

Statement of Qualifications

Drainage Engineering

for

Transportation Projects

2010



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STATEMENT OF QUALIFICATIONS

OUR COMPANY

H & H Resources, Inc. was founded in 2001 as a civil engineering consulting firm that assists clients in finding practical, feasible, and economical design and permitting solutions. In doing so, our goal is to deliver products and services that are on time, accurate, and within budget. **HHR** has a particular specialty in drainage engineering for transportation projects, and also provides other related civil engineering services.

Our principals, Eric Friedrich, P.E., CFM and Wayne Fowler, P.E., CFM, each have over 25 years of experience. The staff includes additional registered professional engineers plus technician and administrative support, bringing to the firm a variety of design experience and resources for accomplishing project tasks.

To illustrate our company's varied background, our engineers have worked as staff or consultants for the following public entities:

- U.S.D.A Natural Resources Conservation Service
- Texas Department of Transportation
- Georgia Department of Transportation
- Fort Bend County Toll Road Authority, Texas
- Cities of Houston, Fort Worth, Bryan, Georgetown, Texas
- Cities of Albany, Douglas, and Hiawassee, Georgia
- Georgia Counties: Union, Henry, Lee, Fulton
- Harris County, TX Flood Control District
- Texas A&M University's Texas Engineering Extension Service
- UT Austin Center for Lifelong Engineering Education
- University of Texas at Arlington

In an effort to serve our clients better, our engineers continue to update their skills by receiving continuing education in various software programs and engineering topics related to drainage and transportation. As leaders in our profession, we provide instructors and training courses in the fields of hydrology, hydraulics, and erosion control. Our principals or employees have been involved in the development of drainage standards, policies, and procedures for local and state governments, and have published technical and research documents.

HHR is registered as a consulting engineering firm to practice in the states of Texas, Georgia, and North Carolina.

OUR TRANSPORTATION DRAINAGE PRACTICE

HHR has the project experience to offer these services on transportation projects:

- Hydraulic Engineering
 - Watershed hydrology
 - Bridge and culvert hydraulics
 - Channel improvements
 - Stormwater management (detention, retention, water quality)
 - Scour analysis
 - Master planning
 - Third-party plan review
- NFIP-related Submittals
 - MT-2: CLOMR/LOMR
 - Floodway No Impact analysis and certification
 - Base Flood Elevation (BFE) determinations
- Project Management
 - Coordination with lead and external agencies
 - Coordination with other consultants and disciplines
 - Third-party plan review
 - Scheduling
 - Quantity estimates, opinions of probable cost

Our drainage engineering work requires us to be knowledgeable about DOT drainage design standards and procedures, coordination with FEMA, the U.S. Army Corps of Engineers, state environmental agencies, and local flood control districts.

Our engineers have used a variety of design software, manuals, and procedures, including:

- HEC-1, HEC-HMS
- HEC-2, HEC-RAS
- EPA-SWMM
- THYSYS, CULVERT, Winstorm
- NRCS TR-20, TR-55, WSP-2
- USGS PeakFQ
- SWFHVD (NUDALLAS)
- HY-8
- UNET
- SMS Programs (RMA2, SED2D)
- Microstation
- Geopak Drainage
- AutoCad
- GIS (Arcmap, Spatial Analyst, 3D analyst)

- Texas DOT Hydraulic Design Manual
- Georgia DOT Manual on Drainage Design for Highways
- Georgia Stormwater Management Manual
- Manual for Erosion and Sediment Control in Georgia
- North Carolina Erosion and Sediment Control Planning and Design Manual
- FEMA Flood Insurance Studies (FIS), Flood Insurance Rate Maps (FIRM)
- FEMA Guidelines and Specifications for Flood Hazard Mapping Partners
- FHWA HDS 6, *River Engineering for Highway Encroachments*
- FHWA HY-8, *Culvert Analysis*
- FHWA HEC No. 18, *Evaluating Scour at Bridges*
- FHWA HEC No. 20, *Stream Stability at Highway Structures*
- FHWA HEC No. 23, *Bridge Scour and Stream Instability Countermeasures*

We believe our DOT qualifications are indicative of our ability to provide drainage engineering for state and local community transportation projects. The following is a list of these qualifications.

