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Case Study

CS 06/09

City Hall
City of Cambridge
Ontario, Canada

Canada's high-tech, "green" government facility is the first to win Gold LEED® Certification – and the first to install Belden's robust 10 Gigabit structured cabling system.

Courtesy of City of Cambridge Photo Gallery.

City of Cambridge Powers Network with Belden IBDN System 10GX®

The City of Cambridge (population: 126,000) is located near Toronto, Ontario, in the heart of Canada's fast-growing "Technology Triangle." Although Cambridge can be proud of its rich history, well-designed public spaces and traditional architecture, its latest achievement is the new City Hall Civic Administration Building. Situated in downtown Galt, Cambridge City Hall is on the leading edge of sustainable design. It is the first city hall in Canada to be awarded Gold certification for Leadership in Energy and Environmental Design (LEED®) from the Canada Green Building Association.

Although its architecture blends in with the area's historic buildings, the City Hall incorporates an array of high efficiency, eco-friendly design features aimed at conserving energy, reducing air conditioning and artificial lighting, and creating a people-friendly, "green" working environment. According to conservative estimates comparing a standard 85,000 sq foot building with the LEED-certified Cambridge City Hall, the city estimates energy savings of $160,000 per year.

Choosing an Advanced Networking System

Another major technological advancement is Cambridge City Hall's networking and communications cabling and cable management infrastructure. Under the leadership of Francis Villamil, Manager of Technology Services (TS) Support, a state-of-the-art fiber- and copper-based cabling and connectivity framework with an extended, or "green" lifecycle, has been implemented to deliver high-bandwidth, high-speed services throughout the facility — including data and voice communications, security system and cameras, building automation systems, and wireless access points.

The sustainable networking system Villamil specified is the Belden IBDN System 10GX, an end-to-end solution designed from the ground up to deliver top performing, reliable 10 Gigabit Ethernet service. "In keeping with the holistic concept and vision of excellence and sustainability, our TS team wanted an advanced networking infrastructure that would support the city's extensive data and voice communications needs today and for many years to come," said Villamil. "We evaluated several vendors' solutions and Belden was the clear choice because of its long-standing reputation for innovation, high quality products, reliability, product longevity and technical support."

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Belden: Cabling the Data Center to the Desktop

This all-Belden installation includes a Fiber*Express* cabling system for the backbone and main data center; Belden's 10GX (Category 6A) copper cabling system for the building's VoIP, security, building automation, wireless and sign messaging systems.

To implement the networking and communications system, the City of Cambridge selected Cable Assembly Systems, Ltd. of Brantford, Ontario, a leading designer/installer of structured cabling systems and an experienced Belden Certified Systems Vendor (CSV). The installation team was led by Cable Assembly President Brian Manese.

In specifying the cable system design, the Cambridge Technology Services team determined that this was to be an all-Belden installation. Belden's Fiber*Express* cabling system is used for the backbone and main data center. Belden 10GX cabling is used for horizontal cabling supporting the VoIP system, as well as all the auxiliary cabling used for security cameras, messaging signs, wireless applications, building automation and control, and the radio frequency (RF)-enabled emergency command and control center.

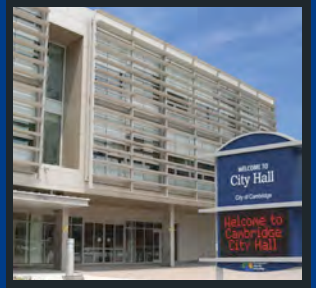
Commenting on the infrastructure design, Manese notes: "Most cabling systems need to be replaced or upgraded after five or ten years. This design resulted in an exceptionally sustainable, flexible and robust system that should serve the evolving mission-critical needs of the City of Cambridge government over the next several decades."

Networking Scope and System Design

Designed for occupancy by several hundred city employees, the Cambridge City Hall building is comprised of four floors designed around a central four-story high atrium and green wall, with a plethora of plantings nourished by rainwater collected from the building's roof. It's a built-in biofilter enhancing air quality. A portion of the roof is also a "green" area, made up of plants, grass and shrubs, which help to retain heat in winter and cool things off in summer.

