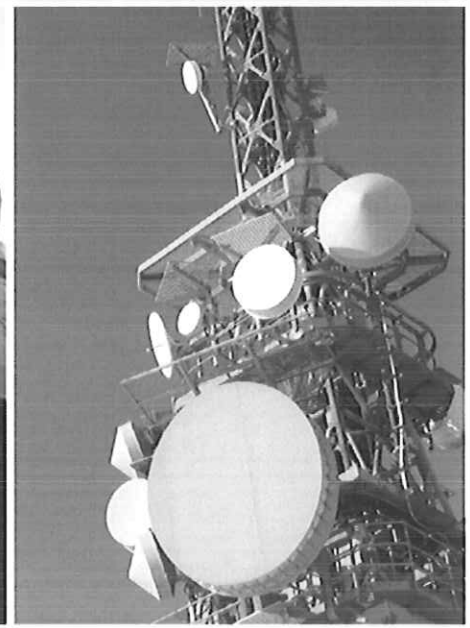


*Original*

Prepared for:

**West Virginia  
Department of Health and  
Human Resources,  
Bureau for Public Health,  
Office of Emergency  
Medical Services,  
Medical Communication  
Division**

**Engineering & Design  
Services for  
Towers & Buildings  
BPH14010  
Expression of Interest**



May 28, 2013

05/28/13 10:59:47 AM  
West Virginia Purchasing Division



Prepared by:

**TRC Engineers  
975 W. Bitters Road  
San Antonio, TX 78216**



975 West Bitters Road  
San Antonio, TX 78216

210.496.3200 PHONE  
210.494.9987 FAX

[www.TRCSolutions.com](http://www.TRCSolutions.com)

**May 23, 2013**

**Ms. Roberta Wagner**  
**Department of Administration, Purchasing Division**  
**2019 Washington Street East**  
**P.O. Box 50130**  
**Charleston, WV 25305-0130**

**RE: BPH14010 – Expression of Interest**  
**VIA Fed-Ex/Hand Delivery**

**Dear Ms. Wagner:**

Enclosed, please find the requested documentation for our "Expression of Interest" (EOI) submittal as requested in BPH14010 dated April 24, 2013 and due May 28, 2013.

TRC Engineers, Inc. is indeed "interested" in providing these services to the State of West Virginia because we have been providing these types of services to the State of West Virginia since 1998 – a total of 15 years. During this period, our previous company, Alexander Utility Engineering, Inc., was acquired by TRC Engineers, Inc. in 2011. All submittals for this new EOI will be under the name of TRC Engineers, Inc.

The previous contract, BPH80345, under the name of Alexander Utility Engineering, Inc., has now expired. The qualifications and submittals for this EOI will include the previous West Virginia contract experience as well as experience of current expanded operations under TRC.

Included in this EOI Submittal is the following documentation:

- Tab 1 – Statement of Qualifications
- Tab 2 – Personnel Resumes
- Tab 3 – References

**Statement of Qualifications:**

The Statement of Qualifications comprises the qualifications of TRC Engineers, Inc. as Prime Contractor along with Subcontractors Mead&Hunt and Comsearch. This three (3) way team has been the core group of engineers and designers who, for the last 15 years, have assisted the State of WVA

DHHR with development and expansion of the Statewide microwave and two-way trunked radio system. The principals represented in this EOI are the same principals who have been providing these services under the previous contract.

TRC Engineers, Inc. provides all the microwave and communication engineering required for support of the State Medical Command Microwave System and is named as the Owners Engineer in the NTIA Broadband Stimulus Grant. TRC also directs and approves all subcontract work for Mead & Hunt and Comsearch.

Mead & Hunt provides all the site civil engineering and environmental studies required to build out or improve the microwave network.

Comsearch provides all the frequency coordination required for the FCC authorization of each set of frequencies utilized for the microwave network.

**Personnel Resumes:**

The resumes which are included in this section of our EOI include all the key principals who are available to provide these services to the State of West Virginia. These personnel comprise all of the technical skills required to deliver each of the skill sets identified in Paragraph 4.0 Project Goals.

An organization chart is included to indicate how the various skill sets will be managed to deliver the desired results.

**References:**

The references detailed in this section are all of current projects and clients with whom TRC has provided similar services. We have included a short description of each type of project we have/are providing to these clients.

TRC sincerely appreciates the opportunity to submit this EOI and looks forward to visiting with you and your staff on this project. Please let us know if you have any questions.

Sincerely,



**Dan R. Banks, R.C.D.D.**  
**Manager – Communications Engineering**  
**TRC Engineers, Inc.**  
**Email: [drbanks@trcsolutions.com](mailto:drbanks@trcsolutions.com)**  
**Cell tel: 210-771-5228**



## Table of Contents

### Letter of Introduction – TRC Engineers, Inc.

Tab 1	Statement of Qualifications	
	TRC Engineers, Inc. Qualifications and Certificates	5
	Mead & Hunt Qualifications and Certificates	27
	Comsearch Qualifications and Certificates	34
Tab 2	Personnel Resumes	
	Organizational Chart	37
	TRC Engineers, Inc. resumes	38
	Mead & Hunt resumes	61
	Comsearch resumes	72
Tab 3	References	70
Tab 4	Appendices	
	Appendix A – Purchasing Affidavit	72
	Appendix B – Certification and Signatures Page	74
	Appendix C – Addendum Acknowledgement	76

**TAB 1 – STATEMENT OF QUALIFICATIONS**

TRC is proud to present the qualifications and certifications of TRC Engineers Inc., Mead & Hunt Inc. and Comsearch, Inc. These three entities will work together to fulfill the mission of the West Virginia DHHR OEMS in the engineering, design, build-out and maintenance of the West Virginia State Medical Command Microwave System. The following matrix describes the approach that will be taken to accomplish the tasks required.

**Engineering & Design Services**  
**BPH14010 Expression of Interest**

line	task	West Virginia - Engineering and Design Services for Towers and Buildings	Service Provided By:		
			TRC	Mead & Hunt	Comsearch
0001	4.1	Provide Professional Engineering and Design Services to design, build-out, and maintain six (6) BTOP microwave and radio sites			
	4.1.1	<b>Microwave backbone system design and build including the following:</b>			
	4.1.1.1	Site selection path analysis, design and engineering of towers	✓	✓	
	4.1.1.2	System design plan	✓		
	4.1.1.3	Project management support	✓		
	4.1.1.4	Provision of detailed fee schedules for personnel and services	✓		
	4.1.1.5	Multiple path studies and engineering documentation to determine system requirements	✓		
	4.1.1.6	Antenna system design with documentation and data sheets	✓		
	4.1.1.7	Builds of material specifications and lists	✓		
	4.1.1.8	Development of T1 plans and Digital Access and Cross Connect System (DACS) applications	✓		
	4.1.1.9	Network management systems and alarms	✓		
	4.1.1.10	Network synchronization plan	✓		
	4.1.1.11	Prior Coordination Notices(PCN) preparation and responses			✓
	4.1.1.12	Specifications of equipment and antenna systems	✓		
	4.1.1.13	Detailed equipment lists and specifications	✓		
	4.1.1.14	Frequency selection and coordination with Comsearch			✓
	4.1.1.15	License filing and coordination			✓
	4.1.1.16	Integration of equipment and system with existing equipment and hardware	✓		
	4.1.1.17	2.4 GHz MW path relocation support as needed and required by Federal Communication Commission (FCC)	✓		
	4.1.1.18	Design of "overbuild" networks for cut-over of existing paths to new digital system with minimal outage time	✓		
	4.1.1.19	Coordination between Vendor and Agency for Internet Protocol (IP) addressing within the network management system	✓		
	4.1.1.20	Written documentation of "asbuilt" system including equipment rack drawings and overall system wide channel plan	✓		
	4.1.1.21	Evaluation of PCN requests for interference from Comsearch			✓
	4.1.1.22	Specialized roof top design of antenna system		✓	
	4.1.1.23	Assist in recommendation of alternative vendors for components and hardware	✓		
	4.1.1.24	Engineering legal advice with FCC in key license documents			✓
	4.1.1.25	Bandwidth usage analysis	✓		
	4.1.1.26	Digital microwave broadband engineering and design	✓		
	4.1.2	<b>Design the latest cutting edge in the digital broadband TDM Microwave technology to provide the maximum usage of the state system for all public safety agencies</b>	✓		
	4.1.3	<b>Completion of the following tower site design and civil work:</b>			
	4.1.3.1	Analysis of location and terrain		✓	
	4.1.3.2	Survey, plot design, site elevations, and "as built" documentation including tower, buildings, utilities, and associated attachments		✓	
	4.1.3.3	Plot map of site		✓	
	4.1.3.4	Filing appropriate regulatory applications & permits including appropriate due diligence to include National Environmental Protection Act (NEPA), State Historic Preservation office (SHPO), Tribal Historic Preservation Office (THPO) & other env & hist eval		✓	
	4.1.3.5	Collection of information and filing of appropriate (Federal Aviation Administration(FAA) and FCC documents		✓	
	4.1.3.6	Tower loading and structural analysis as required to meet appropriate loading and antenna requirement		✓	
	4.1.3.7	AC/DC power systems design	✓		
	4.1.3.8	Communications building selection and design		✓	
	4.1.3.9	Back-up power fuel system power design		✓	
	4.1.3.10	Digital broadband microwave engineering and analysis	✓		
	4.1.4	<b>Acquire and license the maximum amount of available frequencies to populate the six sites with the maximum amount of frequencies available</b>			✓
	4.1.5	<b>Design the communication system of both digital and broadband microwave and standard radio system including:</b>			
	4.1.5.1	Frequency identification and coordination of appropriate Radio Frequency (RF) frequencies			✓
	4.1.5.2	Coordinate with Association of Public Safety Communication Officers (APCO) or other coordinating entities			✓
	4.1.5.3	Trunked radio system connectivity channel plans	✓		
	4.1.5.4	Detailed equipment and antenna list and specification	✓		
	4.1.6	<b>Acquire the latest test equipment to train Agency technicians so that they will be able to provide maximum amount of maintenance by:</b>	✓		

**Engineering & Design Services**  
**BPH14010 Expression of Interest**

line	task		Service Provided By:		
			TRC	Mead & Hunt	Comsearch
		<b>West Virginia - Engineering and Design Services for Towers and Buildings</b>			
	4.1.6.1	Developing a detailed list of required and recommended service and test equipment to maintain the system components	✓		
	4.1.6.2	Developing a detailed list and recommendations on appropriate parts and spares to be maintained by Agency for maintenance and repair of system	✓		
	4.1.6.3	Researching, providing and coordinating assistance in recommended appropriate training courses for service and maintenance of system	✓		
	4.1.7	<b>Provide preliminary and post construction environmental assessments, monitoring and compliance to the full range of the microwave and associated BTOP program.</b>		✓	
0002	4.2	<b>Provide ongoing professional engineering services to continue the build-out and maintenance of eleven (11) existing BTOP microwave and radio sites</b>			
	4.2.1	Post construction environmental assessments, monitoring and compliance to the full range of the microwave and associated BTOP program		✓	
	4.2.2	Frequency selection and coordination with Comsearch	✓		
	4.2.3	License filing and coordination			✓
	4.2.4	2.4 Ghz MW path relocation support as needed and required by Federal Communication Commission (FCC)	✓		
	4.2.5	Filing appropriate regulatory applications & permits including appropriate due diligence to include National Environmental Protection Act (NEPA), State Historic Preservation office (SHPO), Tribal Historic Preservation Office (THPO) & other env & hist eval		✓	
	4.2.6	Collection of information and filing of appropriate (Federal Aviation Administration (FAA) and FCC documents		✓	
0003	4.3	<b>Provide ongoing professional engineering service for ninety-three (93) existing State Medical Command Microwave System microwave and radio sites</b>			
	4.3.1	Post construction environmental assessments, monitoring and compliance to the full range of the microwave and associated State Medical Command Microwave System		✓	
	4.3.2	Frequency selection and coordination with Comsearch	✓		
	4.3.3	License filing and coordination			✓
	4.3.4	2.4 Ghz MW path relocation support as needed and required by Federal Communication Commission (FCC)	✓		
	4.3.5	Filing appropriate regulatory applications & permits including appropriate due diligence to include National Environmental Protection Act (NEPA), State Historic Preservation office (SHPO), Tribal Historic Preservation Office (THPO) & other env & hist eval		✓	
	4.3.6	Collection of information and filing of appropriate (Federal Aviation Administration (FAA) and FCC documents		✓	
0004	4.4	<b>Provide professional engineering and design services to design, build-out, and maintain seven (7) SIRM microwave and radio sites to be constructed during the project period</b>			
	4.4.1	<b>Microwave backbone system design and build including the following:</b>			
	4.4.1.1	Site selection path analysis, design and engineering of towers	✓		
	4.4.1.2	System design plan	✓		
	4.4.1.3	Project management support	✓		
	4.4.1.4	Provision of detailed fee schedules for personnel and services	✓		
	4.4.1.5	Multiple path studies and engineering documentation to determine system requirements	✓		
	4.4.1.6	Antenna system design with documentation and data sheets	✓		
	4.4.1.7	Builds of material specifications and lists	✓		
	4.4.1.8	Development of T1 plans and Digital Access and Cross Connect System (DACS) applications	✓		
	4.4.1.9	Network management systems and alarms	✓		
	4.4.1.10	Network synchronization plan	✓		
	4.4.1.11	Prior Coordination Notices(PCN) preparation and responses			✓
	4.4.1.12	Specifications of equipment and antenna systems	✓		
	4.4.1.13	Detailed equipment lists and specifications	✓		
	4.4.1.14	Frequency selection and coordination with Comsearch			✓
	4.4.1.15	License filing and coordination			✓
	4.4.1.16	Integration of equipment and system with existing equipment and hardware	✓		
	4.4.1.17	2.4 Ghz MW path relocation support as needed and required by Federal Communication Commission (FCC)	✓		

**Engineering & Design Services**  
**BPH14010 Expression of Interest**

Line	Task	West Virginia - Engineering and Design Services for Towers and Buildings	Service Provided By:		
			TRC	Mead & Hunt	Comsearch
4.4.1.18	Design of "overbuild" networks for cut-over of existing paths to new digital system with minimal outage time		✓		
4.4.1.19	Coordination between Vendor and Agency for Internet Protocol (IP) addressing within the network management system		✓		
4.4.1.20	Written documentation of "asbuilt" system including equipment rack drawings and overall system wide channel plan		✓		
4.4.1.21	Evaluation of PCN requests for interference from Comsearch				✓
4.4.1.22	Specialized roof top design of antenna system			✓	
4.4.1.23	Assist in recommendation of alternative vendors for components and hardware		✓		
4.4.1.24	Engineering legal advice with FCC in key license documents		✓		
4.4.1.25	Bandwidth usage analysis		✓		
4.4.1.26	Digital microwave broadband engineering and design		✓		
4.4.2	<b>Design the latest cutting edge in the digital broadband TDM Microwave technology to provide the maximum usage of the state system for all public safety agencies</b>		✓		
4.4.3	<b>Completion of the following tower site design and civil work:</b>				
4.4.3.1	Analysis of location and terrain			✓	
4.4.3.2	Survey, plot design, site elevations, and "as built" documentation including tower, buildings, utilities, and associated attachments			✓	
4.4.3.3	Plot map of site			✓	
4.4.3.4	Filing appropriate regulatory applications & permits including appropriate due diligence to include National Environmental Protection Act (NEPA), State Historic Preservation office (SHPO), Tribal Historic Preservation Office (THPO) & other env & hist eva			✓	
4.4.3.5	Collection of information and filing of appropriate (Federal Aviation Administration (FAA) and FCC documents			✓	
4.4.3.6	Tower loading and structural analysis as required to meet appropriate loading and antenna requirement			✓	
4.4.3.7	AC/DC power systems design		✓		
4.4.3.8	Communications building selection and design			✓	
4.4.3.9	Back-up power fuel system power design			✓	
4.4.3.10	Digital broadband microwave engineering and analysis		✓		
4.4.4	<b>Acquire and license the maximum amount of available frequencies to populate the six sites with the maximum amount of frequencies available</b>				✓
4.4.5	<b>Design the communication system of both digital and broadband microwave and standard radio system including:</b>				
4.4.5.1	Frequency identification and coordination of appropriate Radio Frequency (RF) frequencies				✓
4.4.5.2	Coordinate with Association of Public Safety Communication Officers (APCO) or other coordinating entities				✓
4.4.5.3	Trunked radio system connectivity channel plans		✓		
4.4.5.4	Detailed equipment and antenna list and specification		✓		
4.4.6	<b>Acquire the latest test equipment to train Agency technicians so that they will be able to provide maximum amount of maintenance by:</b>				
4.4.6.1	Developing a detailed list of required and recommended service and test equipment to maintain the system components		✓		
4.1.6.2	Developing a detailed list and recommendations on appropriate parts and spares to be maintained by Agency for maintenance and repair of system		✓		
4.1.6.3	Researching, providing and coordinating assistance in recommended appropriate training courses for service and maintenance of system		✓		
4.4.7	<b>Provide preliminary and post construction environmental assessments, monitoring and compliance to the full range of the microwave and associated BTOP program.</b>			✓	
0005	4.5	Provide ongoing professional engineering service for twenty-one (21) medical and communication buildings			
4.5.1	Frequency selection and coordination with Comsearch		✓		
4.5.2	License filing and coordination				✓
4.5.3	2.4 Ghz MW parth relocation support as needed and required by Federal Communication Commission (FCC)		✓		
4.5.4	Filing appropriate regulatory applications & permits including appropriate due diligence to include National Environmental Protection Act (NEPA), State Historic Preservation office (SHPO), Tribal Historic Preservation Office (THPO) & other env & hist eva			✓	
4.5.5	Collection of information and filing of appropriate (Federal Aviation Administration (FAA) and FCC documents			✓	



## ABOUT OUR COMPANY

### TRC COMPANIES, INC.

TRC Companies, Inc. (NYSE: TRR) is an engineering, consulting, and construction management firm that provides integrated services to the environmental, energy, and infrastructure markets. Our multidisciplinary project teams provide turnkey services to move complex projects from initial concept to delivery and operation. A broad range of commercial, utility, industrial, and government clients depend on us for customized and complete solutions to their toughest business challenges. With more than 2800 professionals in over 100 offices located throughout the nation, our broad base of experts with industry experience assures you that we will deliver and execute solutions that meet your real world needs—and add true value to your operations.



