; designed an on site sewage disposal system; prepared site utility plans and details; prepared erosion control drawings; reviewed layout plans showing all site features and layout dimensions; designed and prepared typical details for all road parking lots and path pavement; designed underfield drainage for soccer fields; designed all site water supply to water fountains, irrigation for all soccer fields, and plumbing for fire hydrants; prepared specifications for all areas involved with design areas including earthwork, asphalt and concrete paving, reinforcing steel, site utilities, and soccer field lighting; and reviewed shop drawing submittals.

Memphis Storm Water NPDES, Memphis, Tennessee - Project Manager. Field screening sites were set up in a GIS related database to record both when sites were sampled and the results of laboratory tests. Information on each site was linked to graphic nodes at the outflow of each drainage basin. In all, about 1,200 subbasins were defined in this project. The tests results were later used to calculate projected contaminate loads in basin based upon the land use characteristics in each individual basin.

Flood Control Mitigation Study, Horseshoe Lake, Arkansas - Project Manager responsible for flood control mitigation study for a 16,000-acre Horseshoe lake basin.

Professional Affiliations

Member, Water Pollution Control Federation

Member, American Society of Civil Engineers

Member, Consulting Engineers of Tennessee, Inc. (President from 1984B85)

Member, National Society of Professional Engineers

Member, American Public Works Association

Member, Memphis Engineers Club

Member, American Consulting Engineers Council, Washington, D.C. (Vice President from 1990B92).



Mr. Hill’s background includes working as the City Civil Design Engineer and Chief Street Design Engineer for the City of Memphis, TN. He has more than 25 years of experience in civil engineering, including transportation planning, design, and land development and has expertise in roadway planning and design, storm drainage systems, sanitary sewer systems, environmental permitting, community development programs, and construction administration.

EXPERIENCE

Walnut Grove Lake Spillway Replacement, Memphis, TN, 2009-2010– Senior Civil Engineer responsible for the hydraulics/hydrology analysis, design and coordination of the replacement spillway of an existing 50 acre lake. This included preparation of the TDEC application, site grading and drainage, and outlet structure design.

Taxiway Yankee Hydraulic Study, Memphis International Airport, Memphis, TN- Project engineer on hydraulic and hydrology study on hurricane creek adjacent to Taxiway Yankee at Memphis International Airport.

Cobblestone Landing Phase 2, Riverfront Development Corporation, Memphis, TN, 2008-2009 - Senior Civil Engineer responsible for the design and coordination of the restoration and improvements to the historic cobblestone landing along the banks of the Mississippi River. This included design of the utility connections for the Memphis Queen Lines docking facilities, three area overlooks onto the cobblestones, restoration, stabilization, and replacement of the cobblestone field, preparation of the Storm Water Pollution Prevention Plan (SWPPP), 404 Permit, site grading and drainage, sanitary sewer design, and geometric layout

Owensboro Riverfront-Ph 2 River, City of Owensboro, KY., Owensboro, KY, 2007-2009 - Senior Civil Engineer responsible for the design and coordination an expanded riverfront park located on the Ohio River. This included the coordination and design of the relocated combined sewer system , storm drainage, grading and drainage, roadway, underdrains, and geometric layout.

Preserve @ Forest Creek, Altman Development Corp., Memphis, TN, 2007-2008– Senior Civil Engineer responsible for the design and coordination of a multi family apartment complex infrastructure. This included preparation of the Storm Water Pollution Prevention Plan (SWPPP), detention design, roadway design, site grading and drainage, sanitary sewer design, water distribution, and geometric layout.

