

Structural Requirements for Alteration and Addition Works in Existing Buildings

Alteration and Addition (A&A) works to existing buildings involve, among others, the design of new structural works and/or the checking of structural adequacy of the existing construction. This practice note gives guidance on the structural aspects of A&A submissions.

Condition of Existing Structural Elements

2. All submissions of structural plans for A&A works should be accompanied by an assessment on the structural viability of the proposal. To satisfy himself/herself that a proposal is viable in the context of structural stability, the appointed authorized person (AP) or, if appropriate, the registered structural engineer (RSE) should inspect the condition of the existing structural elements affected by the works. Wherever possible, site photographs clearly showing all affected structural elements should be submitted for reference and record purposes.

Design of New Works

3. All new structural elements in the A&A works should be designed in accordance with the current Building Regulations and relevant codes of practice. In submitting the structural plans for the A&A proposal, you should include, if appropriate, results of any tests that you have carried out for ascertaining the structural condition of existing elements likely to be affected by the works and any planned remedial works, if required.

Structural Adequacy of Existing Works

4. The structural adequacy of an existing building or part thereof, as may be affected by proposed A&A works may, subject to the following requirements, be checked according to the then prevailing Building Regulations and codes of practice to which they were designed:

(a) *Wind Calculations*

In the case of A&A works involving:

- i. partial or total removal of existing major wind resisting walls or frames, which would result in a reduction in their stiffness by 5% or more, or
 - ii. the extension of building dimensions which would result in an increase of 10% or more of the wind exposure areas of a building,
- the structural adequacy of the building due to wind should be checked based on the current wind code.

(b) *Imposed Loads in Storage Areas*

When existing floors used for storage purposes are affected, their structural adequacy should be checked using the minimum imposed loads stipulated in the current Building (Construction) Regulations.

(c) *Shear in Flat Slabs*

When flat slabs, which were originally designed based on working stress method, are structurally altered or subject to any additional load, the shearing stresses in the slabs should be checked using the Code of Practice for the Structural Use of Concrete - 1987.

Details of Existing Structural Elements

5. For the purpose of paragraph 4 above, AP/RSE should have knowledge of the structural details of existing members. These details are available from the original approved plans. In a case where the original approved plans are not available, justifications on your design by means of a comparison of the effects of new and original loading, bending moments and shear forces of the structural members may be accepted. If necessary, opening up of the affected structural elements to ascertain the amount of reinforcement and concrete strength should be performed. According to paragraph 6 of PNAP 121, reinforcement details of the structural members in the existing building affected by the A&A works, when available, should be shown on drawings.

Fire Resistance

6. PNAPs 202 and 231 provide guidance on the application of the codes of practice relating to fire safety.



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