

October 18, 2024

Ambi Blyden

Virgin Islands Water and Power Authority  
9720 Estate Thomas  
3rd floor, Al Cohen's Plaza  
Charlotte Amalie, St. Thomas 00802

RE: Make Ready Engineering Services

Davey Resource Group Inc is pleased to submit this proposal for Make-Ready Engineering Services (MRE). This proposal is a response to the RFP provided by Virgin Islands Water and Power Authority. DRG has outlined in this proposal our approach to completing the make-ready process for VIWAPA. DRG will provide all services required to complete the project with full time DRG staff and a partnership with Symbiosa for GIS services.

**DRG anticipates project completion within a 10-12 week period of project start.**

Davey Resource Group (DRG) offers the security of a well-established firm with a history of strong performance and client satisfaction. Davey Resource Group is a division of The Davey Tree Expert Company, which was established in 1880. DRG has been offering its asset management services to utilities such as VIWAPA for over 30 years. We are committed to the electrical utility industry, and our over 250 utility clients will back that up. You will find that our particular experience with the make-ready services covered in this RFP is matched by few others. In 2020 alone, DRG will field, engineer, design, and deliver over **250,000 poles** across the U.S. To successfully manage this volume, we employ a staff of over **200 make-ready engineers (PE's), designers and field staff.**

The principal point of contact for this proposal will be Tommy Maloney, Sr. Project Developer - phone: (770) 377-1584; e-mail: [tommy.maloney@davey.com](mailto:tommy.maloney@davey.com).

Thank you for your consideration. We look forward to working with you and your staff to develop a successful project with significant benefits for VIWAPA.

Respectfully Submitted,



Tommy Maloney  
Senior Project Developer, Asset Management  
Davey Resource Group



# Make-Ready Engineering

*Virgin Islands Water and Power  
Authority*

October 18, 2024



# PROPOSAL:

## Make Ready Engineering

### CORPORATE OFFICE:

Davey Resource Group, Inc.  
295 S. Water St., Suite 300  
Kent, OH 44240

### TAX IDENTIFICATION NUMBER:

82-1948528

### D&B NUMBER:

10-544-6632

### CONTACT PERSON:

Tommy Maloney

### CONTACT PHONE:

770.377.1584

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330.673.0860

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### **Presented to:**

Virgin Islands water and Power Authority  
Via email  
Ambi.Blyden@viwapa.vi

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# INTRODUCTION

Davey Resource Group, Inc. (DRG) understands that Virgin Islands Water and Power Authority (VIWAPA) is seeking expert advice and proposals from companies that have experience in providing Make Ready Engineering services and who have provided multiple projects of this kind.

The following information prepared by DRG is intended to provide VIWAPA with pricing, schedules, and associated labor and equipment needed for the work identified in the RFP provided by VIWAPA.

Davey Resource Group, a division of The Davey Tree Expert Company, is uniquely qualified to complete the Distribution System Field Inventory and Make Ready engineering services for VIWAPA. DRG completes more than 30 projects annually that are similar in scope to the information that VIWAPA has requested and, with over 300 field and technical employees. DRG has the resources to complete this project in the time frame requested. VIWAPA will benefit from the extensive experience of our Field Project Managers, Field Operations Managers, GIS Production Managers, Site Coordinators, Project Developers, and qualified Field Technicians. These individuals will be present throughout the duration of this project and are committed to exceeding the expectations of VIWAPA. DRG is an ESRI business partner and Preferred Business Partner of Milsoft..

DRG is dedicated to providing a clear focus on this project to ensure that all procedures are designed with the objectives of VIWAPA in mind.

Davey Resource Group (DRG) recognizes that utilities place great priority on a make-ready engineering program that meets the needs of their company, their customers, the attaching companies and regulatory entities. In order to enable our clients to meet these needs Davey Resource Group has developed a process which is customizable to VIWAPA and focuses on these critical areas:

- **Meeting Cooperative Construction Deadlines:** The make-ready process is driven by both internal and external deadline pressures. DRG's current experience will assist in meeting and exceeding the make ready production goals.
- **DRG Resources working together.** DRG currently employs more than 300 inventory and make-ready specialist staff. The approximate breakdown includes: 90 inventory technicians, 85 Designers, 100 Fielders, 31 Administrative Staff, 2 PE's and 8 Managers.
- As DRG works more closely and integrates into our client's programs, we continuously seek to find opportunities to enhance the process from sharing our experiences elsewhere in the industry.
- **Exceeding Utility Customer Service Level Expectations:** Perhaps the least measurable, but most important aspect of a make-ready program is how it is perceived by the participants. make-ready impacts not only the utility, but also other pole occupants and utility customers. DRG's safety practices, excellent reputation, and experience will provide a seamless integration into the project as it will allow us to perform the fielding and deliver data daily as well as get maker ready poles to VIWAPA faster. The learning curve will be reduced which in turn will lead to fast startup and quicker production.

To accomplish the objectives listed above, DRG intends to offer a wealth of experience, expertise and resources to the utility. We want to emphasize that all DRG and our parent company The Davey Tree Expert Company's resources will be made available to support VIWAPA. This means that the utility will have the human, capital and financial resources of a 130+-year-old, financially stable industry expert as their partner. In practical terms, the utility can expect that DRG will have the capabilities to support them in the following ways:

- Capacity to scale up/down the workforce as conditions require.
- Access to utility professionals in allied disciplines (Forestry, Line Clearance, GIS, Civil Engineering, as examples).
- Financial strength to adapt to changes and stand behind the program.

# COMPANY / FIRM OVERVIEW

Davey Resource Group's main office is located in Kent, Ohio, with regional offices in Alpharetta, Georgia; Richfield, Ohio; Huntsville, Alabama; San Diego, California; and Albany, New York. Operational headquarters are also located in Michigan, Illinois, Delaware, Maryland, Florida, Texas, Louisiana, Mississippi, North Carolina, and Washington.

DRG's major area of focus is asset management on the right-of-way. Our services in this field include Make-ready Engineering, Construction, Joint Use Management Services, pole inspections; GPS field inventories/verifications; geographic information system (GIS) database development and data collection; and equipment inventories and audits that include joint use, streetlight, underground equipment, and NESC safety compliance. DRG's projects have spanned from the annual inspections for 10,000 pole utilities to a joint use inventory project of 1,500,000 poles over a three-year period.

DRG is committed to the electric utility marketplace. We offer our dedicated and experienced staff to your important Inventory and make-ready project. Some of the key attributes that DRG offers to VIWAPA are summarized in the following fact sheet:

- **Milsoft GIS Experience:** DRG is a Milsoft business Partner has extensive experience in Milsoft, and various other ESRI based systems.
- **Current MRE Projects:** DRG currently has **74 make-ready projects** ongoing across the country
- **Multi-Year Projects:** DRG has been onsite for more than three years on 36 of the projects
- **Annual Poles Completed:** DRG will process and deliver greater than **250,000 MRE poles** in 2024
- **MRE Staff Size:** DRG currently employs more than 600 make-ready specialist staff. The approximate breakdown includes: 400 Designers, 125 Fielders, 40 Administrative/Support Staff, and 36 Managers and 3 professional engineers on staff
- **Office Locations:** DRG has dedicated MRE staff located in: Alpharetta, GA; Richfield, OH; Toledo, OH; Albuquerque, NM; Lansing, MI; Milwaukee, WI; Pittsburgh, PA, and Austin, TX along with remote locations in almost every state - staffed with make-ready Fielders, Designers and Engineers.
- **Pole Loading Analysis Experience:** DRG has had extensive training and experience utilizing various PLA software applications including daily use of over 250 seats of O-Calc, SPIDACalc, and Pole Foreman
- DRG has 35 internal GIS professionals to provide support to clients.

