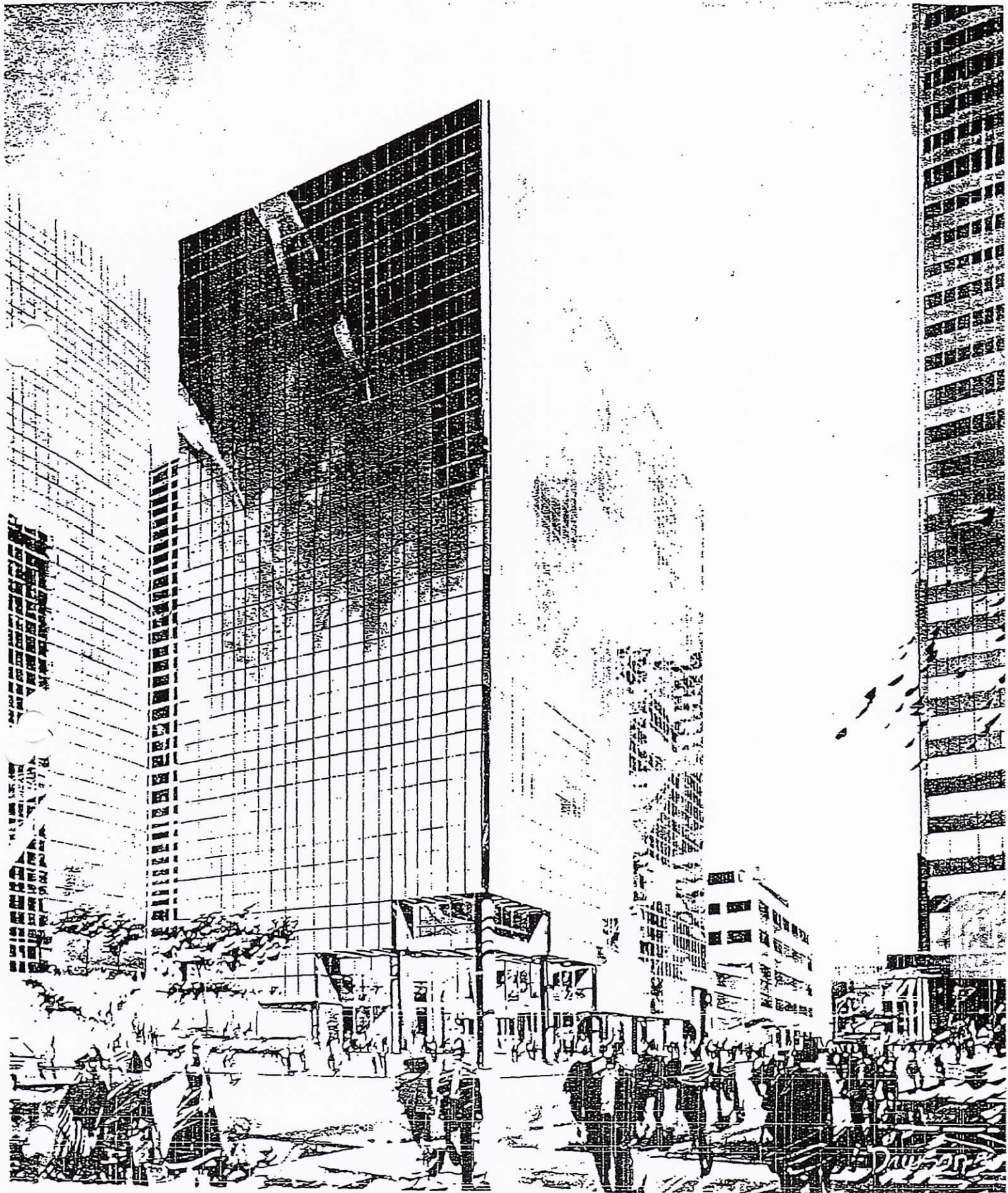


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WITH NEW CONCRETE TESTING SYSTEM



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Capitalizing on the cost reductions made possible by using the new LOK-TEST system to determine early concrete strengths, Oxford Development Group Ltd., Toronto, recently chopped a month off the construction of its Toronto Place Phase II office building. In the process, it saved over \$600,000. in interest payments, secured other design and construction economies, and was able to advance the occupancy date, according to John V. Roce, Vice President, Design and Construction for Oxford.

