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BRITISH STANDARD CODE OF PRACTICE

LARGE-PANEL STRUCTURES AND STRUCTURAL CONNECTIONS IN PRECAST CONCRETE

Addendum No. 1 (1970) to
CP 116 : 1965 and CP 116 : Part 2 : 1969
The structural use of precast concrete

THE COUNCIL FOR CODES OF PRACTICE
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Addendum No. 1 (1970)
to CP 116

Addendum No. 1 (1970) to CP 116 : 1965 and CP 116 : Part 2 : 1969.

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This Addendum makes reference to the following British Standard and Code of Practice:

BS 916. Black bolts, screws and nuts.
CP 116. The structural use of precast concrete.

British Standards and Codes of Practice are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users ascertain that they are in possession of the latest amendments or editions.

The following BSI references relate to the work on this Code of Practice:
Committee reference BLCP/35 Draft for comment 69/4327

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Addendum No. 1 (1970)
to CP 116

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The Committee is indebted to the following for valuable assistance in connection with the Addendum:

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This Addendum represents a standard of good practice and therefore takes the form of recommendations. Compliance with it does not confer immunity from relevant statutory and legal requirements.

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BRITISH STANDARD CODE OF PRACTICE CP 116

THE STRUCTURAL USE OF PRECAST CONCRETE

ADDENDUM No. 1

LARGE-PANEL STRUCTURES AND STRUCTURAL CONNECTIONS IN PRECAST CONCRETE

FOREWORD

When CP 116, 'The structural use of precast concrete', was published in 1965, the Foreword stated:

> 'A sub-committee has been set up to make a detailed study of connections in precast structural frames, and any recommendations that can be made as a result of this sub-committee's work will be issued as addenda to the Code.'

When the work of this sub-committee commenced, it was decided to include large loadbearing panel construction.

The Ministry of Housing and Local Government published Circular 62/68 in November 1968 dealing with flats constructed with precast concrete panels. The CP 116 committee is aware of this circular and of the notes published by the Institution of Structural Engineers giving guidance on the circular and also their paper 'Structural stability and the prevention of progressive collapse'. This addendum contains the recommendations of the committee with respect to large precast concrete panels at the present time to deal with Recommendation 44 of the Ronan Point Inquiry Report:

> 'A Code of Practice applicable specifically to large concrete panel construction should be prepared and published as a matter of urgency.'

The committee has had uppermost in its mind the need to guard against a chain reaction of failures following damage to a small part of the structure due to an accidental loading not specifically considered in design, i.e. what has become known as progressive collapse. The committee realises that not enough is known about the magnitude and frequency of possible accidental loadings, such as explosive forces, nor about the response of the structure to such loading. For the time being, therefore, and until the necessary evidence becomes available, the committee has adopted the criteria contained in the Building (Fifth Amendment) Regulations 1970.

The clause numbers in this addendum are a continuation of the clause numbers in CP 116. Where cross reference is made to clauses not forming part of

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the addendum, these clause numbers refer to clauses in CP 116. Values in this addendum are given in both SI and imperial units as this forms an addendum to both CP 116 : 1965 and CP 116 : Part 2 : 1969 (metric units). It supplements and extends these existing Codes, and it should not be used in isolation from the main Codes. In particular, Clause 909 replaces and extends Clause 346.

1. GENERAL

901. Introduction. This addendum relates to structures which utilize precast loadbearing wall panels of not less than single-storey height. The recommendations apply particularly where floor and roof are also in concrete panel construction, but the principles should be taken to apply where other types of floor and roof construction are used.

Clauses 909 to 916 also relate to connections in all types of precast concrete structures.

The stability of large-panel structures is normally obtained by arranging and joining floors and walls so that the floors can transmit loads or reactions to the walls which act as thin, deep buttresses and transmit these loads to the foundations. The choice of plan form is a most important consideration for ensuring stability and, as far as practicable, the various elements of a building should be arranged in such a way as to reduce the effect of any local accident.

The connections and critical sections of panels close to joints have to be designed to resist the worst combinations of shear, axial force and bending caused by vertical and horizontal loads. The detailed design of each critical section at a joint will determine whether there is full continuity, or whether there is a release of bending restraint without excessive reduction of resistance to shear and axial force. Where floor or roof units are designed as simply supported members, care should be taken that their shear resistance is adequate taking into account the effects of cracking due to restraint against rotation at the supports.

Large-panel structures have to be capable of withstanding safely the normal loadings specified for the type of structure concerned. In addition provision has to be made to accommodate local or general effects arising from constructional defects such as misalignment and lack of plumb and for which recommendations are given in Clause 902.

The recommendations given in Clause 903 to 908 inclusive dealing with the connections between units, the tying together of the structure, and the plan form of the building, aim at enabling the structure to accommodate a limited amount of accidental loading which may occur as a result of causes such as construction loading, differential settlement of the supports, thermal movements, explosions, accidental impact, etc., which are not defined as normal loading. These accidental loadings may produce local damage, but the recommendations have as their objective the limitation of the extent of such damage to an acceptable risk. No

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