### TRC POWER DELIVERY

Within the energy sector of TRC, the Power Delivery group is comprised of over 450 professionals throughout the United States. Power Delivery provides full service engineering consulting for utilities, developers, municipalities and industry in the areas of:

- Power Systems Studies
- Routing, Permitting and Siting
- Transmission Engineering and Design
- Substation and Switchyard Engineering & Design
- Distribution Planning, Engineering & Design
- Protection & Control
- Field Services
- Operational Consulting
- Nuclear Generation
- Renewable Engineering
- Communication Engineering



## TRC TELECOM SOLUTIONS

TRC Telecom Solutions, the communications engineering practice within the TRC Power Delivery umbrella, is comprised of a solid base of experienced engineers and project teams who know how to plan, design, and install facilities that meet your financial, technical, and scheduling goals.

TRC Telecom Solutions is unique in the communications industry in that we offer a full spectrum of services from initial needs assessment including discovery, inventory and evaluation all the way through design and recommendation to construction and final commissioning.

TRC Telecom Solutions provides a variety of communication engineering services to validate options, develop cost estimates, make intelligent choices of equipment and procedures, obtain detailed design documents suitable for bidding and follow up on the construction and turn-up processes to ensure that the installed system functions as originally intended.

TRC Telecom Solutions offers a full range of solutions and engineering design for all types of communication projects including:

- Master Planning Engineering
- Power Grid Communications Engineering
- Mobile Communications Engineering
- Microwave Network Engineering
- Fiber Optic Cable Engineering
- Security System Engineering



## About our Services

### MASTER PLANNING ENGINEERING

TRC Telecom Solutions provides master planning engineering services to major utilities that must gain a coordinated and cohesive approach to the deployment of technology, maintain services provided by existing systems and provide a smoother transition to the future. TRC Telecom Solutions provides services including:

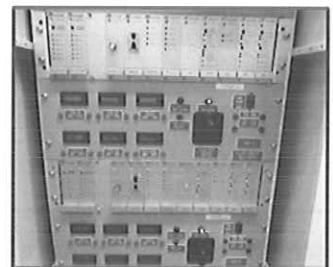
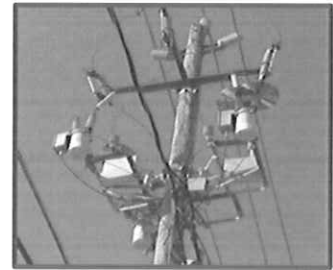
- Discovery, Inventory and Current State Evaluations
- Needs Assessment and Strategic Planning
- Technology Assessment and Design
- Security Assessment and Design
- Comprehensive Design Development
- Optimization and Detailed Cost Projection
- Implementation Planning/Business Alignment
- Material and Equipment Acquisition
- Construction Management
- Project and Program Management
- Engineer, Procure and Construct (EPC) Contracts



## POWER GRID COMMUNICATION ENGINEERING

TRC Telecom Solutions provides power grid communication engineering support to evolving grid operations and legacy systems for electric utilities, industry and commercial users. TRC Telecom Solutions provides services including:

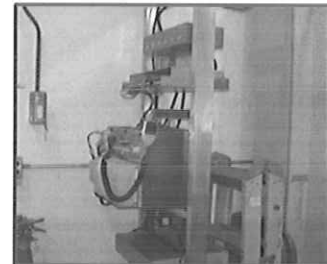
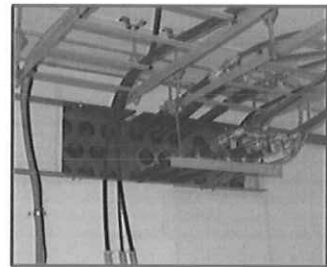
- Security Assessment and Design
- Intelligent Device Integration
- SCADA and Line Protection
- Substation Communication Design
- Distribution Automation
- AMI Integration
- Cell Relay Design
- Benchmark Threshold Design
- Protocol Selections
- EMF Testing and Validation
- RFP Total Services



## MOBILE COMMUNICATION ENGINEERING

TRC Telecom Solutions provides utility, public safety and critical interoperable mobile communications engineering for voice and data services. TRC Telecom Solutions provides services including:

- Voice, Data and Video Design
- Security Assessment and Design
- VHF, UHF, 700-800-900 MHz, Wi-Fi/Wi-Max, PCS, AWS, LTE
- Computer Aided Propagation Modeling
- Conventional, Trunked, Interoperable Designs
- FCC Frequency Selection/Coordination/Licensing
- Tower Specification, Inspection and Load Analysis
- Site Surveys
- New Site Design
- AC/DC Power Systems/Engine Generators
- Grounding Systems
- FCC Legal Service Coordination

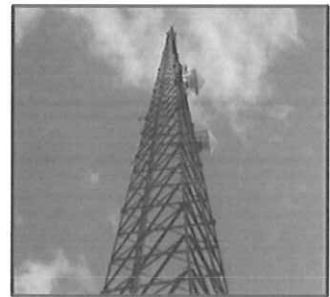


## MICROWAVE NETWORK ENGINEERING

TRC Telecom Solutions provides microwave network engineering services to support licensed, unlicensed, point-to-point and point-to-multipoint applications.

TRC Telecom Solutions provides services including:

- Field Surveys
- Path Surveys
- Frequency Selection/Coordination
- Structure Analysis
- Site Surveys/New Site Designs
- AC/DC Power Systems/Engine Generators
- Licensed/Unlicensed/Wide & Narrow Bands
- Total System Design for Channels, Security, SCADA, Line Protection Relaying
- FCC Legal Service Coordination
- Beam Easements
- Tower and Shelter Design
- Power Systems

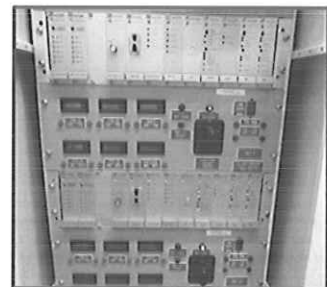
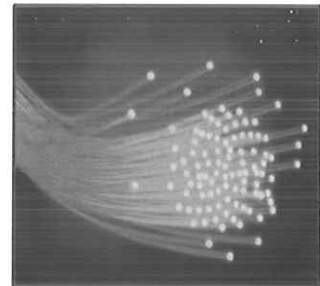


## FIBER OPTIC CABLE ENGINEERING

TRC Telecom Solutions provides fiber optic cable engineering services for the installation of OPGW Optical Power Ground Wire, ADSS All Dielectric Self Supported, UGFO Underground Fiber Optic, and OHFO Overhead Fiber Optic.

TRC Telecom Solutions provides services including:

- Field Surveys
- Cable Selection
- Mode, Attenuation, nWDM, Bandwidth Capacity Designs
- Transmission, Distribution, Underground and Duct Designs
- Structure Analysis
- Custom Splicing and Termination Designs
- On-Line Client Mapping Services
- Route, Site, Cable and path engineering
- RFP Total Services



## SECURITY SYSTEM ENGINEERING

TRC Telecom Solutions helps clients meet the significant and ongoing evolution of regulatory and legal requirements of physical and cybersecurity protection for critical infrastructure.

TRC Telecom Solutions provides services including:

- Planning/Process Documentation
- Physical Controls
- Cyber/Network Configurations
- Operations/Response Protocols
- Organization/Governance
- Business Continuity/Disaster Recovery Planning
- Risk & Threat Assessment
- Communication and Data Network Infrastructure Design and Construction





## About our Experience

### PROJECT EXPERIENCE

#### Master Planning Engineering

- Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc. and Maui Electric Company, Inc.
  - Telecommunications Master Plan and 10-Year Action Plan
- CenterPoint Energy
  - Masterplan for Fiber Optic and Microwave Expansion
- City Public Service Energy, San Antonio, Texas
  - Masterplan for extension of fiber optic network to all electric substations within the City of San Antonio – approx. 80
- City of Garland, Texas
  - Masterplan for SCADA Expansion of Water and Waste Water Networks
- City of Richardson, Texas
  - Masterplan for extension of fiber optic network to a combined city and school district fiber optic network
- City of New Braunfels, Texas
  - Masterplan for extension of fiber optic network to a combined city and school district fiber optic network
- City of Bryan, Texas
  - Masterplan for extension of fiber optic network to a combined utility, city and school district fiber optic network
- City of Waco, Texas
  - Masterplan for extension of fiber optic network to a public works city owned network
- Guadalupe Valley Electric Cooperative
  - Transmission Optical Fiber Expansion Plan

- County of Bell, State of Texas
  - Masterplan for extension of fiber optic network to a combined governmental agency fiber optic network.
- Navigant
  - LCRA IP Migration Planning
- Lea County Electric Cooperative
  - Masterplan for replacement of obsolete microwave and SCADA equipment
- NuStar Energy
  - Masterplan for Installation or relocation of pipeline facilities for City of San Antonio
- ATT, Inc.
  - Masterplans for telco feeder route expansions to provide broadband connectivity for multiple services and locations.
  
- **Power Grid Communications Engineering**
  - CPS Energy, San Antonio, Texas
    - Utility Communications Systems
    - Protective Relaying
    - Smart Grid
    - Data Center Redundancy
  - HDR
    - Systems Integration of new and upgraded communications systems for Bonneville Power Authority
    - Wind farm integration in Nebraska
    - SONET and MPLS/IP integration for utilities in mid-west
  - CenterPoint Energy, Houston, Texas
    - Cell Relay network design and implementation for 1.7 million AMI system deployment
    - Microwave packet radio design and implementation.
  - Medina Electric Cooperative

- Design of Demand Response wireless communication system for interruptible loads.
- SCADA upgrade for RTU's
- Hawaiian Electric Company
  - Design and expansion of SONET network to provide service to new substation at Airport.
  
- **Mobile Communications Engineering**
  - State of West Virginia
    - Support of UHF trunked two way statewide network for public safety with microwave backbone construction.
  - CPS Energy, San Antonio, TX
    - Two Way Radio Interference Study
  - HDR, Vancouver WA
    - Mobile Radio Replacement P25 System for Bonneville Power Administration
  - City of Briarcliff Manor, NY
    - Cellular RF – Project Mgr. for new cellular tower construction and buildout of existing water tower site.
  - City of Bedford, Texas
    - FCC License Amendment and Narrowband upgrades
    - Narrowbanding engineering support
  - Floresville Electric Light and Power, Texas
    - Design and implementation of new UHF digital trunked two way radio system.
  - 800 MHz Rebanding
    - Provide negotiations and license support to 10 public safety agencies to assist with rebanding of 800MHz trunked systems with Nextel.
  - Piedmont Electric Cooperative, Hillsborough, North Carolina
    - Design and implementation of new UHF trunked two way radio system.

- **Microwave Network Engineering**
  - CenterPoint Energy, Houston, Texas
    - Frequency Study
    - Microwave Engineering Path Designs
  - CPS Energy, San Antonio, Texas
    - Monopole Inspections
    - Lattice tower inspections
    - Tower Replacements
    - Tower and Comm Shelters
    - Digital Microwave Path Design, Construction and Implementation
  - Tennessee Valley Authority, Chattanooga, TN
    - Microwave Radio Upgrade
    - Engineering Assistance
  - South Texas Electric Cooperative
    - Microwave Communication Site Development
    - Microwave path design
  - State of West Virginia
    - Design of Statewide Broadband Microwave Network with 125 hops of 300MB radio
    - License Coordination Services
    - Frequency Coordination Services
  - Bonneville Power Administration
    - Design of digital microwave systems to replace analog
    - Design of new microwave paths for wind farm integration.
    - Integration of fiber optic and microwave systems.
  - Hawaiian Electric Company
    - Design of new microwave paths for substation integration
    - Vendor hardware selections and studies

- **Fiber Optic Cable Engineering**
  - Bryan Texas Utilities, Bryan, Texas
    - Fiber Relocation
  - Brooks Development Authority, San Antonio, Texas
    - Remove and Replace, Relocate, Repair, Rehab Fiber Optics
  - City of Georgetown, Texas
    - Fiber Optic Route Engineering
    - Fiber Mapping and Bentley Fiber Software System
  - CPS Energy, San Antonio, Texas
    - Installation of OPGW and ADSS on transmission lines
    - 500 mile fiber optic ring network on distribution and transmission
    - PLS-CADD modeling of structures
    - Fiber to new substations
  - Guadalupe Valley Electric Cooperative, Gonzales, Texas
    - Fiber Extensions on transmission lines
    - Fiber Entrances to buildings and substations
    - Structural Analysis
  - Hawaiian Electric Company
    - Substation Fiber Optic Cable
  - New Braunfels Independent School District
    - Design and Integration of combined City and School District fiber optic network
  
- **Security System Engineering**
  - Hawaiian Electric Company
    - Security impacts on technology selections.
    - Firewall designs
    - NERC/CIP integration requirements
  - City Public Service Energy, San Antonio, Texas
    - Data Center Integration and Security back-up for data

## **PROJECT REFERENCES**

Project references are included in Tab 3 – References.

**TRC Engineers, Inc. is proud to provide services to:**

Bonneville Power Administration, WA  
Brazos Electric Generation and Transmission, TX  
Brooks Air Force Base Development Authority, TX  
Bryan Texas Utilities, TX  
CenterPoint Energy, TX  
City of Austin Texas  
City of Bedford Texas  
City of College Station Texas  
City of Dallas Texas  
City of Georgetown Texas  
City of Grand Prairie Texas  
City of Mansfield Texas  
City of New Braunfels Texas - New Braunfels Utilities  
City of Richardson Texas  
City of Richardson Independent School District, TX  
City of San Antonio Texas  
City of San Diego, California  
CPS Energy  
Denton Texas Independent School  
Denton County Texas  
Floresville Electric Light and Power, TX  
Greater Austin Area Telecommunications Network, TX  
Guadalupe Valley Electric Cooperative, TX  
Guadalupe Valley Telephone Cooperative, TX  
Hawaiian Electric Company, Inc., HI  
Hawaii Electric Light Company, Inc.  
HDR Engineering, Inc., MT  
Houston Texas Independent School District  
James R. Schultz & Associates – San Antonio Water Systems, TX  
Kimley Horn and Associates – San Antonio Water Systems , TX  
Lower Colorado River Authority, TX  
Maui Electric Company, Inc., HI  
Medina Electric Cooperative, TX  
Navigant Consulting, NY  
Nebraska Public Power District, NE  
New Braunfels Independent School District, TX  
Northeast Tarrant County Radio Consortium, TX  
Northside San Antonio Independent School District, TX  
NuStar Energy – City of San Antonio, TX  
Rochester Gas and Electric, NY  
Seminole Electric Cooperative, FL  
South Texas Electric Utility, TX  
State of West Virginia  
Tennessee Valley Authority, TN

## About our Team

TRC Telecom Solutions has the right team with the right experience in place to handle projects ranging from comprehensive master planning to broadband, fiber optics, microwave and wireless network installations. Our efforts are backed up by a depth of resources to provide a solid and robust solution to meet even the most demanding project's needs.

TRC Telecom Solutions is unique in the communications industry in that we offer a full spectrum of services from initial needs assessment including discovery, inventory and evaluation all the way through design and recommendation to construction and final commissioning. As part of 2800 TRC professionals in over 100 offices located throughout the nation, our broad base of experts with industry experience assures you that we will deliver and execute solutions that meet your real world needs—and add true value to your operations.



# The United States of America

## Federal Communications Commission

### GENERAL RADIOTELEPHONE OPERATOR LICENSE

(General Radiotelephone Certificate)

This certifies that the individual named below is a licensed radio operator and is authorized to operate licensed radio stations for which this class of license is valid. The authority granted is subject to any endorsement placed on this license. The authority granted is also subject to the orders, rules, and regulations of the Federal Communications Commission, the statutes of the United States, and the provision of any treaties to which the United States is a party, which are binding upon radio operators.

This license may not be assigned or transferred to any other person. This license is valid for the lifetime of the holder unless suspended by the FCC.

Endorsement: **NONE**

Licensee: PATRICK J. WORSHAM

		Place of Issuance HOUSTON, TX.
Date of Birth [REDACTED]	Issuance Date JANUARY 2, 1985	License Number [REDACTED]

Patrick J. Worsham  
Signature of Licensee



**Texas Board of Professional Engineers  
CERTIFICATE OF REGISTRATION**

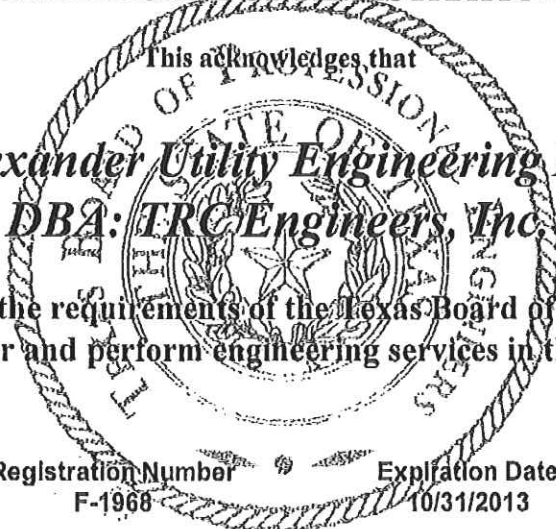
This acknowledges that

*Alexander Utility Engineering, Inc*  
*DBA: TRC Engineers, Inc.*

has fulfilled the requirements of the Texas Board of Professional Engineers to offer and perform engineering services in the state of Texas.

