



ELECTRICAL DESIGN IMPROVES FIRST RESPONDER AND HEALTHCARE COMMUNICATIONS – ENERGY-EFFICIENCY A PRIORITY

By John Whitcraft, PE, CLD, LEED AP BD+C, President of [Whitcraft Engineering Solutions, Inc.](http://WhitcraftEngineeringSolutions.com)

Los Angeles is home to nearly 4 million people and also home to Dodger Stadium, L.A. Memorial Coliseum, Griffith Park and Griffith Observatory, Walt Disney Concert Hall, The Getty Center, Hollywood Walk of Fame, and multiple professional sports teams that draw thousands of spectators each year. LA seems to offer something for everyone – including challenging and fulfilling design work for those of us in the construction and design industry.

Los Angeles Regional Interoperable Communications System (LA-RICS)

I'm honored to have contributed my electrical design services for several LA-based projects by upgrading the radio and broadband communications for first responders across Los Angeles County. I was the engineer of record for the design of cellular radio power at three hospitals in Los Angeles and multiple police and fire stations.

Cell Towers Improve San Diego Hospitals' Communication

Currently, I'm designing cellular base transceiver stations to be installed at four hospitals that are part of Scripps Health: Scripps Mercy Hospital Chula Vista, Scripps Mercy Hospital San Diego, Scripps Green Hospital Radiation Therapy Center, and Scripps Memorial Hospital Encinitas. The project team includes hospital maintenance staff, Crown Castle (antenna system owner), Mitchell J Architects, and Whitcraft Engineering Solutions, Inc.

Previously, cell phones were prohibited inside hospitals for fear of disrupting hospital communication/telemetry to patient equipment and nurse-call systems. With the introduction of safe areas for antennas and associated equipment, disruption is no longer a concern.

The project requires the installation of small cellular antennas within common areas of the hospitals. A number of Omni/Panel antennas and associated equipment will be installed legally-specified areas.

As a result, the cellular base station is communicating with subscriber cell phones and directing them to transmit with sufficient power to be received without blocking other subscribers' signals. By placing antennas inside safe areas of the hospital, subscriber phones will transmit with lower power when used near the new antennas in the hospital.

Cellular providers place their new equipment in a hub where hospital Wi-Fi, computer, and telephone equipment already exist. The providers then connect to the new distributed antenna network. The system is coordinated with competing cellular companies using the same antenna system.

LEED Projects – Path to Energy-Efficiency

Many Los Angeles-based organizations are highly committed to energy-efficiency in their construction, expansion, and remodeling projects. With my LEED (Leadership in Energy and Environmental Design) AP BD+C credentials, I am recognized as an expert in energy-efficiency. The AP BD+C designation is an advanced accreditation for LEED experts who are knowledgeable about and actively working on green building and LEED projects and is a professional accreditation program overseen by the [U.S. Green Building Council](http://U.S.GreenBuildingCouncil.org), which is also responsible for certifying LEED-eligible buildings.

To achieve LEED certification, a building project earns points by adhering to prerequisites and credits that address carbon, energy, water, waste, transportation, materials, health, and indoor environmental quality. Projects submit to a verification and review process by [Green Business Certification, Inc.](http://GreenBusinessCertification.com) (GBCI) and are awarded points that correspond to a level of LEED certification.

LEED-certified buildings in Los Angeles include [University of California Los Angeles](http://UniversityofCaliforniaLosAngeles.edu), the [AON Center](http://AONCenter.com), and recording center [Cherokee Studios](http://CherokeeStudios.com).

California Leads the Nation in Clean Energy Projects

The [California Energy Commission](http://CaliforniaEnergyCommission.com) states, "California is leading the nation toward a 100 percent clean energy future and addressing climate change for all." The Energy Commission develops and mandates programs that use renewable energy, offers incentives for energy technology installation and renewable energy grants, and ensures that the efforts benefit all Californians.

In addition to encouraging energy-efficient commercial buildings, California is now rewarding home builders who chose all-electric systems and appliances, instead of gas. Recently, [the Building Initiative for Low-Emissions Development \(BUILD\) Program](http://theBuildingInitiativeforLowEmissionsDevelopment.org) was developed to reduce greenhouse gas emissions and expand access to affordable all-electric buildings to include those most vulnerable to pollution and climate change. "Buildings are a major contributor to California's [greenhouse gas] emissions, emitting a quarter of the state's GHG..." states a [March 2022 press release](http://March2022pressrelease.com). "Programs like BUILD are essential to moving the market on new climate solutions while ensuring all Californians benefit through targeted investments," according to CEC Commissioner J. Andrew McAllister. A few details on the BUILD program include the following:

The [BUILD](http://BUILDprogram.com) program design was developed by the CEC in collaboration with the California Public Utilities Commission and is based on extensive stakeholder engagement and input.