The network's fiber backbone runs from the Computer Room (main data center) to the four telecommunications rooms housing the horizontal cabling system, one on each floor. A fifth telecom room in a more private area handles the building's automation service requirements. All fiber links have redundant pathways built in to ensure maximum reliability and network uptime.

Within the City Hall, eco-friendly features conserve energy while creating a people-friendly environment for city employees and vistors. "Green" features include a four-story high atrium topped by skylights to maximize natural light, abundant greenery throughout, and a rooftop garden that helps retain heat in winter and cools the building in summer. (Courtesy of City of Cambridge Photo Gallery.)



The fiber backbone is also linked to four additional municipal facilities adjacent to the City Hall — the Art Centre, Fire Museum, Farmers' Market, and Historic City Hall, which was preserved as an historical landmark. Civic Square, which is a series of open spaces and walkways, connects each of these facilities for convenient access and integration of these buildings. A glass link connects historic and new city hall.

Overall, the structured cabling system installation required approximately 10,000 feet (nearly two miles) of Belden Fiber*Express* single-mode and multimode fiber optic cabling, about 200,000 feet (nearly 39 miles) of the 10GX UTP cabling, and about 30 24-port and 48-port 10GX patch panels. The City of Cambridge has the distinction of being the first municipality in Canada to deploy Belden's System 10GX throughout a government office building.

System 10GX Installation and Testing

Belden's IBDN System 10GX is an end-to-end UTP cabling solution designed and engineered to meet the high-speed, high-reliability requirements of 10 Gigabit Ethernet service. The system not only meets and exceeds all Category 6A requirements, but delivers guaranteed performance up to 625 MHz — 125 MHz beyond the standard. The 10GX solution is built around a series of patent-pending enabling technologies which serve to optimize the performance of each critical component of the solution, including 10GX Cables, 10GX Patch Panels, and 10GX Modular Jacks and Cords.

Regarding installation, Manese notes that one key success factor was Cable Assembly's skilled and experienced team of installers, including one RCDD and all Belden-trained. He explains: "Belden's 10GX Cable is very robust. Like all Category 6A type cables, it is somewhat larger and more rigid than standard Category 5e cabling. For inexperienced workers, this can make Cat 6A cabling more challenging to pull, run and dress. However, thanks to our Belden training, our technical staff knew the proper installation techniques to use."

Upon completion of the cabling installation, Cable Assembly conducted testing on every drop of the 10GX System using Fluke DTX-1800 Meters with 10GX Modules. The system passed the very first test, confirming 625 MHz performance — with not a single failure. The Fiber*Express* System was also tested. As a result, the entire installation was certified and therefore received Belden's exclusive 25-Year Component Warranty and Lifetime Application Assurance Program.

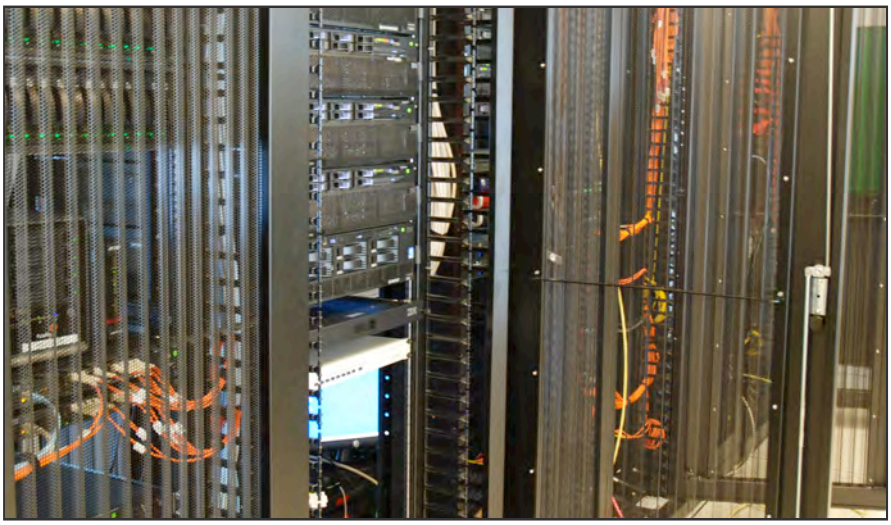
Data Center Design and Cable Management

To complete the installation, the City of Cambridge selected all-Belden racks and enclosures to hold equipment in the Computer Room, as well as to manage the cabling system with ease and efficiency. Cable Assembly president Manese recalls how this came about:

