

**GRAND VALLEY ENGINEERING SOLUTIONS LLC
ELECTRICAL ENGINEERING/SOFTWARE**

2961 CIRCLING HAWK COURT
GRAND JUNCTION, CO 81503

P: (970) 256-0353 F: (970) 245-6319 C: (970) 778-8558

Grand Valley Engineering Solutions LLC – The Company

I formed Grand Valley Engineering Solutions (GVES) in 2002 during my last semester as a student in Computer Science at Colorado Mesa University. I had two goals with the new company. My first goal was to resume my 30 year career as an electrical engineering consultant, and my second was put my computer science degree to use developing electrical engineering software.



Our primary business is the design of lighting, power distribution, communication, and alarm systems for residential, commercial, and industrial buildings. In addition, with the launch of our website, we are offering to license our first commercial software application, our 'Loads' program. Although we are small, with just two permanent employees and operating out of a home office, through associations and subcontracts with other engineering and CAD professionals, we

have successfully completed building projects in excess of 100,000 square feet.

GVES is a Limited Liability Company registered in the State of Colorado with offices located in Grand Junction. We are fully insured, maintaining \$1,000,000 in Errors and Omissions coverage, as well as General Liability, and Workman's Compensation. We are licensed to practice electrical engineering in Colorado and the adjacent states as well as Massachusetts and California. We are equipped with 3 Pentium 4 work stations, each having phone, fax, cable, and broadband internet connections. The work stations are networked together to a UPS backed server with a hardware firewall, and mirrored striped (Raid 10) hot swappable hard drives.

We back up using 25 GB blueray DVD's. Progress and design team coordination prints are produced in-house using our networked HP Design-jet 800 ink-jet plotter.

On the engineering side, we have two licenses for AutoCad 2012. Project specifications are produced using the MasterSpec program. Panelboard, and mechanical equipment schedules are produced using our 'Loads' program. Lighting fixture and wiring device schedules are produced using other in-house developed software. Point-to-point lighting analysis is done using Lithonia's Visual program. Short circuit analysis is done using Bussman's short circuit program. Breaker coordination is done using Siemens graphical breaker coordination program, and cost estimating is done using Means CostWorks 2011.

On the software development side, we are writing in Visual C++ and Visual Basic using Microsoft's Visual Studio development environment, and AutoCad's AutoLisp program extension. Our website was written using Microsoft's Expression Web 4, and Adobe's Photoshop CS3 graphics application.

Engineering Philosophy:

Because there are always engineering trade-offs in the design of a building, and because we aren't spending our own money, we feel that the first step in any successful design project is to find out the things that are important to the owner. Is he concerned with achieving the lowest first cost? Is he more concerned with energy use, maintenance costs or life cycle costs? Is he concerned with projecting a certain image, or with using cutting edge technologies?

When we have an understanding of the owner's priorities, budget, and the electrical systems which are to be included in the design, our preferred approach is to prepare a set of design development level drawings showing every light fixture, switch and receptacle, and review these drawings on a room by room basis with the owner and architect. We feel that this is the best way to fine tune the design, and obtain the owner's acceptance.

The industry seems to be diverging toward two philosophies when it comes to the production of construction documents. One philosophy I'll call "less is safer" contends that the less you say in the documents, the less chance there is of being accused of having made a mistake. The other philosophy which I'll call "more is better", and the philosophy that I subscribe to, holds that the more information you put in the documents, the better your control is of the final product.

Under the "less is safer" philosophy, design fees can be lower but the contractor is in control and often times even he isn't sure what the final product will look like. Under the "more is better" philosophy, the design fees can be a little higher, but the construction phase generally is smoother and the final product more controllable.

Under OUR "more is better" philosophy, we try to minimize the additional design fee through the use of data base programs to generate lighting fixture and wiring device schedules, and object oriented software to generate panel and equipment schedules. We have also developed a method of showing circuiting and switching using "room keys" and "device tags" without showing conduit. In general, the "room key" defines all of the devices in a given room. Exceptions are handled using "device tags". Examples of each are shown on our web page. This approach makes the inevitable design changes much easier and less costly.

Software Design Philosophy:

We believe that engineering software should be intuitive, easy to use, flexible, and designed in a manner that limits errors. Because we are primarily an engineering company, the software we produce is geared toward efficiency in the production of contract documents. Also, because we are engineers, our software must be flexible enough to easily allow us to change both individual circuit breaker panels as well as the interconnections of those panels. Finally, because engineers don't like to type and we really don't like to make mistakes, we have made extensive use of pull-down menus, lists, and check boxes in our software.

All calculations and configurations are automatically saved, and all automatic sizing may be overridden by the engineer. In fact, every time a circuit breaker panel is loaded in memory, the system automatically determines how each of the panels is interconnected, reloads equipment and panels whose loads have changed, and reflect those changes throughout the distribution system. This also may be overridden by the engineer. Panel feeders and equipment branch circuits can be changed manually then locked by the user.

Finally, the schedules that are generated have been purposely been configured to optimize space usage in a 'D' size sheet. Three panel schedules or one equipment and one panel schedule fit perfectly in a single row on a 'D' size sheet.

Personnel:

The greatest asset of any company is its people. I believe I have assembled a support team that is intelligent, hardworking, educated, and a team that possesses a great deal of knowledge about the intricacies of the electrical consulting business. And best of all, they are fun to be around.



Kaye Buxman

Katy has been my office manager for the past 10 years. Her responsibilities include running QuickBooks, billing, payroll, government reports, filing, and special projects. She understands that a major percentage of her work is tedious, and that's why they call it work. She manages to meet all of her obligations in less than a day each week, and the rest of the time, she has a life. I look forward to Wednesdays because that's the day Katy works, and that's the day I find out what people who don't work all of the time do for fun.



Karen Theobald

Karen came to work for me in the early 1980's with a drafting school certificate, a little drawing experience, a calm intelligence, and a strong desire to learn and work. We picked up computer aided design together experiencing the heartache of clogged plotter pens, interminable drawing regens and floppy disk back-up failures. She was a willing partner (read guinea pig) whenever I needed someone to test new software, and complained the least of them all. After 30 years of working together on literally thousands of projects, she is an excellent designer of lighting and power distribution systems, and can operate AutoCad faster and with less effort than anyone I have seen.