

SS 677 : 2021
(ICS 91.100.30)

SINGAPORE STANDARD

**Design and execution of precast concrete slabs
and walls for buildings**



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Published by Enterprise Singapore

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ISBN 978-981- 5024-96-8

The content of this Singapore Standard was approved on 31 August 2021 by the Building and Construction Standards Committee (BCSC) under the purview of the Singapore Standards Council.

First published, 2021

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Association of Consulting Engineers Singapore

Building and Construction Authority

Eastern Pretech Pte Ltd

Excel Precast Pte Ltd

Housing & Development Board

JTC Corporation

LSW Consulting Engineers Pte Ltd

National University of Singapore

Singapore Concrete Institute

Singapore Contractors Association Ltd

Singapore Institute of Technology

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Contents

	Page
Foreword _____	7
1 Scope _____	9
2 Normative references _____	9
3 Terms and definitions _____	9
4 Design and durability _____	11
5 Watertightness and weather-resistance at precast joints _____	41
6 Production quality control _____	68
7 Handling, storage, transportation and erection _____	77
8 Acceptance of precast components _____	83
 Annexes	
A Examples of connections (informative) _____	85
B Hoisting of precast components (informative) _____	100
C Stacking of precast components (informative) _____	103
D Cracks in reinforced concrete, prestressed concrete, solid, ribbed or voided precast components and hollow core slab (informative) _____	107
 Tables	
1 Allowances for effects of spalling at supports _____	20
2 Allowances for effects of spalling at supported members _____	20
3 Design flexural tensile stresses in in-situ concrete _____	32
4 Classification of sealants, sealing strips, gaskets and baffles _____	50
5 Fillers for movement joint _____	52
 Figures	
1 Typical example of ties in precast structure _____	15
2 Continuity of ties: bars in precast member lapped with bar in in-situ concrete _____	17
3 Continuity of ties: anchorage by enclosing links _____	17
4 Continuity of ties: bars lapped within in-situ concrete _____	17
5 Example of bearing width definitions _____	19
6 Corbel strut-and-tie model _____	22
7 Corbel detailing _____	23
8 Typical plan details of vertical wall joints _____	26
9 Reinforcement of vertical wall joints _____	27
10 Horizontal joints supporting slab ends _____	29
11 Horizontal joints not supporting slab ends _____	29

	Page
12	Application of sealant at precast joint _____ 42
13	Two-sided adhesion of sealant at precast joint _____ 43
14	Typical sealant system at precast joint _____ 44
15	Sealant system with joint filler _____ 44
16	Sealant system with bond breaker tape _____ 44
17	Gasket cast-in with precast component during manufacturing at plant _____ 47
18	Gasket fitted during erection of precast component _____ 47
19	Omega gasket fitted during erection of precast component _____ 48
20	Gasket fitted after erection of precast component _____ 48
21	Gasket junctions of wall panels _____ 49
22	Waterproofing system at typical horizontal joint of precast facades _____ 53
23	Horizontal joint of facade with canopy or ledge at top _____ 54
24	Horizontal joint of facade with ledge at bottom _____ 55
25	Horizontal joint of precast infill wall _____ 55
26	Horizontal joint of non-load bearing precast wall at wet area _____ 56
27	Typical horizontal joint of precast column _____ 57
28	Typical horizontal joint of precast wall - with and without slab _____ 57
29	Waterproofing system at typical vertical joint with column and wall _____ 59
30	Typical detail of stress relief space _____ 60
31	Incorrect positions of backing rod at vertical joint _____ 61
32	Detailing of stress relief space with respect to horizontal joint profile _____ 61
33	Sectional view of stress relief space _____ 62
34	External vertical joints between precast wall panel and in-situ wall _____ 63
35	Elevation of butt joint _____ 63
36	Sectional view of vertical joint with waterproofing membrane _____ 64
37	Precast prestressed plank _____ 65
38	Precast slab joint (precast solid slab) _____ 66
39	Joint between wall and floor with in-situ upstand kerb _____ 67
40	Joint between wall and floor (when kerb is not provided) _____ 67
41	Common rigging configurations _____ 82
	Bibliography _____ 112

Foreword

This Singapore Standard was prepared by the Working Group on Design and Execution of Precast Concrete Slabs and Walls for Buildings set up by the Technical Committee on Building Structures and Substructures under the purview of BCSC.

This standard resulted from the review of CP 81:1999, "Code of practice for precast concrete slab and wall panels". SS 677 replaces CP 81.

The local industry is moving towards greater prefabrication in building construction to achieve higher construction productivity and better-quality building finish. Among other precast concrete elements, precast concrete slab and wall panels are commonly used in building construction.

The standard gives provisions for the design, production and construction of precast slab and wall panels in buildings. It is based on local experiences, practices and relevant standards and codes of practices. It covers the following main areas:

- Design and durability;
- Watertightness and weather-resistance at precast joints;
- Production quality control;
- Handling, storage, transportation and erection; and
- Acceptance of precast components.

To gain the full benefits of using precast slabs and wall panels, it is important to have proper planning starting from the design and development stage of a building project. The planning involves the standardisation and simplicity in design, production, transportation, site accessibility and installation of precast components. This standard will help the users achieve an efficient and economical design that will contribute to higher production and construction productivity and better-quality precast products.

The design of precast reinforced and prestressed concrete slab and wall panels for ultimate and serviceability limit state is in accordance with the requirements and recommendations given in Eurocode 2 : Design of concrete structures. The important design data and requirements recommended in Eurocode 2 such as the basic design considerations on building stability, connections and durability aspect are incorporated in this standard for ease of reference and design of precast slab and wall panels.

Joints are the feature of precast slab and wall panel design. Improper design and detail of the joints will lead to the problem of water seepage through the joints. In this standard, the design and details of the joints in relation to joint width and waterproofing material are recommended to ensure water- and weather-tightness.

The standard also includes requirements and guidelines on acceptance of precast slab and wall panels in relation to the quality and integrity of the precast components that are received on job sites.

It is assumed in the drafting of this standard that the design of precast reinforced or prestressed concrete slab and wall panels is entrusted to a Professional Engineer and the execution of the work is carried out under the direction of an appropriately qualified supervisor.

In preparing this standard, reference was made to the following publications. Permission has also been sought from the following organisations for the reproduction/adaptation of materials from their publications into this standard (refer to the footnotes in the standard):

BSI Standards Limited

BS 6093:2006+A1:2013, 'Code of practice for design of joint and jointing in building construction'

CEN

EN 1992-1-1:2004, 'Eurocode 2 : Design of concrete structures – Part 1-1 : General rules and rules for buildings' © CEN, reproduced with permission.

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Design and execution of precast concrete slabs and walls for buildings

1 Scope

This standard gives requirements and recommendations for the design, manufacture, handling, transportation, erection and acceptance of precast concrete slabs (with or without prestress), load bearing and non-load bearing precast concrete wall panels.

The production, handling and construction techniques vary with different types of equipment, machinery and construction material used. As such, the design and detail for the stresses induced in the precast concrete slab and wall panels arising from different techniques of production, handling and construction are not covered in this standard.

2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS EN ISO 11600	Building construction. Jointing products. Classification and requirements for sealants
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