

# Carpenter's Union tilt-up project nearing completion

The new Carpenters' Training Institute building, a union sponsored project, in Paradise, Newfoundland is nearing completion. According to Brad Green, P.Eng., president of Project Management Services Inc., the design-build contractor for the \$2.2 million project, the new tenants should be able to move in before Christmas.

"Work on the site started the first of July," he says. "We're 80 per cent complete now. It's been a beautiful fall here in Newfoundland, and work has proceeded as planned."

The 22,400 sq.ft. project is a tilt-up design. J.W. Lindsay Enterprises Ltd. of Dartmouth, Nova Scotia used 608.5 cubic metres of concrete from Capital Ready Mix in the founda-

tions, slab and panels for the building.

The building will be the head quarters and training facility for the Carpenters' Union, and will also house office space for other construction trade unions in Newfoundland, including the millwrights, insulators and bricklayers.

"These smaller groups will be permanent tenants of the building, and we had to design a space that met the needs of the carpenters as well as everyone else," Greene says.

Venture Architecture 2000 Inc. supplied the architectural design, which marries office space with industrial-like settings.

Much of the building is two-stories tall, but there is one small section that stands three stories high.

That is the interior training area for the carpenters. There is also substantial training areas setup outside the building.

"Because many of the tradespeople who come to the building will be working on their skills using the outside training areas, we had to pay particular attention to the keeping these areas very level," Green says. "The tradespeople coming to the training institute for skill work are not likely to be residential sector carpenters or bricklayers. The building and grounds have been constructed to provide training for tradespeople working in the ICI (industrial, commercial and institutional) sectors."

QuadraTec Inc. did the mechanical and electrical design work for the project. Greene credits the firm for the state-of-the-art DDC energy management systems in place in the building.

"Energy is expensive in the east, and we were convinced the this advanced energy management system would offer long-term pay-

back, and keep the building in line with environmental concerns such as energy conservation and the requirements outlined in the Kyoto Accords.

Project Management Services, which offers what its name implies along with design and build services, is working on another union headquarters. Greene says the company is also working on a project for the Newfoundland Nurses Union.

"We can get very busy here," Greene says. "We've got a small core team in the office and we typically subcontract approximately 95 per cent of our workload."

**This new building will be the headquarters and training facility for the Newfoundland and Labrador Carpenters' Union. It will also house office space for other construction trade unions in Newfoundland, including the millwrights, insulators and bricklayers. These smaller groups will be permanent tenants of the building, and the interior was specifically designed to meet their needs in addition to those of the carpenters.**



## Successful concreting in cold weather

Once again as we approach the winter construction season the contractor and concrete supplier should review important steps to successful cold weather concreting.

The Table below illustrates the impact that decreasing concrete temperatures have on concrete setting times.

Temperature	Approximate Time of Set
21	5-6 hours
16	7-8 hours
10	10-11 hours
4	13-14 hours
-1	> 19 hours
-7	Set does not occur, concrete will freeze

Source: "Concrete Construction" March, 1990.

ACI 306 and ACI 306-R recognize the long term strength and durability benefit of placing concrete at low temperatures providing the concrete is protected from

freezing and properly cured.

However, in the plastic state concrete will freeze when its temperature falls below about -2°C level and the subsequent strength loss will be greater than 50 per cent of design. If properly designed concrete is protected from freezing until it achieves 3.5 Mpa (500 psi) compressive strength, it will withstand a single freeze/thaw cycle. Concrete subjected to repeated Freeze/Thaw should reach a minimum compressive strength of 24 MPa. CSA A2.3.1-00 has specific guidelines for the specification of concrete exposed to freeze/thaw or de-icing salts.

The contractor has an important responsibility in protecting and properly curing concrete placed in cold weather. In absence of direct specification, they should:

- Maintain proper curing conditions to promote normal strength development.
- Maintain form protection until the proper compressive strength has been achieved for safety.
- Minimize rapid concrete temperature changes that will induce thermal stress cracks.
- Provide adequate protection for the intended serviceability of the structure.

The most common procedure for Concrete producers to heat concrete in cold weather is to use hot water. Heating aggregates and cement is not as cost efficient and may be impractical for the producer. Concrete temperature may be increased by 0.5°C by doing one of the following:

- Increasing cement temperature by 4°.
- Increasing water temperature by 2°.
- Increasing aggregate temp by 1°.