Texas DOT Precertifications

- 3.1.1 Route Studies & Schematic Design - Minor Roadways
- 3.2.1 Route Studies & Schematic Design - Major Roadways
- 3.4.1 Minor Bridge Layouts
- 3.5.1 Major Bridge Layouts
- 4.1.1 Minor Roadway Design
- 4.2.1 Major Roadway Design
- 4.3.1 Complex Highway Design
- 10.1.1 Hydrologic Studies
- 10.2.1 Basic Hydraulic Design
- 10.3.1 Complex Hydraulic Design
- 10.4.1 Pump Station-Hydraulics
- 10.5.1 Bridge Scour Evaluations and Analysis

Georgia DOT Prequalifications

- 3.12 Hydraulic & Hydrological Studies (Roadway)
- 4.04 Hydraulic & Hydrological Studies (Bridges)

OUR PEOPLE

At **HHR**, we believe our staff is second to none. Our employees are selected based on their exceptional qualifications in our areas of expertise. We have engineers, technical, and administrative staff that work together to meet the needs of our clients.

Eric R. Friedrich, P.E., CFM

President

B.S. Civil Engineering, University of Texas, 1983

Mr. Friedrich's experience consists of preliminary engineering and PS&E development for highway and bridge projects, particularly hydrology and hydraulics analysis and design. He has managed projects for roadway, bridge and drainage design. In 2001 he founded **H & H Resources, Inc.** His prior experience includes 11 years with the TxDOT Bridge Division Hydraulics Section and the Fort Worth District.

He has provided drainage studies, culvert, bridge, storm sewer, and channel hydraulics, detention ponds, erosion control, bridge scour, pump station design, and floodplain/floodway coordination with FEMA. Modeling expertise includes THYSYS Culvert and WinStorm; HEC-1, HEC-HMS, HEC-2, HEC-RAS; SCS TR-20, WSP-2, USGS PeakFQ, Geopak Drainage and EPA SWMM. Mr. Friedrich is an instructor under contract with University of Texas at Arlington teaching hydrology and hydraulics to TxDOT personnel.

Mr. Friedrich has been involved in the development of the following technical publications, standards development, and policy-generation:

- TxDOT Bridge Division Hydraulic Manual 3rd Edition, 1985
- AASHTO Task Force on Hydrology and Hydraulics, 1985 – 1990
- TxDOT Bridge Scour Evaluation Program, 1990
- TxDOT IH 10 Katy Freeway Reconstruction Program, Drainage Design Criteria, 2001-05
- Texas Engineering Extension Service, Professional Development Training Program, Hydrologic and Hydraulic Design for Culverts and Storm Drains, 2003-04.
- TxDOT US 290 / Hempstead Corridor Program Management, Drainage Design Criteria, 2006-09

Mr. Friedrich is a member of the American Society of Civil Engineers (ASCE), and the Texas Floodplain Management Association (TFMA).

Wayne E. Fowler, P.E., CFM

Vice President

B.S. Engineering, Auburn University, 1983

Post-graduate studies, Auburn University, 1984

Mr. Fowler is a registered professional engineer in Georgia, Texas, North Carolina, and Alabama. He has experience in a variety of public and private sector civil engineering projects, particularly in hydrology and hydraulics analysis and design. He has managed roadway, drainage, floodplain, utility, and land development projects. He has served as a County Engineer and Floodplain Administrator. In 2001, he founded a consulting firm that later merged with **H & H Resources, Inc.** Prior employment experience includes USDA-NRCS; engineering consulting firms in TX, GA, and AL; a 2-yr international assignment in water resource development.

He has provided engineering for water resources projects including, bridge hydraulics and scour analysis, municipal and transportation storm sewers, pump stations, detention facilities, pavement drainage, and erosion control. Software experience includes HEC-1, HEC-HMS, SWFHVD, HEC-2, HEC-RAS, HY-8, WSP2, PeakFQ, XP-SWMM.

