Building Enclosure Institute. Inc
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Failed Façade Tectonics - Slab Deflection Joints

Summary: A project that we previously photographed during construction, started exhibiting the anticipated failures. It's one of the most typical architectural issues: disregard for slab deflection joints in façade design.

At the time we took initial photographs during construction, we noted that the accent lines on the façade, serving apparently as control joints for the finish layer, were placed well above the slab deflection joints, while the latter remained unaddressed. Such a defect was expected to fail in a short period of time. The subsequent photographs taken below, prove that expectation was correct, and the failure took place very quickly, in a matter of couple of years. Additional cracks of the finish layer were also observed, matching the typical stress lines, apparently unaddressed in the construction either.

The contractor posted an excellent time-lapse construction video (link at the bottom), showing how the building was constructed: the frame and slabs were poured first, and the exterior masonry walls were erected later, necessitating slab deflection joints at heads and shoulders.

Disclaimer. Photographs were taken from the public street. We were just bystanders, and had neither any relationship to this project, nor any conflict of interest with the contractor, nor the architect, nor any other party involved in this project, and therefore it's published here without the customary veil of anonymity.

General Photographs. East Elevation. Visible stains and cracks.

East Elevation. Typical. Visible stains and cracks along the unaddressed slab deflection joints and additional cracks propagating from corners of openings. Also visible efflorescence.

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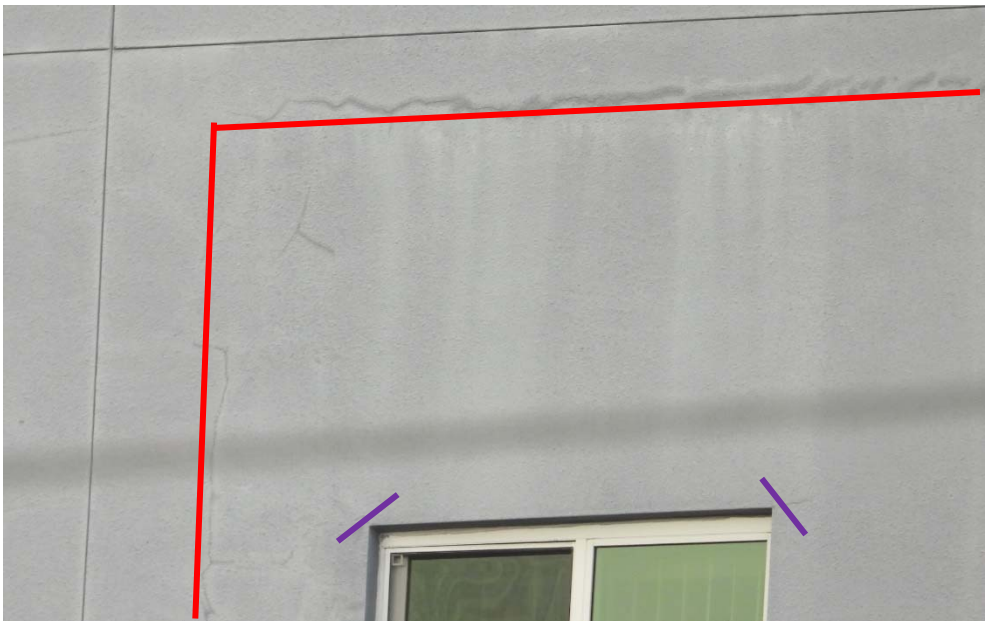


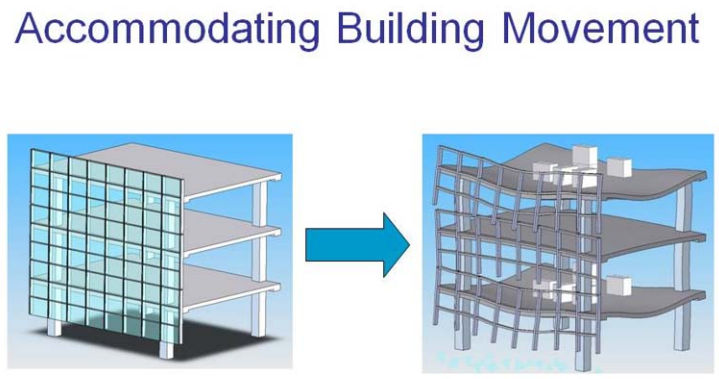
East Elevation. Further Magnification. Typical. Visible stains and cracks along the unaddressed slab deflection joints and additional cracks propagating from corners of openings. Also visible efflorescence. The red line marks the unaddressed slab deflection joint (vertical portions are shoulders of masonry walls). That's where the movement joints in the finish layer should had been placed to control the cracking. Purple lines indicate the missing/inadequate diagonal reinforcement based on appearance of diagonal cracks propagating from corners of openings.

Typical. Visible stains and cracks along the unaddressed slab deflection joints and additional cracks propagating from corners of openings. Also visible efflorescence. Control joints appear to partially participate, making the crack pattern less linear.

03/24/2015. Photos taken during construction. Visible misaligned slab deflection joints and horizontal control joints, the former left unaddressed. We found no weather resistive barrier on the façade, nor any flashing to address water drainage. These were the reasons why we took these photographs, expecting there would be some educational content in showing the history of this façade later, compared with photos of anticipated future failures. We were not dissapointed.

References:

Here is a relevant slide from our seminar titled “Principles of Façade Design,” illustrating the slab deflection movement, and the resulting need for such joints:



The following is a relevant slide from our seminar titled “Greening Building Envelopes,” also illustrating the unaddressed slab deflection movements in a stucco façade:

The red line marks the unaddressed slab deflection joint (vertical portions are shoulders of masonry walls).

The moral of this story: Structural movement always trumps material movement. These failures normally produce water intrusions, as well as contribute to air, noise, odor, and pest transmission. (We have no knowledge of such intrusion in this building.)

Relevant Links for the SEVENTH AVENUE TRANSIT VILLAGE at 6101, 6145, and 6145 NW 7TH AVE, Miami, FL 33127:

Contractor's Website: Link Construction Group https://www.linkconstructiongroup.net/project-post/seventh-avenue-transit-village/ (see the time-lapse video)

Architect's Website: Zyscovich Architects: http://www.zyscovich.com/project/8-153-seventh-avenue-transit-village

HUD Website (Affordable Housing): https://www.huduser.gov/portal/casestudies/study-080620.html

Atlantic Pacific communities' website https://www.apcompanies.com/apartment-living#/stores

(The owner is APC SEVENTH AVENUE HOLDINGS LLC)

Structural Engineer of Record's website http://www.bniengineers.com/ (Bliss & NYItray Inc.)

Another Structural Engineer's website: http://www.lrstructural.com/portfolio-view/7th-ave-transit-village/

Leasing Office's website https://www.seventhavenuetransitvillage.com/Photo-Tour.aspx