

BACKGROUND

The balconies of a condominium complex had been the source ongoing concern due to the externally apparent severity of deterioration thereof for several condominium units.

INITIAL CONDITION

The balconies' structure included pre-stressed concrete beams supported on CMU walls between the condominium units. The externally apparent physical condition of these concrete beams varied significantly between units. Among the balconies which were suspected to be in the poorest condition; severe spalling, longitudinal cracking and steel reinforcement corrosion were observed.

ANALYSIS

In order to more accurately determine the effect of the observed deterioration on the structural integrity of the concrete beams, Induspec performed a thorough evaluation of an apparently critically deteriorated concrete beam. The evaluation consisted of the careful sectioning and extraction of an outer beam to reveal the interior condition and the layout of the concrete and reinforcing steel. This information would then be used to assess the interior condition of other balcony beams based on exterior characteristics, rather than performing labor-intensive unit-specific evaluations for each.

The evaluation included extensive Schmidt Rebound Hammer testing and visual inspections along the length of the beam, as well as throughout the cross-sectional faces of the removed sections. A shoring structure was designed and built to support the beam during removal.

IDENTIFIED CAUSE

The results of the evaluation suggested that the concrete beam could no longer provide the required safe load-bearing capacity. Significant portions of concrete within the beam were observed to have virtually no compressive strength; whereby some sections would collapse under their own weight during removal and smaller pieces could be crushed by hand.

It is suspected that poor weatherproofing along the edge of the beam had encouraged water to seep-in and cause increasing damage to the concrete during freeze-thaw cycles.

RECOMMENDATIONS

Induspec performed a site investigation to assess the condition of the balconies of the other units of the condominium complex. Based on the evaluation that had been completed and a visual inspection of the other balconies, the owners and the building department were notified that those balconies which were no longer safe for continued use must be rehabilitated or replaced.

IMPLEMENTATION

A balcony restoration strategy was proposed to the owners of units with balconies that were no longer safe for use.

Gallery