Mr. Fowler is especially qualified for projects that have National Flood Insurance Program (NFIP) implications, having prepared over 80 Conditional Letter of Map Revision (CLOMR) and LOMR applications, No-Rise certifications, and other NFIP- or FEMA-related submittals in Texas, Georgia, and North Carolina. He has assisted with countywide floodplain mapping and floodplain map modernization projects. He has extensive experience in watershed hydrology, floodplain analysis, bridge, floodway, and encroachment modeling, coordination with FEMA, and floodplain/floodway delineation.

Mr. Fowler is a member of the American Society of Civil Engineers (ASCE), Association of State Floodplain Managers (ASFPM), and Georgia Association of Floodplain Management (GAFM). He is an instructor in Georgia's Erosion Control Certification Program.

John A. Terry, P.E., CFM

Senior Project Manager

B.S. Civil Engineering, University of Texas at Arlington, 1977

Mr. Terry's experience consists of Drainage and Transportation Engineering, including preliminary engineering and PS&E development for highway and bridge projects for urban freeways, major arterial streets, and city streets. Mr. Terry retired from TxDOT in 2008 and joined the staff of **HHR** in 2009.

As Central Design Engineer for TxDOT's Fort Worth District, Mr. Terry managed development of PS&E by both TxDOT staff and consultants. He developed numerous roadway detail standard sheets for TxDOT-FTW, addressing various roadway, pavement, drainage, maintenance and erosion control issues, and has developed Special Specifications and Special Provisions to supplement TxDOT Standard Specifications. He has made presentations to the annual TxDOT Transportation Short Course, at Fort Worth District Consultant Workshops, and as an expert witness in ROW condemnation cases, both at commissioner's hearings and at jury/bench trials.

As the Fort Worth District Hydraulics Engineer, Mr. Terry reviewed all drainage design for the Districts, developed formats for hydraulic reports and bridge hydraulic data. He investigated drainage complaints and coordinated with Area Office and maintenance staff to resolve any problems that resulted from TxDOT facilities or activities. He also served as a Project Advisor on several TxDOT drainage-related research projects, and served on the Executive Oversight Committee for updating the TxDOT Hydraulic Design Manual.

Mr. Terry's hydraulic modeling experience includes WinStorm, Geopak Drainage, THYSYS Culvert, HY-8, HEC-HMS, HEC-2, HEC-RAS; SCS TR-55, USGS PeakFQ.

Cynthia R. Carle, P.E., CFM

Project Manager

B.S. Civil Engineering, Texas A&M University-Kingsville, 1998

Ms. Carle manages the Stafford, TX branch office. Her primary area of expertise is surface water hydrology and hydraulics. She has served as Project Manager and Engineer on multiple transportation drainage projects. Her project experience includes storm sewer improvements, floodplain studies, drainage and storm water management, bridge and culvert hydraulic analysis, hydrologic and hydraulic computer modeling, drainage mitigation analysis, and scour analysis.

Ms. Carle has computer modeling experience using models developed by the U.S. Army Corps of Engineers including HEC-1, HEC-2, HEC-HMS, HEC-RAS; the Soil Conservation Service including TR-20, TR-55 and WSP2; the Texas Department of Transportation including CULVERT, WINSTORM, THYSYS RUNOFF and, THYSYS PUMP; and the Environmental Protection Agency (EPA) Stormwater Management Model (SWMM). Ms. Carle is a member of the Texas Floodplain Management Association (TFMA).

Veronica N. Hodge, P.E., CFM

Project Manager

B.S. Civil Engineering, Texas A&M University, 1996

Ms. Hodge specializes in hydrology and hydraulics. She has served as a Project Manager and Engineer on multiple transportation drainage projects. Her project experience includes storm sewer improvements, drainage and storm water management, hydrologic and hydraulic computer modeling, storm water pollution prevention plans and scour analysis.

Ms. Hodge has computer modeling experience using models developed by the U.S. Army Corps of Engineers including HEC-1, HEC-2, HEC-RAS, HEC-HMS; the Soil Conservation Service including TR-20 and TR-55; the Environmental Protection Agency (EPA) Stormwater Management Model (SWMM); the Texas Department of Transportation including CULVERT, WINSTORM and THYSYS RUNOFF; and Geopak Roadway, Drainage and Site software.

