

Parking deck zone A detaches from southern perimeter wall.

The region of initial failure is further from the building, meaning that the the intact region of deck is larger and heavier and would apply more force/torque/bending moments/leverage/displacement on the 1' 6" drop slab feature at the columns at row 9.1 The lever is longer.

The geometry of a region of initial failure at the southern perimeter wall means that the deck becomes restrained in the north south direction by the three columns I14.1, I14 and I12.1, and others to the East, after they punch through.

The failure geometry is linear allowing the forces to be applied concurrently in unison to columns I9.1, K9.1, L9.1 and M9.1

Photographic evidence of localized concrete degradation and rebar failure means the location of the weakest point on the deck cannot be determined from the design or as built details.

Failure geometry for punching through the single column I14.1 is a cantilever slab that is bending on one axis (south north) and after I14.1 punches through the additional deck area and weight would be transferred to I14 dramatically increasing the probability of its punch through failure. In addition to the momentum of the falling deck.

This theory clearly explains each step of the progression and how the loads increase as the failure progresses.

Column K13.1 punched through

Point of failure is closer to the building resulting in relatively low force/torque/bending moments/leverage/displacement at the 1' 6" drop slab feature at the building columns at row 9.1. The lever is shorter.

The geometry of an initial point of failure at column K13.1 would mean that the deck between the point of failure and the columns on row 9.1 at the building facade would only be constrained by column K11.1 which has a beam connecting it to column K9.1 which reduces the chances of its punch through failure.

The failure geometry is concentric/radial meaning forces are concentrated on column K9.1 and lower on other columns along row 9.1

Reason stated for this initial point of failure is that it there were excessive spans or that the deck thickness was insufficient for the span but there is no reference to the possibility that the extent of rebar corrosion or concrete degradation varies significantly across the deck. Note 1.

Failure geometry after K13.1 punches through would transfer load across a two dimensional surface (the deck) to 8 surrounding columns as a primarily lateral/ horizontal load.

This theory fails to identify which element fails after column K13.1 punches through, so fails to establish a progression.

Failure beginning in zone A allows the debris below zone A (dropped through below the deck), to differ from the debris in zone C (propped against the wall after collapse)

This theory fails to explain the difference in the condition of the debris below zone A and zone C at the southern perimeter wall. With small pieces and lots of dust below zone A and one large piece and little dust below zone C or the position of the debris relative to the deck, with debris below the deck level below zone A.

Dust created by the initial failure would be expelled from the basement garage space by subsequent deck collapse and deposited on the privacy wall support column at the 8-foot to 4-foot transition. As observed.

Dust created by an initial failure in this location would be expelled from the garage ramp gate area by any subsequent deck collapse to the south. Not observed on video evidence.

Note 1

The Model by Dawn Lehman's team presented in the Miami Herald does acknowledge and incorporate localized degradation but fails to identify or explain the causes of the increased degradation seen at the southern property line wall.