University Place, Phase 3, Architecture, Inc., Memphis, TN, 2008-2009– Senior Civil Engineer responsible for the design and coordination of a multi family development infrastructure. This included preparation of the Storm Water Pollution Prevention Plan (SWPPP), roadway design, site grading and drainage, sanitary sewer design, and geometric layout

University Place, Phase 2 Public Improvements, Architecture, Inc., Memphis, TN, 2007-2009 -Senior Civil Engineer responsible for the design and coordination of a multi family development infrastructure. This included preparation of the Storm Water Pollution Prevention Plan (SWPPP), detention

Project Role:
Sr. Civil Engineer

Education:
B.S., Civil Engineering,
University of Memphis, 1983
M.S., Civil Engineering,
University of Memphis, 1991

Registrations/Certifications:
Professional Engineer
Tennessee, No.19169

Professional Affiliations:
American Society of Civil
Engineers

Office:
Memphis, Tennessee

Years of Experience:
Since 1980

Years with Tetra Tech:
Since 2006



design, roadway design, site grading and drainage, sanitary sewer design, and geometric layout

University Place Hope VI Housing Development, McCormack Barron Salazar, Memphis, TN, 2007- Senior Civil Engineer responsible for the design and coordination of a multi family and single family development infrastructure. This included preparation of the Storm Water Pollution Prevention Plan (SWPPP), detention design, roadway design, site grading and drainage, sanitary sewer design, and geometric layout.

Elm Street Widening, Alabama Department of Transportation, Athens, AL, 2007 - Responsibilities included design for widening of Elm St. between US 31 & Elkton Rd in Athens, AL.

Ed Rose Apartments, Ed Rose and Sons, Memphis, TN, 2008-2009 - Senior Civil Engineer responsible for the preliminary design and coordination of a multi family apartment complex infrastructure. This includes preliminary design of the detention, roadway, site grading and drainage, sanitary sewer and geometric layout

Depot Redevelopment Corporation Widening, Milling, and Paving, Depot Redevelopment Corp., Memphis, TN, 2008-2009- Senior Civil Engineer responsible for the design and coordination of a widening, milling, and resurfacing of roadways within the Memphis Defense Depot

Somerville Intersection Design, Tennessee Department of Transportation, Somerville, TN, 2007-2009 - Responsibilities include design and coordination of the drainage system for six miles of controlled access roadway

Cumberland Bridge & Road Design, USACOE, Cumberland, KY, 2007 - Responsibilities include design and coordination of the reconstruction of several roadways and bridges needed to improve access.

First Tennessee Bank Renovation, LRK, Inc., Memphis, TN, 2008 - Responsibilities include design of the curb and gutter replacement along existing streets to conform to current ADA requirements.

Legends Park - Hope VI Redevelopment Master Plan, Memphis, TN, 2006-Current- Civil Engineer for master planning of a new \$75 million mixed-use community of multi-family housing proposed on the existing Dixie Homes public housing site. Tetra Tech was prime consultant and provided site and infrastructure design as well as civil engineering in support of the master planning effort. This project has been selected to participate in the LEED™ Neighborhood Developments Pilot program and will be certified by the U.S. Green Building Council. Tetra Tech will play an integral role in helping to obtain LEED™ certification.

Westin Beale Hotel, Memphis, TN, 2006- Senior Civil Engineer responsible for the design and coordination of roadway design, drainage design, sanitary sewer design, and traffic control plans for a hotel site in Downtown Memphis.

Weaver Road Neighborhood Strategy Area, City of Memphis Housing and Community Development, Memphis, TN- Worked with the City of Memphis Housing and Community Development to coordinate redevelopment planning, design, and construction of a deteriorated neighborhood. Assessed the needs of the community as related to infrastructure and housing.

Dr. Logan Subdivision, Memphis, TN- Project engineer on reconstruction of roadway and drainage system including curb and gutters and drainage system within existing right of way.

Raleigh Egypt Middle School, Memphis, TN- Design engineer on expansion of existing building, including grading and drainage, site layout, etc.

Parkway Village Elementary School, Memphis, TN- Design engineer on new school construction including grading and drainage, sanitary sewer, site layout, etc.

Forest City Federal Prison, Memphis, TN- Worked with contractor on a design/build prison project. Project included grading and drainage, sanitary sewer, water system and site layout.

