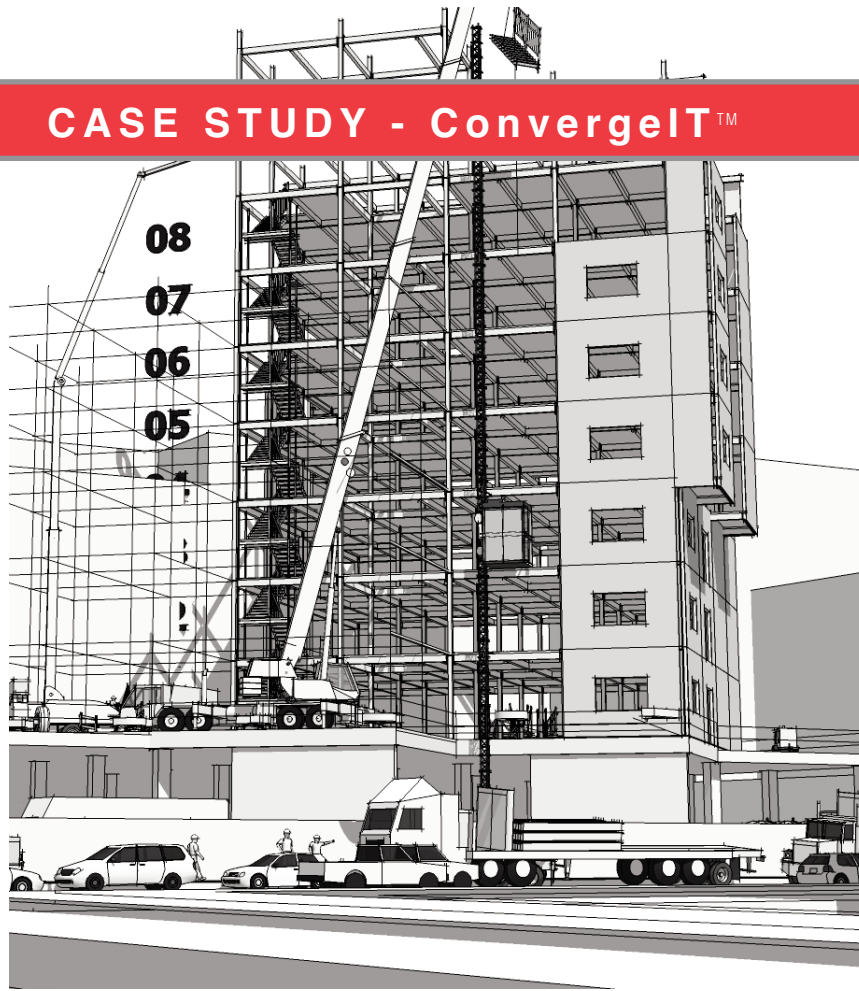




Walker Engineering's Holistic Approach to Converged Smart Building Infrastructure Design



The idea of an intelligent building infrastructure, or “smart building”, is not particularly new. In theory at least, the concept of integrating a facility’s various services, such as security, access control, HVAC, data, voice, and video, into a centrally controlled system offers a list of benefits. These systems support an extremely flexible infrastructure, rapid deployment, reduced labor, improved asset management, maximum ability to interact with “smart” devices, and more efficient utilization of the deployed cabling and pathways. For the eventual building owners, facility managers, and tenants, the capital cost saving from resource optimization, the energy efficiencies, and long-term operating cost savings of a smart building approach make selecting these systems a no-brainer.

Historically however, the deployment of such technology has faced some hurdles. This is particularly true in the design, planning and construction phases, where disconnects between the building owner, architect, builder, and the builder’s sub-contractors made the realization of a converged

platform elusive. Add the potentially contradictory recommendations of competing equipment vendors and service providers, who often promote proprietary technology and infrastructures, and the probability for confusion mounts.

