

Don't gamble  
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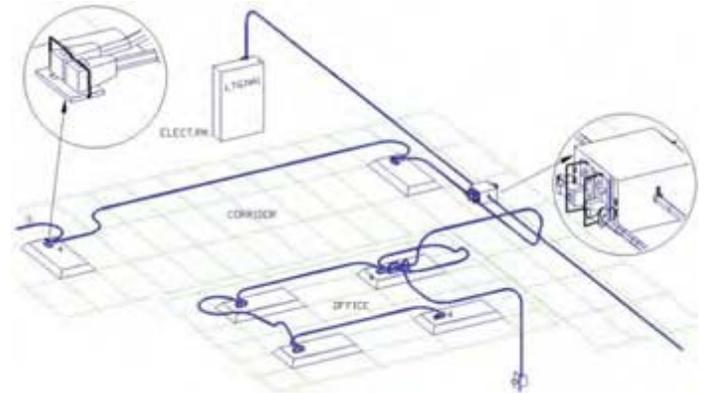
**Call the experts.**

Electrical safety and Arc-Flash are on everyone's minds these days. Littelfuse is now offering a variety of electrical safety services and tools to help you avoid potential hazards. Our services include:

- Short Circuit and Coordination Studies
- Arc-Flash Hazard Assessment Service
- On Site Electrical Safety Training
- One-line drawing development

Littelfuse has the products and expertise needed to help you reduce Arc-Flash and other hazards, as well as comply with code regulations and NFPA 70E requirements.

Contact your local Littelfuse sales representative today for more information about the safety services available from Littelfuse. Visit us online at [www.littelfuse.com](http://www.littelfuse.com) or call our technical hotline at (800) TEC-FUSE.



# MANUFACTURED WIRING SYSTEMS: THE CONSTRUCTION COST CUTTER

By Serge Oberoi, P.Eng.

In the 1990s a giant six-storey pulp mill built in Japan was tugged over 8,000 miles to its final destination in Brazil's interior. More recently, in the summer of 2007, a highway bridge constructed a mile away was transported to replace an old bridge on a main turnpike in the city of Ottawa, Canada.

Using a self-propelled transporter, this 650-ton Island Park Bridge was maneuvered to its final location and secured in place. From start to finish, the entire bridge was completed in less than 18 hours and traffic on the highway was buzzing soon after. This rapid replacement was made possible by prefabricating the bridge off-site in nearby Hampton Park.

**Using traditional methods of construction the Island Park Bridge would have taken several months to complete while exposing the residential streets to unwelcome traffic gridlocks.**

**Continued on Page 14**

## UTILITY CABLE

Underground service cables such as USEB90, USE190, or M302 are available, plus overhead service cables such as duplex, triplex, quadruplex, ACSR, or AAC. High voltage power cable in either copper or aluminum, from 5000 to 46000 volt, is available in concentric neutral, PILC, airport lighting, or XLP power cable.

## BUILDING WIRE

We stock copper or aluminum building wire to fill every need. From non-metallic NMD90 and NMWU; armoured AC90 and ACWU90; underground RWU90 and TWU-40; copper building wire such as TW75, RW90, T90. Or bare copper.

## ELECTRONIC WIRE AND CABLE

Any electronic wire and cable for a multitude of applications is immediately available. From equipment and hook-up wire, audio, video, telephone, intercom, and microphone cable to thermostat, fire alarm, speaker wire, plenum, data communication, and fiber optic cable.

## SPECIALTY CABLES

Noramco carries a variety of specialty cables designed to meet critical environmental applications. Polarflex 40 welding cable, as with our portable cord, is specially formulated to remain tough, light, and flexible in temperatures ranging from desert heat to arctic cold. Submersible pump cable, irrigation and golf course sprinkler wire, high temperature wire, guy wire, blasting wire, tracer and water meter cable are all part of our specialty cable lineup.

## PORTABLE CORD

Standard service; special purpose; thermoplastic; multi-conductor; portable mining cable; motor and lead wire, coil or retractile cords.

## TECK CABLE

Teck cables known for their quality of design and manufacture, are the only cables for use in pulp and paper, chemical and petroleum facilities, or in similar areas where there is a risk of cable damage due to chemical or mechanical abuse. Teck cables are available in single, multi-conductor, or composite configurations with voltages of 600V through 25000V, with either aluminum or steel interlocked armour.

## INSTRUMENTATION AND CONTROL CABLE

Instrumentation and thermocouple cable is available in unarmoured, aluminum or steel interlocked armour, with either 300 or 600 volt insulation thickness. Unshielded, overall, individual, or overall and individual shield are also available. Other control cables include tray, traffic signal, street lighting, and loop detector cable.

## INDUSTRIAL CABLES

We supply a variety of specialty industrial cables from stock, for marine, automotive, or other industrial applications. Bronze or aluminum braid marine, PVC/PVC brake cable, GPT, SXL, trailer and boat cable, oil rig, transit, trolley wire, and magnet wire.

## CABLE ACCESSORIES

We carry a wide range of cable accessories including electrical and electronic connection products as well as a complete selection of premise wiring and networking products.

