

(JA/32)

Barbara Lane – Floors

Tina Donoghue

From: Barbara Lane <Barbara.Lane@arup.com>
Sent: 15 June 2017 15:40
To: Allen, John: CP-Plan: RBKC
Subject: floors

Importance: High

John

As you know we have no drgs, not on the scene, no detailed information and have done no form of analysis or investigation, so this is just our best professional guidance on a no liability basis (which I am obliged to make clear, no alarm intended).

We also have no idea what temperature and when the rebar was exposed to – this is VIP wrt its residual strength today.

Checklist:

4 people seems reasonable subject to:

- A) check soffit for any spalling worse than already seen. I.e. Two layers of bars with no concrete around them**
- B) No significant deflection of slab already**
- C) No more than 50-80mm standing water on slab**
- D) slab loaded progressively and if it is felt to deflect noticeably, retreat.**

Further information below to support these 4 items.

Assuming an original design live load of 1.5kN/sq.m

4 fire fighters might be expected to apply between 0.12 and 0.16kN/sq.m to the overall bay sizes, or approximately 10% of the intended design live load.

100mm depth of water gives about 1kN/sq.m.

So if the outer floors are waterlogged to 100mm depth then adding fire fighters would take the applied live load up to about 77% of design live load.

If rebar has been exposed to temperatures above 700°C then the floor would be reaching or exceeding its residual capacity with 4 persons standing on it.

Going in one at a time could reduce the risk of sudden failure but the brigade must react and make their own decisions on the basis of this information.

If they are doing casualty evacuation, *then the floor loads change again, depending on the number and condition of the casualties.*

Items for consideration

1) the limited evidence we have found regarding the original structural design, is that the cross walls were not intended to be load bearing. They appear to be concrete and cast integral with slab below. Information on head detail would confirm – if you want to investigate further. Nonetheless they are likely to be carrying some load now. You could review load path of walls through lower storeys and basement.

2) panels not shown on original construction photos –these are likely to be only there to attach windows to.

3) 4 people seems reasonable subject to:

A) check soffit for any spalling worse than already seen. I.e. Two layers of bars with no concrete around them

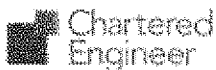
B) No significant deflection of slab already

C) no more than 50-80mm standing water on slab

D) slab loaded progressively and if it is felt to deflect noticeably, retreat.

4)As mentioned last night acoustic monitoring of the building may give indication of ongoing damage. It may be that background noise from the movement as it cools would mask further bar breaks or significant crushing. Happy to ask about if anyone thinks useful?

Dr Barbara Lane FREng C Eng



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