School Zone Flashers, Germantown, TN- Project engineer on new and updating of school zone flasher system for city of Germantown



Tom Lee Park, Memphis, TN- Project engineer responsible for design and construction of park improvements including grading and drainage, decorative sidewalks, irrigation system, electrical system, and parking lot.

Gray's Creek Study, Memphis, TN- Civil engineer involved in assessment and recommendation for future development of Eastern Shelby County.

Getwell Road to City Limits to Shelby Drive, Memphis, TN- Project engineer for widening and improving 0.5 miles of roadway including curb and gutter, drainage, traffic control, and signal upgrade.

Riverport Road, Memphis, TN- Responsible for the coordination of planning and design for 6 miles of roadway serving the Pidgeon Industrial Park in Southwest Memphis. This included assessing alternative roadways needed to accommodate industrial traffic and lessen the impact on the surrounding residential roadway system. Project included environmental permitting, roadway and drainage design.

Riverside Drive, Memphis, TN- Responsible for the planning and design of the roadway adjacent to Tom Lee Park along the Mississippi River.

Swinnea Road, Memphis, TN- Coordinated with the Memphis and Shelby County Airport Authority to obtain design and construction approval of the relocated Swinnea Road project.

Taxiways Charlie, Mike, November and Zulu, Memphis International Airport, Memphis, TN- Worked as a member of design teams responsible for grading, underdrain systems, taxiway markings, and quantities on multiple taxiway expansion projects.

Project Engineer, City of Germantown, 2001-2006- Review and manage site development projects and subdivisions. Design, review, and manage the City of Germantown's Capital Improvements Program projects for traffic signals, roadway, and drainage projects.

Principal, Hill & Associates, Inc., 1999-2001- As a design consultant, marketed, designed, and managed various civil projects, including roadway, school, drainage, site development, and airport projects. Assisted other local engineering firms and government entities with various projects.

Director of Civil Engineering/Principal, Toles & Associates, Inc., 1998-1999- Designed and managed various roadway, drainage, site development, and airport projects. As a Principal, handled business development and marketing.

City Civil Design Engineer, City of Memphis, 1989-1998- Managed the City of Memphis' Civil Design Department. This included supervising a staff of engineers and technicians. Also managed the City of Memphis' multimillion dollar Capital Improvements Program projects and budget for roadway, drainage, and structural projects. This included negotiations of consultant fees and coordination and approval of consultant and in-house design projects. Coordinated numerous construction projects with various government agencies, including Tennessee Department of Transportation, Memphis Light, Gas, & Water Division, Memphis Airport Authority, Memphis Area Transportation Authority, and others.

Project Design Engineer, Harland Bartholomew & Associates, Inc., 1986-1989- Project Manager for the civil design of several highways, drainage improvements, and private developments.

Design Engineer, Dickinson and Bennett, Inc., 1980 to 1986- Designed, coordinated, and obtained approval for various subdivisions, planned developments, apartment complexes, and individual site plans.



Mr. Wilson has over 12 years experience in engineering and management of general civil and transportation projects during all phases including planning, studies, design, bidding and construction. He offers strong experience in site design, horizontal geometry, plans and profiles, grading, stormwater drainage and detention, drainage studies, erosion and sediment control, traffic control, utilities, specifications, bid documents and engineer's opinions of probable cost.

EXPERIENCE

Legends Park Hope VI Revitalization, Architecture, Inc. / McCormack Baron Salazar - Memphis, TN, 2007-Current- Project Manager / Lead Civil Engineer for a new \$86 million, 7-phase mixed-income community of multi-family rental housing on the former Dixie Homes public housing site. The comprehensive mixed-use development also includes commercial development along Poplar Avenue, community swimming pool, park space, and extensive public infrastructure improvements.

Responsible for coordinating entire Planned Development process with the Office of Planning and Development, preparing Outline Plan and Final Plans for each phase. Design includes public improvements for new and existing streets, storm drainage and sanitary sewer systems; and site preparation including clearing/demolition, soil remediation, rough grading of site and preparation of engineered building pads. Also responsible for final civil/site design in support of multi-family housing construction.

