UNIVERSITY OF CALIFORNIA, DAVIS
School of Law

400 Mrak Hall Drive
Davis, CA 95616-5201
(530) 752-0243

October 9, 2015

To: Council Officers and Members, Los Angeles City Council
Re: Public Comment for October 9, 2015 City Council Meeting

Request for technical amendment or deferred consideration of **Council File: 14-1697-S1: Resilience by Design**

I am a retired UC Davis law professor, now residing in CD11. I have learned that my retirement condominium is in a complex of 4 rare nonductile concrete lift-slab buildings that were built in 1962-1963. If we have an earthquake with strong lateral shaking, expert structural engineers who have studied our plans say our buildings will probably collapse, killing everyone inside. The science is clear, and two committees of the Structural Engineers Association of Southern California (SEAOSC) plus a report by the National Institute of Building Sciences all agree that lift slabs should be included in the class of vulnerable nonductile concrete buildings that this proposed ordinance addresses. The attached Addendum provides those statements.

Because these lift-slab columns are steel and not concrete, however, the ordinance's current definition of concrete buildings excludes them. A few words can fix this discrete but important technical problem:

SEC. 91.9503. DEFINITIONS.

. . . .

CONCRETE BUILDING is a building having concrete floors and/or roofs, either with or without beams, supported by concrete walls and/or concrete columns, and/or concrete frames with or without masonry infills, ~~or~~ any combination thereof, or a lift-slab building with a concrete lateral force resisting system.

There is no known opposition to including these buildings or using this language. I understand that lift slabs are left out simply because one engineer said at one meeting that nonductility is not the reason that they fail. The literature and the SEAOSC committees are completely and uniformly to the contrary. But when others at that meeting tried to correct the misstatement, someone apparently concluded that engineers do not agree about the issue. This tragic failure to consult the literature and SEAOSC's expert committees leaves Los Angeles residents who live in our 145 condos and other Los Angeles lift-slabs, if there are any others, at terrible risk. This is the appropriate vehicle to address lift-slabs, and this is the appropriate time. We residents are so few in number that we have no other realistic hope for the life-preserving help we need.

I respectfully request a technical amendment that adds lift slabs to this ordinance. Alternatively, I ask that members abstain from voting on the ordinance today to ensure that the matter will be held over for the next Council meeting. That will allow Councilmember Bonin's attendance, my own return from Illinois, and clarifying discussions with the authors about this narrow, but vital concern. Thank you all for your consideration.

Sincerely yours,

Carol S. Bruch (pronounced Brook)
Distinguished Professor Emerita
https://law.ucdavis.edu/faculty/bruch/

Addendum to C. Bruch's October 9, 2015 Public Comment on CF 14-1697-S1

1) On January 14, 2015 two of SEAOSC's committees -- Seismology and Existing Buildings -- issued a joint report that commented on the Mayor's original draft ordinances. At the top of its page 8 they recommended that the definition of affected concrete buildings be expanded to expressly include lift slabs:

- **Suggestion:**
  - Suggest modifying the statement and definition to focus on the most vulnerable buildings (i.e. exceptions for one and two story concrete shear wall buildings may be appropriate).
  - **The current concrete building and masonry definition should also clarify that highly vulnerable buildings such as lift slab buildings should be included in the ordinance.** The city should clarify if other buildings such as Tilt-Up buildings or steel gravity columns with masonry infills are (or not) part of the ordinance.

2) In 2010, the National Institute of Building Sciences' Building Seismic Safety Council said that, "as a class, older concrete buildings are likely to include a significant number of buildings at risk of significant damage and collapse in earthquake shaking." The first step in reducing these risks, it stated, is to inventory them and the structural systems they employ. Accordingly, they reported, PEER had been funded to collect inventory data in Los Angeles, and the Concrete Coalition to collect inventories in California's high seismic regions. At page 13, the report identified lift slab buildings as dangerous older concrete buildings that should be included:

Lift-slab buildings, although not common, are another special case. One dangerous failure mode is loss of support at the steel-column-to-flat-slab connection, which could be controlled by brittle concrete behavior. The lateral system for these buildings is typically a concrete core that, when improperly detailed, can exhibit serious degradation. Therefore, although mostly supported on steel columns, such a building is likely to suffer a brittle concrete failure and should be included in the class. http://nehrp.gov/pdf/nistgcr10-917-6.pdf

3) Terry Paret, the highly regarded structural engineer who led the study of our documents, edited a fuller explanation of lift-slab science to ensure its clarity and accuracy. His major studies, here and abroad, are listed at http://www.wje.com/assets/pdfs/staff/Paret_Terry.pdf.:

Unfortunately, the Mayor's draft plan's definitions seem to overlook lift slab buildings, a particularly vulnerable type of nonductile concrete building. Because these buildings are rare in seismic zones, the literature, even model codes, frequently overlook them as well. Yet they are likely to pancake in an earthquake with strong lateral shaking, producing many casualties.

In lift slab buildings, which are usually multi-story and in some cases are high-rise, reinforced concrete floors are cast on the ground and jacked into place around steel or concrete columns. These columns are typically designed for gravity only. The slabs are then held in place by steel "collars" or similar devices. When subjected to lateral forces that make the building sway, these columns may bind on the collars and their ability to support gravity loads can be compromised. The problem is exacerbated by the fact that these buildings were all constructed prior to the incorporation of ductile detailing requirements into the code, so the shear walls that support these buildings laterally are typically quite brittle, which leads to an increment of drift for which the collars and columns were not designed. If so, the building will collapse and those inside will die. A sobering example of a high-rise lift slab building collapse occurred in Anchorage, Alaska in 1964.
http://www.ngdc.noaa.gov/hazardimages/picture/show/147