Walker Engineering of Houston Texas sees these conflicts often. A veteran low-voltage integrator firm, Walker is often called in to coordinate between multiple parties with conflicting solutions and produce a workable converged technology platform. Walker saw that a more holistic approach was needed.

Matt Kenjura of Walker can see where the confusion begins. “The owner, the architect and the builder all talk but not always together, and when they do technology is rarely included in the discussion,” Kenjura explains. “The concept of converged technology services is often introduced after the preconstruction phase and pushed to the construction managers and sub-contractors to implement.”

This pushes the risk downstream to the specialist subs, who are now in a position where they have to deploy a silo system that will ultimately need to integrate with other systems without the benefit of an infrastructure design that provides a common platform for these technology silos. “The subs do the best they can and many do an admirable job,” Kenjura recalls. “But having everyone doing their own thing causes budget issues. Later in the installation phase, when someone has to figure out how to implement the technology engineer’s design and get all of these disparate systems working together, it costs more than planned and doesn’t go as smoothly as it should.”

The team at Walker has long believed in the concept of Integrated Project Delivery (IPD), espoused by the AIA. In the IPD model, the owner, architect and building contractor function in a true 3-party arrangement to coordinate and manage costs during all phases of the building project. Walker brings technology into the IPD process at the pre-construction phase.

The benefits are easy to see. The technology needs of the building owner and engineer can be fully developed into an actionable plan. With this visibility, the architect/engineer can develop a design to accommodate the technology platform and the contractor can manage the project according to a far more comprehensive and detailed set of design documents.

“Walker steps in with the expertise to convert the owner’s vision and engineer’s specifications into a technology plan that helps the design team and contractor make it happen”, explained Kenjura. “By locking into systems and overall design early, we remove many of the hidden costs associated with integrating multiple building technology systems.”

Contractors work more efficiently when armed with the big picture and a detailed technology implementation plan. With equipment and pathways for audio/visual (A/V), access control, HVAC, data, etc. on design drawings from the start, issues can be addressed and solved before costly rework becomes necessary. In fact, many trade coordination and scope overlap hurdles can be eliminated at the design phase, allowing these issues to be addressed in initial budget estimates.

This budget visibility offers game-changing possibilities. “It’s an eye-opener to have these costs above the line rather than popping up in later budget contingencies,” Kenjura said. “Even though it’s the first time some owners see the combined total cost of technology, it’s clear that Walker’s program significantly cuts unnecessary costs. It’s also clear that a common infrastructure adds value by reducing deployment costs.”

To address potential sticker shock, Walker approaches expenditure discussions from a full system total cost of ownership position. The initial IPD process clarifies client technology needs while helping to build a predictable plan and cost model. Traditionally, however, that plan would be a collection of separate silo systems and support infrastructures. HVAC controls would run on one system, security cameras on another, telecommunications on another, etc. Walker emphasizes the great potential for efficiency and increased capex/opex value converging these separate technologies onto a common network infrastructure.

Siemon, a leading global network cabling company, saw the same potential for a unified building technology platform, but was aware that there was also a general lack of expertise on the structured cabling needs for such a platform. Siemon launched the ConvergeIT intelligent

building cabling solution to specifically address this gap. ConvergeIT is purpose-designed to help building owners, designers and contractors deploy a structured cabling based infrastructure capable of supporting the full range of low-voltage intelligent building applications. (See Sidebar)

The increasing popularity of intelligent equipment drives further efficiencies. With the use of IP-enabled devices, the converged, structured cabling infrastructures championed by Siemon and Walker can potentially be extended to all smart building systems, providing faster, less costly deployment and long-term operational cost savings.