Registration Number  
F-1968

Expiration Date  
10/31/2013



TEXAS BOARD OF PROFESSIONAL ENGINEERS

This card certifies that  
WILLIAM MCKINLEY HAWK III  
is a Licensed Professional Engineer.

P.E. License Number



Status

ACTIVE

Expiration Date

9/30/2013

Two handwritten signatures in black ink. The signature on the left is a stylized 'W' followed by 'Hawk'. The signature on the right is a cursive signature, likely of the Executive Director.

P.E. Signature

TBPE Executive Director

The professional designation of

**RCDD** <sup>(R)</sup>

Registered Communications Distribution Designer

is awarded to

*Dan R Banks*

by BICSI<sup>®</sup> in recognition of having successfully completed  
BICSI's registration and examination requirements.

1/1/2012

Issued

12/31/2014

Expires

*Bain Hosen*

President, BICSI

*John D. Clark Sr.*

BICSI Executive Director & Chief Executive Officer



# CERTIFICATE OF *Authorization*

STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS

*The West Virginia State Board of Registration for Professional Engineers  
having verified the person in responsible charge is registered in  
West Virginia as a professional engineer for the noted firm, hereby certifies*

**TRC ENGINEERS, INC.**

**C02609-00**

**Engineer in Responsible Charge: DAVID CLEVINGER - WV PE 010944**

*has complied with section §30-13-17 of the West Virginia Code governing  
the issuance of a Certificate of Authorization. The Board hereby notifies you of its  
certification with issuance of this Certification of Authorization for the period of:*

**July 1, 2012 - June 30, 2013**

*providing for the practice of engineering services in the State of West Virginia.*



IF YOU ARE REQUIRED TO REGISTER WITH THE SECRETARY OF STATE'S OFFICE,  
PLEASE SUBMIT THIS CERTIFICATE WITH YOUR APPLICATION.

IN TESTIMONY WHEREOF, THE WEST VIRGINIA STATE BOARD OF  
REGISTRATION FOR PROFESSIONAL ENGINEERS HAS ISSUED THIS COA  
UNDER ITS SEAL, AND SIGNED BY THE PRESIDENT OF SAID BOARD.

BOARD PRESIDENT

**WEST VIRGINIA  
STATE TAX DEPARTMENT  
BUSINESS REGISTRATION  
CERTIFICATE**

ISSUED TO:  
**TRC ENGINEERS INC  
7 SKYLINE DR  
HAWTHORNE, NY 10532**

**BUSINESS REGISTRATION ACCOUNT NUMBER: 1007-4011**

This certificate is issued on: 06/18/2010

*This certificate is issued by  
the West Virginia State Tax Commissioner  
in accordance with W.Va. Code § 11-12.*

*The person or organization identified on this certificate is registered  
to conduct business in the State of West Virginia at the location above.*

**This certificate is not transferrable and must be displayed at the location for which issued.**

**This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.**

**Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.**

**TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them.  
CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of  
this certificate displayed at every job site within West Virginia.**

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L1774623488

# Mead & Hunt Qualifications




# Mead & Hunt

## Wireless Telecommunications

At Mead & Hunt, our turn-key wireless services take your project from site design through start of construction. Our telecommunications professionals are experienced in new builds and upgrades. We'll help you navigate the permitting process and meet your project schedule.

With services including zoning, building permitting and all applicable state and federal approvals, Mead & Hunt staff has over 25 years experience in the wireless industry covering West Virginia, Pennsylvania, Maryland, Ohio, Virginia, North Carolina, Tennessee and Kentucky. This experienced staff is familiar with the "Fast Track Process" typical with wireless projects and can meet client's expectation for deliverables and timelines for new builds or upgrading existing facilities.

Mead & Hunt offers a full complement of wireless services including site surveys, 1A Certifications, 2C Certifications, construction drawings, Phase I ESAs, NEPA checklists (with SHPO/THPO clearances, archaeology and historical structures) geotechnical investigations, zoning approvals and structural analysis. 

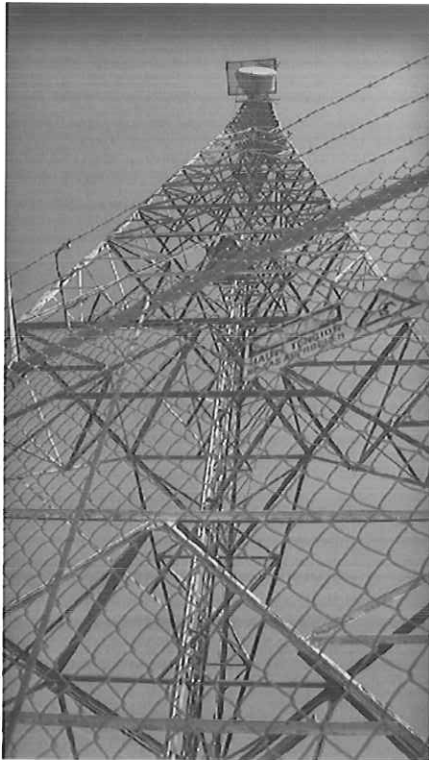
Jamie Bumgarner  
400 Tracy Way, Suite 200  
Charleston, West Virginia  
304-345-6712  
Mead & Hunt, Inc.  
meadhunt.com



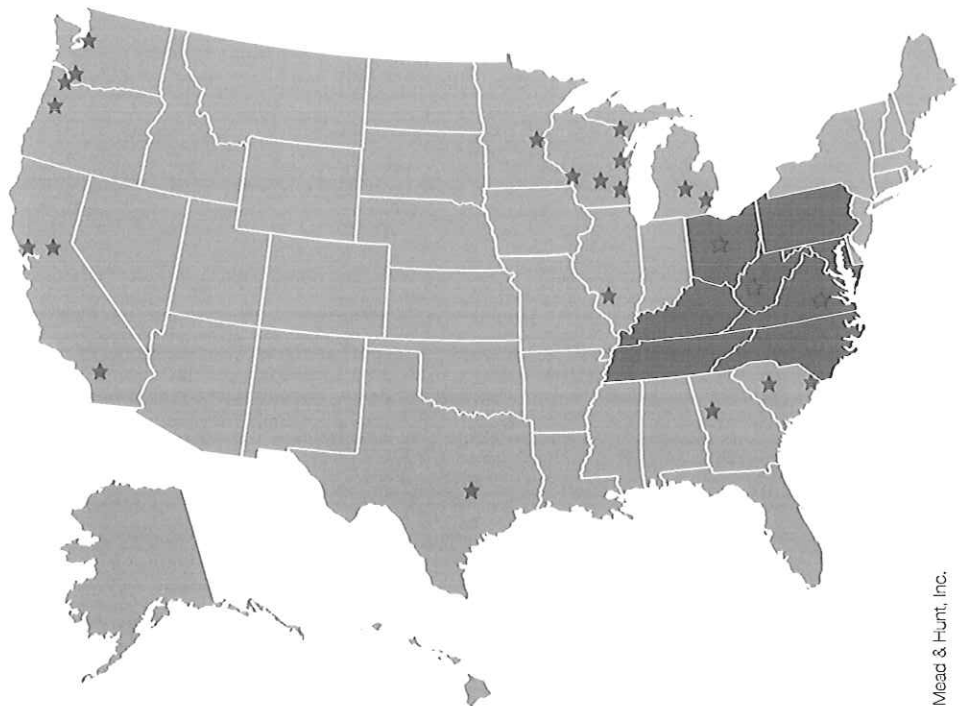


## Wireless Telecommunications Services

- 1A certifications
- 2C certifications
- Site feasibility surveys
- Lease surveys
- Zoning drawings
- Photo simulations
- Construction drawings
- Co-location drawings
- Tower mapping
- Structural analysis
- Construction staking
- As-built surveys
- Geotechnical core borings
- Concrete testing
- Construction monitoring
- NEPA checklist
- Phase I/II ESAs
- THPO approval
- SHPO approval
- HLC negotiations/mitigation
- EA preparation
- Archaeology oversight
- Historic architecture oversight
- Storm water permitting (NOI & NPDES)
- Air permitting (diesel/gas generators)
- USACE permitting
- Co-location, packages and rooftop
- Wetland permitting
- Endangered species surveys
- National Forest permitting



## Telecommunications Experience



Curtis Paxton  
 304-345-6712  
 curtis.paxton@meadhunt.com  
 meadhunt.com





EXPERT & ENTREPRENEURIAL AUTHENTIC & INTENTIONAL DEDICATED & DILIGENT

# Mead & Hunt

## Corporate Profile

Mead & Hunt builds relationships that last well beyond a job done right. We're experts in planning, design, engineering and architecture, serving markets nationwide. Skilled, diverse and deeply experienced, we are driven by our clients' success, because we measure our success by theirs.

- Engineering and architectural firm in operation since 1900
- Nearly 450 employees
- \$64 million in revenues in fiscal year 2011
- 155 ranking in *Engineering News Record's* annual Top 500 design firm list
- Named one of the Best Places to Work by *CE News*
- Named one of the fastest growing firms in the country last several years by the *Zweig Letter*
- More than 20 offices
- Nationwide service area with clients in nearly every state
- Employee-owned corporation





*"Mead & Hunt is an integrated multi-discipline engineering consulting company with experienced and dedicated bridge designers and historians. This quality of diverse professional staff thought to be the best fit for the success of this project."*

Mahmoud (Mac) N. Malas, PE  
formerly with Milwaukee County  
DTPW-Bridges & Structures

*"Mead & Hunt can successfully deliver projects of any size level or complexity.*

*They are strong project managers and excellent communicators; they provide whatever resources are necessary to meet schedules and budgets."*

Derek Martin, AAE  
(former) Airport Director  
Klamath Falls Airport

*"Mead & Hunt's support has been a trusted and valued engineering resource for SAFCA in providing hydraulic, civil, mechanical, and electrical analysis and design for a variety of infrastructure work."*

John Bassett  
Sacramento Area  
Flood Control Agency

There's nothing like stability in an industry that boasts an ever-changing landscape. And it's often literally changing: earth, water, populations and regulations. Mead & Hunt's decades-long client relationships and roster of storied industry leaders proves the point. We care about people, we invest in relationships and we bring the best of who we are to bear on every client engagement. 🏡

## Markets We Serve

- Aviation
- Dams & Hydropower
- Developers
- Education
- Federal & State
- Food & Industrial
- Military
- Municipalities
- Renewable Energy
- Telecommunications
- Transportation
- Water Resources

## Services We Provide

- Air Service
- Architecture
- Construction Services
- Engineering
- Environmental
- Historic Preservation
- Information Technology
- Planning
- Program Management
- Sustainable Design
- Surveying



## Corporate Capabilities

### Architecture & Buildings

- Architecture and structural engineering
- Energy analysis
- Fire and security protection
- Heating, ventilating and air conditioning
- Instrumentation and communication systems
- Interior design
- Lighting
- Plumbing

### Aviation

- Airfield engineering
- Airport planning
- Environmental services
- Air service consulting
- Program management
- Financial and business services
- Electrical engineering
- NAVAIDs and instrumentation
- Security systems
- Architecture – terminals, hangars, control towers and facilities
- Construction management

### Communications

- Agency coordination
- Public information meetings
- Public and media relations
- Website development
- 3-D imaging

### Construction Services

- Building commissioning
- Commercial construction inspection
- LEED® certification
- Right-of-way coordination
- Surveying
- Transportation inspection
- Video pipe inspection

### Dams & Hydropower

- Feasibility and project economics
- Regulatory
- Dam safety
- Hydro plant design
- Dam design
- Specialized consulting
- Dam removal
- Geotechnical

### Environmental

- Environmental Assessments (NEPA)
- Environmental Impact Reports (CEQA)
- Habitat assessment
- Historic architecture surveys and reports
- Planning
- Stream restoration
- Water quality sampling
- Wetlands mitigation design

Mead&Hunt

*(continued on reverse)*



## Historic Preservation

- Archaeology management
- Architectural surveys
- Historic context development
- Historic landscape studies
- Historic property documentation (HABS/HAER)
- Historic Structures Reports
- Mitigation documents
- National Register Nominations
- Preservation plans (inc. historic resource management plans)
- Section 106 compliance

## Municipal

- Land use planning
- Storm water management
- Streets and bridges
- Traffic studies
- Utility coordination
- Wastewater treatment and collection systems
- Water system engineering

## Technology Support

- AutoCAD and MicroStation
- Digitized maps
- Geographic Information System (GIS)
- Global Positioning System
- Image Processing System
- Satellite imagery

## Telecommunications

- Telecom services
- Wide Area Networks
- Telecommunications tower A/E services

## Transportation

- Bridges
- Construction engineering
- Environmental documentation
- Highway garages
- Historic preservation
- Program management
- Rest areas
- Street lighting
- Streets and highways
- Surveying
- Traffic engineering
- Transportation planning
- Weigh stations

## Urban Planning

- Downtown redevelopment
- Grant and loan applications
- Master plans
- Parks and recreation plans
- Residential, commercial, industrial and business developments
- Strategic plans
- Wetland assessments
- Zoning ordinances

## Water Resources

- Design and evaluation
- Hydrology and hydraulic analyses
- Levees and floodwalls
- Regulatory compliance
- Channel stabilization and restoration
- Ports and harbors

# Office Locations

## California

180 Promenade Circle, Suite 240  
Sacramento, CA 95834  
916-971-3961

133 Aviation Boulevard, Suite 100  
Santa Rosa, CA 95403  
707-526-5010

## Colorado

1743 Wazee Street, Suite 400  
Denver, CO 80202  
303-825-8844

## Georgia

2011 Commerce Drive, Suite F101  
Peachtree City, GA 30269  
678-364-9738  
*\*greater Atlanta metro area*

## Illinois

152 Ginger Hill Court  
Glen Carbon, IL 62034  
618-656-2848  
*\*greater St. Louis metro area*

## Michigan

2605 Port Lansing Road  
Lansing, MI 48906  
517-321-8334

715 Main Street  
PO Box 65  
Norway, MI 49870  
906-563-1310

803 Willow Run Airport-West  
Hangar #1 Room 402  
Ypsilanti, MI 48198  
313-348-7059  
*\*greater Detroit metro area*

## Minnesota

7900 West 78th Street, Suite 370  
Minneapolis, MN 55439  
952-941-5619

## Ohio

5900 Wilcox Place  
Dublin, OH 43016  
614-792-5900  
*\*greater Columbus metro area*

## Oklahoma

Cherry Street Building  
1616 East 15th Street  
Tulsa, OK 74120  
918-585-8844

## Oregon

476 Salty Way  
Eugene, OR 97404  
541-689-9997  
  
9600 NE Cascades Parkway  
Suite 100  
Portland, OR 97220  
503-548-1494

## South Carolina

307 West Main Street  
Lexington, SC 29072  
803-996-2900

322 West Main Street  
Lexington, SC 29072  
803-785-2090

1012 38th Avenue North, Suite 301  
Myrtle Beach, SC 29577  
843-839-1490

## Texas

8217 Shoal Creek Boulevard  
Suite 108  
Austin, TX 78757  
512-371-7690

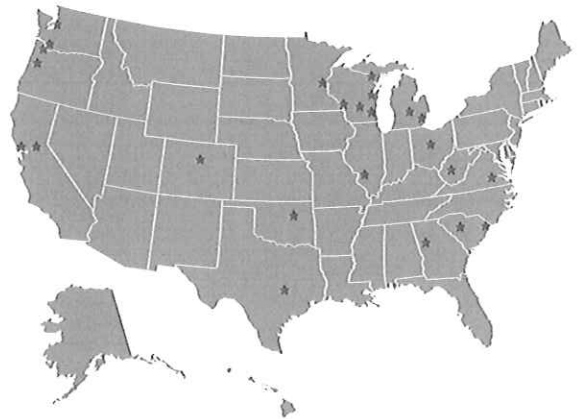
## Virginia

9100 Arboretum Parkway, Suite 350  
Richmond, VA 23236  
804-514-1653

## Washington

201 NE Park Plaza Drive, Suite 167  
Vancouver, WA 98684  
360-883-0047  
*\*greater Portland metro area*

1180 NW Maple Street, Suite 105  
Issaquah, WA 98027  
425-369-9004  
*\*greater Seattle metro area*



## West Virginia

400 Tracy Way, Suite 200  
Charleston, WV 25311  
304-345-6712

## Wisconsin

1345B North Road  
Green Bay, WI 54313  
920-496-0500

750 North Third Street  
La Crosse, WI 54601  
608-784-6040

6501 Watts Road  
Madison, WI 53719  
608-273-6380

10700 West Research Drive, Suite 155  
Wauwatosa, WI 53226-3458  
262-790-0232  
*\*greater Milwaukee metro area*

# Comsearch Qualifications

## Point-to-Point Frequency Engineering, Coordination & Licensing Services

Comsearch provides cost-effective engineering and FCC Licensing services for point-to-point microwave communications. These services cover the microwave bands between 930 MHz and 23 GHz found in FCC Rule Part 101. Below is a listing of our standard services. In addition, we maintain a staff of engineers who have experience in everything from network design to system implementation, so if you need a service not outlined here please give us a call!