Mike L. Talley, P.E., CFM

Project Manager

B.S. Civil Engineering, Georgia Institute of Technology, 1998

Mr. Talley manages the Albany, GA branch office. He has worked on a wide range of engineering projects, including drainage, water supply, sanitary sewer, and transportation. His drainage engineering experience includes storm sewer improvements, floodplain studies, storm water management, and third party review of reports/designs. Project types include commercial, residential, transportation (road and rail), and municipal (water and sewer design). He has participated in developing city policies and standards. Previous employment includes: Norfolk Southern Railroad in Atlanta, Georgia; Stevenson & Palmer Engineering, in Albany, Georgia; and the City of Albany Georgia.

Mr. Talley is a member of the Georgia Association of Floodplain Management. He has recently completed continuing education in NPDES Phase II, XP-SWMM, Erosion and Sediment Control Design, and Transportation Safety Audits. He has experience with HEC-2, HEC-RAS, GEO-RAS, HEC-HMS, XP-SWMM, GIS (Arcmap, Spatial Analyst, 3D analyst), Geopak.

Jaime Benoliel, P.E., CFM

Project Engineer

B.S. Civil Engineering, University of Houston, 2001

Ms. Benoliel specializes in hydrology and hydraulics. She was previously employed with the Harris County Flood Control District. She has served as Project Engineer on multiple flood study and transportation drainage projects. Her project experience includes storm sewer improvements, bridge, culvert, detention pond sizing, hydrologic and hydraulic computer modeling, and drainage mitigation analysis.

Ms. Benoliel has experience with HEC-1, HEC-2, HEC-RAS (steady and unsteady), GEO-RAS, HEC-HMS; UNET, Geopak Drainage, THYSYS CULVERT and WINSTORM, XP-SWMM, and GIS (Arcmap, Spatial Analyst, 3D analyst), and the Environmental Protection Agency (EPA) Stormwater Management Model (SWMM).

Ms. Benoliel is a member of the Texas Floodplain Management Association (TFMA), and has been an instructor in drainage engineering courses.

Ms. Benoliel co-authored the following papers with Dr. Yu-Chun Su:

- Sediment Transport Modeling of Dredged Disposal Materials Near Sabine Pass.” Coastal Texas 2020 Technical Erosion Conference 2005, Houston, Texas, September 14-16, 2005.
- “Modeling of Flood Control Channels Using SMS/RMA2.” TFMA 17th Annual Texas Flood Conference, Fort Worth, Texas, 2004.

OUR PROJECTS

Our projects vary in size from a simple municipal storm sewer to an Interstate corridor. HHR has enjoyed working relationships with city mayors, public works superintendents, county commissioners/managers, state transportation officials, and other consultants.

As the following descriptions show, HHR has recent and ongoing projects that have required a range of experience and qualifications.

- **US 290 / Hempstead Tollway, Houston, TX (2006-present);** Program Management Consultant (PMC) Drainage Task Manager. Drainage impact studies for Hempstead Tollway and US 290 from IH 610 to FM 2920. (34 mile corridor). Storm sewer improvements, floodplain impact/mitigation studies, drainage and storm water management, bridge hydraulics, third party review of drainage designs by Section Design Consultants, development of drainage design criteria. Design software: EPA-SWMM, HEC-HMS, HEC-RAS, TxDOT's Winstorm, Microstation, Geopak Drainage and Geopak Site.
- **IH 35 From Woodlawn Rd to FM 2063, McLennan County, TX (2010-present);** Drainage Task Manager. Hydrologic study for 22 crossings, including 4 FEMA detailed study streams. Hydraulic design of all crossings along the 9 mile corridor including local roadway crossings that are affected by the roadway reconstruction. Determine detention requirements at two locations and complete impact analysis. Prepare PS&E drainage area maps and hydraulic data sheets. Design and detail water quality BMPs for the entire corridor. Design all roadside ditches according to local design standards. Design software: EPA-SWMM, HEC-HMS, HEC-2, HEC-RAS, and Microstation.
- **Legacy Park Circle, Kennesaw, GA (2010);** Hydrology/hydraulics design, NFIP compliance, scour analysis, complete PS&E for replacement of bridge-class culvert with ConSpan® precast bridge. Project team leader and prime consultant. Coordination with local utilities. Project funded by FEMA for City of Kennesaw. Design software: HEC-1, HEC-RAS, Microstation.
- **Beck Street Extension Project, Bryan, TX (2005-2009);** Hydrology/hydraulics design for storm sewer improvements, storm water management. Floodplain studies (CLOMR, LOMR requests). PS&E included four new location bridge-class culverts and two detention basins. Design software: HEC-1, HEC-RAS, Microstation, Geopak Site.
- **College Street at San Gabriel River, Georgetown, TX (2008);** Bridge hydrology/ hydraulics design, scour analysis, floodplain study (CLOMR request), storm sewer improvements, culvert design, Water Pollution Abatement Plan (WPAP), Bioretention Pond design for water quality Best Management Practices (BMP). Design software: HEC-HMS, WSP2, HEC-RAS, Microstation, Geopak Drainage, Geopak Site.
- **Airport Terminal Road, Union County, GA (2006-08);** Design of GDOT-funded county road from four-lane divided median highway to airport terminal. Prepared PS&E for new road alignment, GDOT access permit, grading, drainage design, erosion control, striping and signage, and borrow area. Bid and construction phase services. Coordinate with other consultants and agencies for funding, survey,