The LOK-TEST service which tests the concrete strength in the structure itself, rather than in cylinders broken in a laboratory, was provided by TROW LTD. the Toronto-based consulting materials engineering firm which pioneered the use of the system in North American.

John Bickley, Vice President of TROW LTD., says that LOK-TEST allows concreting to be done with far better control than with any other testing method, and as is close to a fail-safe system as modern technology has, as yet, devised. Used in conjunction with early high strength concrete mixes, such as those frequently placed by Oxford, the system determines the earliest time for safely stripping formwork.

In operation, the LOK-TEST device, a calibrated screw-actuated hydraulic jack, non-destructively pulls pre-positioned bolts embedded in the concrete. The force needed to crack the concrete surrounding the bolts is converted to compressive strength, to determine if there has been sufficient strength gain to permit form stripping.

Oxford's 20 storey Phase II National Bank Building, on which LOK-TEST was used, is located at the corner of York and Adelaide Sts., adjacent to the Phase I Westin and Guardian Tower. Designed by Toronto-based Pellow Architect and Jablonsky Associates, consulting structural engineers, the \$21.5 million (construction cost) structure was constructed by the Toronto Branch of PCL Construction Ltd., Edmonton.

Framed in a 30 ft. by 30 ft. column grid, the 480,000 sq. ft. building contains 8 in. thick floor slabs, strengthened with modified drop panels at the columns. Extremely economical, the section requires less reinforcing and concrete than does a conventional 10 in. thick flat plate floor system. On this project, for instance, it saved about \$.50/sq.ft. in materials and forming costs.

During construction, however; the thinner section is less forgiving than flat plate, requiring careful monitoring of concrete strengths, the sequence of form stripping, and the methods of reshoring.

Special precautions were particularly important on the National Bank Building, slated for construction in only 18 months, and requiring a faster than normal concrete pouring cycle. Against this background of extraordinary design and construction considerations, the LOK-TEST system was suggested by Paul Ast, Jablonsky's Chief Engineer, as a means of providing better control over the concrete strength.

Subsequently, the system was adopted, and, as Oxford's Roce explains, what started out to be a purely mechanical solution to a purely construction problem, produced collateral benefits which came as "a very happy surprise" to his firm.

The LOK-TEST, used with concrete strengths in the floors often higher than the 4000 psi material specified, enabled the pouring schedule to be safely reduced from 10½ to 9½ months.

This one month time gain, coming, as it did, in the front half of the construction program, enabled Oxford, in a typical situation, to get an early drawdown of its permanent financing. The accumulated savings derived from the difference in interest rates between the high-cost short term construction financing and the long term mortgage were in excess of \$600,000.

Additional benefits included over \$200,000 in accelerated gross income (made possible by the earlier-than-anticipated tenant occupancy of the building) and the construction cost reduction of over \$200,000. gained by using the modified drop panel floor section design.

Oxford's added expenses to secure these substantial financial advantages were comparatively modest. Roger Peterson, Project Manager for PCI, reports that the premium price for the "higher than specified" 4500-5000 psi concrete, used on about 1/3 of the floors during cold weather, added about \$20,000. to concrete costs. The TROW LOK-TEST service was approximately \$10,000., plus an additional \$5,000. for PCL to place over 900 test bolts in the formwork.

Based on the 480,000 sq.ft. of gross floor areas, these figures represent added costs of about \$.04/sq.ft. for the premium priced concrete, but only about \$.03/sq.ft. for the complete LOK-TEST service. Compared with the Oxford construction estimates of \$44.50/sq.ft. for the complete building, or \$8.00/sq.ft. for the structure and foundations, these costs, conclude Roce and Peterson, were certainly very reasonable.

RBH/jc