### Interference Analysis

Can you get a frequency clear of interference? Will your frequency interfere with somebody else's system? At Comsearch we have spent the past 30 years refining our methods of interference prediction. No other firm offers the combination of frequency engineering experience and expertise, industry leadership and quality software and databases. Our interference analysis services include:

- **Determination of Existing Frequency Plans**  
We will identify co-located or nearby transmitters already licensed in your frequency band in order to reduce the possibility of "bucking" a site or encountering reflective interference from a nearby system.
- **Computer Modeling**  
Our software considers such factors as climate, antenna height elevation, antenna performance, receiver filter performance, terrain, modulation, path orientation, receiver threshold, and others, in order to accurately predict specific interfering levels into your system from the environment and into the environment from your system. The accuracy of our calculations is ensured by "real time" maintenance of our point-to-point microwave, earth station, equipment, antenna, interference objective, terrain and even address databases! Our proprietary software is constantly maintained and enhanced by a team of software specialists.
- **Frequency Selection**  
Our engineers are versed in the latest techniques and criteria for interference resolution. Comsearch is an active participant in the Telecommunications Industry Association (TIA) and has made significant contributions to Bulletin 10, the industry standard for computing interference objectives. We will conduct an interference analysis to identify available frequencies considering existing and proposed systems found in the database. When applicable, we will perform analysis of systems in adjacent bands to ensure your system does not receive unwanted threshold degradation. In shared bands, we will also perform an analysis of potential earth station interference.

- **Engineering Documentation**

Upon completion of the frequency selection process, the system parameters including the selected frequencies are documented. In addition, any outstanding interference conflicts or points of interest are detailed for your review, as well as any options for resolution.

#### Prior Coordination

All microwave bands subject to FCC Rule Part 101 now require prior coordination. Comsearch's experience with coordination and case resolution spans twenty years. During this period, Comsearch has played an active and lead role in the National Spectrum Managers Association (NSMA), the industry body recognized in the development and refinement of prior coordination procedures. When you have Comsearch prior coordinate your system you get:

- **Notification**

Comsearch circulates to all existing and proposed licensees in your area and frequency band of operation the technical parameters of your proposed system. By FCC rule, recipients are given 30 days to respond.

- **Case Resolution**

Often the response to a prior coordination notice is not in full agreement. Comsearch receives and responds to these objections to your proposed system and acts as your technical liaison until all cases are resolved.

- **FCC Documentation**

Upon successful completion of the prior coordination process, Comsearch will prepare documentation required to satisfy FCC Rule Part 101.103 (d). This exhibit is required upon submittal of your license application.

#### FCC Form Preparation

Comsearch can prepare your FCC license application and check to make certain all required exhibits are enclosed.

#### Qualifications

- Dedicated management and staff specifically for FCC licensing
- More than 25 years experience in FCC application filing
- Detailed knowledge of FCC rules and Regulations
- Detailed knowledge and solutions to FCC waiver situations
- Tracking and notification mechanisms keep you informed
- Working relationship with the FCC staff in Gettysburg
- Comsearch files over 4,000 FCC applications per year
- Hundreds of satisfied customers per year
- High efficiency application batch processing using the Comsearch ULS Express software
- Major license carriers currently take advantage of Comsearch License Management

### Typical Filing Process

- Comsearch files the FCC 601 microwave application upon written approval.
- Comsearch provides an electronic copy of the application to licensee via email.
- Comsearch tracks the status of the application until the license is granted. Amendments will be handled expeditiously if needed.
- Comsearch notifies licensee when the license has granted via email.
- Comsearch files the Completion of Construction upon written approval from licensee.
- Comsearch notifies licensee that the Completion of Construction has been filed.

### Service Detail

Comsearch provides the following microwave application filings:

- New
- Modification
- Special Temporary Authority (STA)
- Required Notification (Completion of Construction)
- Renewal Only
- Renewal Modification
- Administrative updates
- Cancellations
- Transfers of Control
- Assignments
- Waivers
  - CFR 47, Part 101.145 Geostationary satellite justification
  - CFR 47, Part 101.109 and 101.147(l)—30 MHz channel in 6.7 GHz band
  - CFR 47, Part 101.141—Microwave Modulation

### FAA Services

Comsearch provides FAA support which includes the filing of FAA Tower Registration form 7460-1 and the associated FCC Antenna Structure Registration Form 854. Comsearch works closely with the local FAA field office to ensure timely determinations.

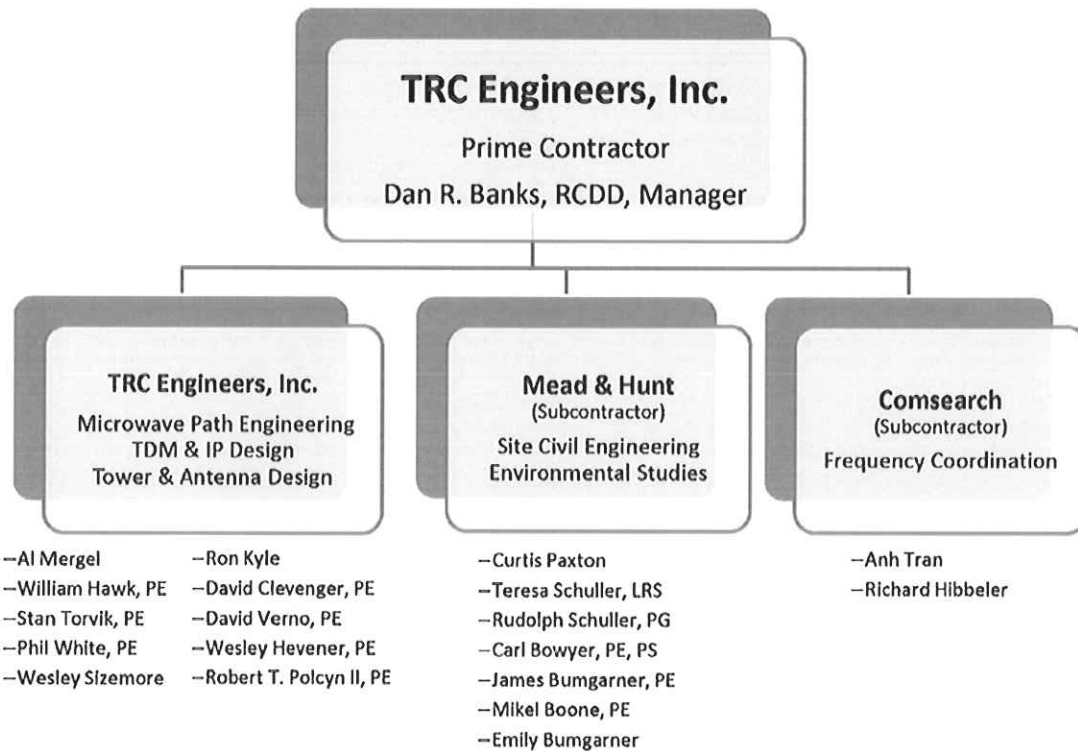
### Protection Services

Comsearch provides one year of Free Protection Service on all paths that we coordinate. After one year a subscription service can be purchased.



## TAB 2 – PERSONNEL RESUMES

The following organization chart and resumes represent the strong project team TRC has assembled. TRC has a solid base of experienced engineers, project managers, and technical experts who are well qualified to bring this project in on time and on target.



## **DAN R. BANKS, R.C.D.D./N.T.S.**

**Manager – Communications Engineering**

### **PROFESSIONAL REGISTRATIONS/CERTIFICATIONS**

Registered Communication Distribution Designer, BICSI, 1990  
RCDD #081324 (Physical Communication Design Certification)  
NTS #20508 (Network Transport Specialist Certification)  
Building Industry Consulting, Communications Certification, BICSI, 1990

### **REPRESENTATIVE EXPERIENCE**

Mr. Banks has demonstrated successful experience in supervising all Communications projects and personnel for over 20 years. He has extensive experience in assisting with corporate business development and implementation of company goals and objectives. Mr. Banks oversees and directs the engineering and design services of telecommunication facilities for clients with wired, wireless and broadband requirements throughout Texas and the United States. He has served in a Principal engineering, design and consulting capacity on major, multi-million dollar projects.

#### **TRC Engineers, Inc., San Antonio, Texas – 2011 - present**

##### **Manager – Communications Engineering**

Since acquisition by TRC in February, 2011, Mr. Banks has been developing expanded communications staff and resources to support the existing TRC client base as well as procuring new client projects. Some of the new client projects being supported by TRC staff are as follows:

- Hawaiian Electric Company - 2011-2012  
Development of Phase 1 of a Total Telecommunication Master Plan to support the challenging electric operations on the Island of Oahu, Hawaii. Engineering support of a new Distributed Generation system for the airport on Oahu. Engineering support for new SCADA/RTU integration of a Battery Energy Storage System (BESS) for the Island of Maui, Hawaii.
- Tennessee Valley Authority – 2011-2012  
Engineering support for new microwave systems utilizing SONET technology to upgrade an exhausted digital 28T-1 network.
- Bonneville Power Administration – 2009-2012  
Expansion of projects for both microwave and fiber optic based communication systems to assist BPA with conversion of analog to digital communication networks and to provide communication systems for renewable energy integration into the grid. Current project to Canada includes design of new mountain-top sites.
- CenterPoint Energy-2008-2012  
Development of Telecommunication Master Plan to assist with integration of expanded IP networks over the legacy digital fiber and microwave backbone system. Previous design engineering support for AMI network integration with legacy digital microwave and fiber optic networks. Also designed a new IP based two-way radio system at 800 MHz
- City Public Service Energy – San Antonio – 1992 – 2012  
As a long-standing client, TRC is currently helping CPSE with interference analysis of two-way radio system in addition to fiber optic and microwave system expansions.
- City of Georgetown, Texas -2001-2012  
Support for a hosted, Internet based, fiber optic mapping application to support fiber optic cable expansion and maintenance.
- State of West Virginia Broadband Network-1995-2012

- Continued communication engineering support for microwave expansion of over 125+ hops of digital TDM and IP microwave for public service agencies within the State of West Virginia.
- Brooks Development Authority -2001-2012  
Continued communication engineering support to transition previous USAF communication facilities to private industry networks for large commercial development park.

**Alexander Utility Engineering, Inc., San Antonio, Texas – 1992- 2011**  
**Communications Division Vice President**

- FCC Mandated Frequency Auctions – 1995 – 2011  
Provided independent engineering and consulting services to incumbents of microwave systems that were auctioned off by the FCC and required to be replaced by the licensee. Services included detailed path engineering, site engineering, network design, digital access systems and vendor coordination. A total of over 1000 hops of microwave have been successfully relocated for incumbents.
- Bonneville Power Administration – 2009-2011  
Design engineering for addition of fiber optic and microwave communication networks to support wind farm development and migration of microwave networks from analog to digital transmission. Prepared business case for new P25 two-way radio system.
- CenterPoint Energy-2008-2011  
Design engineering support for AMI network integration with legacy digital microwave and fiber optic networks. Also designed a new IP based two-way radio system at 800 MHz
- Guadalupe Valley Electric Cooperative-2007-2011  
Planning, engineering design and construction administration for development of a 200+ mile ADSS fiber optic network on the transmission line backbone.
- Brazos Electric Power Cooperative-2007-2009  
3DS3 microwave backbone upgrade to IP and provision for smart grid support for all member cooperatives.
- City of San Antonio-2005-2009  
Providing consulting engineering services for RFP preparation for contract of all communication services for the City of San Antonio.
- San Antonio Water System-2005-2011  
Providing SCADA engineering services for new sewer lift station RF and SCADA deployments.
- West Virginia EMS Technical Services Network-1998-2011  
Developed a statewide plan for EMS communication services and oversees major microwave network expansions. Currently engineering a \$125 million broadband grant for a statewide broadband network.
- Brooks Development Authority-2003-2009  
Providing program oversight and management for privatization of United States Air Force Base to private network for military base that was de-commissioned by the USAF and established as a City-Base.
- CPS Energy – Fiber Optic and SONET Microwave Networks-1995-2011  
Principal on a major fiber optic and microwave network development for support of ERCOT mandated transmission line switching programs.
- Medina Electric Cooperative Microwave Network-2002-2011  
Providing program oversight and management for development of a 10+ hop new digital microwave network to provide connectivity to all offices and substations included in the Medina system.

## **ALBERT (AL) H. MERGEL**

Senior RF Designer

### **AREAS OF EXPERTISE**

Mr. Albert Mergel has technical experience in the following general areas:

- Project Management
- System Design
- Construction Management
- FCC & FAA Permitting

### **REPRESENTATIVE EXPERIENCE**

Mr. Mergel has demonstrated successful application of management support and project engineering with clients. He has experience in Project requirements, estimates, schedules and preliminary system designs. Mr. Mergel is results-oriented with an emphasis on Bid specifications, request documents, response evaluations and summaries.

#### **Alexander Utility Engineering, Inc. (Senior RF Designer: 1996 – Present)**

Mr. Mergel has worked on projects that include:

- West Virginia State Trauma Emergency Care System – various phases of a multi-agency public safety project – from Pilot to Statewide.
- City of San Diego Communication Site Audit for IT&C multi-agency public safety project.
- Dayton Power & Light – System design and specification proposal engineering to competitively bid replacement of (30+ paths) analog microwave system with ring-loop high speed SONET 6 GHz digital microwave and multiplex.
- Arkansas State Police – System design and specification proposal engineering to competitively bid replacement of (70+ paths) analog microwave system with multiple ring loop high speed SONET 6 GHz digital microwave and multiplex.
- Southeast Ohio Emergency Management – System design and specification proposal engineering to competitively bid replacement of (7 paths) analog microwave system with high speed digital microwave and multiplex.
- Guadalupe Valley Electric Cooperative – Engineering support for path design and frequency coordination.
- City of Dayton – System design and specification proposal engineering to competitively bid replacement of (7 paths) analog microwave system with high-speed digital microwave and multiplex.

#### **Southern California Edison, (Senior RF Engineering and Microwave Systems Project Manager, 1968-1996)**

Mr. Mergel was Responsible for the design engineering, planning, budgeting, scheduling, project management and tracking of large analog to 6 GHz digital microwave and multiplex replace project. Additional work included managing various disciplines of civil engineering, construction, client coordination and cutover coordination.

**WILLIAM M. HAWK, P.E.**  
**Senior Engineer – Communications**

**AREAS OF EXPERTISE**

Mr. Hawk has technical experience in the following general areas:

- Fiber Optic, CATV, and Voice Cabling Networks
- Ethernet, IP, and SONET Networks
- Frame Relay, ISDN, PSTN Networks
- Wi-Fi, Wi-Max, Mesh, Public Wireless Networking
- Telephone Systems, ACD/Call Centers, VoIP
- Cyber and Physical Security
- Microwave and Two-Way Radio Systems – Analog, Digital, P25
- Hybrid Analog/PDH/SDH/IP Network Planning and Implementation
- Smart Grid - SCADA, AMI, Telemetry, Relaying, Distribution and Substation Automation, HAN
- UPS, Backup Power Systems, Grounding Systems
- Project Financial Planning and Analysis
- Project Budget Preparation
- Strategic Technology Planning

**REPRESENTATIVE EXPERIENCE**

Mr. Hawk has 28 years of experience in the planning, design, and implementation of all aspects of telecommunications systems, data networks, fiber optic networks, security systems, and radio systems, as well as high-voltage electrical system relaying, metering, and telemetry. He is very knowledgeable in financial planning and project justification, requirements assessment and definition development, project and design team management, and inter-disciplinary coordination between internal and client personnel. Mr. Hawk has successfully completed numerous large telecommunications projects with local, municipal, and state utilities, governments, school districts, commercial and industrial businesses, universities and university systems.

**TRC Engineers, Inc. Austin, Texas – 2011 – present**  
**Senior Engineer**

Since acquisition by TRC in February, 2011, Mr. Hawk has focused on engineering projects for new clients as follows:

- Hawaiian Electric Company – 2011-current  
Mr. Hawk has provided the lead engineer role on a detailed Phase 1 corporate Telecommunication Master Plan to provide on-site system inventory documentation, a two-year action plan and refined processes for providing telecommunication interconnections to Independent Power Producers for connection of renewable energy sources.
- Tennessee Valley Authority -2011-current  
Mr. Hawk is providing the lead engineer role on new microwave path and site engineering projects to include coordination with internal TVA staff and resources to document standards and methodologies for completing projects.
- Bonneville Power Administration -2008-current

- Mr. Hawk is providing the lead engineer and program manager role for multiple projects in the Pacific Northwest for integration of renewable energy projects into the power grid. Multiple projects include TDM and IP digital networks using fiber, microwave and RF systems.
- CenterPoint Energy-2011 – current  
Mr. Hawk provides the lead engineer role for all telecommunication projects designated by CenterPoint Energy in Houston, TX. He has most recently completed a Five-Year Telecommunications Master Plan.

**Alexander Utility Engineering, Inc. Austin, Texas - 2003 – 2011**

**Senior Engineer**

- CenterPoint Energy, Houston, TX  
Evaluated network requirements and developed RFP for acquisition of municipal/regional Wi-Max network for CenterPoint Energy in the Houston metropolitan area, using 3650MHz RF band. Evaluation and design included coverage analysis, RFP preparation, proposal evaluation, vendor interviews, and implementation planning. The network was designed to be tightly integrated with mesh AMI network and microwave/fiber backhaul to create a utility Smart Grid backbone network.
- Brazos Electric Power Cooperative  
Provided lead engineer role to undertake a comprehensive review of the capabilities and current uses of BEPC microwave systems, and to develop and provide a series of recommended enhancements. The services that provided over the microwave system for the cooperative members were fundamental to reliable electric operations. Assisted BEPC in establishing a beneficial policy to encourage all members to obtain access to the services, recommended capacity and reliability enhancements to the microwave system to increase reliability of the electric system, and recommended requiring members to pay for services they receive.
- Bonneville Power Administration, Vancouver, WA

Managed multi-site design effort for the Bonneville Power Administration to provide microwave and fiber optic communications to multiple substation, radio station, and hydro generation facilities, to incorporate wind generation into backbone Remedial Action Scheme control system. Design work included construction of three greenfield sites, as well as new and replacement towers and buildings at several sites, backup generator and fuel systems, and integration at each site with utility monitoring and control systems.