DRG has extensive knowledge and experience in the Pole Attachment application and make-ready process for electric utilities and third party attachers. Our experience includes all aspects of field data collection, PLA, make-ready, Application Review, Construction and Post Construction Inspection.

These factors ensure that VIWAPA will obtain the best possible solution from DRG for a well - managed and successfully integrated project.

# EXPERIENCE

**Firm Name:** Davey Resource Group Inc.

**Firm Address:** 1500 N. Mantua, Kent Ohio 44240

**Phone:** 330-673-5685 Ext. 7399

**Key Contact:** Tommy Maloney Senior Project Developer

# Davey Employees 12,536

# DRG Employees - 3,200

# DRG Asset Management Employees 1,842

## Firm Description:

Davey Resource Group (DRG) is the utility consulting and technical services division of The Davey Tree Expert Company. DRG had its beginnings providing our parent company with consulting services as early as 1909. We have been providing right of way and asset management services to the utility industry since 1991.

A major specialization in our division is providing comprehensive services for asset management on the right of way. Some of our services include make-ready Engineering, Joint Use Audits, Double Wood Management, Field Inventories, NECS Compliance, Pole Inspections, GIS Management Services, Infrared Inspections, and Underground Inspections and audits. DRG's projects have spanned from the annual inspection of 10,000 poles to a joint use inventory project of 1,500,000 poles completed within a 10-month time frame. We have performed these services across the United States and Canada. The large range of scopes and geographical areas in which we have performed these services have provided Davey Resource Group with a detailed understanding of how to mobilize and complete even the most complex projects.

Relative to this project, Davey Resource Group has extensive experience in providing comprehensive Joint Use Management services to utilities across the United States. With our strong relationship with the NRECA, the Southeastern Electric Exchange and WEI we are a leading provider of Joint Use services to many of those member utilities.



# CLIENT REFERENCES

Below is a list of contacts that have been delivered services similar to those requested by VIWAPA. Following are individual projects selected to demonstrate the capability of Davey Resource Group to provide Make Ready engineering Services. Additional references can be provided upon request.

## MRE Clients:

- Northern Neck Electric Cooperative
  - Description: Pole Attachment Permitting Process Management, Make Ready Engineering, and Electrical Construction Management (Includes a detailed review with the pole owner of the proposed fiber route and potential electrical Make Ready Work required, application screening, rejection, or acceptance on behalf of the pole owner, pole data collection and verification, Engineering Design, work order and staking design management, notification system management, permitting, release to electrical construction, electrical construction management, and post construction inspection auditing).
  - Contract Period: 2021 - 2024
  - Volume: 20,000 to 35,000 poles annually
  - Contact: Brad Hicks, (804) 313-5622
  - Contact: Steve Minor, (804) 333-6125
- Shenandoah Valley Electric Cooperative
  - Description: Pole Attachment Permitting Process Management, Make Ready Engineering, and Electrical Construction Management (Includes a detailed review with the pole owner of the proposed fiber route and potential electrical Make Ready Work required, application screening, rejection, or acceptance on behalf of the pole owner, pole data collection and verification, Engineering Design, work order and staking design management, notification system management, permitting, release to electrical construction, electrical construction management, and post construction inspection auditing).
  - Contract Period: 2023 - 2026
  - Volume: 20,000 to 35,000 poles annually
  - Contact: Chris Strecky, (540) 574-7253
- Presque Isle Electric and Gas
  - Description: Pole Attachment Permitting Process Management (Includes application screening, pole data collection, design, work order and notification system management, permitting, release to construction, and post construction auditing).
  - Contract Period: Yearly renewal starting in 2022
  - Contact: Wesley Repke, (989) 733-8515 x 1044

- Consumers Energy, MI
  - Description: Low Voltage Distribution design and engineering services including pole inspections, new customers, and reliability. Pole Attachment Permitting Process Management (Includes application screening, pole data collection, design, work order and notification system management, permitting, release to construction, and post construction auditing). Exemplary performance on the first 5-year contract led to recent award of an additional 5 year contract.
  - Contract Period: 2015 - present
  - Volume: 20,000 to 35,000 poles annually
  - Contact: Charlie Hatchard, (517) 788-8965
- Penelec, PA
  - Description: Pole Attachment Permitting Process Management (Includes application screening, pole data collection, design, work order and notification system management, permitting, release to construction, construction coordination, and post construction auditing)
  - Contract Period: 2017 - present
  - Volume: 4,000 - 6,000 poles annually
  - Contact: Robert Chumrik (814) 949-4738
- Metropolitan Edison, PA
  - Description: Pole Attachment Permitting Process Management (includes route design, cost causing, invoicing, billing tracking, Katapult data collection and processing, AutoCAD work order packets, competitive bidding construction, scheduling, material procurement, subcontracted JU Construction, post construction auditing, and violation billing).
  - Contract Period: 2021 - present
  - Volume: 12,000 - 17,000 Poles annually
  - Contact: Kyle Rosendale (419) 265-8163
- Ohio Edison, OH
  - Description: Pole Attachment Permitting Process Management (Includes application screening, pole data collection, design, work order and notification system management, permitting, release to construction, construction coordination, and post construction auditing)
  - Contract Period: 2017 - present
  - Volume: 10,000 to 15,000 poles annually
  - Contact: Michael Christensen (330) 301-6601

# PROJECT APPROACH

Davey Resource Group (DRG) will use a defined and tested approach for working with VIWAPA. DRG has the resources, technical knowledge and industry experience to complete the Inventory and MRE project on time. Our team is committed to creating efficiencies that will reduce the challenges encountered by VIWAPA in the management of GIS Inventory data, make-ready, and application submission. The foundations of our success with this approach start with a couple of key components:

- **Using Katapult** as the collection application.
- **A single point of contact** – a single, experienced Project Manager will be responsible for communicating with VIWAPA staff.
- **A phased ramp-up** – a deliberate mobilization of resources will allow VIWAPA and DRG to become familiar with the intentions and the mechanics of the make-ready program. We view the time spent carefully ramping up the project to be the best investment in its ultimate success.

The solution DRG is proposing takes advantage of elements of past projects that have been successful. This approach ensures that communication discipline is established from the beginning and that all program stakeholders are working toward the same goals from the outset.

## Project Management Discipline

Project Management is a central discipline used in all DRG projects. Each project is assigned to an experienced Project Manager who has been exposed to on-the-job experience, typically in other job functions. Project Managers also undergo additional training and development through programs offered by DRG.

Each project adheres to a standard approach as described in an earlier section of this proposal. This approach takes advantage of a suite of Project Management processes and tools. These controls are expanded on in the following sections. The end result is that the majority of DRG's projects are successful when judged by their delivery within budget and on schedule. Project controls ensure abundant and useful communication, tight scope control and standardization in collection and delivery of the DRG work products.

