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# CONSTRUCTION

TODAY

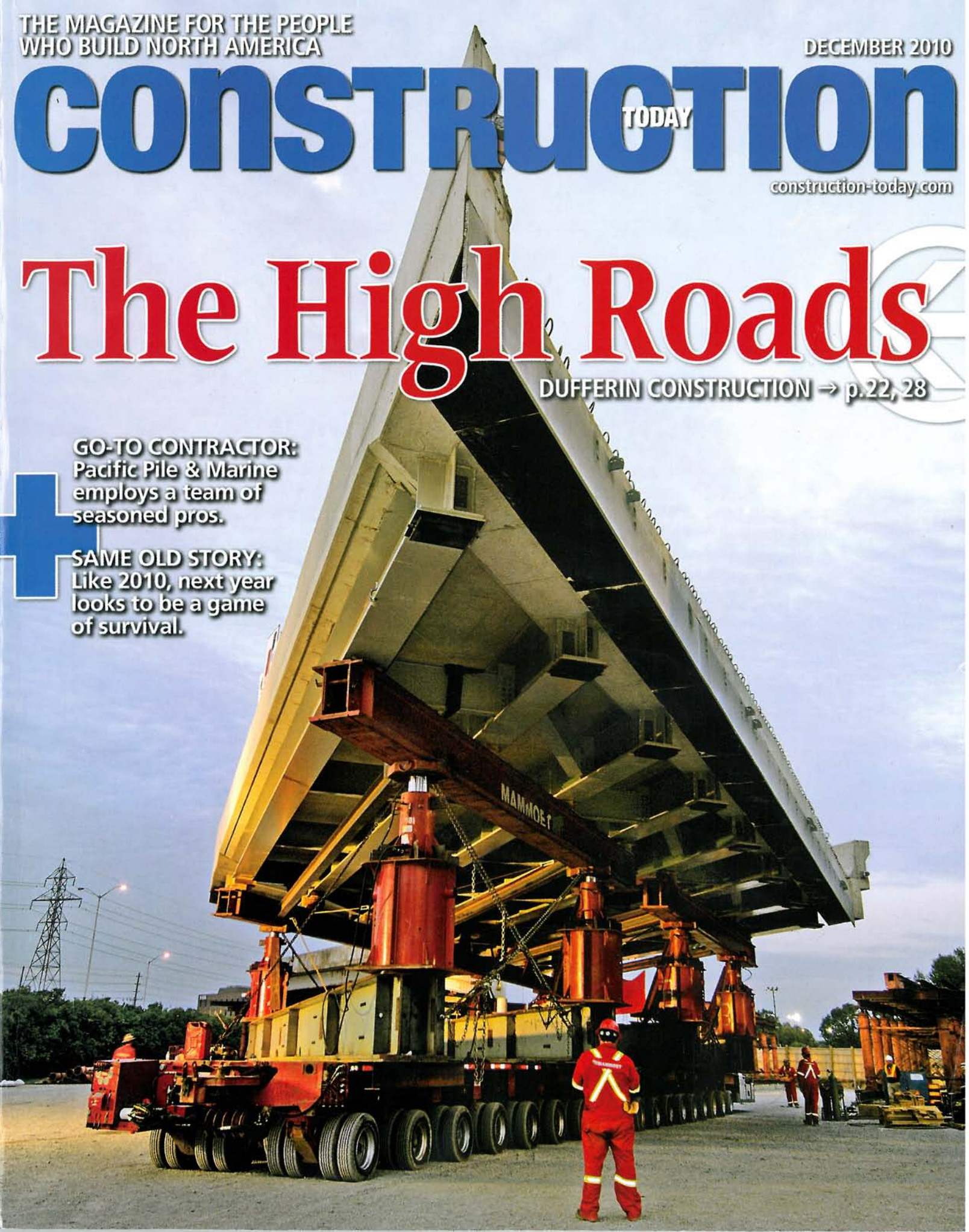
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## The High Roads

DUFFERIN CONSTRUCTION → p.22, 28

**GO-TO CONTRACTOR:**  
Pacific Pile & Marine  
employs a team of  
seasoned pros.

**SAME OLD STORY:**  
Like 2010, next year  
looks to be a game  
of survival.







# *In the* LAB



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The environment and the basic systems needed for laboratories do not need to be at odds.

BY DAVID SKINNER  
AND MELANIE TUNGET

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**A**s green initiatives and LEED certification becomes more mainstream in the general construction industry, constructing a green laboratory or technical facility continues to be no easy feat. The complex nature and systems required in these facilities make "going green" a challenge. However, LCS Constructors Inc. strives to achieve this balance between environmental responsibility and the operational performance requirements of laboratories and technical facilities - while adhering to the facility owner's budget.