**Navigant Consulting/JanCom Engineering, Austin, Texas – 1992 - 2002**

**Senior Engineer**

- Lower Colorado River Authority, Austin, TX  
Evaluated and developed market valuation for three telecommunication systems owned and operated by the LCRA: an 800MHz trunked two-way radio system, a fiber optic network running from La Grange to past Buchanan Dam, and an OC-3 digital microwave radio system creating multiple looped communication networks around Central Texas. Provided market assessment, regulatory assessment, recommendations for further development of the assets, and recommendations for Board policy modifications to allow development of greater inter-community network support by the LCRA.

## **STANFORD D. TORVIK, P.E.**

**Senior Engineer – Communications**

### **PROFESSIONAL REGISTRATIONS/CERTIFICATIONS**

Professional Engineer, Texas, (License #74558, 1993)

### **AREAS OF EXPERTISE**

Mr. Stanford D. Torvik has extensive management experience over a wide range of technology and business applications in the following areas:

- Telephony (Call Center, Substation, Emergency Circuits)
- Telecommunications (Transport, Interconnect, Microwave, Fiber Optics)
- SCADA (Operations, Technology Strategy, Upgrade Systems)
- Protective Relaying (PLC, Fiber Optic, Microwave, Tone Relaying)
- Control Center Operations
- Fiber Optic Transport
- Mobile Radio, Mobile Data
- Data Center Design and Operations
- Emergency Power Design
- Applications Development (Operations, Corporate)
- Information Technology (GIS, SAP, legacy, Desktop Support, Personal Computing)
- Network (LAN, WAN, MAN)
- Design & Negotiations related to the leasing of excess infrastructure

### **REPRESENTATIVE EXPERIENCE**

Mr. Torvik began his engineering career in the design and implementation of technology projects which included all support services necessary to operate and maintain the diverse system infrastructure. He has extensive engineering and management experience implementing LAN, WAN and MAN in very diverse physical locations such as underground, underwater, overhead distribution, high voltage towers, static wire and inside plant. Mr. Torvik's responsibilities include design, procurement and construction of extensive communication infrastructure requiring secure multi-tenant use of shelters and towers.

#### **TRC Engineers, Inc., San Antonio, Texas - 2011 – present**

Mr. Torvik is responsible for the communications engineering design deliverables for numerous Electric Utility clients of TRC Engineers. Current projects in which he is involved are as follows:

- Bonneville Power Administration – 2011 – current Mr. Torvik is providing detailed project engineering and management of deliverable milestone projects for the extensive replacement of analog microwave with digital microwave and fiber optic cable.
- Hawaiian Electric Company – DG Project – 2011 – current Mr. Torvik is providing the lead engineer on the integration of a new DG Generator at the Airport into the existing SONET architecture of HECO.
- Maui Electric Company – BESS Project - 2011 – current Mr. Torvik is coordinating the SCADA/RTU programming updates for a new Battery Energy Storage System with the TRC engineering staffs located in Augusta, Maine.
- National Grid – Franklin, MA – 2012 – current Mr. Torvik is researching the communication projects required by National Grid to integrate a diverse operational area in the Northeastern United States. Solutions and plans are being developed at this time.

**CPS Energy, San Antonio, Texas -1982-2007**

- Responsible for design and implementation of a comprehensive multi-year communications technology upgrade.
- Replaced entire microwave infrastructure w/dual loop 600 channel microwave w/ fiber optics at core providing geographic and electronic redundancy for SCADA, telephony, protective relaying and data requirements.
- Implemented new Mobile Radio System to support Operations and Distribution Services.
- Implemented a Mobile Data System providing integrated dispatch, scheduling, maps and notification to field personnel. Installed radio towers for diversity and enhanced received signal performance w/significant improvements in reliability and coverage.
- Mr. Torvik was responsible for implementing new telephony architecture that improved capacity, redundancy and used computer/telephony integration features to improve customer service.
- Responsible for design and implementation of large scale fiber optic network to support core strategic goals. Over 600 miles of fiber cable was installed w/counts ranging from 48 to 288 fibers at core paths. Network support, troubleshooting and emergency restoration procedures were developed to ensure a robust environment.
- Responsible for design and implementation of large SONET multi-ring high speed protective relaying network using fiber backbone for reduced latency and reliability. Over 21 rings were optimized for minimal delay related to high speed isolation of faults/incidents.
- Responsible for design, implementation and strategy in leasing of temporarily excess Communications Infrastructure. Included installation of Communications Shelters in over 80 sites capable of being double stacked, in support of Fiber Optic Network, Substation Communications, SCADA communications, Mobile Radio transport and back-haul, Mobile Data Transport and back-haul, and Protection Relay network communications. Negotiations were executed w/third party providers who had interest in leasing allocated units in shelters, towers and transmission tower space. Responsibilities included all aspects of technical design, business case development, access by third parties that did not impact operations and program oversight.
- Active participant on the DA/DSM committee that created business case for implementation. Responsible for and designed the communications infrastructure to support DA/DSM technology. Implemented strategic plan to position CPS Energy to have maximum flexibility in support of future decisions. This included implementation of core scalable infrastructure that was necessary to carry device communications between substations and related distribution feeder circuits. Budget consideration at the time postponed implementation on a large scale.
- Provided Information Technology support for GIS integration w/Outage Management. Interface support throughout SAP Business System implementation and legacy decommissioning. Significant effort reducing point to point interfaces that were extremely difficult to maintain and troubleshoot. An enterprise bus architecture was used within SAP to publish and subscribe to information as each related computing platform/or system required it. This simplified the ability to maintain integrity of sources of data and standardize the use across diverse platforms.



## **PHILIP C. WHITE, PE**

**Senior Engineer – Communications**

### **PROFESSIONAL REGISTRATIONS/CERTIFICATIONS**

Registered Professional Engineer, State of Texas, 38731

### **AREAS OF EXPERTISE**

Mr. Philip White has technical experience in the following general areas:

- Project Management\
- Sight Design
- Construction Management
- Condition Assessment

### **REPRESENTATIVE EXPERIENCE**

Mr. White has demonstrated successful application of previous consulting engineer work experience as an electrical engineer. He has engineering and project management experience in the planning, site design and installation of broadband systems. Mr. White is results-oriented with an emphasis on quality, function, economics, and customer requirements. He currently serves as a Senior RF Engineer with TRC Engineering/Alexander Utility Engineering.

#### **TRC Engineering/Alexander Utility Engineering, Inc., San Antonio, Texas (Senior RF Engineer: 2009 – present)**

Mr. White is responsible for the design of 48 remote 900 MHz spread spectrum point-to-multipoint system for the San Antonio Water System including three master hubs and multiple store-an-forward repeaters. His duties also include the design and oversight of 6GHz microwave path for CPS Energy.

#### **Lockard & White, Elk River, Minnesota, (Contract Project Engineer: 2006-2008)**

Mr. White was responsible for all as-built drawings for 600 CPE sites which included the Quality Assurance (QA) function. He was also involved in Customer Premise Equipment (CPE) remotes for a 60 take out point base station network with 600 CPE cell relay points on a new 700MHz broadband wireless network that Great River Energy purchased from Arcadian Networks. Mr. White also had experience in 700 MHz broadband systems and the QA requirements needed for network reliability.

#### **TRC Engineering, Kerrville, Texas (Project Engineer: 2005-2006)**

Mr. White engineered and supervised the installation of a new 700MHz broadband system for the delivery of regulated telecommunication services for a licensed telephone company in the Valley of Texas. The system started with about 100 Cell Relay CPE sites and was expanded to several hundred additional sites as experience was gained with 700 MHz services.

#### **Louis Berger Group, Baghdad, Iraq (Project Engineer: 2004-2005)**

Mr. White was responsible for the installation, project management and QA for a new Tetra trunk radio network, including base stations and mobile radios for Iraqi Police to support the general elections in January, 2005. His duties also included preparation of proposal for and project management of the rebuilding of the fiber optic network for the Iraqi National Railway. Mr. White

was also responsible for engineering and installation of a wireless broadband system for the Iraqi government in Baghdad for several government buildings into a network.

**Lockard & White, Houston, Texas (Senior Engineer: 1993-2004)**

Mr. White was responsible for:

- RF Monitoring for Union Pacific Railroad in La Porte and Brownsville, Texas
- Prepared RFPs for fiber/microwave system for Great River Energy and Texas/New Mexico Power Co.
- EMF survey for Public Service Company in New Mexico.
- Project Engineer for Burlington Northern and Santa Fe Railway on various microwave projects in Washington, Nebraska and New Mexico.
- Project Engineer for Central & South West in Oklahoma on various microwave projects.
- Project Engineer for LCRA in Austin, Texas on fiber optic backbone system, including engineering of terminals, paths and repeaters using Lucent Technologies DDM-2000.
- Project Manager for Chevron for two PCS microwave replacement projects.
- Telecom engineer for Lower Colorado River Authority in Austin, Texas on various projects.
- Microwave engineer for Central Power and Light in Corpus Christi, Texas.

**Aramco, Dhahran, Saudi Arabia: (Project Engineer, Operations Engineer, Communications Engineer – 1982 – 1992)**

Mr. White was responsible for:

- Communications Engineer responsible for various engineering projects including:
  - Identified and solved microwave path problems
  - Team Leader of group of 21 engineers to make the Iraqi Pipeline Fiber Optic System operational in 19 days.
- Supervisor of Quality Assurance/Quality Control in Communications Operations Department
- Project Engineer on Phase 2 of 450 kilometer fiber optic backbone system – responsible for project proposal, bid process, design, manufacturing and installation.
- Energy Management Engineer surveying Air Force Bases in Texas and Oklahoma for U.S. Corps of Engineers.

**Microcomm Engineering, Farmers Branch, Texas (President/Chief Engineer, 1979-1981)**

Mr. White created and ran small business in microprocessor system design and development.

**Rockwell/Collins, Riyadh, Saudi Arabia, (Project Management Team Member: 1977-1978)**

Mr. White's responsibilities included surveying, supervision, collection of data, setup and manage communication network.

**Davis & Associates, Richardson, Texas (Contract Telecom Engineer: 1976-1977)**

Mr. White was contracted as a Microwave Engineer and as a Satellite Engineer.

## **RONALD A. KYLE**

Senior Project Manager

### **AREAS OF EXPERTISE**

Mr. Kyle has served his entire 40 year career in public safety and is currently serving as a senior consultant and project manager for the West Virginia Broadband Technologies Opportunity Project.

### **REPRESENTATIVE EXPERIENCE**

#### **City of Morgantown, West Virginia, Career Firefighter**

Mr. Kyle served as a career firefighter with 21 years of service. He retired in 1988 as Lead Arson Investigator and Department Training Officer. During his career with the City of Morgantown, he served nine years on the West Virginia Fire Commission including three terms as chair. He was also honored to serve for ten years as a member of the Board of Directors of the West Virginia Professional Firefighters.

#### **Monogalia County, West Virginia, County Emergency Manager/9-1-1 Director**

Mr. Kyle served as the County Emergency Manager and 9-1-1 Director for the Monogalia County, West Virginia for 19 years. During his career with the County, he served as Certified Emergency Manager and as an Emergency Number Professional (ENP). Mr. Kyle helped found the West Virginia Enhanced 9-1-1-Council and served two terms as chair. He also co-authored a successful grand request for the first interoperable radio project in West Virginia and served on the West Virginia statewide Interoperable Project Steering Committee.

Mr. Kyle has served on the national committee to create a comprehensive evacuation plan of the National Capitol Region for Physically or Mentally challenged individuals.

#### **TRC Engineers, Inc. Morgantown, West Virginia, August 2011 to present**

Mr. Kyle is the project manager for broadband development overseeing accuracy and inventory of all equipment being purchased and installed to support the broadband system.

## Wesley A. Sizemore

Senior RF Designer

### EDUCATION

- Associate of Applied Science, Electronic Engineering Technology, Cleveland Institute of Electronics, Cleveland, OH, 1984
- Associate of Science, Bluefield State College, Lewisburg, WV, 1981

### AREAS OF EXPERTISE

Mr. Wesley Sizemore has extensive experience with spectrum analysis, including RFI identification, location and mitigation, as well as GIS and radio frequency propagation software such as TAP.

### REPRESENTATIVE EXPERIENCE

Mr. Sizemore has thirty years of experience working for the National Radio Astronomy Observatory (NRAO), and has brought his expansive knowledge to TRC.

#### TRC Engineers, Inc., Dunmore, WV (Senior RF Designer, 2012 – present)

Mr. Sizemore works on location in West Virginia under the guidance of TRC's San Antonio office. His duties include providing radio frequency interference (RFI) analysis services for communications systems within the "quiet zone" of the NRAO in Green Bank, West Virginia.

#### National Radio Astronomy Observatory (NRAO), Green Bank, WV (Scientific Associate/Technical Specialist, 1981 – 2011)

Mr. Sizemore maintained the National Radio Quiet Zone (NRQZ) for the NRAO and in support of NIOC (Sugar Grove, WV) in a variety of capacities including:

- Administration, propagation studies, and technical field work in the NRQZ
- Developed fixed and mobile monitoring stations capable of covering frequencies from 100 MHz to 4 GHz.
- Investigated radio frequency interference (RFI) reports from observers, interfaced with local community while mitigating sources of interference
- Identified RFI sources in the NRQZ using both mobile and stationary monitoring stations
- Coordinated shutdowns of off-site transmitters in support of specific observation efforts, including maintenance of a frequency-searchable database of coordination possibilities
- Worked on NRQZ evaluation/transition from TAP to ERSI-GIS software with TIREM model
- Participated in Virginia Tech/NSWC Propagation Model Study
- Trained visiting NRAO researchers, site staff, and students about RFI
- Educated local community and general public about radio astronomy and RFI in a variety of settings including lectures, classes, and on-site tours
- Operated an interferometer radio telescope and associated equipment, including computer systems, microwave links, and radio receivers

Mr. Sizemore was featured in the December 2002 issue of Wired Magazine ([http://www.wired.com/wired/archive/12.02/quiet\\_pr.html](http://www.wired.com/wired/archive/12.02/quiet_pr.html)) and the PBS series Wired Science ([http://www.pbs.org/kcet/wiredscience/story/105-the\\_quiet\\_zone.html](http://www.pbs.org/kcet/wiredscience/story/105-the_quiet_zone.html))

## **DAVID E. CLEVINGER, PE, PS**

### **EDUCATION**

B.S., Civil Engineering, West Virginia Institute of Technology, 1985

### **PROFESSIONAL REGISTRATIONS/CERTIFICATIONS**

Professional Engineer, Kentucky (#24362, expires 6/30/2013), 2005  
Professional Engineer, West Virginia (#10944, expires 6/30/2013), 1990  
Professional Engineer, Virginia (#0402 042978, expires 11/30/2014), 2006  
Professional Engineer, Illinois (#062.059601, expires 11/30/2013), 2007  
Professional Engineer, Pennsylvania (#075211, expires 9/30/2013), 2008  
Professional Surveyor, West Virginia (#1555, expires 6/30/2013), 1995  
Professional Engineer, South Carolina (#27161, expires 6/30/2014), 2009

### **AREAS OF EXPERTISE**

- Highway Design
- Drainage Design
- Feasibility Studies
- Project Management

### **REPRESENTATIVE EXPERIENCE**

Mr. Clevenger's current role for the firm is the assistant practice leader for transportation design for the eastern and central regions of TRC. He is responsible for overseeing the design operations for three design offices within the firm. His responsibilities include overseeing project budgets, staffing, QA/QC reviewer of design plans, project scope development, project fee negotiations, project management and marketing. Mr. Clevenger has 27 years of engineering design experience, 19 of which was acquired while an employee of the WVDOT. He held various positions while employed by the Department, the last nine years of which involved his supervision of the Consultant Review Section of the Engineering Division. He has also supervised the design of numerous roadway and bridge projects ranging from new bridge structures spanning navigable waterways and railroads, bridge replacements, bridge repairs and renovations, retaining walls, new four-lane highway facilities, interchanges, urban roadway improvements, rural highway design, commercial development projects, utility relocations, environmental studies and various roadway and bridge design studies. His work required him to maintain close coordination with a variety of Divisions within the Department, among those being Construction, Right-of-Way, Utilities, Materials, Planning and Traffic, along with such state and federal agencies such as the Corp of Engineers, Federal Highway Administration, State Historic Preservation Office, Department of Environmental Protection, Department of Natural Resources and US Fish and Wildlife. Representative examples of Mr. Clevenger's experience include the following assignments:

**West Virginia Department of Transportation – Division of Highways - Kanawha Trestle Trail Study, Kanawha County, WV (Principal-in-Charge: 2012)** Mr. Clevenger was the Principal-in-Charge for this study which will involve a re-configuration of Kanawha Boulevard in the City of Charleston to accommodate bike lanes. The project area is from Pennsylvania Avenue to Patrick Street (Approximately 1.5 miles) adjacent to the Kanawha River. The existing typical section consists of four travel lanes (two in each direction) divided by a raised five foot grass median, on-street parking along the non-riverside of the boulevard and a six foot wide mixed-use path along the riverside of the boulevard. Key design challenges included staying within the existing 60-foot roadway corridor to avoid right-of-way impacts, separating pedestrian and bike traffic, addressing constructability and maintenance of traffic issues, and maximizing the project scope using the available funding.

**Bridge Street Bridge – Taylor County, WV (Principal-in-Charge: 2011 - Current)**

Mr. Clevenger is the Principal-in-Charge and also the overall project manager for this project. The project consists of the study, design and contract plan development for the replacement of the existing bridge structure carrying Bridge Street over the Three Fork Creek, CSX Railroad and Front Street in Grafton, WV. The proposed bridge design consists of a two span steel girder bridge approximately 300' in length with abutments founded on steel piles and the pier type being a two-column frame founded on drilled shafts. MSE walls are required for both abutments and along the connection of Front Street which ties in at the end of the bridge structure. A hydraulic analysis for the causeway to construct the bridge and the final bridge layout was performed for the project. Close coordination with CSX with respect to the construction of the new bridge and the demolition of the existing bridge is required for this project. Coordination with each utility involved was required with respect to the staging of the construction of the project. Maintenance of traffic plans were developed based on the construction staging. The project included the development of the right of way plans and the coordination of the relocation of the utilities that are in conflict with the proposed construction. The roadway plan development consisted of the design of the approaches to the bridge and the roadside drainage for the project. In addition, approximately 500' of waterline and 500' of sewer line relocations were designed for the City of Grafton and were included in the contract plans.

