

# THE INNOVATOR

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## DOCUMENT YOUR BUILDING

Wading through countless amounts of renovation drawings and project manuals trying to find the most up-to-date as-built documents? Wouldn't it be nice to have it all in one place? Are you in an older building which lacks any proper documentation? Wouldn't it be nice to bring your building into current times? It has been our experience that the older the facility, the closer that institution is to losing a substantial amount of knowledge of their building(s) be it with the retirement of a maintenance lead or building administrator. How do you prepare for an upcoming renovation that requires complex phasing of systems to keep your building operational without any current documents? It's hard to keep track of all the changes your building has experienced over time. We can help with that. Thus, our existing systems documentation services has become a substantial part of the portfolio, intertwined with our assessment, design, and construction support services.

As you might imagine, existing systems documentation can cover a lot of territory. Existing systems documentation can include architectural, structural, civil, a number of mechanical, electrical, and plumbing (MEP) systems, etc. However, the focus of this discussion is that related to how we document the electrical service and distribution systems serving a facility. Documentation of existing electrical service and distribution systems can include varying levels of information and can be customized for its intended use. Typically, the use falls within three (3) general categories, all of which are important to any facility. These categories include the following: *(Continued on Page 2)*

See Cameron Labunski, P.E. at the AIA Austin Building Enclosures Council (BEC) Meeting

APRIL 2, 2014

2-1pm | @ Center for Architecture

Topic: Building Envelope Design And The Impacts On HVAC Design/ Energy Calculations - A Look At Your HVAC Engineers' Assumptions Through Industry Load Calculations And Other Metrics

Reservation: Click [HERE](#)



american institute of architects

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## CAT 1

**Survey and Documentation for Owner's Operational Use:** This task provides a complete riser (or one-line diagram) along with floor plans indicating equipment locations/sizes/ratings, feeder sizes, etc. of the entire electrical service and distribution system (normal and emergency power). In general, these survey and documentation efforts provide as-builts of the existing service and distribution systems.

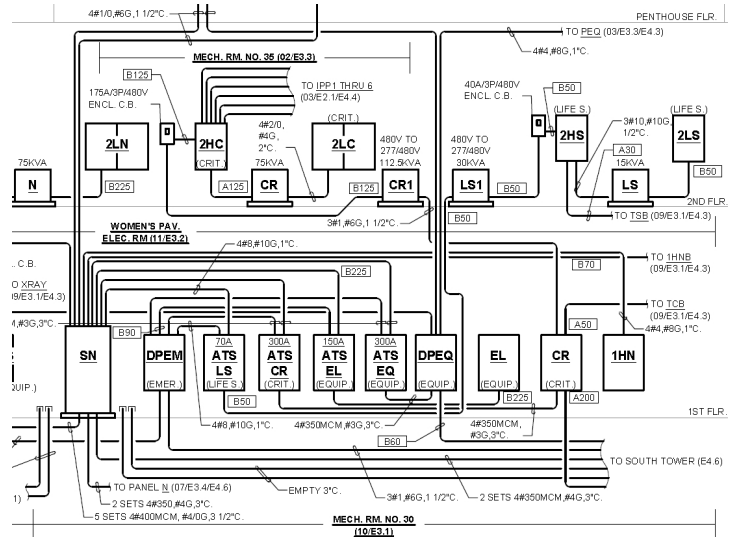
Having a complete riser (or one-line diagram) of a facility's electrical service and distribution system in a single set of documents is highly valuable to facilities engineering and is critical to its day to day operations.

Large health care, higher education, institutional, etc. facilities are continuously undergoing renovations and expansions. It is difficult for anyone (including facilities engineering) to keep up with the constant changes. The challenge we as engineers and the Owners run into is that you are faced with a plan room full of documents for these various projects that change/add to the distribution systems, none of which include the complete and current system as is.

Mulling through various sets of documents and putting a time line together to identify a starting point with the latest and most current information is tedious and time consuming for a design team. Even more important are the critical situations that can occur within the electrical systems requiring immediate attention from facilities engineering. Hence a complete set of current electrical service and distribution system documents are a must for any facilities operations group.