Laboratories and technical facilities require special systems and are immense consumers of power, especially the HVAC systems that not only provide for the comfort of the facility, but also provide the necessary air changes to ensure the operational integrity of the lab. LCS finds its clients want to be more environmentally conscious, which can present challenges in lab design; finding a way to always follow safety guidelines and meet facility research goals while being greener poses many challenges due to unique safety, environmental and health issues contractors of laboratories and technical facilities encounter.

Green initiatives can occur in many forms, from the type of electrical, mechanical and plumbing systems installed, to the disposal of construction debris. However, laboratory construction requires a greater degree of planning and consideration due to the variety of



processes occurring in these facilities. For example, laboratories require special safety features, such as eye wash stations for staffers to rinse acids or other contaminants from their eyes, or an industrial waste line from lab sinks to allow for the dilution and testing of pollutants – and you can't just send these contaminants down the drain. In laboratory and technical facility construction, there are always numerous human and environmental hazards that must be considered.

### Using Variable Air Volume Controls

A technique for controlling the demand required of the heating, ventilation and air conditioning, or the HVAC system, the utilization of variable air volume (VAV) controls is cost-effective and energy-efficient. The controls utilized in VAV systems monitor the demand for conditioned "supply air" – and adjust the volume of supply air automatically to match the exhaust system's demand.

The two primary advantages to VAV systems are fan capacity control and dehumidification. With fan capacity control, particularly with modern electronic variable speed drives, the energy consumed by fans is reduced, thus leading to a substantial reduction in the total cooling energy requirements of a building. The other advantage is dehumidification, which is greater with VAV systems than with constant volume systems because they modulate the discharge air temperature to attain a partial cooling capacity load. Of course, maintenance and proper use of the system is vital to its efficiency.

Using smart strategies such as VAV systems can yield immediate energy and cost savings – and while there is an increase in the initial investment for these systems – the payback period is increasingly supporting this type of green investment. There are also emerging trends in energy-efficient lighting, which in itself is a trend that is gaining popularity as an important element for controlling costs, cutting energy consumption and reducing environmental impacts. More and more facility owners are realizing the use of energy-efficient lighting and motion sensors can result in substantial energy savings. Today, there are a variety of government incentives and other programs encouraging lighting retrofits in existing facilities as well as in new projects.

### Saving Debris from Landfills

On a recently completed renovation project, LCS was charged with completing significant seismic upgrades as well as restoring and renovating existing laboratory space. Throughout this project, a significant amount of debris was generated. Rather than hauling the debris off to the local landfill, the company was resourceful with materials deemed "scrap." As the "trash and scrap" generated from demolition efforts on a job started piling up, the resourceful company realized the construction debris could be recycled. First considered worthless scrap, the debris was hauled off to a nearby recycling facility rather than a landfill. This is just one example of a simple solution and environmentally friendly approach to material disposal.

Another client of the company's converted its space into a multifunctional building, including significant infrastructure upgrades for the company's corporate headquarters and laboratory space. The project was a complete design/build renovation and included the mechanical, electrical and plumbing systems. During this particular renovation, LCS was able to re-use many items with proper pre-construction planning.

So, rather than throwing away perfectly good ceiling tiles, doors, door frames and hardware, and heating, venting and air conditioning duct work and vent covers, LCS worked to salvage every item possible. These efforts not only prevented these items from going into a landfill, they also saved the client a significant amount of money – and reduced the carbon footprint required by the manufacture and transportation of new materials. Additionally, the reuse of laboratory casework and fume hoods in multiple facilities has saved several of the company's clients significant capital costs – while also being the environmentally responsible thing to do.

A cost-effective analysis of the owner's needs and the development of true costs early in the conceptual phase of a project is a time-proven approach to the development of a new laboratory or technical facility, bringing together the entire project delivery team early in the process. The key to this is the collaboration of the designer, contractor and subcontractors at the front end of the project and is an effective way to integrate green project solutions into any job.

LCS also has a design department that works with owners or owner's representatives, project engineers and architects in determining the appropriate scope of work required for the unique needs of each user group in a laboratory or technical facility. The LCS Design Workshop focuses specifically on the functional requirements and business processes of each client, and brings together design and construction professionals around "one table" – with the end result being a functional schematic design for the proposed facility that is both efficiently constructible and at a probable cost of construction that is within a 10 percent margin.

LCS works with its clients on a variety of levels to solve problems and to work through challenges to produce the end-result of a laboratory or technical facility that meets or exceeds the needs of each individual client. Each facility will require special systems, and designing and installing these systems is dependent on the requirements of the work conducted at the facility. Once these requirements are established, LCS can work with clients for the most energy-efficient and cost-effective solutions for their facility. ♦

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