right-of-way acquisition, geotechnical exploration, reinforced earth design, traffic and airport engineering, and environmental compliance. Design software: Microstation, WinTR-55, HY-8.

- **Precinct Line Rd. at Walker Branch, Fort Worth, TX (2006-08)**; Hydrology and hydraulics design of bridge replacement and approach embankment in floodplain. Watershed analysis, channel improvements and lining, impact/mitigation analysis, floodplain study (CLOMR request). Design software: SWFHVD, HEC-2, HEC-RAS, Microstation, Geopak Site.
- **LaGrange Bypass, LaGrange, GA (2008)**; Drainage Task Leader for design of new road culvert crossing at Dixie Creek. Analyze watershed hydrology and prepare hydraulic analysis to evaluate compliance with NFIP criteria and GDOT standards. Design software: Microstation, HEC-RAS.
- **Gumlog Road at Lvy Log Creek, Union County, GA (2006)**; Design for bridge-class culvert replacement on existing county road. Hydraulic analysis and design, structure layout for 24'x11' Conspan® precast bridge. Bid and construction phase services. Coordinate with other consultants and agencies for funding, survey, right-of-way acquisition, geotechnical exploration, utility relocation. Design software: Microstation, HEC-RAS.
- **IH 10 Katy Freeway GEC, Houston, TX (2001-05)**; Drainage Task Leader for General Engineering Consultant. Storm sewer improvements, drainage and storm water management, drainage design coordination, floodplain impact studies, and third party review of drainage designs (PS&E) for 21 miles of freeway main lanes and frontage road reconstruction. Drainage coordination with stakeholder agencies. Hydraulics design of seven stream crossings and three stormwater pumping stations. Coordination of drainage design and permitting in jurisdictional waters. PS&E review of drainage construction for ten construction contracts, preparation of corridor-wide drainage design criteria and special specifications, and coordination with stakeholder and regulatory agencies. Construction phase services. Design software: SWFHVD, HEC-2, HEC-RAS, Microstation, Geopak Site.

The following list of transportation drainage projects gives a broader view of our experience.

- **The Valley at Brasstown Creek S/D, Towns County, GA (2008)**
- **IH 10 at White Oak Bayou, Harris County, TX (2005-08)**
- **Heritage Way at Tributary of Bosque River, Erath County, TX (2006-07)**
- **IH 35 at Lake Creek, Round Rock, TX (2007)**
- **SH 31 at Cedar Creek, Henderson County, TX (2006-07)**
- **SH 105 at E. Fork San Jacinto River, Liberty County, TX (2005-06)**
- **FM 2790 at N. Prong Atascosa River, Atascosa County, TX (2005-06)**
- **FM 55 at Chambers Creek, FM 660 at Village Creek, Ellis County, TX (2004-05)**
- **Holloway Basin Drainage Master Plan, Albany, GA (2000-05)**

OUR REFERENCES

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OUR LOCATIONS

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