## Project Controls

The principal project control tool is the project procedures manual. Each project requires that a procedures manual be drafted and accepted by all project stakeholders. The manual is extensively reviewed at the project kickoff, scheduled upon award of any contract. The manual's format is standard. It will contain the following sections:

- Project Scope Overview
- Project Contact List
- Project Metrics and Schedule
- Project Schedule
- Detailed Data Collection and Delivery Table
- Detailed Description of Deliverables
- Invoicing Processes and Invoice Template

## Project Startup

Once DRG is awarded a project, we will schedule a project kickoff. The kickoff is an important first step and will be used to build the DRG knowledge base for the project. It also clarifies the expectations, assumptions, and goals of the make-ready program. Some of the items that are finalized at kickoff include:

1. Introduce VIWAPA and DRG project staff.
2. Review of the proposed work and clarification of any gaps/assumptions.
3. Definition of the project ramp-up plan and milestones.
4. Definition of initial phase and deliverables.
5. Data collection and deliverable preparation discussion.
6. Initial Training on work order development in MapWise Staking.
7. Draft of the DRG project procedures manual.

A detailed project specification including the procedures manual is created at the kickoff meeting. This specification unifies the expectations of all the stakeholders and helps to ensure consistency among the project team. In the case of this project, VIWAPA already holds an extensive and complete set of documentation. DRG expects that most of the procedure's manual will be focused on tying all the VIWAPA's process documents into a single repository linked to DRG's business practices (like QA and payroll tracking).

The project kickoff typically occurs upon completion of contract award and prior to any fieldwork.

## Mobilization

Concurrent with project kickoff, DRG will begin mobilizing the senior staff assigned to the initial phase of the project. This staff will be pulled from ongoing projects where they are performing similar work. Any of the design engineering staff earmarked for the project who have not been through a four-week distribution design training class will be sent there prior to arriving on VIWAPA's property. (see Training)

Once our staff are at VIWAPA, we will send them through VIWAPA-specific training. Our assumption is that the training dates will be set during the discussions taking place at project kickoff.

## Training

Early in the history of Davey, John Davey recognized the importance of training and engagement of our employees and the value that was provided to both the company and our customers. Because of this Davey began recruiting and training young men in the art and science of Tree Care in the off season to both retain good, dedicated employees and ensure high quality and well-trained resources for our customers. This was the beginning of the formation of what has now become the Davey Institute of Technology. Since its inception, the Davey Institute has served as a resource for both our customers and our company developing intensive job specific training to ensure we provide the highest level of service to our customers.

Our Asset Management training programs have been developed through the Institute and built with experts in the various fields of service. Each person assigned to the VIWAPA MRE program will have gone through one or more of several programs or proven their understanding in their specific field of service. (See appendix B for course content)

# Project Communication Plan


DRG will require weekly and as needed conference calls to discuss the project schedule and issues that may arise.

DRG project management staff will deliver a weekly progress report to VIWAPA's Project Manager by 10:00 AM EST every Monday via e-mail, regardless of whether or not work was performed, throughout the duration of the project. The report will include the following, at a minimum:

- Poles/Work Orders collected in the previous week.
- Poles/Work Orders slated for the coming week.
- Number of crews working.
  - Expected completion of Poles, feeder(s) or substation(s) where fieldwork has been completed.

The DRG team uses the reports and graphs below to track various stages of the project. These reports ensure that production is being met and that we are on schedule. These reports will be available to VIWAPA during the project. Updated schedules and productions rates will be provided once the pilot project is completed, and full production mode is in place.

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16
Verification (Miles of CV Distribution)	0	1,445	2,889	4,045	5,201	6,646	7,802	8,557	10,402	11,558	12,714	14,158	15,314	16,470	17,364	
Percentage Complete	0.00%	0.32%	10.64%	23.30%	29.95%	35.27%	44.93%	61.69%	69.91%	65.60%	73.22%	81.64%	85.20%	94.06%	100.00%	
Verification (Joint Use Distribution)	0	332	664	929	1,194	1,526	1,792	2,057	2,389	2,654	2,920	3,251	3,517	3,782	3,960	
Percentage Complete	0.00%	0.36%	10.76%	23.45%	30.15%	35.64%	46.24%	61.96%	69.32%	67.03%	73.73%	82.11%	85.01%	96.61%	100.00%	
Verification (poles)		7200	14400	21600	28800	36000	43200	50400	57600	64800	72000	79200	86400	93600	100800	108000
Percentage Complete	0.00%	0.07%	13.33%	20.00%	26.67%	33.33%	40.00%	46.67%	53.33%	60.00%	66.67%	73.33%	80.00%	86.67%	93.33%	100.00%



**DAVEY**  
RESOURCE GROUP  
A Division of The Davey Tree Expert Company

**DRG-XXXX Weekly Report**

Report Period	xxxx/xx to xxx/xx
Distribute to	xxxx
Prepared by	xxxx

**Safety Report:**


- All work completed safely for week ending xxx/xx
- No OSHA recordable incidents
- No other incidents
- No near misses

**Current Staff Assignments:**

Name	Email	Phone	Feeder
Jesse Hughes	jesse.hughes@davey.com	xxx-xxx-xxxx	CT 1105/1105
Jay Cull	jay.cull@davey.com	xxx-xxx-xxxx	CT 1105
John Morrow	john.morrow@davey.com	xxx-xxx-xxxx	CT 1105
Leroy Mahoning	leroy.mahoning@davey.com	xxx-xxx-xxxx	CT 1105
Daniel Terasi	daniel.terasi@davey.com	xxx-xxx-xxxx	CT 1105
Roland Pratt	roland.pratt@davey.com	xxx-xxx-xxxx	CT 1105 TR

**Project Metrics:**

- Features mapped this week = 1,261 \*Note this number is based on GPSed features ( Poles )
- Features mapped to date = 21,600 \*Note this number is based on GPSed features ( Poles )
- Action Items



**DAVEY**  
RESOURCE GROUP  
A Division of The Davey Tree Expert Company

**DRG-XXXX Weekly Conference Call Agenda xxx.xx.xx**

Client Team:  
DRG Team:

**Weekly Production Summary**

**Safety**

- Cuts in Mapping:
- Cuts in QC:
- Cuts in Delivery:

**Data Collection Status**

- Features mapped this week = xxx \*Note this number is based on GPSed features
- Features mapped to date = xxx \*Note this number is based on GPSed features
- Deliveries this week: xxx

**Discussion Items:**

-

**Action Items**

-

**Schedule Status**

**Questions/ Additional Items**

Client team:  
DRG team:

## Weekly Status Reports

Weekly status reports are provided to VIWAPA by the DRG field operations manager and include:

- Poles, Feeder and/or substation being worked on.
- Consumer complaints.

Monthly reports of work completed and work in progress include:

- Poles collected.
- Project schedule update.
- Data delivery schedules.
- Percent work completed per feeder or work order.
- Percent worked on the total project to date.



DRG works toward an industry standard accuracy rate of 97%. DRG uses mapping grade GPS equipment in the field inventory process. DRG will meet the following location accuracy specifications:

DRG's office project manager is responsible for the data manipulation and electronic QA/QC procedures. GPS Technicians upload files and data nightly for the office project manager to run validations the GPS files. See a sample status report on the next page.