When performing these survey and documentation efforts, we find the best approach is to team up with the Owner's electrical staff from start to finish as this approach familiarizes the Owner's personnel (as well as the electrical engineering team) with the entire system. It is rare to find a group of electricians, Engineers and/or Owners that are familiar with the entire electrical system. However, once the survey and documentation efforts are complete, the team is better prepared for situational issues on site and for future renovations and expansions.

The completed documents are typically provided to the Owner in hard copy (full size and half size) along with electronic (PDF and ACAD) formats. The intent is that the Owner (or the Engineers) will then modify/edit the current documents as changes occur. *(Continued on Page 3)*



"The Electrical Distribution Documentation has been an invaluable aid to CMC in reducing labor cost associated to finding feeder, branch circuits and panel-boards. No more wondering where the master switch is, what amperage, voltage or wire size. It is all there for the viewing. Paid for itself in less than one year."

**- TOMMY PULLIN, DIRECTOR OF ENGINEERING, CITIZENS MEDICAL CENTER**

"Over the years we have counted on [TGCE] to design our electrical, mechanical and plumbing systems for the many projects we have completed at our hospital. [Their] on site analysis in preparation for the work eliminated many of the problems we have had with other firms."

**- JULIAN CERVANTES, DIRECTOR OF PLANT OPERATIONS, MPMC**

## CAT 2

Survey and Documentation for Coordination, Short Circuit and Arc Flash Studies: In general, these survey and documentation efforts expand on that indicated above in Category 1 to include additional information required to perform the studies.

The additional information obtained and documented generally includes manufacturer/model numbers of equipment, circuit breaker/fuse information and settings, AIC ratings, voltage/ampere ratings, feeder conduit/conductor types, feeder lengths, etc. and is typically documented in a one-line diagram format. It is important to have the Owner's electrical staff work with well qualified consultants during the required survey work.

The National Electrical Code (NEC) requires that all distribution systems be properly rated/coordinated and that arc flash labels be affixed to equipment requiring examination, adjustment, servicing, or maintenance while energized. It is not uncommon to find that existing service and distribution systems within existing facilities are not properly coordinated to minimize the effect of a fault and/or rated for available fault currents. Nor is it uncommon to find that arc flash labels are not affixed to the equipment. Hence, the survey and documentation efforts required to perform these studies are a critical step for a well documented electrical system.

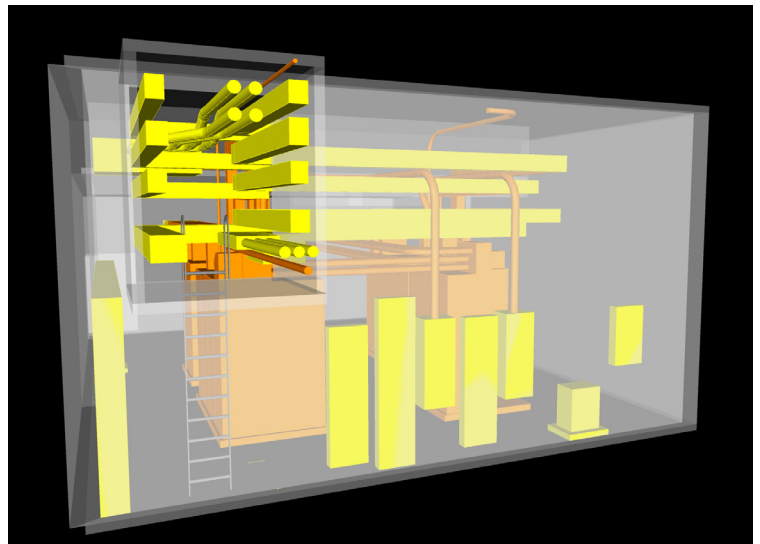


## CAT 3

Survey and Documentation for Contractor's Use: The documentation efforts for contractors' use typically includes 3D modeling and layouts of mechanical/electrical rooms, utility tunnels, etc. and can be great time savers in submittals and construction phases of a project. In general, these survey and documentation efforts include only those areas involved in the scope of the project and expand on that indicated above in Category 1 to include additional field measurements of equipment, feeders, bus ducts, etc. as required for 3D modeling.