University Place Hope VI Revitalization, Architecture, Inc. / McCormack Baron Salazar - Memphis, TN, 2007-Current- Project Manager / Lead Civil Engineer for a new \$100 million, 5-phase mixed-income community of single and multi-family rental housing on the site of former Lamar Terrace public housing and adjacent industrial/institutional sites. The comprehensive mixed-use development also includes a community/management center with swimming pool, a 118-unit senior building, a new police precinct, park space as well as extensive public infrastructure improvements.

Responsible for coordinating entire Planned Development process with the Office of Planning and Development, preparing Outline Plan and Final Plans for each phase. Design includes public improvements for new and existing streets, storm drainage, on-site storm detention and sanitary sewer systems; and site preparation including site clearing/demolition, rough grading of site and preparation of engineered building pads. Also responsible for final civil/site design in support of multi-family housing construction.

FedEx Family House, LRK/Methodist Lebonheur - Memphis, TN, 2009-Current - Lead Civil Engineer responsible for civil/site design in support of new three-story, 30,000 square foot short-term stay facility for families and patients. The site will accommodate an additional 30,000 square foot future expansion.

DeSoto Hardwood Remediation/Demolition, Memphis Housing Authority, - Memphis, TN, 2007-Current - Project Manager / Lead Civil Engineer for remediation/demolition of former DeSoto Hardwood Flooring properties at 977 Sledge Avenue.

The \$5 million, 4-phase project includes 22.3 acres of hazardous material

Project Role:
Sr. Civil Engineer

Education:
University of Tennessee at Knoxville, B.S. Civil Engineering, 1996

Registrations/Certifications:
Professional Engineer, Tennessee, 2001, No. 107001

Professional Affiliations:
American Society of Civil Engineers / Member

Office:
Memphis, Tennessee

Years of Experience:
Since 1996

Years with Tetra Tech:
Since 2007



remediation, asbestos abatement, building and structural demolition (offices, warehouses, sheds, drying kilns, process equipment), utility infrastructure and pavement removal, earthwork, erosion control and other related work.

Cobblestone Landing Restoration and Improvements (Phase II), Riverfront Development Corporation, Memphis, TN, 2008-Current – Project Engineer responsible for Quality Control / Assurance as well as resource allocation and scheduling required to meet project commitments.

Project includes restoration of the historic Cobblestone Landing along the banks of the Mississippi River, and related improvements to make it a pedestrian-friendly area for observing and enjoying the river. Design includes restoration, stabilization, and replacement of the cobblestone field; three area overlooks, walkways and stairs, utility connectivity for Memphis Queen Line docking facilities and modifications to the Gayoso Bayou culvert outfall.

Memphis Depot Roadway Repairs and Sealing, Depot Redevelopment Corporation - Memphis, TN, 2009-Current – Lead Civil Engineer responsible for design of private roadway repairs, milling and resurfacing, crack filling, sealcoating and restriping for approximately 60,000 square yards of asphalt and concrete pavement.

FedEx Emerging Technology Complex, LRK/University of Memphis - Memphis, TN – Lead Civil Engineer for 2-acres of site development in support of a new four-story, 80,000 square foot educational building and a 12,000 square foot auditorium, a 2,600 remote mechanical building. Major site work includes new concrete pedestrian and vehicular plaza, reconfiguration of an existing parking lot, site retaining walls and extensive relocation of existing underground utilities. \$18 million est. construction cost / completed 2004. (previous work history)

Pickwick Landing State Park Inn and Conference Center, Hnedak Bobo Group/State of Tennessee – Pickwick, TN – Lead Civil Engineer for a new multi-story hotel and conference center overlooking Pickwick Lake. Major site work includes site clearing, new asphalt parking lots and drives, site retaining walls and walking trails along the lake. (previous work history)