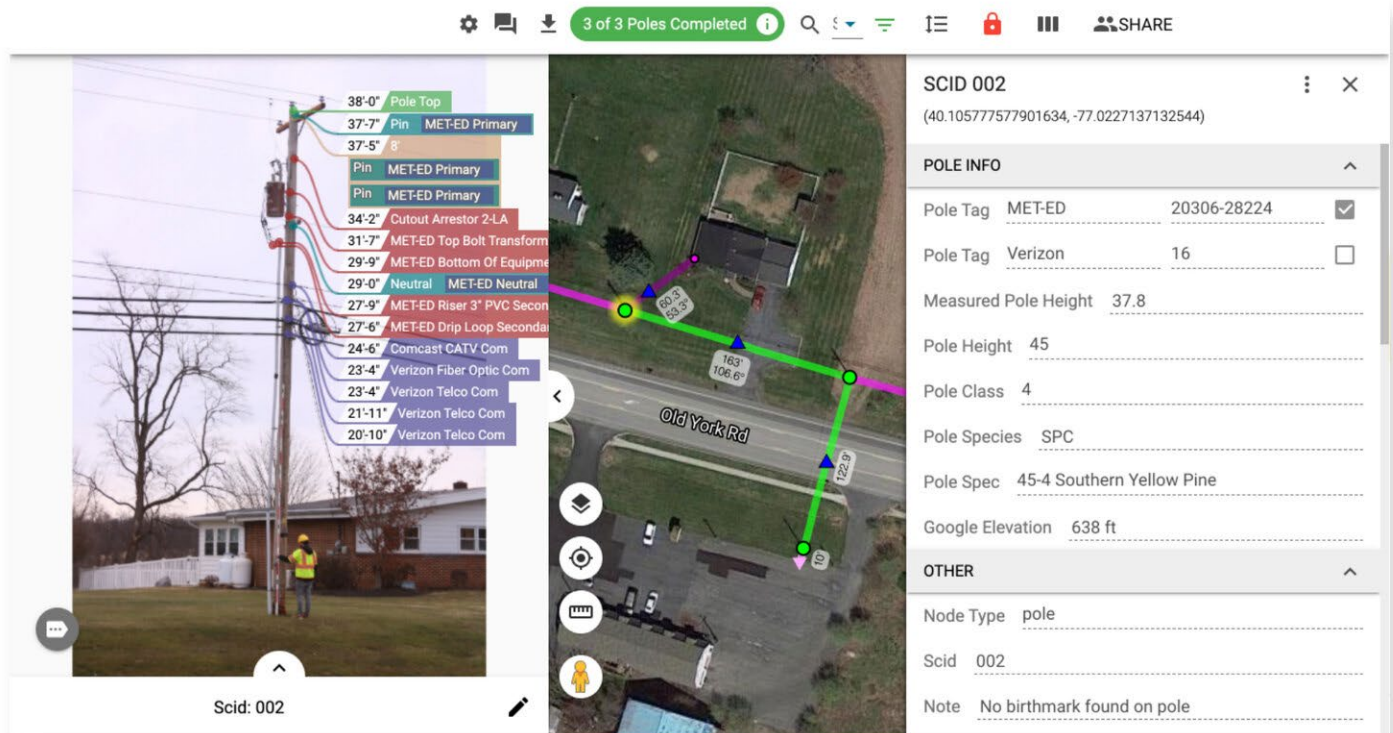
### Software

Davey Resource Group operates with the following software. This list is not inclusive of all software used at DRG:

Katapult	ESRI ArcView
SpidaCalc PLA	ESRI ArcIMS
ESRI ArcSDE	Trimble Pathfinder Office
ESRI Map Objects	Milsoft WindMil
Partner Software	MapWise GIS
NISC's MapWise Software	Microsoft Access
Oracle	Trimble Asset Surveyor
Patterson and Dewar's PDMaP	Miner and Miner ArcFM
AutoDesk ACAD	Microsoft Visual Basic
Trimble TerraSync	Partner Software

## Data Collection Equipment and Technology

The Katapult method uses a unique documentation process to facilitate data collection in the field with photographs. Developed for a safer, faster, more accurate way to document existing conditions, less time is spent at each pole while collecting superior data.



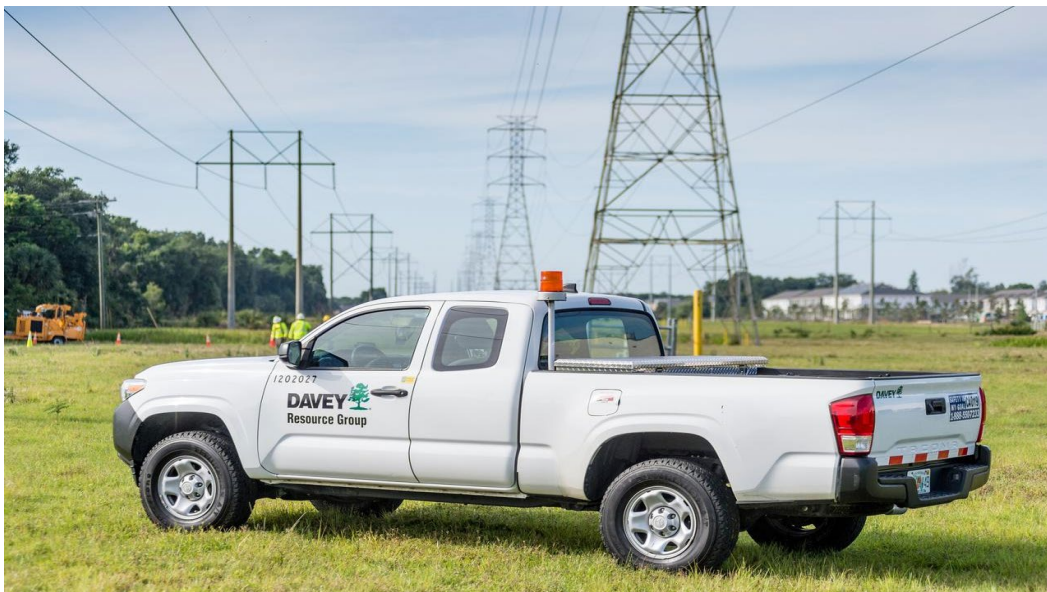
Katapult is a flexible solution for all data collection needs:

- Crews do not have to enter the power space to collect data, saving your team from potential liability and improving turnaround times
- Engineers can perform make ready engineering and pole loading analysis remotely, without ever leaving the comfort of their desk
- Collection follows standard scopes no matter the client; your permitting field crew can grab data for SPIDACalc analysis without switching workflows



## Company Attire and Vehicles

The team outfits its field staff with the best tools to perform the work at the highest level and work as safely as possible. Below is an example of a DRG team company vehicle.





## Summary of Tasks for MRE

The objective of VIWAPA is to increase the efficiency of the make-ready engineering process, **reducing the total timespan from make-ready to construction**. DRG personnel will assist by providing experienced personnel for data collection and engineering. The following are the key tasks that DRG will take part in, providing significant positive impact for VIWAPA:

- **Field Data Collection Services** – Field data will be collected during the inventory stage in order to verify and evaluate the serviceability of the pole for the intended attachments (loading, clearance, condition). DRG will provide experienced staff to perform data collection as well as the MRE services. Data will be collected in Katapult and go or no-go status will be determined. During this phase DRG will collect the required measurements that will allow DRG to perform the make ready and do the engineering and work order creation.
  - All pertinent information required for a pole inventory, safety/clearance, loading, and design standards inspection will be collected in Katapult. The data collected will be used to complete data collection in Katapult with an export to SPIDACalc for any loading that is required. This process includes visual inventory and measurement of attachments at the pole and at mid-span.
  - DRG will also collect GPS, full-pole images intended to capture key environmental and design conditions, and sketches of any important access or construction considerations.
  - A preliminary pole load analysis may also be performed at each pole. If a pole fails an initial load analysis, it can be routed into a more rigorous analysis/design workflow.
  - DRG's field engineer will also write up design alternatives in the field as noted. This provides cues to make-ready designers regarding design approaches and alternatives.
- **Make-Ready Engineering** - DRG will provide VIWAPA with an engineering design for each pole requiring it. The design will provide new pole attachment heights, as well as the heights for any rearrangement of current facilities. This task will involve several subtasks and will be guided by VIWAPA's business practices. DRG will operate inside of VIWAPA's MapWise system to develop the staking sheet - this is a fairly standard approach in the industry. If not, DRG can provide a suite of tools and solutions as a "standalone" approach. The general workflow of make-ready Engineering involves:
  - Design of remedies to VIWAPA standards.
  - Creation of itemized lists of tasks and materials - usually tied to the utilities work management system
  - Creation of construction prints depicting all make-ready activities. (Shape File or PDF)
  - Documentation of other work and costs (communications make-ready, permitting, easements, ROW preparation)
  - Coordination of any power make-ready with VIWAPA's construction resources.



