A Publication of the
Reinforcing Steel
Institute of Ontario

RSIO

Volume 3 No. 1
Summer 1989

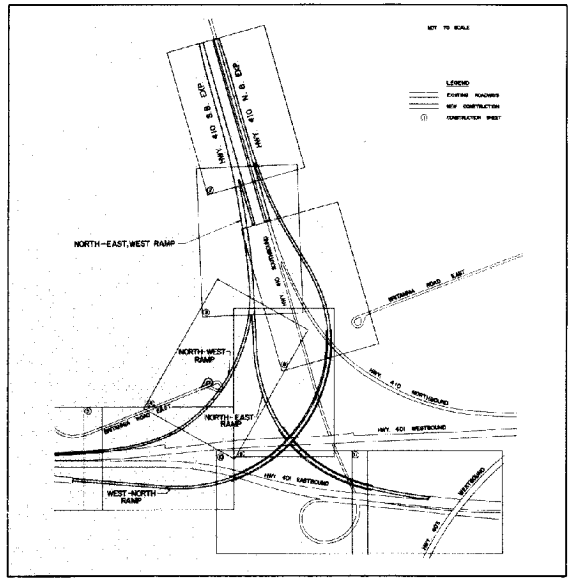
# MTO CONSTRUCTS MASSIVE OVERPASS

When construction is completed in 1990 of the new 4-tier $17.2 million interchange that connects Highway 401 eastbound to Highway 410 northbound (555 metres long), it will form part of the largest interchange in Canada says Barry Reid, Project Supervisor for the Ministry of Transportation Ontario. In making this determination, Reid is including the projected Highway 410 to Highway 403 connection that is proposed for construction in 1992 and the existing Highway 403 at 401 Highway connection.

As a consequence, the operative word for the current project is "BIG" says Reid. In total, 1 088 tonnes of uncoated rebar along with 607 tonnes of epoxy coated rebar are being used. Total concrete required for the project is 22 500 cubic metres.

Included in the epoxy coated rebar are several 2.4 metre diameter spirals which, according to the rebar fabricator, posed quite a challenge. Generally, in other construction projects, the diameter of spirals is normally one metre. In comparison this was a monster size.

As the rebar is fabricated to the correct radius, the spirals are formed by welding together pre-coated, straight lengths of bar. Care is taken to ensure the epoxy coating is not damaged.

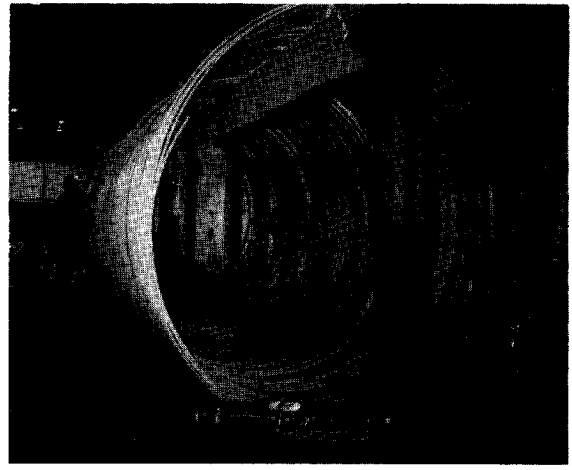



The project is also unusual for the height of the columns says Reid. The highest column is 23.5 metres at the centre point of the structure (the usual height for a structural crossing over Highway 401 is 4.5 metres). Construction joints were required to ensure proper concrete placing and curing.

This created an on-site challenge of splicing the large 45M and 55M vertical bars. The rebar was placed in three stages by use of a moveable platform and approximately 1,400 mechanical splices were used. This meant that a crane was at work almost continuously on the column, quite an unusual occurrence for this type of project says Reid.

When completed, the new interchange will move more of the ever increasing Mississauga/Brampton traffic onto Highway 410, which is better able to handle it, and should ease the flow on Highway 10.