Southern College of Optometry, Hnedak Bobo Group, Memphis, TN, 2000-2001 – Lead Civil Engineer for a new multi-million dollar Eye Clinic located on Madison Ave. (previous work history)

City of Memphis - Southeast Police Precinct - Memphis, TN – Lead Civil Engineer for a new police precinct building on Airways Blvd. with separate vehicle maintenance building. (previous work history)

City of Memphis – New Community Center at Riverview Park - Memphis, TN – Lead Civil Engineer for a new community center with tennis court, asphalt jogging trails and paved parking lot. (previous work history)

Shelby County Government - Memphis-Arlington Road Extension - Arlington, Tennessee - Civil Engineer – Project included construction plans for the extension of Memphis-Arlington Road from Airline Road to Jetway Road (1000 feet +/-). The new roadway was designed for future marking of 4 travel lanes. Project construction included curb and gutter, sidewalk and storm drainage facilities. Coordination of project with Shelby County Government and Town of Arlington. (previous work history)

City of Memphis - Levi Road Improvements / 2 Bridges – Memphis, TN- Project Manager / Project Engineer - Civil engineering services for the preparation of preliminary and final design plans and right-of-way, easement plats in conjunction with the widening of Levi Road from Oakshire Street to Monteagle Drive (2,000 feet +/-) and the design of two bridges. Preliminary and final design consists of the widening of Levi Road to 64 feet curb to curb (84 foot right-of-way) from Oakshire Street to Monteagle Drive. Estimated construction costs: \$2.8 million. Project complete through 60% design phase. (previous work history)

Baptist Memorial Hospital - Baptist Memorial Boulevard / Tenway Drive / Southcrest Circle West – Southaven, MS - Civil Engineer – 2000 feet +/- of new publicly dedicated streets serving the hospital, designed in accordance with MDOT State Aid Road Construction standards and oversight. Roadway improvements constructed under this project include curb and gutter, sidewalk and storm drainage facilities. Coordination of project with MDOT State Aid Road Construction and City of Southaven, Mississippi. Estimated construction costs: \$3.3 million / completed 2007. (previous work history)



TDOT – Walnut Grove Widening and Improvements – Memphis, Tennessee - Civil Engineer – The project consists of widening and raising the bridge over I-240, widening Walnut Grove between the interstate and the Wolf River, replacing the at-grade Humphreys intersection with a Single Point Urban Interchange, and building three new bridges over the Wolf River to replace the current structure. Est. completion 2008. (previous work history)

TDOT - State Route 22 – Henderson County, Tennessee - Civil Engineer – Design of right-of-way and construction plans for 8.5 miles of roadway. \$18.5 million est. construction cost / completed 2002. (previous work history)

City of Memphis - Germantown Road Widening Improvements - Memphis, Tennessee - Civil Engineer - Design included right-of-way and construction plans for the widening and improvement of a two-lane rural section of roadway to a seven-lane urban roadway. Prepared plans for a new bridge to replace an existing 3-span bridge crossing an unnamed tributary of Nonconnah Creek. Hydraulic design and drainage for the new 3-span bridge. (previous work history)

City of Germantown – Hacks Cross Road Drainage Improvements - Germantown, TN- Project Engineer - Design of a new 12'x5' concrete box culvert, concrete channel lining and reconstruction of roadway medians, curbs and sidewalks. Project involved the relocation of an existing 10" sanitary sewer main to avoid horizontal and vertical conflicts with new culvert and the development of a sanitary sewer plan & profile for the relocation. \$900,000 est. construction cost / completed 2005. (previous work history)

Germantown Road Widening – Walgreens Store at Saddle Creek - Germantown, Tennessee- Project Engineer - Design included construction plans for the widening of Germantown Road including a new right-turn lane along the frontage of a Walgreens Store at intersection of Germantown and Farmington Boulevard. Included the installation of curb, gutter and sidewalk. (previous work history)