Central to our approach to make-ready Engineering is our process documentation discipline. Tools and methods vary across our clients. We set up each program with a baseline of expertise in utility construction and design and we supplement it by building a project-specific procedures document. This document contains the methods and steps needed to sequence a project through the utility make-ready process. DRG will create a VIWAPA-specific Procedures Manual once awarded the contract.

Davey Resource Group is committed to helping VIWAPA achieve their timeline objectives. Our goal is to find solutions to the issues that impact the project timeline and eliminate bottlenecks in the process. We are confident in the benefits our team will provide and we look forward to the opportunity to collaborate on this project.

## Project Tools and PLA

**SPIDACalc** Should PLA be necessary or requested DRG would utilize SPIDACalc PLA software. DRG is basing our initial proposal on using SPIDACalc to perform PLA with any field calculations and desired NESC clearance inspections. This software also has the capability to provide critical reporting required by VIWAPA. It is important to note that DRG is very flexible and may work with VIWAPA to find a more appropriate solution as needed.

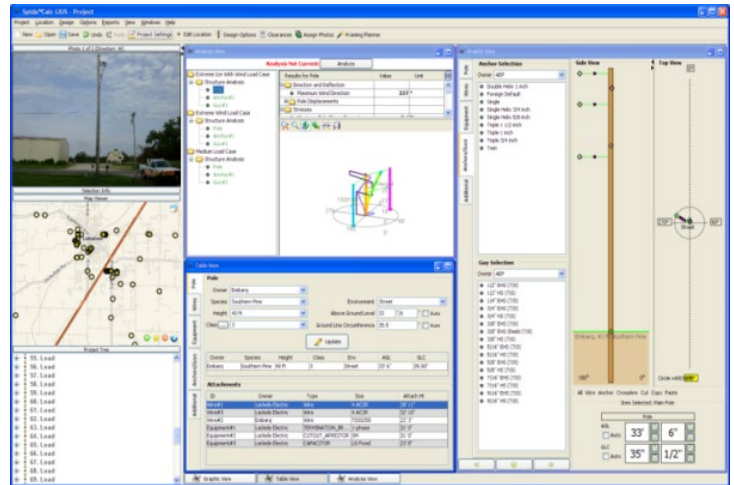
**SPIDACalc** PLA software is a field application ideal for tablet and laptop PCs. SPIDACalc is also for the office, but SPIDAWeb developers focused on the field technician when formulating the product layout. The software features a unique, easy-to-use interface combined with sophisticated and powerful pole engineering calculation capabilities. Results are easy to understand and graphically displayed on-screen.

The flexibility of SPIDACalc software allows it to be used in multiple ways. It can be used to screen a large volume of poles quickly, or it can be used to perform in-depth, detailed structural engineering analysis on individual structures.

By using VIWAPA's collected pole data and standards, SPIDACalc generates a solid, engineering-based analysis and facilitates remedy decisions. Highlights of this powerful and portable software include:

- Easily capture current attachment heights, along with proposed heights.
- Clearance evaluations at the pole and along the span.
- Evaluation of existing and new attachments.
- Remediation tools identify and summarize design modifications.
- Analysis of structure load and strength including guys, anchors, crossarms, and insulators.
- Remediation tools identify and summarize design modifications.

Existing pole, conductor, communication and guy conditions are recorded in SPIDACalc using an interactive 3D view. VIWAPA's construction standards can be used to build a custom client file that is loaded into SPIDACalc software. The software uses the data collected in the field including span lengths, guy lead lengths, pole attached equipment and line angles with the loaded tensions and assemblies to run a structural analysis on the pole based on the pole type, year and condition. Additionally, the software has the ability to set clearance requirements based on the users needed code requirements. When the clearance analysis is run in SPIDACalc, a report is generated to include any clearance violations based on data that is collected and recorded in the field.



## Production Reporting and Weekly Status Updates

DRG maintains weekly production reporting. This tool has proven valuable for ensuring work is completed within the time frame clients require. Combined with a documented quality assurance program, this gives DRG managers the capability to effectively manage projects.

Production reporting will consist of metrics, tables and graphs that support VIWAPA's efforts to monitor production. DRG will present a full suite of data points around all phases of work undertaken. While much of the metrics reported are fairly standard across make-ready programs (and are shown in figure 2); DRG will work closely with VIWAPA to define the content and presentation of reporting for this project. This happens at the project's kickoff. There will be a *Production Plan* developed at the beginning of the project. As the project proceeds, DRG will transmit production and status details weekly, along with a scheduled program call where progress, issues, and plans will be reviewed. Typically, in these calls, a time is set aside to have a full, application by application review of jobs at risk of missing timelines or experiencing unusual holds. This is a forum for informing and problem-solving.

Figure 2. Weekly Reporting.

Project Snapshot, 7-01-17: Current numbers for applications received, in-process and complete

[illegible]

## General Workflow Example

1. DRG Receives preliminary pole locations of all 1,000 pole locations
2. Projects are setup in Katapult and broken up into smaller sections for field assignments
3. Using Katapult, collect all data required for pole loading analysis and NESC/VIWAPA violation evaluations. This will include, but may not be limited to:
  - a. Pole class and height, GLC measurement where necessary
  - b. Wire sizes
  - c. Third Party Attachment identification
  - d. Equipment sizes
  - e. Attachment heights
  - f. Down guy/anchor sizing and lead length
  - g. GPS locations
  - h. Span lengths
  - i. Midspan heights
  - j. Pictures of poles and spans
4. Process data in Katapult
  - a. Calibrate photos
  - b. Wire identification and tracing
  - c. Photo annotation
  - d. SPIDAlcalc prep such as assembly identification
5. SPIDAlcalc analysis of the pole in its existing, measured condition
6. Evaluate pole to determine if there are any existing NESC/VIWAPA violations such as low ground clearances or safety zone separation violations
7. Determine recommended remedies for all identified loading, clearance and separation violations
8. Re-analyze pole to apply recommended remedies and determine class and height for any proposed pole replacements
9. Evaluate pole with any proposed third party attachment and determine and Make Ready work required to allow the applicant to attach, including additional pole loading analysis when required
10. Provide Excel Summary Sheet with all recommended remedies and Make Ready work

# PRICING

ID	MRE Process	Qty	2024 Price	UOM	Extended Price	MRE Service Description
1	Project Mobilization	-	-	Overall/ 1000 poles	\$3,000	Project Meetings, Crew Setup, Processing of a min 1000 poles.
2	Field Crew Mobilization	1	\$4,200.00	Per Trip	\$4,200	On an as needed basis per two man field crew. 100 poles in the field would take 2-3 days. Employees would fly in, field collect and fly back. If WAPA can keep work out in front of crews, flights will be for arrival and end of project departure.
3	Field Data Collection	1,000	\$60.84	Per Pole	\$60,837	Field data collection using Katapult including all data necessary for pole loading analysis.
4	SPIDAcalc Client File Build	32	\$77.33	Per Hour	\$2,475	One time charge at the beginning of the project to build out a client file needed for loading analysis.
5	Pole Loading Analysis	1,000	\$76.04	Per Pole	\$76,043	Perform Clearance, Structural, Strength, and loading analysis. Evaluation of Results and provide Make-Ready recommendations as needed.
6	Processing updates in GIS platform (ESRI/ArcGIS)	1,000	\$50.31	Per pole	\$50,313	Updating new data/pics unto GIS platform (shapefile, geodatabase, etc)
7	Additional Field Rate		\$126.93	Per Hour		Any additional field functions outside of scope.
8	Additional Design Rate		\$77.33	Per Hour		Any additional design functions outside of scope.

