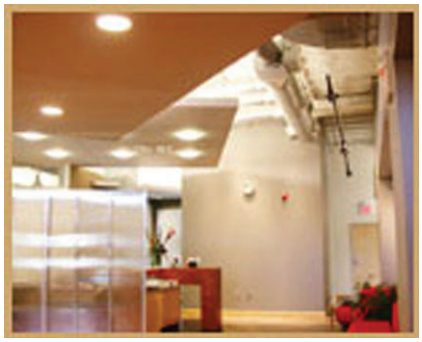


William Tao & Associates, Inc. Combines Low Voltage Cabling, BIM Modeling and Cable Sharing in their LEED Platinum Plans

William Tao & Associates, Inc. (WTA) is a multi-discipline engineering firm recognized as a leader in innovative and energy-effective building systems. For over 40 years, St. Louis, MO, - based WTA has supported a global client base with a wide range of engineering services including mechanical/HVAC, electrical, plumbing, fire protection, building automation, structural/civil, master planning and commissioning. So, when WTA decided to relocate their corporate headquarters, they knew what they wanted – a modern, efficient and sustainable "smart building" that would both support their high-tech business needs and serve as a showcase for their design capabilities. Beyond knowing what they wanted, they also had the expertise to design it themselves.

The most critical and aggressive goal is their pursuit of LEED Platinum certification. Developed by the US Green Building Council, the LEED green building certification program is a rating system encouraging sustainable green building and development practices. Platinum certification is the top LEED rating and based on extremely challenging requirements, recognizes only the highest levels of environmental and health performance. Every facet of WTA's design would need to consider overall building sustainability.

WTA's green focus includes the low-voltage infrastructure. Often neglected in green building plans, WTA saw great opportunity to improve the building's overall efficiency with wise low-voltage cabling choices. As a smart building, WTA's headquarters will deploy multiple building applications, such as voice and data, video, lighting controls, security and HVAC controls onto a centrally managed system. Such centralized intelligent building automation systems can simplify facility management, reduce operating costs and cut energy use by up to 70%.

Traditionally, however, these low-voltage smart building systems would run on separate and often proprietary cabling infrastructures. HVAC controls would run on one system, security cameras on another, telecommunications on another, etc. WTA recognized the potential to further enhance efficiency and reduce material and deployment costs by converging these separate technologies onto a common cabling infrastructure.

Siemon's ConvergeIT Intelligent Building Infrastructure

ConvergeIT is an intelligent building cabling method that supports the convergence of all low-voltage building systems onto one integrated Siemon copper twisted-pair or optical fiber structured cabling network. ConvergeIT supports:

Voice & Data
- Networked computers and servers
- Analog and VoIP phones
- PBX and Fax

A/V (Audio & Video)
- CATV, satellite video, IPTV
- HDMI, VGA, SVHS, composite/component A/V
- In-house broadcast, paging, and intercoms
- Indoor digital signage

Energy Management
- Energy demand monitoring
- Automated, demand-based energy controls
- Smart Grid integration

Lighting Controls
- Automated demand-based lighting
- Sensors
- Smart switches

Security
- CCTV (analog and IP-based) camera and monitors
- Pan, tilt, zoom and remote powered devices
- Motion, glass-break and audio detectors
- Access control (card and biometric readers

Fire/Safety
- Alarms
- Fire, smoke and carbon monoxide detectors
- Pull stations
- Emergency lighting and pathway guidance

HVAC
- Automated climate control
- Temperature sensors
- Air movers/ventilation

Wireless Devices
- LAN's
- Scanners and readers (including RFID)

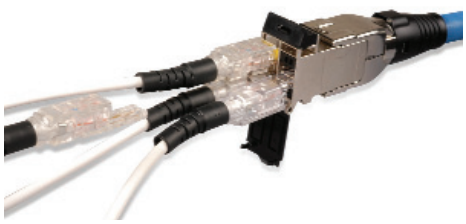
To help develop this converged low-voltage infrastructure, WTA turned to Siemon, a leading global network cabling company. Siemon's ConvergeIT intelligent building cabling solution was specifically created to help building owners, designers and contractors deploy a unified building technology platform, providing WTA unique expertise on the structured cabling needs for such a platform. (See Sidebar)

Working with Siemon, WTA designed a unified structured-cabling based infrastructure supporting a wide range of low voltage applications, including voice, data, video, surveillance cameras, access control and more. This converged design reduces the cabling and pathway materials needed to support their smart building systems – such material reductions are an important facet of LEED certification.