**Jefferson Road Study - Kanawha County, WV (Principal-in-Charge: 2011 - Current)**

This project involves the study of the necessary improvements that would be required to Jefferson Road (WV Route 601) in order to relieve the current and anticipated future traffic congestion along this route. Jefferson Road is currently a two-lane highway which is highly travelled with an ADT of nearly 30,000 vehicles. The route connects US Route 119 to the South with US Route 60 and Interstate 64 to the North. Mr. Clevenger participated in the development of four (4) alignment alternatives that were studied. He evaluated all of the alternatives with respect to the required maintenance of traffic that would be needed during the construction of each alternative. He also coordinated the traffic modeling that was performed for this project. The project also included the development of potential right of way takes for the properties involved with each alternative. In addition, Mr. Clevenger evaluated each alternative as to the potential construction phasing with respect to available funding of the project. A design report was developed for the project, which included the cost estimates for each alternative and a recommendation of the preferred alternative. The estimated cost of the preferred alternative is approximately \$46 million.

## DAVID A. VERNO, PE

### EDUCATION

B.S., Civil Engineering, West Virginia University, 1993

### PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Professional Engineer, Kentucky (#22497, expires 6/30/2014), 2002

Professional Engineer, Pennsylvania (#PE-055618-E, expires 9/30/2013), 1999

Professional Engineer, West Virginia (#13640, expires 6/30/2013), 1998

Professional Engineer, Florida (#55048, expires 2/28/2015), 1999

Professional Engineer, Ohio (#77249, expires 12/31/2013), 2013

### AREAS OF EXPERTISE

Mr. David Verno, PE has project management and technical experience in the following general areas:

- Bridge Design
- Project Management
- Feasibility Studies

### REPRESENTATIVE EXPERIENCE

Mr. Verno has more than 19 years of bridge design and engineering experience, five of which was gained while an employee of the West Virginia Department of Transportation. His experience with TRC consists of preliminary engineering tasks including: bridge layout, preparation of Span Arrangement documents, TS&L documents and various design studies. He has designed abutments, concrete beams, steel girders, elastomeric bearings and box culverts. Mr. Verno has also been involved with the preparation of bridge erection and demolition plans. While employed with the Department, Mr. Verno was involved with the design of numerous structural projects including 15 bridges, three composite deck designs, a superstructure replacement, pedestrian bridge and a retaining wall. In addition to bridge design, he has also designed roadway approaches and has been responsible for the preparation of right-of-way plans and coordination of utility relocations. Representative examples of Mr. Verno's experience include the following projects:

#### **West Virginia Division of Highways, Linmont Bridge Replacement, Cabell County, WV (Project Manager: 2009)**

Mr. Verno was responsible for the development of plans for this three span (80'-120'-80') steel girder bridge to replace an existing structure. He was involved with the structure layout and preparation of the Span Arrangement and TS&L submissions, along with direct coordination with the WVDOH District Bridge Engineer through all phases of project development.

#### **SMH Construction Company, Inc., Jug Neck Bridge and Blake Bridge, Mercer County, WV (Project Manager: 2009)**

Mr. Verno was responsible for the preparation of demolition plans for two existing bridges and the design of temporary bridges. He assisted in the development and preparation of the bridge demolition procedures for both structures.

#### **West Virginia Division of Highways, Middle Fork Patterson Creek Box Culvert, Grant County, WV (Project Manager: 2007 - 2009)**

Mr. Verno was responsible for the design of a 1,427 feet long reinforced concrete box culvert with skewed wingwalls. The culvert was located under approximately 180 feet of earth fill. He assisted in the preparation of the box culvert TS&L and Final Detail Plan development and submission for this box culvert which replaced the proposed Middle Fork Patterson Creek Bridge on Corridor H. His work consisted of the design of a cast-in-place concrete box culvert. Software used for design included Brass Culvert and BOXCAR (Box Culvert Analysis and Reinforcing Design).

**Ahern & Associates, Inc., US 52 Bridge over US 19 and NSX Railroad -Mercer County, WV (Project Manager: 2007 - 2008)**

The project consisted of developing an erection plan and designing temporary structures to aid in erection of a 1,155 feet long bridge over a roadway, waterway and railroad. Mr. Verno assisted in the development and review of the project, along with coordination with the Contractor.

**West Virginia Division of Highways, District 9, Category 6 Bridge Replacement, Raders Run Bridge, Greenbrier County, Dunloup Bridges #5, #6, and #8 - Fayette County, WV (Project Manager: 2007-2009)**

Mr. Verno was responsible for the layout, development and preparation of contract plans for four bridges. These structures were completed on an accelerated schedule of less than three months (for all four bridges). Two of these structures were located within National Park Service property and required meetings with various State agencies and the incorporation of special features to meet project requirements.

**Trumbull Corporation, Existing Crooked Creek Bridge Demolition – Putnam County, WV (Project Manager: 2007)**

Mr. Verno was responsible for the preparation of the superstructure demolition plans for the US 35 Crooked Creek Bridge. This work included the staging of dismantling phases along with providing the deck and beam demolition procedures for the 205 ft span, rolled beam bridge over I-64 in Putnam County. This project consisted of coordination with a local contractor to develop plans for submission to the WVDOH.

**Black Diamond Construction & Apogee Coal Company, Yolyn Bridge - Logan County, WV (Project Manager: 2006)**

Mr. Verno was responsible for the design of this 129' long adjacent panel bridge which spans a large cut, necessary to allow access for coal mining equipment to pass beneath County Route 14 without disruption of local traffic. The proposed structure is also on the State's coal resource transportation system (CRTS). This project consisted of bridge layout design along with coordination between a local coal company, bridge contractor and the WVDOH.



## **WESLEY D. HEVENER, PE**

### **EDUCATION**

B.S., Civil Engineering, West Virginia University College of Engineering and Mineral Resources (ABET Accredited), 2001

M.S., Civil Engineering, West Virginia University College of Engineering and Mineral Resources (ABET Accredited), 2003

M.B.A., West Virginia University College of Business and Economics (AACSB Accredited), 2006

### **PROFESSIONAL REGISTRATIONS/CERTIFICATIONS**

Professional Engineer, West Virginia (#17725, expires 6/30/2013), 2008

Professional Engineer, Florida (#75849, expires 2/28/2015), 2013

Professional Engineer, Ohio (#74074, expires 12/31/2013), 2009

Professional Engineer, Pennsylvania (#76911, expires 9/30/2013), 2009

Professional Engineer, North Carolina (#36583, expires 12/31/2013), 2010

Professional Engineer, Virginia (#50582, expires 5/31/2014), 2012

Professional Engineer, Louisiana (#37841, expires 09/30/2013), 2013

National Council of Examiners for Engineering and Surveying (NCEES) Records Program (#38010)

### **SPECIALIZED TRAINING/COURSES**

NHI Course #130055 - Safety Inspection of In-Service Bridges (5/2010) NHI Course #130081C - LRFD for Highway Bridge Superstructures-Steel (3/2009)

NHI Course #130092A - Load and Resistance Factor Rating for Highway Bridges (9/2009)

NHI-FHWA Project No. DTFH61-06-D-00037- Integrated Bridge Project Delivery and Life Cycle Management (10/2010)

NHI Course #130087 – Inspection and Maintenance of Ancillary Highway Structures (11/2012)

Highway Bridge Services – Steel Bridge Design using AASHTO LRFD Bridge Design Specifications including Curved Girders and Gusset Plate Analysis (05/2011)

High Performance Management Training, GAI Consultants, Inc., 6/2009

Advanced Project Manager Training Course, PSMJ Resources, Inc. in affiliation with GAI Consultants, Inc., 12/2009

Project Manager Principles Training Course, HNTB Corporation, 8/2012

### **REPRESENTATIVE EXPERIENCE**

Wesley Hevener has 10 years of experience and serves in TRC's Charleston, WV office. His engineering experiences include construction services, bridge design and analysis, bridge inspection, structural design, highway/transportation design, and permitting. He has performed a wide array of new bridge design utilizing LFD and LRFD design specifications. In addition to new design, he is experienced with retrofit design and structural analyses of bridges and other structures including proficient use of the finite element analysis software LUSAS.

Some of his experience with retrofit design includes joint replacement and modification, fatigue crack identification and arrest measures, structural steel modifications and improvements, bearing replacement, and concrete repair and replacement. As a bridge inspection team leader, he has been responsible for daily operations of the bridge inspection team, performing field inspections of key bridge components and writing inspection reports discussing inspection findings. He routinely serves as a task assignee and a project engineer, supervising staff, maintaining project schedules and preparing fee proposals. Mr. Hevener has received management training for High Performance Management Training

(DDI/GAI Consultants), Advanced Project Manager Training Courses (PSMJ Resources, Inc./GAI Consultants) and Project Management Principles (HNTB Corporation Training).

Wesley's educational background includes completion of BS and MS degrees in Civil Engineering, with an emphasis on structural and bridge design, from West Virginia University. In addition, Mr. Hevener has completed a MBA degree from West Virginia University. Upon completion of the Pomeroy-Mason Bridge Project in November 2008, he joined the structures group in HNTB's Scott Depot, WV office. Mr. Hevener spent 2 years with GAI Consultants where he was the Senior Engineer for various bridge analysis and design, structural design, bridge inspection, and transportation design projects. He rejoined HNTB in August 2010 as a Project Engineer for the bridge department where he was responsible for project management, design and analysis of structures and bridge inspection for the Scott Depot, WV office. In August, 2012, Mr. Hevener joined the TRC team as a Senior Structural Engineer.

**West Virginia Division of Highways, Madison Railroad Overpass Bridge - Boone County, WV (Project Manager/Bridge Design Engineer: 2012)**

Mr. Hevener's was assigned the Project Manager responsible for the design oversight and compliance to the WVDOH and CSX Railroad guidelines. He was responsible for developing the scope of work, fee proposal and negotiation and scheduling with the use of Microsoft Project incorporating client milestones. Mr. Hevener worked to coordinate the span arrangement submission with Jeff Konrad, HNTB's CSX Northeast Client representative, prior to his departure from HNTB.

**West Virginia Division of Highways, Willowood Bridge - Summers County, WV (Bridge Design Engineer: 2008)**

Mr. Hevener's duties as Design Engineer included the review of various shop drawings including the structural steel, stiffeners, and bearings for this three- span, flared-end steel girder bridge in coordination with design plans.

**WVPA Bridge Retrofit - Kanawha County, WV (Bridge Design Engineer: 2012)**

Mr. Hevener was the Design Engineer responsible for the design calculation checks needed for the new elastomeric bearing pads and abutment rehabilitation of Bridge 3059N. The design utilized the 2010 LRFD design specifications for the reinforced concrete and Method B bearing pad design.

**West Virginia Parkways Authority (WVPA) - Raleigh County, WV (Bridge Design Engineer: 2003-2004)**

Mr. Hevener was the Design Engineer responsible for the preliminary design tasks associated with the widening and reconstruction of abutments and piers for a twin, 2-span continuous steel plate girder bridge with a total bridge length of approximately 188' using LRFD design specifications for the design and analysis. These bridges crossed active CSX railroad tracks and required coordination to ensure the design was compliant with CSX guidelines.

## **ROBERT T. POLCYN, II, PE**

### **EDUCATION**

B.S., Civil Engineering, Ohio State University, 1994

### **PROFESSIONAL REGISTRATIONS/CERTIFICATIONS**

Professional Engineer, West Virginia (#014178, expires 6/30/2013), 1999

Professional Engineer, Ohio (#65810, expires 12/31/2013), 2001

Professional Engineer, Kentucky (#21875, expires 6/30/2014), 2001

ODOT Maintenance of Traffic, June 2012

ODOT Signings and Markings, May 2012

### **AREAS OF EXPERTISE**

Mr. Robert T. Polcyn, PE has technical experience in the following general areas:

- Geometric Design
- Drainage Design
- Maintenance of Traffic
- Constructability and Phasing
- Value Engineering

### **REPRESENTATIVE EXPERIENCE**

Mr. Polcyn offers 18 years of civil engineering experience that covers a broad range of project types. Related experience includes evaluating and managing storm water impacts. This has involved delineating watershed area boundaries, calculating pre & post storm discharge, developing erosion and sediment control plans, configure and size storm water systems to convey runoff through the site, evaluate and design detention facilities to control peak discharge, and coordinate with various regulatory agencies for permitting compliance. Projects to which he has been assigned have ranged from small civil/site projects, to complex highway work. Representative examples of his experience include the following assignments:

**West Virginia Department of Transportation - Division of Highways, Kanawha Trestle Trail, Kanawha County, WV (Project Manager: 2011 - 2012)** Mr. Polcyn was assigned as the Project Manager responsible for the development and evaluation of several alternatives for multi-use facilities along Kanawha Boulevard between Magic Island and Patrick Street (1.25mi) as part of the Kanawha Trestle Trail project. The project consisted of upgrading the existing 4-lane urban roadway to include bike lanes within the existing right-of-way. He developed four alternative layouts. Typical sections, drainage modifications, maintenance of traffic scenarios and cost estimates were developed for each alternative.

**West Virginia Department of Transportation – Division of Highways – Jefferson Road Study, Kanawha County, WV (Project Engineer: 2012)** Mr. Polcyn was assigned as the Project Engineer responsible for the development and evaluation of six (6) alternative alignments for Jefferson Road (WV 601) between US 119 (Davis Creek Interchange) and US 60 (McCorkle Ave) (1.5mi) as part of the Jefferson Road Corridor Improvement Study. The purpose of the study was to investigate means to alleviate the current and future traffic congestion associated with this corridor. The project consisted of upgrading the existing 2-lane roadway to a 5-lane typical section with varying intersection improvements and side-road connections. The typical section for the mainline of the project was developed to accommodate future bike lanes within the proposed shoulder of the roadway. Horizontal geometry, profiles, typical sections, right-of-way, earthwork, preliminary structural layouts, maintenance of traffic

scenarios and cost estimates were developed for each alternative. Emphasis was placed on developing alternatives that could be phased which would allow the DOH to construct parts of the project within the current funding constraints.

**West Virginia Department of Transportation - Division of Highways, Feasibility Study of US-35 from Buffalo Bridge to Coast Guard Station near Henderson - Putnam and Mason Counties, WV (Project Engineer: 2006)** TRC was retained by the WVDOH to provide engineering services to evaluate the feasibility of four alternatives proposed for the relocation of US 35 which is a major north/south route between the northwest and southeast regions of the US. As a supplement to the feasibility study, Mr. Polcyn was charged with managing the completion of a safety improvement study for upgrading existing US 35 within the same project limits. The study consisted of developing criteria and costs for improving the horizontal alignment and sight distance within the existing right of way. It also involved sections of pavement replacement where needed.

**Competitive Power Ventures, Humboldt County Wind Farm – Humboldt County, CA (Lead Designer)**

Mr. Polcyn was the lead designer for the feasibility study associated with a potential wind farm being proposed by Competitive Power Ventures along a mountain ridge top in Humboldt County. The study consisted of evaluating the existing road system and utilizing the design criteria for the GE 1.5 MW turbine model to design potential haul accesses from the bottom of an unnamed mountain in Humboldt County to the mountain ridge top, consisting of 3,000 feet difference in elevation. Mr. Polcyn developed a digital terrain model of the existing surface of the project for use in calculating estimated earthwork quantities. An estimated construction cost was developed for the haul roads and submitted to the Developer.

**AES Armenia Mountain Wind, LLC, Armenia Mountain Wind Farm - Tioga and Bradford Counties, PA (Lead Designer)**

The project consisted of 124 proposed wind turbines by AES. Mr. Polcyn was one of the lead designers in developing the main haul roads for the project. He designed the accesses to each turbine, in addition to site grading of the lay down areas at each turbine location. Because the Developer required the design for alternate turbine configurations, one layout corresponded to the Clipper 2.5 MW turbine while the other corresponded to the GE 1.5 MW turbine. The project also required that over 33 miles of access roads be designed. Mr. Polcyn led the effort in developing and acquiring the NPDES permit for the project and the individual county permits that were required for the project.

**AES Laurel Mountain, LLC, Laurel Mountain Wind Farm - Barbour and Randolph Counties, WV (Project Manager)**

The project consists of approximately 65 proposed wind turbines to be developed by AES along an 8-mile ridge line on Laurel Mountain. Involves the development of plans for the haul roads that are needed to deliver construction materials as well as design of individual access roads to each turbine location.

CURTIS G. PAXTON  
TELECOMMUNICATIONS PROJECT MANAGER, SURVEYOR

Curtis Paxton has served as survey manager and survey party crew chief on various surveys including boundary, ALTA/ACSM land title surveys, condemnation surveys, WVDOH design projects, GPS aerial control, topographical, construction and building layouts, wireless communications projects, sewer and waterline extensions, construction layout and topographic site surveys. Curtis has over 15 years of experience in the telecommunications industry and has managed **thousands** of cellular tower projects for many telecommunications clients across the country.