\*DRG team anticipates a 10-12 week schedule to complete the 1,000 pole project.

## Proposed Schedule

[illegible]

# STAFFING

The following section is intended to illustrate our proposed organization and the resources that we intend to mobilize. We also want to illuminate the access that VIWAPA will have one of the country's largest utilities services companies. DRG offers a solution with scalability, flexibility and organization.

- **Scalability** – DRG will build a modular organization that can be upsized or downsized depending on project volume demands.
- **Flexibility** – DRG will build a staff optimized to use trained and cross-trained roles to handle changing needs of the process (i.e., high volume of design release requiring additional staff to clear the backlog).
- **Organization** – everyone on the team will have a defined role and clear reporting arrangements. A multi-step process like the VIWAPA make-ready program requires clearly defined roles and reporting relationships.

## Position Descriptions

An effective engineering and design operation is built on defined job roles held by individuals with specific skills, training and assignments who each understand their roles and where they fit in the overall process. While individuals may specialize, the goal is to provide a career path that allows individuals to assume more responsibility for the overall process as they gain experience. The exact shape of the organization will be determined by the tasks and tools that are employed in the program. For the VIWAPA make-ready program, there will be an emphasis on engineers with field and design backgrounds, design specialists and business systems support specialists. Below are DRG project positions which will be integrated into the VIWAPA model:

### *Project Manager:*

Responsibility for overall job coordination and will be the chief liaison with VIWAPA. The Project Manager will become familiar with VIWAPA' make-ready processes, including permitting, customer relations, internal department operations and coordination, distribution design, business systems, and other related tasks, defined by VIWAPA' design procedures and other documents. Main functions of the Project Manager are:

- Process management, tracking, and reporting
- Staff management
- Financial tracking/invoicing
- Principal contact for VIWAPA

### *Designer:*

Designers are responsible for the bulk of the activity associated with incoming application packages. Designers perform pole load and clearance analysis and create remedies (make-ready designs). They will also be responsible for performing the steps involved in work order design and the work order design release. Designers will typically be proficient in distribution design and pole loading prior to joining the team at VIWAPA. Designers are expected to be trained on VIWAPA's construction standards and permitting requirements once onsite. Designers will also be proficient in following VIWAPA's documented design procedures.



### ***Field Technicians:***

Responsible for the field inventory and MRE data collection utilizing Katapult in the field. Field Technicians will also collect additional data elements needed to take care of any VIWAPA-required make-ready analysis and design. Most third-party applications do not include the detail needed to design make-ready solutions for power construction, nor do they contain adequate detail to evaluate the entire pole for clearance, loading, and standards. DRG Field Technicians are trained in overhead distribution and communications inventory and have targeted training to support the project's Designer team members.

### ***Design Coordinator:***

Responsible for communicating with external communications and power construction teams to review designs and facilitate understanding of any scheduling or logistical concerns that may be present. The Design Coordinator works in tandem with the project Manager to ensure that scheduled work is able to be completed. The Design Coordinator also works closely with the Design team to communicate feedback from construction teams on their designs so that future jobs are more effective and meet the needs of VIWAPA, the third parties, and the construction teams.

### ***Office Support:***

Responsible for assisting the entire team on project-related tasks. A critical function of this position will be to evaluate incoming applications for completeness and accuracy so that the applications can be assigned out for data verification and subsequent analysis/design. The Office Support position will spend much of the time supporting project tracking and communications functions, including project schedule updates, initial communications, project documentation, filing, project communications support, and general office tasks.

### ***Data Support:***

Responsible for maintaining and updating data systems used by the DRG project team (field collection tools, internal GIS and project management tools). The Data Support position will NOT be involved in support of VIWAPA's systems.

# SAFETY

The DRG team is firmly committed to maintaining a safe and healthful working environment. To achieve this goal, we have implemented a comprehensive Safety and Loss Prevention Program. It is designed to prevent workplace accidents, injuries, and illnesses. This Program is an Industry Best Safety program called “The Road to Zero.”

The Company’s goal is attaining Zero accidents through consistent reduction of accident frequency per 10,000 labor hours. DRG’s Safety and Loss Prevention Program is a commitment to ensuring that all employees understand the key role that they play in achieving these objectives. The primary purpose of the program is to ensure the safety and health of our workers, provide a safe and healthful work environment, and protect property from damage.



To ensure the safety of all personnel that will be performing work on the VIWAPA project, DRG will additionally define project specific safety requirements that will assist in meeting this goal. In addition, strict adherence to our Fire Safety Plan will be a critical part of our approach. These values are something that we strive for our employees to not only maintain on the job, but something that is internalized as part of their daily lives.

DRG maintains a complete Safety Manual that can be provided to VIWAPA upon request. (This document is more than 200 pages in length, so addition here was not practical).

Any instance where personnel safety becomes an issue, our HTA (Hard to Access) pole approach will be utilized. In severe cases, VIWAPA may be requested to provide security or personnel to assist in access.

For personnel in remote locations, the team has implemented the following procedures (these safety protocols are in addition to all standard safety protocols):

- Any personnel entering an area of inconsistent communications will coordinate call in/out times with immediate supervisory personnel.
- Supervisors will clearly identify daily all locations that may require these procedures.
- Supervisors will coordinate with VIWAPA staff responsible for each local area to understand any specific safety hazards that may be present.
- Any person not contacted within two hours of identified time will be reported to supervisor for an escalated approach.

## Personal Protective Equipment

A key component of preventing incidents is visibility and proper planning. Each employee will be clearly visible and identifiable to the public (see image at right). Proper attire is required at all times after exiting the vehicle. This includes full length pants (jeans are not acceptable), boots above the ankle, DRG approved shirt, and proper identification. DRG data technicians will have in his/her possession and wear the following personal protective equipment (PPE):



- **Class III Safety Vest** – While in the field, personnel will wear Class III safety vests any time work is being performed outside of the vehicle. This vest is worn due to the high visibility needed when working in close contact to heavy traffic and approved for use based on ANSI 107-2004.
- **Hard Hat** – While in the field and outside of the vehicle, personnel will wear Company issued hard hat that meets ANSI Z89.1, 2003, TYPE I, Class “E” & “G” standards.
- **Safety Glasses** – While in the field and outside of the vehicle, personnel will wear company supplied eye protection at all times. This eye protection meets OSHA standards for eye safety.
- **Field Employee Communications** – All personnel have cell phones and can be contacted where service allows. When an individual enters a known area that has no reliable communication options, we will use a “call in/call out” procedure, meaning each auditor will touch base with their direct superior upon entry and exit from these areas. Cell phone contact lists will be used as the primary tool for contact during emergencies. The Project Manager has an updated list of these contacts always. Each employee will call their direct Supervisor at the end of every workday upon returning from their respective field location as an added safety measure.

