

POST TENSION CABLES

HISTORY

Post Tension Cable - PTC is one of the most popular and cost effective concrete floor construction methods for office, apartment and parkade buildings in North America. It was introduced in the 1970's and used in many of the buildings during the early 1980's.

PTC construction involves stretching a series of sleeve-covered steel cables, being 7-strand and 1/2 in-thick, from one side to another side of a building. These cables are encased in concrete so they act as beams, thus reducing construction costs. A large parkade or high-rise building might typically have 2,000 - 3,000 cables.

Presently PTC is still considered an acceptable construction method; in fact for many new condo buildings - PTC was the method of choice.

Present problems arose from lack of care during and after construction. CHMC recommends an annual testing and maintenance program for all buildings built between 1970 -1985. There should be no problems with buildings built after 1985.

Corrosion problems for concrete floor post tension cables (PTC) in buildings.

PTC corrosion problems are related to moisture penetrating the cable sleeve through cuts in the sleeve or leaks in protective expansion grout at the ends of the sleeve. Rusted cables eventually snap suddenly, cease to provide support for the floor, and if left could cause a serious structural and liability exposure hazard to life and property.

Note: No floor collapses have occurred to date in Canada.

Required Assessment: For all concrete buildings built between 1970 -1985

For potential cable stressing defects from corrosion followed by annual inspections.

- A qualified professional civil engineering consultant should be hired to; carry out initial assessment, provide a technical report for any remedial work based on a capacity design review, and develop an annual testing and maintenance program.
- Initial visual inspection of all floor and roof slabs for signs of moisture penetration into slab surface during construction due to lack of care and after construction due to construction failure. Followed by an annual testing and maintenance program.
- Providing access ports to the cables from the underside of the slab to check for signs of moisture, corrosion and stressing defects.

In Calgary there are 400 buildings, according to an assessment by the City of Calgary, of which between 10-20% of those have developed serious problems.

Unlike wood and steel, which sag under excessive load, concrete shows few visible signs. A rare exception is when a snapping cable punches through the concrete. Therefore, early detection within the next 8 years is of utmost importance to reduce loss exposure and cost of repairs. Inhibiting corrosion and replacing broken cables is a very expensive process. Parkade surfaces should be provided with a protective urethane traffic deck coating, to reduce further moisture penetration.

*In this bulletin the reader is provided with information about loss control issues. The bulletin is not a substitute for a thorough loss prevention assessment. In those situations where there is a concern about issues raised in this bulletin the reader should seek professional advice.

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