The 3D modeling and documentation is performed not only for the contractors' use in submittals and construction but allows the Engineers to confirm designs will fit within the available spaces and to perform clash detection.

We continue to see more and more contractors (and manufacturers) utilize 3D platforms in preparing their own shop drawings/submittals. Properly prepared 3D drawings by the design team can save time and dollars during the construction. If the 3D design drawings are created in collaboration with the contracting team (where procurement methods allow), often the 3D design drawings can be turned into fabrication documents with only a small incremental amount of effort.



In closing, I must say that it has been very satisfying to receive the positive feedback from Owners and Contractors that have put our survey documents to use. We are excited about those projects previously completed and look forward to those in the future!



### *About the Author:*

*John Davidson (JD) has more than 36 years of experience in electrical design and construction. He's held Journeyman, Master Electrician, and Electrical Contractors licenses in major cities in Texas and is currently licensed as a Master Electrician in the state of Texas. Along with his experience, JD brings special expertise to the team in matters of constructability, cost control, and schedule maintenance. JD is an owner in TGCE, and also serves as Vice President.*

# TGCE LIFESTYLES

"Nothing in the world can take the place of Persistence. Talent will not; nothing is more common than unsuccessful men with talent. Genius will not; unrewarded genius is almost a proverb. Education will not; the world is full of educated derelicts. Persistence and determination alone are omnipotent. The slogan 'Press On' has solved and always will solve the problems of the human race."

- CALVIN COOLIDGE



Photo courtesy of CROSSFIT CENTRAL

**TOM GREEN ON FITNESS/HEALTH** This article is adapted from one written in the [CrossFit Central](#) community regarding the influences of fitness on everyday lives. For the original version, please click [here](#).

Preface: I'm not preaching. Much to the contrary, just relating some of my own "lessons learned." I have tried to stay reasonably active since my mid-40's, which is about when the priority obligations of family, faith, and 15 years into a start-up business allowed a couple of hours a week for fitness stuff. But it wasn't until the mid-50's that I began to give serious attention to the nutrition.

Once I started to pay attention to the nutritional side of the fitness program, the health part of the fitness equation improved. I'm going way out on a limb, here... one of those "knock on wood" things, but I haven't missed a day of work due to illness in somewhere around 6 years. I'd never had even one year without illness in the entirety of my career before. Better nutrition begets better health results.

Besides fitness and nutrition, however, there's another important ingredient I've learned. It's called fun. So, find something you enjoy. I try to stay active (currently CrossFit in my case) because I really really really like to! The positive energy, the community of regular folks just trying to improve themselves, the stellar instruction...all adds up to inspiration. I had intended to just try to slow the decline of the years, and have discovered that, even at this stage, it is entirely doable to maintain and even improve one's fitness level. Of course I know that is not an indefinite situation, but I am grateful for this period where it is occurring. It is the entire community that creates this environment.

Mom always reminded my brother and me when growing up that our body were temples, and that we should treat them as precious gifts and keep them strong so we could use them for good. While for sure there are no guarantees of how we might get to use this temple in our lives, trying to keep it prepared and versatile and able, as best we might, I believe is consistent with Mom's Biblical reminders. Mom also said one of the best gifts parents can give to their children is to do what we can to be healthy. As she has been a great example in that area, I figure I should learn from it. Dad has always said never stop improving. It's a key to worthwhile living. And never means never. Never quit. Never give in. And help others to do the same. All you can.

Heidi. The greatest tribute goes to her. The inspiration for all I am and the credit for any success I may receive really belongs to her. The greatest earthly gift a fellow could ever receive. *Tom Green, P.E. - Principal Engineer*



## TOM'S TRIVIA

1. What are the names of 10 human body parts that are only three (3) letters long?
2. From what classic movie did the line "so, how much do you think I can bench press?" originate?

\* All "close to correct" responses will be pooled, with a winner drawn and awarded a \$25 gift card to The Home Depot.

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Check our website at [www.tgce.com/news/newsletter](http://www.tgce.com/news/newsletter) for results.