## Safety Tailgates

DRG supplies all field personnel with monthly Safety Tailgates which are supplemented with additional Asset Management specific tailgates as needed. These tailgates are held weekly with field personnel as part of the ongoing DRG and OSHA safe work practices and training requirements.

## Job Briefings

To avoid accidents on the job site, DRG auditors will plan and communicate with one another. Personnel participate in ongoing job briefings in compliance with DRG and OSHA safe work procedure requirements. Ongoing discussions as part of the job briefing:

- Error precursors observed during field visits.
- Practical steps in job completion.
- Potential on the job hazards.
- Action steps to avert the associated on the job hazards.
- Active encouragement of crewmembers to participate in job briefing.

- Answer all questions thoroughly and be certain crew members understand the answers.

All crewmembers must understand how to complete their part of the job assignment safely. They are not allowed to start a job until supervising personnel are assured this is the case. The term “job briefing” has been introduced in recent years; however, evaluating, planning and communicating have long been part of a DRG coordinator’s responsibilities and daily activities. Job briefing remains one of our primary tools for on-the-job hazard identification, training and accident prevention.

## **DRG Defensive Driving**

The DRG Defensive Driving Course (DDDC) is a key element of our driver safety education program. The goal of DDDC is to help you to defend yourself on the road, avoid collisions, and adjust driving to unpredictable conditions and, most importantly, how to save your life and lives of others through safe driving. Each driver is trained through the DDDC on a bi-annum basis.

## **First Aid/CPR**

This DRG First Aid Course is designed to provide first aid training specific to the DRG employee. The level of training provided by DRG is intended to meet the requirements set forth by the Occupational Safety and Health Administration (OSHA) and be comparable to standards set by the American Red Cross. All DRG vehicles are equipped with company supplied First Aid kit and 2.5 lbs. ABC fire extinguisher. All field employees are trained in the full DRG First Aid Course every two years and in CPR every year.

## **Hazardous Materials Training**

DRG’s Hazard Communication (HazCom) Standard Training Program is provided to field operations. The Program consists of eight written sessions, a video, and a Session #1 Test. DRG’s HazCom is united with Department of Transportation (DOT) Hazardous Materials Law HM-126F to form a HazCom and HazMat compliance package. To achieve compliance, employees are educated in the components of the Occupational Safety and Health Administration (OSHA) standard and trained in safe hazardous materials usage, handling, and transport. Each employee is certified as being trained in HazCom and HazMat by a valid and certified Instructor/Trainer. DRG’s monthly Safety Tailgates provide continuing education and training under the OSHA standard. All field employees are trained in the HazCom program on a two- year basis.

## **Electric/Communication Distribution Identification**

Each DRG field technician is trained in the identification of electrical and communication distribution equipment in the classroom and field environments. Each DRG field technician is trained in the identification of electrical distribution hazards as well as minimum approach distances. Stray Voltage training is also provided, to ensure that contact with unnecessary facilities are avoided, unless strictly described by the scope of work.

## **Vehicle Inspection**

Each DRG driver inspects his vehicle daily before its first use and the vehicle surroundings before movement (after being parked).

## Temporary Traffic Control

Each DRG field technician when parking a vehicle will use at a minimum the 3-cone taper traffic control system

## Company Attire and Vehicles

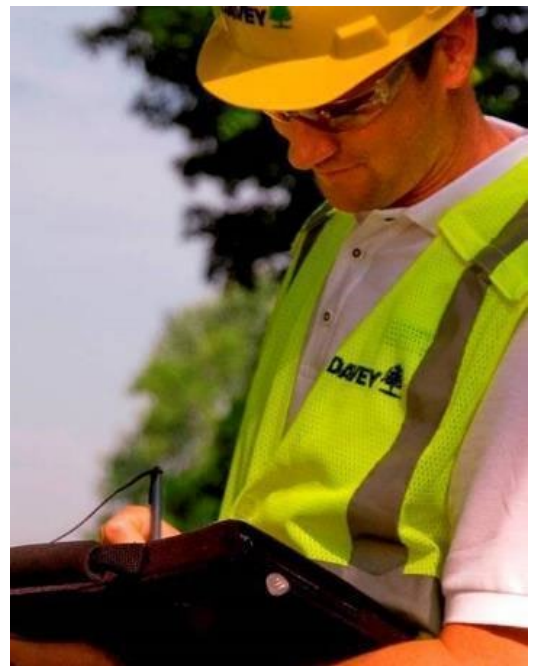
The team outfits its field staff with the best tools to perform the work at the highest level and work as safely as possible. Below is an example of DRG team company vehicle.

## Report Dangerous/Hazardous Field Conditions Patrol Inspection

DRG will report observed dangerous/hazardous field conditions to VIWAPA. “Urgent” field conditions are those occurrences where equipment or structures are broken or negatively impacted by an outside force (e.g., tree limb on conductor, broken crossarm, wire down, wire laying on a crossarm) DRG is providing an option to perform Patrol Inspections on this project.

When an “urgent” field condition is discovered, DRG will:

1. Immediately call the VIWAPA representative and report the problem. All DRG personnel will have the contact information of the VIWAPA representative.
2. Within 24 hours, DRG will submit an “urgent” field condition report to the VIWAPA representative.
3. The “urgent” field condition report will accurately describe the nature of the dangerous condition and precisely identify its location. The report will also state the name of the person who discovered the condition and his contact information.
4. DRG will keep a log of all “urgent” reports submitted to VIWAPA.
5. VIWAPA and DRG will define the “urgent” conditions during project startup. They will include items such as:
  - Large tree limb on primary conductor.
  - Primary conductor off its insulator.
  - Primary conductor laying on crossarm/bracket.
  - Floating conductors.
  - Broken crossarms or braces.



## Davey Personal Excellence

Davey Personal Excellence (DPE) is more than a safety initiative. It is a distinct way of thinking and behaving that helps reduce human error and organizational conditions that create situations where error is likely to occur. When applied to safety, DPE is designed to identify and mitigate these situations that greatly increase the risk of incidents. The overwhelming majority of incidents are caused or triggered by human error.

DPE is adapted from Human Performance Excellence principles that were developed in response to critical organizational incidents in the nuclear power and commercial aviation industries. These five principles are not safety specific. They apply to every aspect of the Davey Mission. “Always deliver a superior tree, landscape and environmental service experience to every residential, utility, commercial and government client.” The success of our mission depends on four key values of our culture: our safety, the quality of our service, our productivity and the client experience that we face every day.

DPE Principles:

- People are fallible, even the best make mistakes. It is important to understand we cannot eliminate all errors. We can, however, reduce the frequency and impact of errors.
- Situations that are likely to result in error are predictable, manageable and preventable. Things like time pressure, distractions, stress and poor communications skills are error precursors that can create situations ripe for error to occur. Enhanced awareness of error precursors allows us to adjust behaviors and conditions to reduce the likelihood of error.
- Individual behavior is influenced by organizational pressures and values. Our Espoused Values are tested every day against our Values-in-Use. Any gaps between our espoused values and values in use put our mission at risk.
- People achieve high levels of performance based largely on the encouragement and reinforcement received from leaders, peers and subordinates. High performance cannot be achieved without discretionary effort (effort beyond the minimum we need to get by). This is a key leadership concept. People cannot be threatened or punished into providing discretionary effort. Discretionary effort can only be elicited by encouragement and positive reinforcement of desired behaviors.
- Incidents can be avoided by understanding the reasons mistakes occur and applying lessons learned from past incidents. A key component of high performing organizations is a “Just Culture” or “an atmosphere of trust in which people are encouraged, even rewarded, for providing essential safety related information, but in which they are clear about where the line must be drawn between acceptable and unacceptable behavior.”