**Owner:** Ministry of Transportation Ontario
**Structural Engineers:** MTO / Parker Consultants
**General Contractor:** BOT Construction



# RSIO LAUNCHES DETAILER CERTIFICATION PROGRAM

The Reinforcing Steel Institute of Ontario has just launched its' Detailer Certification program. The standards for the program were established by the Education Committee after careful consideration of various criteria. The objectives of the program being to encourage new people into the industry with the incentive of gaining certification and to provide existing detailers with evidence of their year of service to the industry.

The Certification program is open to detailers working for, or sponsored by, member companies of the RSIO.

Detailer trainees would be required to serve a minimum of two years apprenticeship as a detailer under the supervision of a senior detailer before requesting certification.

Any detailer with two or more years experience and presently working for a member company will be eligible for certification immediately.

Member companies may sponsor freelance detailers for certification. The detailer must have proven experience in detailing of at least two years and a working relationship of at least one year with the sponsoring company.

# SLURRY WALL CONSTRUCTION ON LRT TUNNEL REQUIRES SITE-FABRICATED REBAR CAGES

While Light Rapid Transit (LRT) is typically a surface transportation technology, the necessary right of ways aren't always available in a built-up city like Toronto. That's why the Toronto Transit Commission (TTC) is putting 120 metres of its new Harbourfront LRT underground.

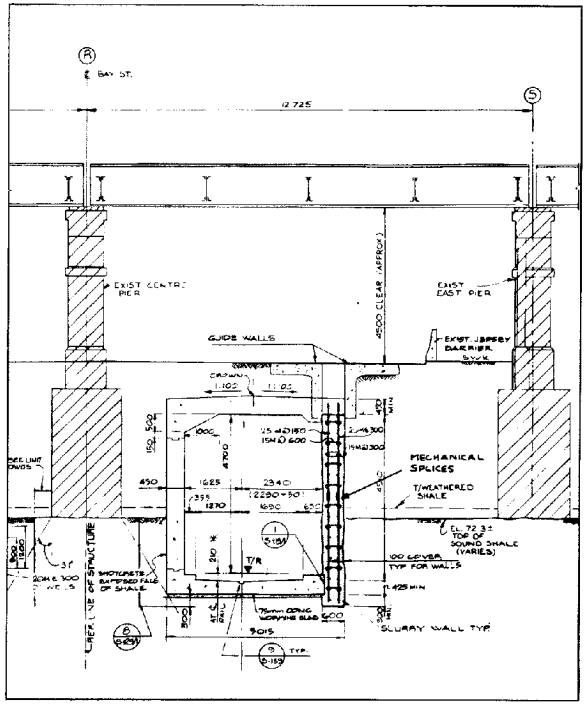
Simple enough so far, but it turns out that soil conditions in the vicinity of the tunnel are poor - like "ash powder" according to TTC structural engineer Bernie Liu - and normal cast-in-place concrete wall construction was out of the question.

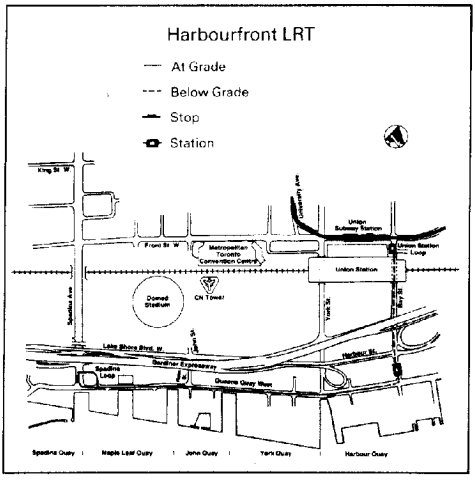
The answer was slurry wall construction which is a process by which a narrow excavation (about 700 mm wide and nine to 11 metres deep) is created and filled with a cement slurry to retain the structural integrity of the excavation while the walls are being built.

Site fabricated rebar cages, using bars of 25 mm and 30 mm sizes, are dropped vertically into the slurry-filled excavations and then the slurry is pumped out while the final concrete mix is poured in. The prefabricated cages are six metres high and range in length from 6 to 12 metres. The width of the cage is about 600 mm.