It is a fact that significant material and labor costs are associated with using multiple contractors to deploy separate, proprietary low-voltage cable runs to support building technology and automation systems. The converged IP network approach reduces labor costs, construction time, and installation expenses by utilizing one unified structured cabling system for all low-voltage, voice, and data applications. MAC (moves, adds, and changes) work is significantly simplified and the redundancy associated with separate pathways is also eliminated. In addition, the low-voltage cabling, which was traditionally left unmanaged after the installation, is now part of the administered network infrastructure. As Kenjura puts it, "At Walker, we like to say 'technology systems installed *in* a building have a better opportunity to realize their lifecycle than those installed *on* a building.'"

The fully converged IP network links building automation, A/V, and other low-voltage systems to the data network, which results in simplified infrastructure management and reduced complexity. This approach also provides a migration path for IP-enabled devices that can be monitored, accessed, and centrally managed by IT and facility administrators. Such centralized device management capability minimizes energy waste (e.g. automatic lighting and HVAC control) and enhances building security and emergency response time (e.g. motion and audio detection).

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

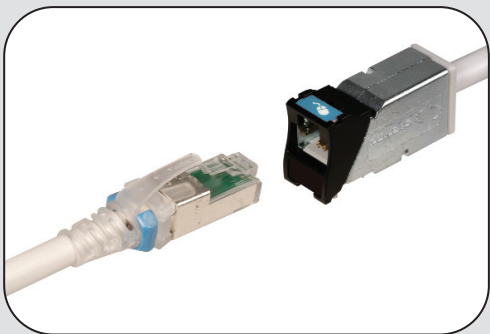
Wireless Devices

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

Choosing the right cabling for converged intelligent building systems

Walker cautions that converging critical building systems onto an IP-based structured-cabling infrastructure makes the selection of the cabling plant all the more critical. "Most of us know first-hand the negative effect a poorly-performing cabling plant has on the data network and how disruptive it can be to upgrade," Kenjura states. "In a converged smart building, there are more systems relying on the structured cabling to perform and more to replace if it doesn't."

In recent projects, Walker has implemented category 6A shielded cabling from Siemon. According to Kenjura, category 6A shielded cabling offers reliable bandwidth to support the data network for 10 years or more and all other low-voltage systems at least as long. This media also has benefits specific to converged intelligent buildings. The shielded cable's enhanced resistance to electromagnetic interference protects signal integrity in "noisy" (i.e. high EMI environments) where low-voltage applications are commonly deployed. In addition, with the increased reliance on PoE and PoE+ equipment in intelligent buildings, shielded cabling's heat dissipation performance provides an additional layer of reliability.



While IP-based building technologies are on the rise, not all systems benefit from being completely deployed in an IP environment. Most smart buildings today are a hybrid of traditional and IP systems. A unified structured cabling infrastructure as laid out in Siemon's ConvergeIT program allows you to install and administer both on a common platform.

Moreover, converging multiple applications over one integrated cabling system enables real-time control of assets and information. This enables simplified compliance with critical regulations such as the Sarbanes-Oxley (SOX) Act, the Health Insurance Portability and Accountability Act (HIPPA), the Real ID Act, the Homeland Security Presidential Directive, ISO 17799 code of information security, and the Information Technology Infrastructure Library (ITIL) for Information Technology Management.

According to the EPA and industry groups such as CABA, converged smart buildings deliver tangible and significant cost savings. During deployment, low voltage cabling material costs can be cut by as much as 33% and related installation labor expenses reduced by over 25%. Over a building's lifecycle, centrally managed systems drive even more savings. Energy usage can be cut by as much as 70% through intelligent applications such as IP-based power management systems and automated HVAC and lighting controls. Recurring MAC costs can be reduced by up to 20% and higher when implementing a zoned cabling design with consolidation and horizontal connection points that facilitate faster and easier changes.

Walker clients today are benefiting from converged low voltage technologies operating on high performance Siemon ConvergeIT structured cabling platforms. "IP-enabled systems were often stigmatized as costly and difficult to implement by vendors and installers of proprietary building automation systems," explained Kenjura. "But, we were able to show clear-black and white savings."

To find out more about Walker Engineering Inc. visit: www.walkertx.com

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