"Early in the Cambridge City Hall design phase, Belden had just launched its modular High Density Racking System (HDRS), which was designed specifically to accommodate high density installations. I arranged to bring Francis Villamil to the Belden facility to see the new products, and the Belden representative helped us in selecting the right components and in ensuring the timely delivery of the equipment we ordered. His ongoing support throughout the project showed us why Belden is clearly the No. 1 cabling solution provider in the marketplace today."

Belden's High-Density Racking System provides a sturdy, modular and exceptionally versatile racking system designed and engineered to optimize network system performance and manageability. The system offers a total of 54 basic and optional components, which allows users to configure a system to their specific space configuration and application requirements – and provides the flexibility to change or modify the configuration quickly and easily as the network grows and evolves.

For data centers and telecommunication rooms, Belden also provides a full complement of enclosures, accessories and cable management components, all of which integrate seamlessly with copper and fiber systems to protect cables and connectors while ensuring optimum performance, density and manageability.



The Computer Room, which is the facility's main data center, is equipped with Belden's modular high-density racks and enclosures. The fiber- and copper-based cabling and connectivity infrastructure supports the building's data networking, telecommunications, and building automation and control systems and services.

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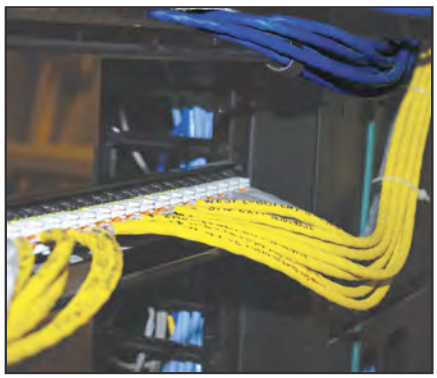
– Francis Villamil
Manager of Technology Services Support, City of Cambridge

Cambridge Selects System 10GX as New Standard

Once the cabling infrastructure within the new City Hall was completed, the City of Cambridge decided to make Belden's end-to-end 10 Gigabit Ethernet solution and 10GX cabling the new standard for all other municipal government facilities. Already in process, this deployment will encompass the city's fire stations, public works depots, public arenas, community and senior centers, swimming pools and recreation center facilities.

Brian Manese gives credit to city leaders and the Technology Services staff for their progressive, forward-thinking approach and diligent planning. "The new City Hall is a remarkable achievement for the City of Cambridge. They really did their homework in regard to evaluating the products, hardware vendors and installers in the market-place and showed a deep understanding of how they could best achieve their goals. This milestone clearly demonstrates how the City worked with its business partners — Cable Assembly and Belden — and made smart choices that will pay dividends in performance and reliability over the long term."

"We are extremely satisfied with the all-Belden installation and the excellent work performed by Cable Assembly Systems," said Francis Villamil. "When we take other municipal IT teams on tours of our award-winning City Hall building, we showcase our 'green' design and high-tech features — and we also highlight the state-of-the-art cabling infrastructure that supports all of our technology."



Belden's IBDN System 10GX incorporates innovative technologies to optimize the performance of critical connectivity components, which include 10GX Cables, Patch Panels, Modular Jacks and Cords. As a result, the 10GX system meets and exceeds all Category 6A requirements.

Belden's Fiber*Express* fiber backbone (Orange cable) runs from the Computer Room to each floor's telecommunications room. The 10GX copper-based cables (Blue, White and Yellow) run horizontally to deliver high-bandwidth 10 Gigabit to desktops on all floors. All fiber links have redundant pathways built in to ensure maximum reliability and network uptime.