Safety is created every day by people negotiating between safety and the other values of our organization in actual operating conditions. Davey Personal Excellence is about leadership and helping people make good decisions in all of our offices and all of our job sites.

## **Accuracy Statement**

DRG will conform to a 97% accuracy rate per circuit. The accuracy rate will be calculated based on the total number of attribute errors to the total number of attributes. That rate will be 97% per circuit. If the circuit fails, the accuracy rate DRG will be notified, and DRG will review errors with VIWAPA and review an additional 5% of the features on that circuit.

## **Billing and Invoicing Processes**

After a completed circuit's data is delivered, an invoice is prepared and sent to VIWAPA. VIWAPA will have 30 days to review the data. Once the data is accepted, or 30 days has passed, a final invoice will be generated for VIWAPA for that substation. Our experience has been that invoicing upon delivery and acceptance of work is the most efficient process. Net is due 30 days.

## **Reconciliation and Error-Checking Processes**

By holding the invoicing for 30 days after delivery and acceptance, reconciliation processes related to invoicing should be kept to an absolute minimum. If there is a need for reconciliation, the corrections will be made to the next invoicing.



# APPENDIX A

## DRG'S ACCESS TO OTHER COMPANY RESOURCES

Davey Resource Group offers VIWAPA access to several closely related services in the utilities industry. The breadth of allied services offered by Davey Resource Group and The Davey Tree Expert Company is unique to our proposed solution when weighed against the capabilities of most consultant or engineering services firms. This access gives VIWAPA considerable assurances of scalability and flexibility if program demands evolve or increase.

The make-ready program at VIWAPA is deeply integrated with many of the other business units and programs that make the utility function effectively on a daily basis. One example of this integration is the involvement of the ROW department. As a part of the design process, Foresters are involved when tree trimming is required. In the event of large projects involving intensive involvement from forestry or line clearance resources, DRG can access a large pool of experienced utility foresters and line clearance crews/equipment from within our organization. This type of “vertical integration” in DRG offers VIWAPA the ability to scale up quickly and use only the extra resources needed for the times required.

DRG has focused on becoming an integrated utility services company that focuses on assisting our utility clients with services covering all aspects of the business, from data collection and systems maintenance (GIS and mapping) to engineering, facilities inspection, process management, construction, and maintenance. Specific to the make-ready program at VIWAPA, we can identify the following Davey Tree/DRG business units available to support and enhance the process for VIWAPA:

### Pole Attachment Transfer and Pole Removal

In response to the needs of our clients who must manage pole attachments, DRG provides a turn-key solution for the issue of two-pole conditions. DRG will identify and inventory locations where a two-pole condition exists, contract with attached parties to complete the necessary transfers, remove the old pole, and bill all the attached parties. In addition, DRG will ensure that the pole owners' and attachers' records systems are updated to reflect the removal of the two-pole condition.

### GIS Services

Geographic Information Systems (GIS) have become integral to the operation of many utilities. Aside from mapping, GIS powers critical operations support systems in a utility. DRG employs GIS technicians, analysts, and managers with professional backgrounds. These professionals are experienced in designing GIS databases, deploying applications, and using the technology for producing analysis and map products for a variety of end uses.

### Pole and Facility Inspections

As part of our right-of-way management services, DRG performs visual, infrared, and radio frequency inspections for any damaged, broken, missing, potentially hazardous or otherwise non-serviceable facilities. Inspection services also can include internal, external, and ground line examinations through traditional methods or the latest resistance and density measuring technologies.



## Utility Forestry

Many utilities in the United States rely on Utility Foresters provided by Davey Resource Group. Contract Utility Foresters are in service as turnkey “forestry departments” or are employed on special projects to assist utilities with special projects. DRG Foresters support work planning, landowner notification and community education, program evaluations, Quality Assurance, and regulatory compliance reporting and documentation. DRG maintains Utility Foresters throughout the US, including Michigan.

## Environmental and Civil Engineering

Wetland Studies and Solutions (WSSI) is a professional engineering firm that joined the DRG family in 2014. WSSI has worked on over 5,000 projects, focusing on land use, restoration and regulatory requirements. The team of 90+ engineers, scientists, archeologists, ecosystem technicians, GIS/survey/compliance and technology/training specialists yields a unique combination of disciplines and provides creative solutions for integrating the constraints of economics and land plan requirements with local, state, and federal environmental regulations.

## Utility Vegetation Management

The Davey Tree Expert Company is an industry leader in Right-of-Way vegetation management and line clearance. Davey leverages state-of-the-art equipment and technology to operate safely and efficiently. In addition to “blue sky” VM services, Davey crews are considered front-line responders in the event of a storm. Our large fleet and national presence mean that Davey crews are available to assist on large or small projects—planned and unplanned.

# APPENDIX B

## ASSET MANAGEMENT ACADEMY

The Asset Management Academy is a 5-day training program specifically designed to introduce new employee to Davey's history, culture and safety decree. It is also a place to educate and cross-train individuals moving to new service lines and emerging leaders looking to get a well-rounded perspective of what Davey Resource Group has to offer. It is an opportunity for all participants to meet corporate employees and visit the Davey Institute and corporate headquarters.

Day 1 – Safety and Compliance - Employees are educated and tested on Hazard Communications, Defensive Driving, First Aid & CPR. They are provided with personal protective equipment and road tested.

Day 2 – Davey 101 – Employees are educated on Davey's history, culture and corporate safety mandate. They are introduced to what we do as a division, who's who within the company and briefed on the various career paths.

Day 3 – Overhead Facilities Recognition & NESC Basics- Employees are introduced to the power grid and how it works. They learn to identify electrical and communication facilities and their functions. They are also introduced to the National Electrical Safety Code. What it is, why it's important and how we use it.

Day 4 & Day 5– Service Line Bootcamp. This is a two-day introduction into the service line that employees are working on. It introduces the employee to the various tools and software that is commonly used.

- make-ready Engineering – Students are introduced to various methods of pole data collection, pole loading, pole design and remediation, work-order creation, easement requisition and make-ready construction. They are also introduced the National Electric Safety Code and how that impacts make-ready all aspects of make-ready Engineering. Students get hands on experience with ikeGPS 4 and are Hastings Rod certified. They also perform guided pole loading and design work with tools like SPIDACalc and Pole Foreman.
- Field Verification, Inventory and Join Use – Students in this service line focus extensively on both overhead and underground facilities recognition and how to identify equipment and wires for electrical and communication companies. They are educated on Phase orientation, the flow of power, various equipment types, pole information and wire sizes They are exposed to the various tools used to do this work (Avistar – Phasing, Collector, Clearion and Rover for Data Collection, Trimble for GPS collection).
- Inspection Services - Students in this service line are introduced to the various methods of pole inspections (Visual, Infrared Analysis, Exacter, Resistagraph, Underground Padmount Transformer, Ohms Grounding Testing Repairs). They are educated on industry regulations and why the services are important to our clients. They are given hands on experience with tools used to perform the work (Exacter, IR Cameras, Resistagraph IML Drill, Ohms Reader) and trained on the various programs to collect, compile and report the data.
- Construction Services -Students in this service line are introduced to the various types of construction services we offer (Double Wood, 3<sup>rd</sup> Party Transfers, make-ready Work (BAU), Fiber Build Outs and Underground Fiber Construction. Students get hands on experience with various field tools to complete the work and software tools to collect, analyze and report results.