The new LRT line which was begun last November begins at a new (future) station at Front and Bay Streets. The line loops around under the north end of the existing Toronto Terminal Railway Bridge on Bay St., and continues south to the Queen's Quay.

The work under the TTR bridge is the tricky part of the job because there is not enough headroom under it to stand up fully-fabricated rebar cages for dropping into the wall excavations. In this section the cages are






fabricated in four-metre-high sections on the ground and dropped vertically into the excavations.

The final two metres of the cages are being added in place by threading individual bars into the prefabricated sections.

Mechanical couplers and splicing devices are being used to accomplish this portion of the operation.

Epoxy-coated rebar is also playing an important part on the Harbourfront LRT project in the tunnel sections. Concern about excess water and salt from vehicles on the roadway above, prompted designers to go for the extra protection afforded by epoxy coating.

**Owner:**
Toronto Transit Commission
**Engineers:**
Toronto Transit Commission
**General Contractor:**
G. Torno Engineering Inc.

# TILT-UP CONSTRUCTION AN ECONOMICAL ALTERNATIVE

Tilt-up construction is a method of construction which involves casting concrete wall panels horizontally on top of an already cast floor slab and tilting them up.

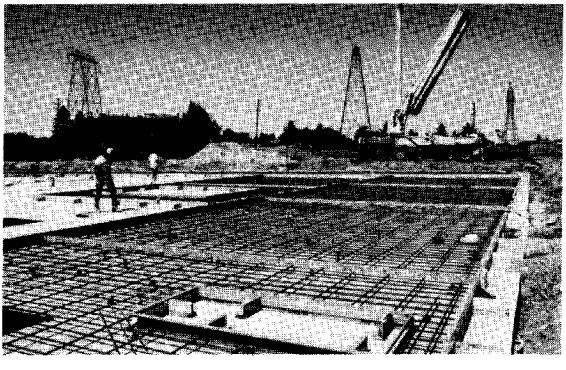
Typically the building method is suited for the warehouse, terminal, and light industrial markets when the building is one or two stories and in excess of 1 000 sq. metres.

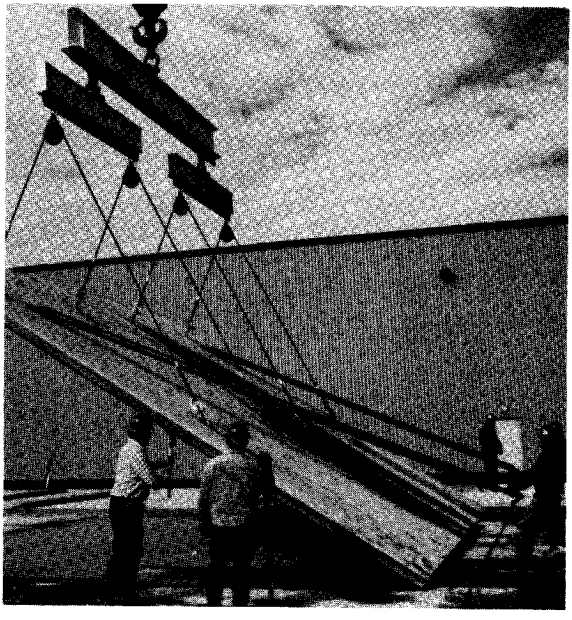
Tilt-up buildings are economically competitive with current building methods for these structures and have many advantages before, during and after construction.

A wide variety of surface finish, colour and texture options allows architects to win contracts with unique and attractive fire-resistant buildings.

Reinforced concrete tilt-up wall panels can serve as shear walls and are also capable of supporting roof loads, thereby minimizing the need for columns. When extended below grade they can act as grade beams in poor soil conditions.

Contractors can build tilt-up concrete buildings on time and on budget with locally-available materials.