RELATED PROJECTS

**Cellular Tower Site Construction and Collocation Surveys  
West Virginia**

Curtis, as a project manager with more than 15 years of experience related to the site layout and construction drawing for various cell tower locations, has managed **thousands** of cellular tower projects for many telecommunications clients across the country. Some of these clients include:

- State of West Virginia/  
County 911
- Verizon Wireless
- Bechtel Corporation
- nTelos Wireless
- Highland Cellular
- Highland Towers
- SBA Communications
- Cellular One
- Crown Castle International
- Everclear Communications
- Pegasus Tower
- Divine Tower International
- Nextel Partners
- Spectra Site
- American Tower
- WV Wireless
- Clear Shot Wireless
- Strategic Communication  
Services
- Meridian Communications
- New Cingular Wireless
- AT&T Mobility
- Alexander Utility Engineering
- Sprint
- American Cellular
- SAI Communications
- Black & Veatch
- Black Dot Wireless
- T- Mobile
- Paradigm Wireless
- Mountain State Wireless
- Andrew Systems Inc.
- US Cellular
- Wireless Resources
- Charter Associates
- Beacon Towers
- Greenland Development
- Dynis
- Florida Tower Partners
- Glotel
- Dobson Cellular



Office Location

- Charleston, West Virginia

Areas of Expertise

- Cellular tower site construction
- Cellular tower collocation surveys
- Roadway and bridge design surveys
- Site design surveys
- Transmission line surveys

Memberships

- West Virginia Society of Professional Surveyors
- United States Army National Guard - Operation Iraqi Freedom
- Virginia Wireless Association
- Pennsylvania Wireless Association

## CURTIS G. PAXTON (CONTINUED)

Curtis routinely performs the following tasks on telecommunications projects including but not limited to:

- 1A certifications
- 2C certifications
- Site feasibility surveys
- Lease surveys
- Zoning drawings
- Photo simulations
- Construction drawings
- Co-location drawings
- Microwave Verification
- Tower mapping
- Structural analysis
- Utility designs
- Construction staking
- As-built surveys
- Geotechnical core borings
- Concrete testing
- Construction monitoring
- Construction oversight
- Azumith verifications

### Design Surveys

#### West Virginia Division of Highways (WVDOH)

##### West Virginia

Curtis has served as survey party crew chief, project manager and survey manger on a variety of roadway and bridge design projects for the WVDOH. Representative projects include:

- East Huntington Bridge Survey
- WV Route 9 in Martinsburg
- Grade Road in Martinsburg
- Flowing Springs Road in Charleston
- Corridor G 6 lane upgrade in Charleston
- Leon Bridge Thru Girder Bridge
- Edwight Truss Bridge
- Bartley Branch Bridge
- Hartland Bridge

### Site Design Surveys

#### West Virginia

Curtis has served as survey party crew chief and survey manager on a variety of site development and design projects for a variety of clients including:

- Thomas Memorial Hospital
- Greenbrier County Hospital
- Gilbert Middle and High Schools
- Tri-State Greyhound Park
- Doddridge County High School
- Princeton Elementary School

### Transmission Line Surveys

Curtis served as project manager for the preparation of easement plats for the Rocksprings Development Coal Company. The project extended approximately 3.7 miles.

### West Virginia DEP Mapping Contract Southern WV

## TERESA SCHULLER, LRS ENVIRONMENTAL PROJECT MANGER

Teresa Schuller brings 33 years of experience in environmental research as well as state and consulting experience. As an analytical chemist, her research included organic and inorganic compounds' fate and degradation in soil, surface water, sediment and ground water. Teresa served as project management of multi-faceted domestic and international mergers and acquisition projects. She managed manual preparation (pollution, prevention and control (PPC); spill, prevention, control and countermeasure (SPCC); spill response, ground water protection plan, etc.). Teresa conducted environmental and Occupational Safety and Health Administration training. She also managed more than 2,500 telecommunications tower siting projects (Phase I ESAs, NEPA compliance, and EAs where needed) in West Virginia, Kentucky, Ohio, Pennsylvania, Maryland and Virginia. Teresa prepared Regulation 13 air applications for various industries and Title V applications for landfill as well as tier II and III air submission for industries. She managed and prepared U.S. Army Corps of Engineers (USCOE) permits for a variety of projects and assisted concrete and timber industries with storm water permitting and discharge monitoring report compliance. She was project manager for various general civil engineering projects and construction management projects. In addition, Teresa was responsible for permitting and construction management of housing authority redevelopment projects and an energy sector-compressor station. She possesses 14 years of experience in applicable risk assessment work conducting and managing over 100 various types of risk assessments for industry and Potentially Responsible Parties (PRP) committees. Teresa managed, prepared and defended Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource and Conservation Recovery Act (RCRA) risk assessments.

### RELATED PROJECTS

#### **State of West Virginia Executive Office BTOP Broadband Grant #2672 NEPA, EA, FONSI West Virginia**

Teresa managed the environmental work for the State of West Virginia Broadband grant from the NTIA. The grant amount is \$126 million to provide 17 new telecommunication towers to the Homeland Security Network (microwave) and approximately 600 miles of fiber to add broadband service to 1,064 anchor tenants (schools, hospitals, libraries, etc.). The work involved the preparation of an EA for the project with specialized negotiations with USFWS, WVDNR, National Forest Agency, SHPO, THPOs (Native American tribes), COE, and WVDEP to obtain clearance letters. The work began in March 2010 with the FONSI issued in February 2011. Teresa will also be responsible for approving fiber construction; tower construction; inspections of towers for E&SC measures; inspections of USFWS and WVDNR RTE species on fiber builds; modifications of the EA for project changes; and coordination with the State of West Virginia's project manager from 2010-2013. Maintenance of files and documents for federal audits are required.

#### **Telecommunications tower siting Various National and Regional Carriers West Virginia, Virginia, Ohio, Kentucky, Maryland, Pennsylvania**

Teresa managed more than 2,500 telecommunications tower siting projects. Tasks



#### Office Location

- Charleston, West Virginia

#### Areas of Expertise

- Project management
- Telecommunication towers
- NEPA and Phase I ESAs
- EAs and FONSI
- COE and state permitting
- Phase I and II ESAs
- Storm water permitting
- Air permitting
- Risk assessment

#### Education

- MS, Chemistry, West Chester University, 1983
- BS, Chemistry, Eastern Illinois University, 1979

#### Registration

- Licensed Remediation Specialist, West Virginia (LRS 174, 2004)

#### Memberships

- Western PAWV AWMA
- VA Wireless Association
- PA Wireless Association

#### Credentials

- Continued education in specialized training and management courses
- OSHA 40 hour certification (HAZWOPER).
- Project management training courses, including PSMJ
- ODOTs Managing the Environmental and Project Development Process Course 2010

#### Past Employment

- TERRADON Corp. 1999-2009
- ERM, Inc. 1986-1998
- E.I. DuPont 1983-1986
- Illinois State Natural History Survey 1979-1981

## TERESA SCHULLER, LRS (CONTINUED)

included Phase I ESAs, National Environmental Policy Act (NEPA) Checklists, NEPA, State Historic Preservation Offices, Tribal Historic Preservation Officers, USFWS and State Department of Natural Resources Clearance, Environmental Assessments (EAs) for FONSI, and Federal Communications Commission's clearances. The EAs followed a modified US ACOE report structure.

### **EA/FONSI for Mt Storm Tower**

#### **WVDHHR**

#### **Grant County, West Virginia**

Teresa managed and prepared an EA for a proposed 480-foot guyed tower to address migratory bird issues. Coordination with the State Ornithologist was necessary to evaluate potential bird kills. Following federal and local 30-day notices, FCC granted a FONSI to allow construction of the tower provided a modified lighting system was utilized.

### **EA for Weston Tower**

#### **WVDHHR**

#### **Lewis County, West Virginia**

Teresa prepared an EA for a critical site for the WV Emergency Medical Services (including state police, fire department, and 911 communications) as a major link between Lewis County responders and the rest of the WV EMS state-wide microwave system. The existing tower was insufficient to link to the remaining state network unless the height was increased, which would adversely impact NRHP sites and historic county sites. The EA included a memorandum of agreement between the Lewis County Commission and SHPO. A FONSI was issued by FCC following a stringent review by SHPO, FCC, and Advisory Council for Historic Places.

### **FEMA EA/FONSI for Four Towers**

#### **WV Division of Homeland Security**

#### **Various Counties, West Virginia**

Teresa managed and prepared a FEMA EAs for four proposed towers to meet FEMA grant funding requirements. Following federal and local 30-day notices, FEMA granted FONSI to allow construction of the towers.

### **Parking tract**

#### **Steptoe & Johnson, PLLC**

#### **Fayette County, West Virginia**

Teresa managed the parking tracts project for the Boy Scout project. The work involved survey crews, archaeology surveys, and wetland delineations. Identified critical areas or habitats were avoided during the upgrade of the existing roadways and construction of parking lots. Future work may require submission of the cultural resource report and wetland delineation to obtain permitting for other land uses.

### **Glen Jean Entrance**

#### **Arrow WV**

#### **Fayette County, West Virginia**

Teresa coordinated the archaeology and cultural resources work, along with wetland review and impacts for the design of a new road alignment in Glen Jean. These efforts supported WVDOH in their completion of a Categorical Exclusion from the ACOE for the construction project.

No. of Years With Mead & Hunt

- February 2009 to present

No. of Years With Other Firms

- 30



**RUDOLPH SCHULLER, PG**  
**SENIOR GEOLOGIST**

Rudy Schuller brings more than 35 years of diverse geologic, site remediation, strategic environmental management, and regulatory compliance experience in Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Resource Conservation and Recovery Act, Clean Air Act, and Clean Water Act. For ten years Rudy served as Manager of Remediation for a large interstate natural gas pipeline company with responsibility for a \$150 million remediation program. He possesses 20 years of experience in environmental consulting with seven years as partner and branch manager with profit/loss (P/L) responsibilities, where duties included strategic planning, marketing and sales, budgeting and staff development. Rudy offered a full range of environmental services both locally and internationally for local clients. He also has five years' experience working in environmental research. Rudy served as manager of 12 engineers, geologists and biologists. He was responsible for meeting the requirements of an Environmental Protection Agency (EPA) Superfund Administrative Order of Consent. Activities included characterization and remediation at more than 240 large facilities and thousands of smaller sites.

**RELATED PROJECTS**

**Telecommunications tower siting**  
**Various National and Regional Carriers**  
**West Virginia, Virginia, Ohio, Kentucky, Maryland, Pennsylvania**

Rudy performed Phase I ESAs on more than 500 telecommunications tower siting projects. Tasks included field visits, interviews with property owners, photographs, database reviews, and preparation of reports. The EAs followed a modified US ACOE report structure.

**Parking tract**  
**Steptoe & Johnson, PLLC**  
**Fayette County, West Virginia**

Rudy conducted the Phase I ESA for the parking tracts project for the Boy Scout project. The work involved field visits, interviews with property owners, photographs, database reviews, and preparation of reports. Future work may require submission of the cultural resource report and wetland delineation to obtain permitting for other land uses.

**Environmental site assessment (ESA)**  
**Charter Associates, Inc.**  
**West Virginia**

Rudy conducted the Phase I ESAs for the purchase of 250- and 280-acre tracts of land in southern West Virginia.

**Environmental site assessment (ESA)**  
**Cranberry Hardwoods, Inc.**  
**Fayette County, West Virginia**

Rudy conducted the Phases I and II ESAs for an 11,000-acre parcel and an 11-acre sawmill property as part of the purchase for the Boy Scouts of America project.



**Office Location**

- Charleston, West Virginia

**Areas of Expertise**

- Phase I and II ESAs
- Geology and hydrogeology
- Site remediation
- Strategic environmental management
- Regulatory compliance
- Environmental services

**Education**

- MS, Geology, Wright State University, 1976
- BS, Geology, Youngstown State University, 1973

**Credentials**

- Persuasive Communications Training
- WHARTON Courses
- ISO 9000 Quality Training
- OSHA 40 hour certification
- Project management training courses

**Past Employment**

- TERRADON Corp. 2007-2009
- Columbia Gas Transmission 1996-2007
- ERM, Inc. 1996-1983
- SMC Martin 1981-1983
- Illinois State Geologic Survey 1976-1981

**No. of Years With Mead & Hunt**

- 2/1/2009

**No. of Years With Other Firms**

- 33

## RUDOLPH SCHULLER, PG (CONTINUED)

### **Phase I/II/III/Remediation Oversight Steptoe & Johnson, PLLC Fayette County, West Virginia**

Rudy was responsible for coordinating a Phase I ESA at a sawmill property. The results of the Phase I ESA concluded that a detailed Phase II investigation of groundwater soil, sediment, lead paint and asbestos sampling and analysis be performed. Rudy also provided remediation oversight and soil/concrete sampling for the removal of the CCA (copper, chromium, arsenic) building and contamination soil removal.

### **Site remediation, site assessments, audits, risk assessments, resource conservation and recovery act facility investigations, industrial hygiene and safety audits and air quality studies**

#### **Fortune 50 Companies Pennsylvania and Ohio**

Rudy was the branch manager responsible for staff of up to 15 professionals, including engineers, geologists and scientists serving facilities and corporate offices in western Pennsylvania and northeastern Ohio. Projects included site remediation, site assessments, audits, risk assessments, resource conservation and recovery act facility investigations, industrial hygiene and safety audits and air quality studies.

### **Superfund studies**

#### **Fortune 50 Companies Pennsylvania, Delaware and New Jersey**

Rudy was primarily responsible for the overall direction and project management of Superfund Amendments and Reauthorization Act/CERCLA/Remedial Investigation/Feasibility Studies (RI/FS) at Superfund sites in Pennsylvania (three sites), Delaware (one site), and New Jersey (one site) for industrial clients. He was responsible for day-to-day scheduling of up to 20 technical staff, budgeting, reporting and interfacing with both clients and regulatory agencies. Rudy provided geochemical risk expertise to groundwater/soil studies.

### **Underground injection control program United States Environmental Protection Agency (USEPA) Kentucky and Ohio**

Rudy served the project manager responsible for projects in the USEPA's Underground Injection Control Program including 40-hour training to EPA technical personnel on groundwater geochemistry and sampling techniques and a major study of surface water impacts from oil/water separators in Kentucky oil field. He was also project manager for an RI/FS at a highly publicized Superfund site in Ohio. Rudy was responsible for day-to-day scheduling of up to ten technical staff, budgeting, reporting and interfacing with clients.

### **Contaminants research Illinois State Geologic Survey Champaign, Illinois**

Rudy conducted research into the mechanisms controlling the solubility and behavior of contaminants from solid and hazardous wastes, groundwater monitoring protocols and the use of lysimeters for studying contaminant behavior in the vadose zone. He participated in the publication and/or presentation of more than 30 papers related to this research. All projects were totally funded by outside agencies. ■

## CARL BOWYER, PE, PS CIVIL ENGINEER, SURVEYOR

Carl Bowyer contributes more than 35 years of civil engineering experience which ranges from the A/E design of telecommunications tower projects, roadway and site design to proposal preparation and project management. Previously Carl served as an administrative section head at the West Virginia Division of Highways (WVDOH). In this position he managed and supervised the initial design section and was in charge of the study and development of preliminary design reports, preparation of contract fees, negotiations and contract agreements for Engineering and Architectural services for both State and Federal Highway projects. He has proven his expertise in roadway and drainage design, storm water detention system design, site grading, storm and sanitary sewer design, waterline analysis and design and development of construction drawings for civil engineering projects.

### RELATED PROJECTS

#### Cellular Tower Site Construction Drawings

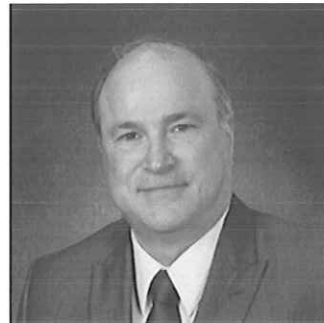
Carl, as a project manager with more than 35 years of experience related to the site layout and construction drawing for various cell tower locations, has overseen the A/E portion of hundreds of cellular tower projects for many telecommunications clients across the country, including but not limited to:

- State of West Virginia/County 911
- Verizon Wireless
- nTelos Wireless
- Highland Towers
- SBA Communications
- Crown Castle International
- Pegasus Tower
- American Tower
- Meridian Communications
- Florida Tower Partners
- Glotel
- AT&T Mobility
- Alexander Utility Engineering
- SAI Communications
- Black & Veatch
- Paradigm Wireless
- US Cellular
- Wireless Resources
- Charter Associates
- Beacon Towers
- Greenland Development
- Dynis

### RELATED PROJECTS (WITH OTHER FIRMS)

#### Initial Design Section/Consultant Services Head West Virginia Department of Highways

This position was charged with preparing and maintaining related documentation leading to the successful negotiations and execution of agreements while assuring the adherence to State and Federal codes in accordance with the guidelines for Qualification-Based Selections. Key Responsibilities included managing the daily operation of the Initial Design Section involving a staff of eleven (Five Professional Engineers, Two Transportation Technologists, a Technologist Enrollee, an Office Assistant and Secretary), preparing advertisements, conducting shortlist meetings, scheduling and conducting interviews, making recommendation for the selection of engineering and architectural services, reviewing engineer's estimates, negotiate fees, prepare agreements, and maintaining all documentation and maintaining databases for



#### Office Location

- Charleston, West Virginia

#### Areas of Expertise

- Roadway design
- Site design
- Project management
- Drainage design
- Storm water detention system design

#### Education

- BS, Civil Engineering, West Virginia Institute of Technology, 1988
- AS, Drafting and Design, West Virginia Institute of Technology, 1976

#### Registration

- Licensed Professional Engineer
- West Virginia (#11818)
- Maryland (#43096)
- Kentucky (#29163)
- Ohio (#PE77303)
- Pennsylvania (#PE080539)
- Licensed Professional Surveyor, WV

## CARL BOWYER, PE, PS (CONTINUED)

tracking the status of agreements, consultant qualifications and confidential information, consultant evaluations and preparing reports.

