

# Condominium Railing + Balcony Materials Failure Investigation

MIAMI, FLORIDA

CTLGroup personnel were retained as experts to investigate failure mechanisms of balconies on a highrise condominium in downtown Miami, Florida.

Observed corrosion of reinforcing bars (rebar situated within the balcony concrete), the delamination, spalling and cracking of post pocket grout and balcony concrete surrounding the aluminum railing columns (posts), as well as aluminum balcony railing coating failures and railing corrosion were material defects investigated.

CTLGroup's study included review of construction documents, a site inspection and sample analyses. Techniques such as stereo-optical microscopy, scanning electron microscopy (SEM), X-ray diffraction (XRD) and Fourier Transform Infrared (FTIR) analyses were used during the course of this examination along with standard petrographic examination of concrete samples. The field evaluation determined that the defects observed on the railings included paint delamination and blistering along with visual evidence of aluminum corrosion beneath the coating in delaminated areas. The exposed rebar was found to be positioned in close proximity of the aluminum railings; at odds with Florida building codes.

The laboratory investigation confirmed the presence of corrosion products on aluminum railings and exposed rebar and revealed that an alkali resistant coating was not applied to the aluminum railing embedded in the post pocket grouts. Further, the railing coating was identified as a polyester powder type and not a more durable PVDF coating.



## Client

Confidential

## Services

SEM, XRD, FTIR Microscopic Analyses  
Petrographic Examination

## Project Team

Boyd Clark | *Senior Principal Materials Scientist*  
Sima Grubjesic | *Organic Chemist*

## Reference

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## Completion Date

July 2018