Gibson County Utility District – U.S. Highway 104 Gas Main Relocation – Gibson and Dyer County, TN - Project Engineer - Relocation of 5.9 miles of existing 2" high pressure gas main along new route of U.S. Hwy. 104 being constructed by the Tennessee Department of Transportation. Project includes modification of existing gas service lines and connections. Includes directional boring under existing roads, creeks and ditches

Résumé

John O. Gordon, PE

Chief Engineer, Memphis, Tennessee
4161 Ridgemoor Avenue
Memphis, Tennessee 38118
(901) 365-1802
john.gordon@psiusa.com

Year started with PSI: 1994
Years experience with other firms: 11

Education

Bachelor of Science in Civil Engineering, Memphis State University, 1983

Certifications/Registrations/Technical Training

Professional Engineer, #8921, Arkansas, 1996
Professional Engineer, #32993, Louisiana, 2007
Professional Engineer, #12541, Mississippi, 1995
Professional Engineer, #20398, Tennessee, 1989
Graduate study at Memphis State University and Arizona State University. Coursework included Theoretical Soil Mechanics – Shear Strength and Consolidation, Design of Earth Structures, Foundations Courses, Soil Dynamics, Case Studies, and Project Courses.
Instructor – Soil Mechanics and Foundations Sections for P.E. Review Course for Memphis Light Gas and Water (by University of Memphis), Adjunct Instructor for foundation engineering courses at CE Departments of University of Memphis and Christian Brothers University.
Numerous Short Courses / Seminars

Affiliations/Memberships

American Society of Civil Engineers (ASCE)
Tau Beta Pi – Engineering Honor Society
Engineers Club of Memphis

Professional Experience

Mr. Gordon has more than 26 years of experience in geotechnical engineering and construction materials testing. Major projects include landfills, hospitals, sports facilities, transportation and river port facilities, earthen dams and levees, high-rise structures, hotels, industrial facilities, distribution center developments, and shopping centers. Currently, he performs geotechnical engineering and construction surveillance for PSI's Memphis and Nashville, Tennessee offices and Louisiana offices.

Representative Earth Structure and Slope Stability Project Experience

- Riverside Drive Feasibility Study, Expansion of Tom Lee Park; Memphis, Tennessee - Member of design team responsible for implementation and supervision of field investigation consisting of over 100 soil borings up to 120 feet in depth, installation and utilization of piezometers for water level measurements and slope indicators for monitoring of lateral slope movements. Assisted in slope stability analysis/preparation of reports. Analysis reviews by members of Memphis District Corps of Engineers.
- Riverbluff Walkway; Memphis, Tennessee - Member of design team responsible for implementation and supervision of field investigation, slope stability analysis considering various options for construction of the walkway, and foundation recommendations including temporary

and permanent retaining structures including soldier pile and lagging walls, as well as shallow and deep foundation systems suitable for construction on the face of a 2 to 1 slope.

- Industrial Port Facilities; Mississippi River and Tributaries; Nucor Steel Mill, Blytheville, Arkansas; Fleischmann's Yeast Plant, Memphis, Tennessee; Cargill Grain Facility, Memphis, Tennessee - Project Manager and Project Engineer for geotechnical explorations responsible for foundation analysis and recommendations for pile foundations and mooring facilities, slope stability analyses, and preparation of geotechnical reports. Fleischmann's Yeast Plant and Cargill Facility were constructed on a site brought to grade using hydraulic fill. Also responsible for observation and inspection during construction to verify compliance with plans and specifications.
- Tunica Riverfront Port and Park; Mississippi River – Project Manager and Project Engineer for geotechnical explorations for a Port Facility for docking of Riverboat Cruise Ships. Responsibilities included slope analysis for various options including reinforced slopes using geo-grid and soil nails. Design of pile foundations for support of the docking facility. Challenges included interfacing of new slope configurations and revetments with existing Corps of Engineers (COE) deployed “trench fill” revetments, recommendations for construction of hydraulic fill to support structures, monitoring of construction of ancillary facilities on hydraulic fill. Required review of reports and analyses by COE personnel.
- Earthen Dams and Levees – Geotechnical explorations, analyses, and design of numerous earthen dams and levees up to 50 feet in height and analyses on existing dams up to 50 feet in height. Includes both water retention and silt retention type structures.
- Carroll County Earthen Dam – Lead Geotechnical Engineer for earthen dam approximately 50 feet in height. Structure included a culvert-type principle spillway and emergency spillway through an abutment.
- Delta Bluffs Dam; Geotechnical exploration, analyses, and design for an earthen dam 35 feet in height south of Horn Lake, Mississippi.
- Member of design team for preliminary analyses for Memphis “Landbridge” across the Wolf River Harbor in Downtown Memphis, Tennessee for Corps of Engineers.
- Glen Springs Dam, Tipton County, Tennessee; Member of design team for the geotechnical exploration and construction of earthen dam.
- Earthen Dam; Samburg, Tennessee – Installation, development, and utilization of pore pressure transducers in foundation soils of earthen dam.