Additionally, Siemon helped WTA drive further material reductions through the specification of their category 7_A TERA cabling system. Through TERA's unique "cable sharing" capability, up to four applications can be supported over a single category 7_A cable and outlet. The standards-accepted practice of cable-sharing is made possible by the TERA connector's four quadrant design, which allows easy access to individual channel pairs via hybrid patch cords combining 1-pair, 2-pair and 4-pair non RJ style TERA plugs terminated to appropriately wired RJ-45 or RJ 11 Ethernet plugs. Because many low-voltage smart building applications are less bandwidth intensive and thereby supported by 1 and 2-pair connections rather than the 4-pair connectivity required for high-speed data transmission, a single TERA channel could replace up to four traditional cabling channels. "The combination of TERA with Siemon's ConvergeIT design maximized the efficiency of the converged low-voltage platform," explained Steve Brohammer of Walker. "Instead of managing a bunch of different cabling types and installing a separate cabling channel for each appli-

cation, we're deploying one cable type and running up to four applications per cable."

Beyond material-saving cable sharing, TERA also provided support for high-speed data transmission. Offering bandwidth of 1000MHz, the category 7A TERA solution more than met WTA's current performance requirements and, supporting speeds in excess of 10Gb/s, offered additional headroom for future advancements. WTA expects an immediate performance impact. "As a full-service design firm, we work with extremely large files," explained Brohammer. "We have full 3D building models including mechanical, plumbing, electrical, structural information and more, with multiple specialist engineers often working simultaneously on the same file, putting huge strain on the network. The extra bandwidth will ensure that we can handle it." Walker's Brohammer and Janice Christopher are confident that TERA's additional headroom will support WTA well into the future, and noted that this future-proofing element plays into the green message by extending the cabling lifecycle and reducing the material waste associated with removing and replacing lower-performing systems.



While the implementation of converged, structured cabling based low-voltage infrastructure offered a list of benefits, it also presented design challenges – especially in light of WTA's decision to renovate an existing facility rather than building new. "If it is done well, renovation is a more environmentally friendly option. Think of it as recycling for buildings," described Christopher of Walker. "But, unlike designing a building from scratch, where you can holistically plan all of the systems together, a renovation forces you to design new systems around those already in place." Fortunately, WTA's extensive experience developing renovation designs for their clients left them well prepared.

Building Information Modeling (BIM) technology a key tool in developing the design of the building's many new systems. The BIM process typically uses dynamic building modeling software to combine multiple building elements and systems into a single, real-time 3-dimensional model of the entire building. In a new building, BIM allows designers to develop the most cost-effective and efficient buildings, helping detect system and structural conflicts in the planning phase, before costly construction rework is necessary. This planning benefit carries into renovations as well.

WTA began by building models of the existing structure, then designing new systems to fit around what was already there. This included planning the new low-voltage cabling infrastructure and pathways. Because multiple low-voltage building systems would be converged onto this cabling plant, its design needed to consider the placement of equipment such as surveillance cameras and access control units in addition to voice and data drops. Utilizing BIM capabilities simplifies this process by allowing WTA designers like Christopher and Brohammer to see potential conflicts and plan efficient system layouts in the early design phases. The infrastructure can be viewed a unified system rather a collection of separate elements.

WILLIAM TAO & ASSOCIATES, INC

WTA used BIM models provided by Siemon to plan the placement and layout of network elements such as cable pathways, telecommunication closets and others. Including network infrastructure products such as racks, cable management, patch panel, Siemon's library of BIM models allowed WTA designers to include specific product details in their building designs, further solidifying the accuracy of the final plans. "Using BIM, we can look at the whole project at once, with an amazing level of detail," stated Christopher. "From the largest structural elements to a single Siemon patch panel, we have the whole building modeled before we break ground."

Like WTA's decision to implement a Siemon ConvergeIT-style infrastructure and utilizing category 7A TERA for its unique cable-sharing capability and high-bandwidth future-proof performance, the use of BIM technology also has a green element. The comprehensive building plans made possible by BIM can help cut material waste by helping identify efficient floor plans, mechanical systems and pathways.

William Tao Associates new headquarters will open in 2011 and is expected to achieve LEED platinum certification.

To find out more about William TAO Associates. visit: www.wmtao.com

For more information on Siemon's ConvergeIT™ Program, visit: www.siemon.com/convergeit

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