CODE GUIDE

BUREAU OF DEVELOPMENT SERVICES

TOPIC: **Fire Resistive Floor Systems - UBC/34/#1**

CODE: **Structural Specialty Code: 1998 Edition**

APPROVED: **February 1, 2002** ***[Margaret Mahoney]***

REFERENCE: **Section 3403.2 – Structural Specialty Code**

SUBJECT: **Existing Plaster Ceilings in Older Multi-Storied Buildings**

QUESTION:

1. Before 1946 the City of Portland Building Code (code) allowed "ribbed construction" (concrete joist) as a 2-hour fire resistive floor system when the slab between the joists had a thickness of 2 ½" with 1" of concrete cover over the structural reinforcing steel. This floor construction system was allowed for buildings up to 16 floors high. In 1946, the code began requiring a ¾" thick plaster ceiling for such floor slabs to get the 2-hour rating. The rating of existing floor systems without the plaster coating was dropped from 2-hours to 1-hour. Over the years, for various reasons, holes have been created in the plaster and have not been repaired, thereby diminishing the 2-hour rating. Section 3403.2 of the UBC permits additions and alterations to existing buildings without requiring the buildings to be brought up to current UBC requirements for newly constructed buildings if the additions and alterations do not reduce required fire resistance or will otherwise create conditions dangerous to human life. The holes in such existing plaster ceilings potentially may reduce fire resistance below the required level and create a life safety issue.

   Based on the above information, can holes remain in plaster ceilings installed below concrete floor assemblies in older multi-storied buildings?

RESPONSE:

1. Yes, existing plaster ceilings that have been compromised either by holes being cut or otherwise made in them, or the plaster ceiling being totally removed, will not be required to be improved to original condition if the provisions of this guide are met.

QUESTION: 2. Which buildings qualify for the provisions listed in this guide?

RESPONSE: 2. The alternates provided in this guide apply to buildings with concrete floor systems classified as Type I construction that were constructed prior to 1955.

QUESTION: 3. Can the provisions of this guide be used in a building that is under the provisions of an FM 41 agreement?

RESPONSE: 3. No. Buildings for which an FM-41 (OAR 837-041-0050) Agreement is in effect shall comply with the conditions of the existing FM-41 agreement. The FM-41 agreement between the building owner and the City will be satisfactory evidence of compliance provided the agreement is free from any owner default.

QUESTION: 4. What if the building had an FM-41 agreement that has expired, or the building never had an FM-41 agreement? Can the provisions of the guide be used in these cases?

RESPONSE: 4. Yes, this Guide may be applied to existing buildings after the expiration of an FM41 agreement, or to buildings which do not have an FM 41 agreement in place, provided the building meets all the construction requirements outlined below and the building is sprinklered.

The level of sprinkler protection required depends upon the condition of the building and the fire and life safety hazard level of the building. The Fire Marshal's Office will make these determinations through negotiation with the building owner. If the building is not equipped with a sprinkler system, the installation schedule shall be determined through negotiations with the Office of Planning & Development Review and the Fire Marshal's Office.

QUESTION: 5. What has to be done to allow the plaster to remain as is?

RESPONSE: 5. All of the following conditions must be met to provide required levels of fire resistance to concrete floor systems in older multi-storied buildings.

1. Slabs shall have a minimum thickness of 2 ½" with spans not exceeding 36" center to center of concrete joist.
2. All structural reinforcing steel shall have a minimum concrete cover of 1" or equivalent fire protection. This requirement does not apply to wire fabric/mesh installed in slabs to control cosmetic cracking.
3. In reinforced concrete structures, where the reinforcing steel has a minimum of 1" of concrete cover as required by item 2 above, all primary and secondary structural members shall be accepted as having the fire resistance required for Type I construction. This provision does not apply to floor-slabs, and is only valid for the purposes of this guide.
4. The building is fully sprinklered to NFPA 13 standards or per existing agreements between the City and the Owner.
5. All holes or other penetrations in concrete floor slabs shall be fire stopped with approved materials or filled with concrete.
6. A suspended acoustical or gypsum board ceiling may be installed below the existing concrete floor system without the need to sprinkler the interstitial space.
7. If an existing plaster ceiling is removed and the concrete floor system is left exposed as the finished ceiling, any sprinkler protection, either existing or newly required, shall be modified or installed so as to be not more than 22" below the concrete floor system and at least 1" below the bottom of the floor rib in accordance with NFPA 13.
8. All wiring in the plenum between the ceiling and the concrete floor shall be in noncombustible conduit or raceway or shall be a plenum rated wire whether or not connected to a power source.

Questions regarding the proper interpretation or application of this Code Guide shall be referred to the OPDR inspections program manager for decision. If the owner objects to the program manager's decision then the owner may pursue an appeal in the usual manner.

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