Incentives are limited to \$2 million per applicant. Applicants must be constructing new single- or multi-family homes in which

Honoring Our Warriors

With a mission to create safe and beautiful cottages for injured military veterans the [Warrior Foundation Freedom Station](http://WarriorFoundationFreedomStation.org) was founded in 2004. I volunteered in 2016 to be part of an electrical design project at the original WFFS campus on 28th St. in the Golden Hill neighborhood of San Diego, which was officially dedicated on May 29, 2020 ([Warrior Foundation Freedom Station II](http://WarriorFoundationFreedomStation.org)).



Affectionately known as The Home of the Brave, this remodeled group of cottages, circa 1920, supports the mission to help United States warriors [successfully progress](http://successfullyprogress.com) from military service to civilian life. One cottage was dedicated to my wife and me with the official designation reading: "This cottage made possible by the generosity of John and Connie Whitcraft, Whitcraft Engineering Solutions, Inc." because of my pro-bono electrical design work on Freedom Stations I and II.

Electrical Design Work – The Details

I designed and negotiated the details of the electrical specifications, working with two architects and two general contractors on Freedom Station II. After measuring and taking notes on my initial site walk, I created an electrical sheet for site information, one sheet for power connections to each floor of the cottages, a single line (schematic) diagram, power load calculations, panel schedules, lighting layouts, power layouts for each cottage, Title 24 energy requirements documents, general notes, and an SDG&E power service request form. The main issue was complying with the California Electrical Code, Title 24 and the California Green energy codes, while keeping equipment costs affordable. Fortunately, my years of experience served me well. I am especially proud of advancing fire protection and electrical safety in these remodeled buildings that have modern appliances and use low-energy lighting.

Supporting Military Veterans –

I highly recommend volunteer work to other design engineers and architects, especially projects that enhance the lives of people who have protected our freedom. "Freedom makes a huge requirement of every human being. With freedom comes responsibility." (Eleanor Roosevelt)

electricity is the only fuel for space heating and cooling, water heating, cooking, and clothes drying. The program also requires that the housing lower residents' utility bills.

The program funds between \$1,000 and \$3,000 per bedroom. Incentives vary by building design and climate zone and are based on the estimated amount of GHG saved by opting for all-electric construction compared to a mixed-fuel development that might use natural gas for heating, for instance. Projects that further reduce GHG emissions with specific technologies—such as electric vehicle (EV) charging stations or appliances using refrigerants with low global warming potential—can qualify for additional reimbursement.

Selecting an Electrical Engineer Who Adheres to California's Energy Rules and Regulations.

California's proactive energy laws, rules, and regulations can be overwhelming for construction industry leaders. The American Institute of Architects (AIA) California offers useful advice in its web posting, ["What You Can Do Right Now: Electrify Everything"](http://WhatYouCanDoRightNowElectrifyEverything.com) (Feb. 2021). According to architects Scott Shell, Henry Siegel, and Joel Stout: "If you are designing a new building, work with your engineers to analyze and propose all-electric equipment and appliances rather than gas equipment and appliances. If you are rehabilitating existing buildings, analyze the costs of 'fuel switching' to all electric equipment, [which] may be limited by the size of the electrical equipment, but rebates are available for fuel switching."

AIA is a trusted, high-profile organization where I have held a membership for several years. In one of my [AIA blogs](http://AIAblogs.com), I wrote, *Streamlining Title 24, CalGreen and the Code Adoption Process with Effective Software*, to share with other members. I was also interviewed about how to select the right electrical engineer – one who strictly adheres to the latest California codes and laws. Here are excerpts from the article, [Electrical Engineer Advises on Selection Process](http://ElectricalEngineerAdvisesOnSelectionProcess.com):

Specific experience and credentials are important, of course, and so is good communication between the engineering consultant and the construction decision-maker. The engineer should inform the construction executive about the importance of complying with Title 24, California's building energy efficiency standards, even if it results in a delay or increased costs. While staying on budget is important, it's vital to adhere to the law.

At the same time, the construction decision-maker should make sure that the electrical engineering contractor is current on legal requirements. Helpful link to 2022 Title 24 California Code changes: [Title 24 CA Code Changes](http://Title24CACodeChanges.com).

Software Recommendations

In my opinion, [Bluebeam Revu](http://BluebeamRevu.com) workflow and construction management software is my top choice. It works within AutoCAD as a high-quality PDF creator and has the ability to count reference points with a certain shape or label, as well as create tables or schedules of lighting fixtures, skylights, and other construction materials. Bluebeam Revu software also helps with a wide variety of documents, such as construction and electrical drawings, plan check comments, supplier cut sheets, and technical specifications.

Whitcraft Engineering Provides Expert Evaluations

I invite you to peruse my website for details about my projects, articles I have written, testimonials, and more. [Whitcraft Engineering Solutions, Inc.](http://WhitcraftEngineeringSolutions.com)

For an assessment of your next project, please email me at: john@whitcraftengineering.com, or call/text (858) 229-8722. You may also message me via [LinkedIn](https://www.linkedin.com/company/whitcraft-engineering-solutions).