Representative Hotel, Office Building, Arena, and Casino Project

- Federal Express World Headquarters Complex; Memphis, Tennessee – Project Manager for geotechnical exploration for the mid-rise structures for the FedEx World Headquarters Complex. On call during construction of the buildings for foundation and retaining wall inspections and observations.
- Peabody Place Element E (Entertainment Facility); Memphis, Tennessee – Project engineer and project manager for the additions to the historic Peabody Hotel in downtown Memphis. Mid-rise structure included movie theaters, restaurants, etc. Project included existing structures in an urban setting, shallow and deep foundations, below grade construction and shoring design, site-specific seismic studies, liquefaction analyses, underpinning of adjacent structures, and protection of existing below grade utilities.
- International Place, Phases I/II 12-Story Office Buildings; Memphis, Tennessee - Project manager for development and implementation of field exploration, analysis of drilled pier, mat, and shallow foundations and preparation of geotechnical reports. Also provided foundation inspection and construction materials QC testing during construction phase.
- Horseshoe Casino Hotel/Parking Garage; Tunica County, Mississippi - Project manager for 14-

story hotel and 4-story parking garage constructed in flood plain of Mississippi River. Duties included geotechnical analysis of foundation options that included the requirement of the structures extending over old fill, eighteen feet of new fill in a canal area, a levee, and a wetland area. Responsible for development of settlement monitoring programs in new fill areas and load testing of foundations.

- Goldstrike Casino Expansion, Hotel/Parking Garage; Tunica County, Mississippi - 32-story hotel and 5-story parking garage constructed in the flood plain of the Mississippi River. Duties included geotechnical analysis of the foundation options and load testing for vertical compressive, tensile, and lateral loading conditions. Portions of the new structures extended over existing basins requiring foundations within water-filled basins. Continued geotechnical consultation throughout the construction process.
- FedEx Forum; Memphis, Tennessee – The New Memphis Arena will be the home of the Memphis Grizzlies NBA Team. Senior project engineer and project manager for the geotechnical exploration for the arena. Project included borings up to 150 feet in depth, piezometers, development of recommendations for dewatering for excavation up to 45 feet in depth for the base of the arena, foundation options and recommendations for multiple levels and widely varying foundation loading conditions, lateral loading of below grade walls and foundations, site specific seismic study, liquefaction analysis, recommendations for temporary shoring and temporary slopes. Analyses included full-scale pump test to estimate potential pumping quantities for construction and long-term dewatering.