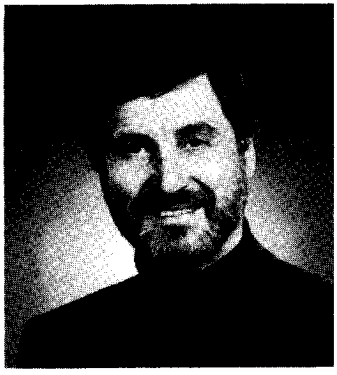


They are easy to place, cure and finish since tilt-up panels are produced at ground level without expensive skilled labour.

In addition to lower construction costs and earlier occupancy, building owners will appreciate the reduced energy consumption, maintenance costs and lower insurance rates due to reinforced concrete buildings' inherent resistance to fires, and weather damages.

Tilt-up construction enjoys great success in British Columbia and Nova Scotia, and is currently making inroads in Ontario.

# NEW RSIO PRESIDENT



Mr. Larry Paikin, Ennis-Paikin Steel Limited, a Subsidiary of Ennisteel Corp., Hamilton, has been elected President of the Reinforcing Steel Institute of Ontario for the 1988-1989 year.

Mr. Paikin, who had served as the first President of the Institute in 1973, noted in his remarks that rebar tonnages shipped from the Institute's Mill Members to the Fabricator Members in the preceding year - July, 1987 to June 30, 1988, had reached a record of 197 400 tonnes.

He said that he looked forward to another busy year in the construction industry, and a productive year in the Institute as it moves ahead in its program of providing buyers of construction and the design community with information on the benefits of cast-in-place reinforced concrete construction.

# FUTURE OUTLOOK REBAR

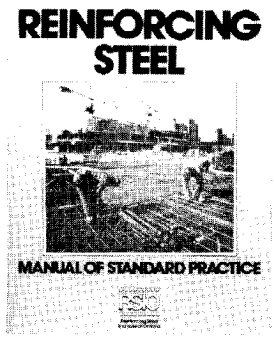
At the RSIO annual meeting, Britt Doherty, an Industrial Products Analyst for RBC Dominion Securities, presented an outlook on the Canadian Steel Industry, forecasting an average growth for 1989 of 2.2% with higher interest rates and a stronger dollar.

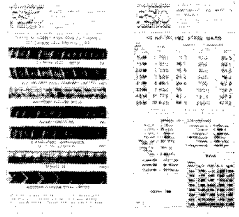
Recent events support that forecast and point to the present economic cycle sustaining a healthy Steel Industry. Britt charted the business cycle of scrap, anticipating that the rise in prices had ended but, admitting a small increase might be possible in early 1989.

He presented a list of mega projects in the planning stage totalling fourteen and one half billion dollars scheduled to start mid 1989 and demonstrated with a graph that one billion worth of construction spending on these projects equated to 20 000 tonnes of steel.

The charts relating to the Construction Industry showed an impressive list of major projects in the Toronto area with a total of twenty-one million square feet for completion in 1993. It is clear that Mr. Doherty has a good depth of knowledge of the Steel Industry and its profitable impact on the economy.

## RSIO PUBLICATIONS AND DESIGN AIDS



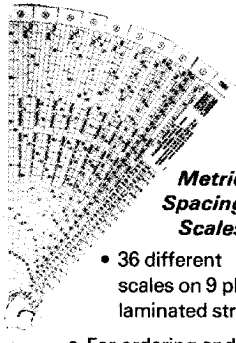
***Pocket Cards***

PC 2 - Rebar Identification - Mill Markings

PC 3 - Bar information standard hooks and laps

***Manual of Standard Practice***

- Industry Practices for Estimating Fabricating Detailing Placing
- Nationally accepted standard



***Metric Spacing Scales***

- 36 different scales on 9 plastic laminated strips


***Case History Reports***

- Shopping Mall
- Parking Structure
- Office Tower
- Office Buildings

- For ordering and costs contact the Institute.

RSIO

**REINFORCING STEEL INSTITUTE OF ONTARIO**

One Sparks Avenue
Willowdale, Ontario M2H 2W1
Tel: **(416) 499-4000** / Fax: **(416) 497-4143**

Technical Director - J. Warren Webster, P.Eng.