SOFT SOILS dictated need for enormous caissons for bicycle-pedestrian bridge. Image by Richard Szegidewicz.

TORONTO LAKEFRONT

People bridge will stand on king-size foundation

AN UNUSUAL SIGHT is in store for motorists who drive on Ontario's Queen Elizabeth Way and Lake Shore Blvd. to cross the Humber River at the western limits of the city of Toronto.

An entire bridge is going to soon take shape *on land*, on the east bank of the river. The 100 m long structural steel arch bridge will be moved across the water, with the west end of the structure carried by a barge. Two cranes at the abutments will lower the bridge into its final positon. Once pinned connections have been made at the arch's base, general contractor Sonterlan Construction Corp., Concord, will build a post-tensioned concrete deck.

The $4-million bicycle-pedestrian bridge will cross the river where it emp-

CAISSONS are drilled about 37 m to rock for west abutment of Humber River single-span structure. Permanent liners prevented concrete from becoming contaminated by soil.

By George A. Peer, P.Eng.

ties into Lake Ontario. The single-span structure, scheduled to open to the public in September, will be followed by six others at the river which will replace existing highway bridges. The old structures have been like roller coasters for drivers because of the way the embankments have been moving.

The Metro Toronto transportation department decided to replace the highway bridges—and build the pedestrian bridge—in stages over seven years for $80 million to $100 million.

The six new highway bridges will consist of structural box girder superstructures, according to consulting engineer Delcan Corp., Toronto. They will be built one at a time, with traffic diverted over new and old structures. Bridge alignments will be straightened in the process. The Lake Shore Blvd. eastbound bridge is first on the list. Tenders will be called by Metro in August with a view to work starting in October. An existing CN railway bridge will not be replaced in the near future.

Enormous caissons

Meanwhile, foundation work on the pedestrian bridge, which was to be completed in late April, looked like it was for a highway bridge. Enormous caissons were being driven about 37 m to shale, five for each abutment, by Deep Foundations, Thornhill.

The 1200 mm dia caissons were needed because of soft soil underlying old fill, according to Dan Orrett, Sonterlan's project engineer. Permanent steel liners were vibrated to rock to prevent tremie concrete from becoming contaminated by the soft soil; 4 m rock sockets were extended below the liners.

The east footing was poured on April 15, but not before a novel solution was found to stem the flow of lake water into the excavation. Instead of using a sheet pile wall, steel trench boxes, normally used for sewer line work, were installed along the sides of the excavation.

The space between the steel walls of the trench box was filled with clay to minimize the flow of water. Two 50 mm sump pumps went inside the 2.4 m deep trench box, the tips of which were 0.6 m below the base of the excavation. The trench box system was developed by Vic Soncin, Sonterlan's vice-president.

Delcan designers refer to the pedestrian crossing as a "basket handle bridge," named after the 1200 mm dia tubular steel arches which will serve as the prime members. The arches, which will be 10.5 m apart at their base, will be only 4.5 m apart at their top.

At the middle of the bridge, the arch will be 21 m above the elevation of the bearings. The arch members will be interconnected with hollow structural steel bracing. The full weight of the concrete deck, and a supporting steel box beam, will be carried by stainless steel hangers.

Dominion Bridge, Oakville, is expected to start assembling the bridge in June. Because this is not a standard pedestrian bridge, the steelwork will be more challenging than usual. The key assembly stage will occur when it is time to temporarily secure the arches with cables until the bridge is sitting on its foundations. The one-day bridge launch is scheduled for August. **HCN**

E-mail speeds communication

Bill Moore, Delcan's on-site project engineer on the Humber River bridges project, first got involved in construction in 1978 when he graduated from university. At the time, all he had at his fingertips was a site telephone. Since then, Moore has taken advantage of the birth of the fax machine, the personal computer and the cellular phone.

On the Humber job, where he arrived in January, he has been using another new communications tool, e-mail, to exchange information with Delcan personnel at head office. "This is the first time we've had e-mail in a field office application," he says.

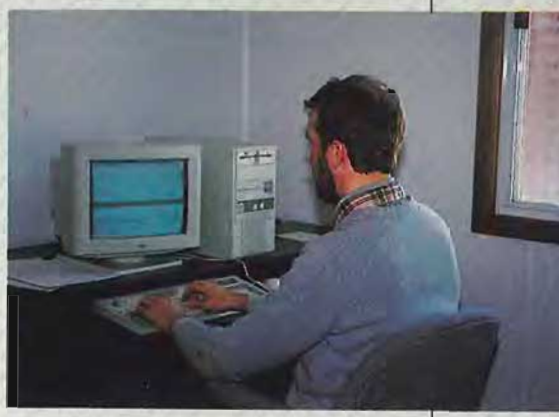
E-mail is an electronic envelope in which memos or data are inserted before being mailed by computer.

To date, he doesn't have e-mail access to Metro, which supplied the site offices and computer hardware, but he believes it's only a matter of time. "I think that will be the next step."

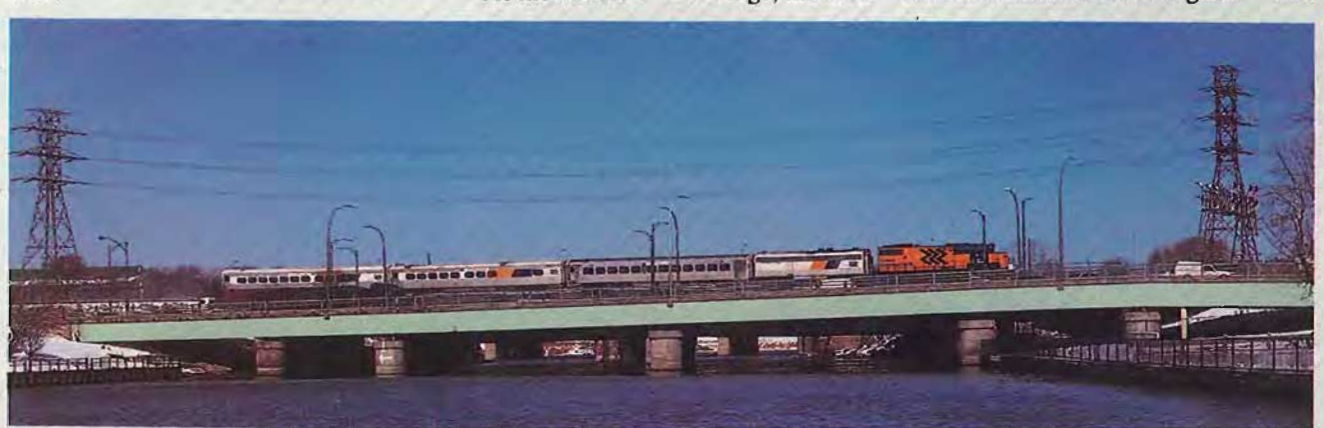
The prime advantage of e-mail is its quick turnaround time: unlike faxes, for example, which often lie in a pile before being picked up or delivered.

"If the contractor asks for an approval for a particular procedure, I will use e-mail to ask the designer or the project manager. Within an hour, I'll have a response, with a crisp copy from the laser printer."

Another benefit of e-mail, which Moore accesses using Onlan/PC version 1.3 software and WordPerfect for the actual writing, is that his memo can be easily sent to other head office PCs without having to make xerox copies. In addition, e-mail correspondence is kept in computer memory for easy retrieval.



Bill Moore uses e-mail to exchange information quickly.



SIX existing highway bridges (but not railway crossing) at Humber River will be replaced in stages.