*Noramco is Canada's source for electrical, electronic wire and cable, as well as premise wiring products for networks. We take pride in the high quality of our products, our selection, and the service for which we are renowned and recognized.*



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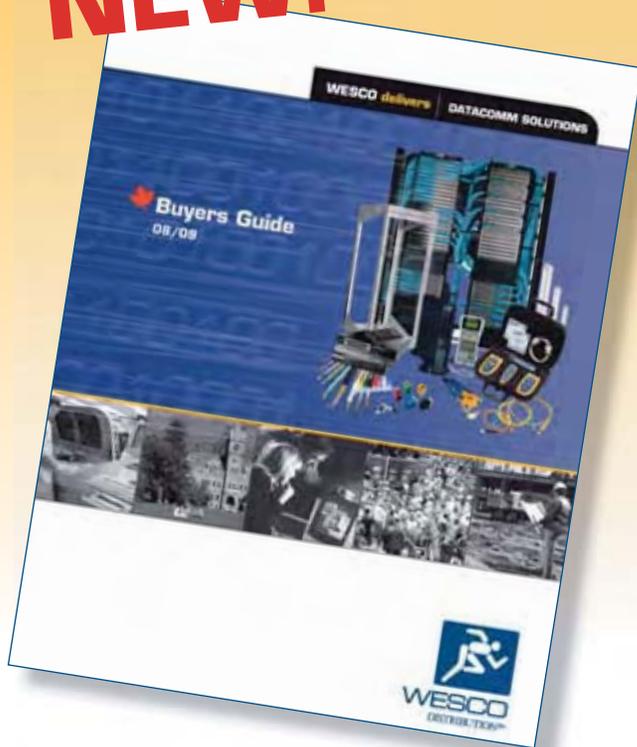
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## Wiring Systems Continued from page 12

Using traditional methods of construction the Island Park Bridge would have taken several months to complete while exposing the residential streets to unwelcome traffic gridlocks. It would have, in addition, cost Ottawa businesses millions in lost revenue, delays and erosion in customer base. This and many other examples are putting a spotlight on manufactured solutions that can help compress construction lead-times, improve installed quality, reduce disruptions, simplify scheduling and lower costs.

Known as pre-build, modular, pre-fab or manufactured systems, the demand for these factory-built solutions is likely to increase as supply of skilled trades tightens and the cost to attract employees to construction jobsites increases. In contrast, with the application of automation, robotics and improved dock-to-dock supply chain, the cost of manufactured solutions is declining. Comfort controlled environment, on-hand tech support and the readily available pool of manpower in the industrial hubs are added leverages that further help slim costs of factory-built products.

Unlike factories, construction sites are often marred by stressful and adverse weather conditions that act counter to achieving higher outputs and quality. It is no surprise that more and more engineers are specifying pre-built solutions to minimize on-site work content, to enhance quality and to expedite completions. Today, it is not uncommon to see pre-cast beams, columns, walls and flooring systems on construction job sites. These systems were rarely used not too long ago. Slowly but surely manufactured wiring systems (MWS) are also beginning to replace the time-consuming pipe and wire construction with pre-built systems. This welcome change will free the electrical trades from the mundane work while reducing costs for building owners and contractors.

MWS simplify installation by providing failsafe plug-and-play connectivity. Lighting fixtures, wall sockets, switches and interceptors can be daisy-chained in a fraction of time with lesser skilled manpower, thus simplifying labor coordination problems.

Pre-factory tested, these sys-

tems tend to be more reliable, secure and flexible. The modular construction and plug-in connections permit easy removal and relocation of MWS. This flexibility allows redundant wiring to be easily de-installed making MWS a preferred solution in LEED (Leadership in Energy and Environmental Design) specified construction.

Demand for manufactured wiring systems is expected to grow rapidly with the increasing cost pressures, strict completion deadlines and environmental concerns. Already, many progressive institutions and businesses are specifying MWS in LEED certified and other building structures. The Bay Adelaide Centre, a 52-story office tower currently under construction in Toronto is being built to LEED GOLD standard. The lighting and power distribution in this building will extensively make use of manufactured wiring systems to help achieve LEED certification and trim costs.

In North America, the building wire and cable is a 2 billion-dollar industry. When combined with the European and emerging world economies, wire and cable is a colossal market. At the present time only a small portion of this market has been captured by MWS. With the field wide open and with the increasing awareness of MWS benefits, the market for manufacture wiring is likely to get crowded. Armed with a line of ingenious MWS products, an Ontario-based company is anxious to get a piece of this growing market. Manufactured wiring sector can no doubt benefit greatly from a healthy competition that helps drive innovation and price reduction. This competition, in turn, will fuel the engine for MWS demand globally.

MWS are here to stay and it is not unlikely that within the next 10 years the traditional method of hardwiring using pipe and wire, like the old floppy and the vinyl disk, will fade away in the sunset.

*Serge Oberoi, P.Eng, consults for manufacturing and technology companies. Serge has over 30 years of national and international experience in process design, product development, business transformation and project management fields. He has contributed to several major corporations including Sandvik, Nortel, CPC, and AECL Commercial.*



# Arc Flash Analysis

## ETAP Automatically Calculates ...

- Arc Flash
- Short-Circuit
- Load Flow
- Motor Starting
- Harmonics
- Transient Stability

**Arcing Fault Currents & Clearing Times**



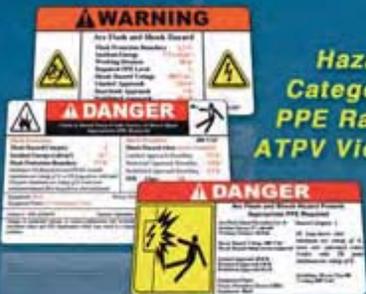
- Cable Systems
- Battery Systems
- Control Systems
- Panel Systems

**Incident Energy & Flash Protection Boundary**



- Device Coordination
- Relay Test Set

**Hazard Categories, PPE Ratings, ATPV Violations**



- Transmission Line
- Optimal Power Flow
- Capacitor Placement
- Reliability Assessment
- Ground Grid Systems
- Wind Turbine Generator
- GIS Map

- Power System Monitoring
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