High concrete temperatures obtained with hot water do not offer significantly longer protection against freezing because of two main reasons:

1. The warmer the concrete, the more batch water required for a given slump.
  2. Heat loss (and surface moisture loss) is more rapid the warmer the concrete is.
- ACI-306R-88 notes that the possibility of thermal stress increases dramatically the wider the variance between concrete and ambient temperatures, therefore shipping high temperature concrete to a cold jobsite can increase the risk of thermal cracking.

It is a popular misconception that Calcium Chloride not only accelerates but also acts as antifreeze. The U.S. Bureau of Reclamation Concrete Manual states that "in the amounts permissible as a concrete admixture, there is such a little effect on the freezing temperatures of the mix as to be totally insignificant." The set acceleration benefit of calcium chloride diminishes rapidly once the concrete temperature falls below 10°C. This is the phenomenon described as concrete going "dead" after placement on a cold subgrade.

Water reducing and set accelerating admixtures such as Pozzolith™ 122HE contain lower concentrations of chlo-

ride yet accelerate as efficiently as calcium chloride because of additional water reduction.

Non-chloride accelerators are gaining greater acceptance due to negative durability issues associated with chlorides and chloride restrictions for concrete. There are two classifications of non-chloride accelerators:

1. Non-chloride accelerators, and
2. Low temperature and sub-freezing non-chloride accelerators.

The technology of the low temperature non-chloride accelerators such as Pozzotec™ 20+ has been used successfully for over 17 years across North America. This technology allows concrete to be placed in ambient conditions down to about -7°C without the concrete freezing, and with the benefit of normal setting characteristics and strength gain.

Cold weather concreting difficulties are mainly caused by low ambient temperatures, and by not adequately protecting concrete from freezing. By following the practices stated below, durable and successful concrete placement can be obtained in cold and sub-freezing conditions.

- Plan protected placement.
- Use warm materials.
- Do not place concrete on frozen sub-grade.
- Protect concrete from freezing temperatures.
- Protect concrete from rapid temperature changes.

Submitted by Cameron Monroe, manager of Technical Services, Master Builders Ltd.



### Custom Glass & Acrylics

Aluminum Windows, Store Fronts, Mirrors, Sealed Units, Float Glass, Acrylic/Plexiglass (cut to size) Fabrications & Storm Windows

• COMMERCIAL • RESIDENTIAL

168 Major's Path, Bus: 738-GLAS (4527) Fax: 738-4526  
E-mail: customglass@datamail.ca

20+ years experience, professional service, Newfoundland owned...

24 HOUR EMERGENCY SERVICE

### Bond & Coolen Contracting Ltd.

Electrical Contractors

Commercial • Industrial • Controls

Ancaster Place, Suite 44

201 Brownlow Ave.

Dartmouth, NS B3B 1W2

Bus: (902) 468-5221

Fax: (902) 468-2736

00183434

### INTEREX

799 Water Street, ST. JOHN'S, NL A1E 1C3  
RESIDENTIAL DOOR SYSTEMS • COMMERCIAL DOOR SYSTEMS  
DSH SLIDING DOOR SYSTEMS • SECURITY SYSTEMS • CLOSET SYSTEMS

DICK MARSHALL  
President

Tel: (709) 579-0027  
Fax: (709) 579-0020  
Res: (709) 782-3313  
Cell: (709) 687-3709  
Toll Free: 1-800-522-0027  
www.interexsystems.com

LOGO

LOGO

00176437

### R.S. ROGERS (1980) LTD.

MECHANICAL CONTRACTORS  
Plumbing & HVAC

PAUL ROGERS, G.S.C.

197 Pennywell Road  
St. John's, NL  
A1C 2L8

Bus: (709) 579-1078

Fax: (709) 579-9507

00183433



PROJECT  
MANAGEMENT  
SERVICES INC.

### PROJECT MANAGEMENT SERVICES INC.

Construction Managers, Design-Build Contractors

We are pleased to be the Design-Build Contractors for the Carpenters Training Institute building.

Brad Greene, P.Eng.  
President

Email: pmsi@nfld.net

Mailing Address: P.O. Box 31002  
Mount Pearl, NF A1N 4L5

Office Address: 171 Water Street  
3rd Floor, St. John's, NF A1C 1B1

Tel: (709) 754-7311 Fax: (709) 754-7070

00176724



Suppliers of Ready Mix Concrete for the Carpenters Training Institute Building

Boyd Critch

Phone: (709) 364-5008

Fax: (709) 364-4833

CAPITAL READY MIX

P.O. Box 8274, Station A  
St. John's, Newfoundland A1B 3N4

00176442