Representative Warehouse Project Experience

- SouthPoint Distribution Center; Memphis, Tennessee – Project involved approximately 5,000,000 square feet of warehouse space for tenants such as The Disney Store, General Motors, and Williams Sonoma. Provided geotechnical exploration analysis for varied foundation conditions including fills of 25 feet in height and super flat floor requirements for automated retrieval systems.
- Williams Sonoma Warehouses; Memphis, Tennessee/Olive Branch, Mississippi – As project engineer, provided geotechnical exploration during construction of approximately 2,000,000 square feet of tilt panel warehouse space in two facilities.
- Procter and Gamble Warehouse Facilities; Green Bay, Wisconsin (1 million square feet) and Albany, Georgia (1.5 million square feet). Client Manager and Senior Project Engineer.
- Nike Warehouse Facility; Memphis, Tennessee - Geotechnical exploration and project engineer during construction for approximately 800,000 square feet of tilt panel warehouse space.
- Mazda North America; Olive Branch, Mississippi - Geotechnical exploration and project engineering during construction phase of approximately 600,000 square feet tilt panel warehouse facility.

Representative Landfill Experience

- BFI North/South Shelby Landfills; Shelby County, Tennessee - QA/QC manager responsible for pre-qualification of potential borrow sources; inspection and testing of compacted clay liner including compaction, material quality, density, strength, and permeability; observation of placement of leachate collection system including sand and gravel quality and header and lateral pipe installation, and final cover evaluation including thickness, density and permeability. Responsible for final reports to the State of Tennessee certifying compliance with the plans and specifications.
- Decatur County Landfill; Decatur County, Tennessee – QA/QC manager responsible for pre-qualification of potential borrow sources, inspection and testing of compacted clay liner including compaction, material quality, density, strength, and permeability, observation and

testing of synthetic HDPE liner, observation of placement of leachate collection system including sand and gravel quality and header and lateral pipe installation. Responsible for final reports to the State of Tennessee certifying compliance with the plans and specifications.

Representative Hospital Experience

- Baptist Memorial Hospital; Memphis Metropolitan Area - Project manager/engineer for parking garages for east/central hospitals, Memphis, Tennessee. BMH East ancillary ICU/CCU expansions, Memphis, Tennessee. Baptist Memorial Hospital Germantown, Tennessee Expansion. Baptist Memorial Hospital, Southaven, Mississippi. Duties included geotechnical analysis and recommendations for augered, cast-in-place piles, drilled piers, and shallow foundations/preparation of reports. Project manager for observation and inspection during construction to verify compliance with plans and specifications.
- Methodist Hospitals, Memphis, Tennessee – Project Manager, Project Engineer for expansions to Methodist North Hospital including CCU expansion and Physician's Office Building. Duties included geotechnical analysis and recommendations for augered, cast-in-place piles, drilled piers, and shallow foundations/preparation of reports. Project manager for observation and inspection during construction to verify compliance with plans and specifications.
- St Jude Children's Research Hospital; Memphis, Tennessee – Geotechnical and construction services consultant for expansions to the research complex.

Representative Airport and Transportation Projects

- Northwest Baggage Handling Facility, Memphis International Airport; Memphis Tennessee - Project engineer for electronic and physical monitoring of shoring system and columns during construction of below grade baggage handling facility. Methods included computer monitoring of strain gauges mounted on shoring components and physical measurements for horizontal and vertical movements of existing columns when the tunnels for the baggage handlers were under construction. The tunnels were excavated in an open manner with steel soldier piles restraining the soil and footing foundations.
- Expansion of Austin Peay Highway; Memphis, Tennessee – Project engineer for geotechnical exploration/report with duties including foundation analyses, recommendations, and slope stability analyses for numerous bridges, including a bridge across the Wolf River, settlement analyses for fills along roadway/abutments, liquefaction analyses/preparation of reports. Bridge and highway were approximately 7 lanes with numerous entrance and exit ramps.
- Taxiway Yankee, Memphis International Airport, Memphis, Tennessee – Project manager and senior author for the geotechnical exploration for a taxiway addition. Project included significant fills, slope stability analyses, existing structures, relocation of electrical vaults, and a bridge for airplane traffic.
- Tennessee State Route 128, Savannah, Tennessee – Principal Consultant for Geotechnical Exploration for the expansion of the route. Included slope stability analysis, foundation analysis for new structures, etc.