### **Agreement Unit Leader for Consultant Services West Virginia Department of Highways**

Carl supervised and coordinated the work of highway engineers and technicians in the preparation of the scope of work, engineering estimates, proposal review, and negotiation of fees for entering into contract agreements for engineering and architectural services. Key Responsibilities included researching and collecting information in the preparation and development of scopes of work, preparing scopes of work notes and bold scopes of work meetings and preparing Engineer's Estimates and negotiating fees documenting the final results. Most notable achievement while holding this position was the successful negotiation of a \$10.3 million design fee for the design of the Blennerhassett Bridge spanning the Ohio River. In addition to this project, successful negotiations were held for the six-lane widening project on I-64 including eight dual structures and the design of the longest Concrete Segmental Span in the United States across the Kanawha River resulting in a design fee of \$13.7 million.

### **Project Manager for Consultant Design West Virginia Department of Highways**

This position required the management, review, and oversight in the development and preparation of roadway, right-of-way, and bridge plans, and related contract documentation prepared for the construction of State and Federal projects in accordance with the WVDOT policies, procedures, and specifications for roads and bridges, by consulting firms. Key Responsibilities included oversight development and review for roadway, right-of-way and structure plans and specification; collectively putting together all documents for the delivery of Plans, Specifications and Estimate for letting and awarding for construction, preparing and holding progress meetings, maintaining project records, participating in public meetings, holding preliminary field and final office reviews for the purposes of maintaining and delivering the project on time and on budget. The most significant accomplishment was coordinating and managing the fast track development of the plans and specifications of the Harpers Ferry Bridge over the South Branch of the Potomac River bringing the plans and specifications together within nine months. ■

## JAMIE BUMGARNER, PE CIVIL ENGINEER

Jamie Bumgarner brings nearly 15 years of civil engineering experience to this project. As a project manager, civil engineer and hydraulic engineer, James has performed various duties associated with the preparation of plans, specifications and estimates for various projects including: drainage design, civil design, right of way plan preparation, geometric layout, utility relocation design, permitting, plan preparation/presentation and construction cost estimates.

Specific drainage design experience includes: hydrologic procedures, inlet spacing computations, channels, culverts, storm drains, erosion and sediment control, storm water management, hydraulic river analysis utilizing HEC-RAS, preparation of Hydrology and Hydraulics (H&H) reports, evaluating scour and temporary construction access/causeway design.

### RELATED PROJECTS

#### Cellular Tower Site Construction Drawings

Jamie, as a civil engineer with nearly 15 years of experience related to the site layout and the preparation of construction drawings for various civil engineering projects, including cell tower locations, has overseen the A/E portion of hundreds of cellular tower projects for many telecommunications clients across the country, including but not limited to:

- State of West Virginia and County 911 Towers
- Verizon Wireless
- nTelos Wireless
- Highland Towers
- SBA Communications
- Crown Castle International
- Pegasus Tower
- American Tower
- AT&T Mobility
- Alexander Utility Engineering
- SAI Communications
- Black Dot Wireless
- Paradigm Wireless
- US Cellular
- Wireless Resources
- Charter and Associates ■



#### Office Location

- Charleston, West Virginia

#### Areas of Expertise

- Civil engineering
- Project management
- Client communication
- Plan preparation
- Hydraulic engineering
- Drainage design

#### Education

- MBA, Business Administration, Marshall University, 2003
- BS, Civil Engineering, West Virginia University, 1998, Magna cum Laude
- AAS, CADD, West Virginia State College, 1995, High Honors
- Certificate in Financial Planning, Florida State University, 2008

#### Registration

- Licensed Professional Engineer
- West Virginia (#15612, 2003)
- Ohio (#70524, 2005)
- South Carolina (#24886, 2006)
- Maryland (#37854, 2009)
- Pennsylvania (#77335, 2009)
- Virginia (#046895, 2009)

#### Memberships

American Council of Engineering Companies of West Virginia -

- Past Chair, Transportation Division, July 2010-June 2011
- Chair, Transportation Division, July 2009-June 2010
- Officer, Board of Directors, July 2009-June 2010
- Chair, Design-Build Committee, May 2007-Present
- Member, Drainage Manual Committee, May 2006-Present

## MIKEL BOONE, PE STRUCTURAL ENGINEER

Mikel Boone has more than 15 years of structural design and inspection experience. He has prepared design studies and contract plans, performed structural analyses and developed load ratings for many different types of structures. Mikel also has experience in field inspections and evaluations of existing structures.

### RELATED PROJECTS

#### Cellular Tower Site Structural Analysis and Design

Mikel, as a civil engineer with more than 15 years of experience related to the structural analysis, structural design, and the preparation of construction drawings for various civil engineering projects, including cell tower locations, has performed the structural analysis of dozens of cellular telecommunications projects for many clients across the country, including but not limited to:

- State of West Virginia and County 911 Towers
- Verizon Wireless
- nTelos Wireless
- Highland Towers
- SBA Communications
- Crown Castle International
- Pegasus Tower
- American Tower
- AT&T Mobility
- Alexander Utility Engineering
- SAI Communications
- Black Dot Wireless
- Paradigm Wireless
- US Cellular
- Wireless Resources
- AT&T Mobility
- Alexander Utility Engineering
- SAI Communications
- Black & Veatch
- Paradigm Wireless
- US Cellular
- Wireless Resources
- Charter Associates
- Beacon Towers
- Greenland Development
- Dynis
- Charter and Associates ■



#### Office Location

- Charleston, West Virginia

#### Areas of Expertise

- Structural analysis
- Bridge design
- Bridge inspection
- Field inspection

#### Education

- BS, Civil Engineering, West Virginia Institute of Technology, 1997

#### Registration

- Licensed Professional Engineer
- West Virginia (#015424, 2002)
- Ohio (#PE69084, 2004)
- South Carolina (#25185, 2006)
- Virginia (#040249721)

## EMILY BUMGARNER, PE HYDRAULIC ENGINEER

Emily Bumgarner has more than 13 years of civil engineering, hydrology and hydraulic-related experience. As a hydraulic engineer, Emily has performed various duties associated with the preparation of plans, specifications and estimates for the drainage related design of various civil engineering projects.

Emily has completed four levels of training utilizing Rosgen's Methods for Natural Stream Design & Stream Relocation Mitigation. Other specific drainage design experience includes hydrologic procedures, pavement/deck drainage, inlet spacing computations, channels, culverts, storm drains, erosion and sediment control ponds, storm water management, hydraulic river analysis utilizing HEC-RAS, preparation of Hydrology and Hydraulics (H&H) reports, evaluation of scour, riprap design and flood routing procedures using HYDROCad software.

### RELATED PROJECTS

#### Telecommunication Projects

##### Various County, West Virginia

Emily performed the hydrologic and hydraulic analysis for these telecommunications tower sites. The hydraulic analysis included ditch design calculations, culvert designs, and comparison of the pre-construction and post-construction discharges. Emily also prepared an Erosion and Sediment Control Plan to meet the regulatory requirements of the local review agency.

#### Drainage Design, US 522

##### West Virginia Division of Highways (WVDOH)

##### Berkley County, West Virginia

Emily was lead hydraulic engineer for the preliminary and final drainage design of this project. This design included the incorporation of 17 sediment basins in a watershed closely monitored by various agencies due to the importance of water levels to local farmers. Other drainage tasks included the design of two concrete box culverts each over 100 feet in length, major culvert design and analysis (108 inch and above), minor drainage design, National Pollutant Discharge Elimination System (NPDES) permitting requirements, storm sewer and ditch design. This project was completed while Emily was employed with another firm.

#### Environmental Engineering, Arch of West Virginia

##### Arch Coal, Inc.

##### Rum Creek, West Virginia

Emily was the engineer responsible for planning and managing reclamation and remediation projects. She conducted quarterly spill prevention, control and countermeasure inspections. She performed daily inspections of acid-mine drainage areas. This project was completed while Emily was employed with another firm.

#### Hydraulic Crossings, I-69 Hydraulic Analysis, 10 Mile Creek & Other Streams White, Jackson and Independence Counties, Arkansas

Emily worked as a design team member for the preliminary and final analysis of seven different hydraulic crossings utilizing HEC-RAS. This project consisted of modeling existing and proposed conditions for various bridges and culverts. This project was completed while Emily was employed with another firm. ■



#### Office Location

- Charleston, West Virginia

#### Areas of Expertise

- Civil engineering hydrology
- Drainage design
- Hydraulic design
- Erosion and Sediment Control Design

#### Education

- MBA, Business Administration, Marshall University, 2002
- BS, Civil Engineering, West Virginia Institute of Technology, 1997

#### Registration

- Licensed Professional Engineer
- West Virginia (#015611, 2003)
- Ohio (#71690, 2006)



**Anh Tran, Engineer III, Microwave Engineering**  
Comsearch, 19700 Janelia Farm Blvd., Ashburn, Virginia 20147  
Phone 703.726.5655 | fax 703.726.5600 | atran@comsearch.com

## **QUALIFICATIONS**

---

- Twenty-Three (23) years of Telecommunications Engineering experience
- Expert in environmental and intersystem interference analysis
- Microwave path design using PathLoss 4 & 5
- Expert in frequency sharing and management in mixed microwave, satellite, and advanced wireless systems environments

## **PROFESSIONAL EXPERIENCE**

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**Engineer III, Comsearch**  
Comsearch, Ashburn, VA

*November, 1989 to Present*

- Daily interaction with dozens of customers
- Responsible for Largest Verizon & AT&T accounts (California & Texas Markets)
- Consistently #1 or #2 in Engineering production work each year
- Handles all of AUE work for AI Mergel for the State Of West Virginia

## **EDUCATION**

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**BSEE (Electrical Engineering), 1989**  
*University of Maryland at College Park, MD*

## **SKILL SETS**

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Computer Languages: C/C++

Hardware: PC and Apple

Operating Systems: Windows 7

Software: MSOffice 2010 (word, Excel)

Telecom Software: PathLoss 4 and 5

**U.S. Citizen**





## **Richard W. Hibbeler, Manager, FCC Licensing Group**

Comsearch, 19700 Janelia Farm Blvd., Ashburn, Virginia 20147  
Phone 703.726.5671 | fax 703.726.5600 | rhibbele@comsearch.com

### **QUALIFICATIONS**

---

- Twenty-Five (25) years of Telecommunications Engineering experience
- Expert in FCC Regulatory & Licensing procedures of microwave networks
- Expert in environmental and intersystem interference analysis

### **PROFESSIONAL EXPERIENCE**

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#### **Manager, FCC Licensing Group Comsearch**

Comsearch, Ashburn, VA

*May, 2002 to Present*

- Manage 10+ internal and external employees on a daily basis for a multimillion dollar business for 1000+ customers
- Daily interaction with customers
- Responsible for customer visits and trade show support
- Team leader in software design and implementation
- Engineering/Coordination production work as needed

#### **Microwave Frequency Coordinator**

Comsearch, Ashburn, VA

*October 1986 to May 2002*

- Provided project engineering for 1000+ microwave links yearly
- Account management for dozens of customers
- Ability to simultaneously manage multiple projects on a daily basis
- Environmental and intersystem interference analysis for microwave systems
- FCC licensing form preparation and support

### **EDUCATION**

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#### **B.A., Geology, 1986**

*Louisiana State University*

### **TAB 3 – REFERENCES**

Included in this section are the references requested in the EOI. All of these references are current projects that are either underway or have been completed in the last 10 years.

#### **West Virginia Broadband Network, Morgantown, WV**

TRC personnel developed a statewide plan for the West Virginia State Medical Command Microwave System and has overseen the expansion of the microwave network as authorized under an ARRA Grant by the NTIA. Engineering services comprised deployment of microwave facilities authorized under a \$125M broadband grant for a statewide broadband network. Engineering services have supported microwave expansion of over 125+ hops of digital TDM and IP microwave for public service agencies within the State of West Virginia.

*Reference: Joe Gonzales, WVECS Director, 304-626-5012, [jgonzo@fastmail.us](mailto:jgonzo@fastmail.us)*

#### **Bonneville Power Administration, Vancouver, WA**

TRC Engineers, Inc. is providing communication system engineering services to Bonneville Power Administration for microwave and fiber optic networks deployed throughout the States of Washington, Oregon, Montana and Idaho. The work includes expansion of network facilities to integrate wind farms into the power grid. The microwave systems comprise approximately 500 hops of microwave. TRC has been providing these services since 2008.

*Reference: Linda Ngov, P.E., CMO Engineer, 360-619-6246, [lningov@bpa.gov](mailto:lningov@bpa.gov)*

#### **Hawaii Electric Power Company, Hawaii Electric Light Company, Maui Electric Company, The Islands of Hawaii**

TRC Engineers, Inc. has completed a 10 year Telecommunications Master Plan for all communication facilities required to support power production on the Islands of Hawaii. A total of over 200 microwave paths are included in the total master plan as either existing or proposed systems. This work is being followed up with action plans to deploy the technology for specific systems planned for the future.

*Reference: Debby Shin, P.E., Planning Engineer, 808-543-7991, [debby.shin@heco.com](mailto:debby.shin@heco.com)*

#### **South Texas Electric Cooperative, Nursery, Texas**

TRC Engineers, Inc. is providing microwave upgrade engineering for paths, sites and towers to support a large microwave radio system spread over South Texas to support power production and delivery to a large utility. A total of approximately 125 hops of microwave are included in this system which is used to support the massive Eagleford Shale oil field developments.

*Reference: Darrel Klmitchek, Manager Technical Services, 361-575-6491, [darrell@stec.org](mailto:darrell@stec.org)*

**Brooks Development Authority Communications System Privatization, San Antonio, Texas**

TRC Engineers, Inc. have provided communication system engineering services to the Brooks Development Authority (BDA) since June, 2003. During this 10 year period TRC has assisted the BDA with the privatization of USAF communication facilities to assist with the development of new "on-site" clients. This assistance included locating and relocating or installing copper and fiber optic communication facilities within the BDA perimeter. A total of over 200 facilities are included at this facility.

*Reference: Carlos Salinas, Telecom Manager, 210-845-241, [carlos.salinas@brookscity-base.com](mailto:carlos.salinas@brookscity-base.com)*

**CPS Energy Communication Systems Engineering, San Antonio, Texas**

TRC Engineers, Inc. personnel have provided communication system engineering services to City Public Service Energy since 1978. TRC maintains a Master Services Agreement with CPS Energy and it has been renewed on a regular basis for the last 35 years. Communications services have included all facets of communication system design to include fiber optic cable, microwave, two-way radio, building wiring designs and route master planning. CPSE operates about 50 hops of microwave, 500 route miles of fiber optic cable and over 200 facilities.

*Reference: Dave Wheeler, Telecom Manager, 210-353-4316, [dwwheeler@cpsenergy.com](mailto:dwwheeler@cpsenergy.com)*

**CenterPoint Energy Communications Systems Engineering, Houston, Texas**

TRC Engineers, Inc. has provided communication system engineering services to CenterPoint Energy since 2008. TRC has assisted CPE with the development of microwave and wireless networks to provide links to automated meter reading systems, new two-way radio to replace their existing network and planning studies to expand the network facilities for system operations to support over 1.7million customers.

*Reference: Theo Woodard, Telecom Manager, 713-207-5192, [Theoplis.woodard@centerpointenergy.com](mailto:Theoplis.woodard@centerpointenergy.com)*

**Subcontractor References**

*Chris Harris, Ntelos, 304-353-8917  
[harrisch@ntelos.com](mailto:harrisch@ntelos.com)*

*David McClure, Highland Towers, LLC., 304-256.6426  
[david.hti@suddenlink.com](mailto:david.hti@suddenlink.com)*

*Michael L. Todorovich, COOP Planner – Deputy J3 – Continuity, 305-561-775,  
[michael.todorovich@ng.army.mil](mailto:michael.todorovich@ng.army.mil)*

**Appendix A Purchasing Affidavit**

RFQ No. BPH14010

STATE OF WEST VIRGINIA  
Purchasing Division

**PURCHASING AFFIDAVIT**

**MANDATE:** Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

**EXCEPTION:** The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

**DEFINITIONS:**

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

**AFFIRMATION:** By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

**WITNESS THE FOLLOWING SIGNATURE:**

Vendor's Name: TRC Engineers, Inc.  
Authorized Signature: *[Signature]* Date: 5/23/2013

State of Texas

County of Bexar, to-wit:

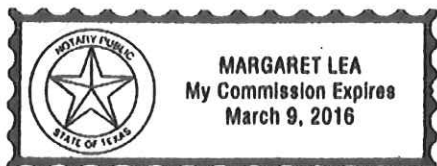
Taken, subscribed, and sworn to before me this 23rd day of May, 2013.

My Commission expires March 9, 2016.

AFFIX SEAL HERE

NOTARY PUBLIC *Margaret Lea*

*Purchasing Affidavit (Revised 07/01/2012)*



**Appendix B      Certification & Signatures Page**

**CERTIFICATION AND SIGNATURE PAGE**

By signing below, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid or proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

TRC Engineers, Inc.

(Company)

(Authorized Signature)

Dan Banks, RCDD, Manager, Communication Engineering

(Representative Name, Title)

210.496.3200 x118

(Phone Number)

210.494.9987

(Fax Number)

May 23, 2013

(Date)

**ADDENDUM ACKNOWLEDGEMENT FORM**  
**SOLICITATION NO.: BPH14010**

**Instructions:** Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

**Acknowledgment:** I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

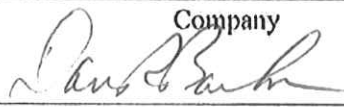
**Addendum Numbers Received:**

(Check the box next to each addendum received)

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6  |
| <input type="checkbox"/> Addendum No. 2            | <input type="checkbox"/> Addendum No. 7  |
| <input type="checkbox"/> Addendum No. 3            | <input type="checkbox"/> Addendum No. 8  |
| <input type="checkbox"/> Addendum No. 4            | <input type="checkbox"/> Addendum No. 9  |
| <input type="checkbox"/> Addendum No. 5            | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

TRC Engineers, Inc.

\_\_\_\_\_  
 Company  
  
 \_\_\_\_\_  
 Authorized Signature

5/17/2013

\_\_\_\_\_  
Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.  
Revised 6/8/2012