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RECOMMENDATIONS FOR CO-ORDINATION OF DIMENSIONS IN BUILDINGS—ARRANGEMENT OF BUILDING COMPONENTS AND ASSEMBLIES

PART I FUNCTIONAL GROUP I—STRUCTURE

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PART I FUNCTIONAL GROUP I—STRUCTURE

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Indian Standard

RECOMMENDATIONS FOR CO-ORDINATION OF DIMENSIONS IN BUILDINGS—ARRANGEMENT OF BUILDING COMPONENTS AND ASSEMBLIES

PART I FUNCTIONAL GROUP 1—STRUCTURE

0. FOREWORD

0.1 This Indian Standard (Part I) was adopted by the Indian Standards Institution on 4 November 1974, after the draft finalized by the Modular Co-ordination Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Since the basic decision to adopt a 10 cm module has been taken, the work connected with the application of this module for different building components, such as bricks, walling materials, roofing materials etc, has been done by different committees and dimensions have been recommended by these committees for such components.

0.2.1 However, it has been felt that some thought had to be given to the need for dimensionally co-ordinating a particular product, specially with respect to the three dimensions — length, width, height/thickness. It was felt that in some cases such co-ordination of dimensions may or may not be necessary, while in other cases it is absolutely imperative. To identify such parameters for individual components, it was felt that building as a whole should be examined from the point of view of various components that go into it and then decide on the need for dimensional co-ordination on an individual basis.

0.2.2 After such a decision has been arrived at, it will then be possible for the relevant committees to adopt this principle in finally arriving at the nominal and work sizes for the individual components. With this end in view the building has been divided broadly into the following five functional groups:

a) Functional group 1 — Structure
b) Functional group 2 — External envelope
c) Functional group 3 — Internal subdivision
d) Functional group 4 — Services and drainage
e) Functional group 5 — Fixtures, furniture and equipment

0.3 It was indeed very useful for the Modular Co-ordination Sectional Committee to have the views of various architects, engineers and users in arriving

at a basic decision regarding the need for dimensionally co-ordinating some of these products so that the relevant committees could exercise their mind on such items only. Based on these decisions, it may be possible to review the existing Indian Standards on different subjects where dimensions have been already given and arrive at new dimensions where necessary.

0.3.1 It may be noted that the words 'co-ordination of dimensions' instead of 'modular co-ordination' have been used in the title of the standard with a view to encouraging the concept of establishing the correlation of two or more products when juxtaposed together to perform a function. If such a function is not necessary or there is no function to be done, then it appears there may not be a need for co-ordinating dimension in the products placed together.

0.4 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country. This has been met by deriving assistance from the following:

BSPD 6432 : Part 1-1969 Recommendations for the co-ordination of dimensions in building — arrangement of building components and assemblies within functional groups; Part 1 Functional groups 1, 2, 3 and 4. British Standards Institution.

BSPD 6432 : Part 2-1969 Recommendations for the co-ordination of dimensions in building — arrangement of building components and assemblies within functional groups, Part 2 Functional group 5. British Standards Institution.

0.5 This standard is one of a series of Indian Standards on modular co-ordination.

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1. SCOPE

1.1 This standard (Part I) lays down recommendations for co-ordinating dimensions of building components and assemblies for functional group 1 structure which comprises of the following elements of construction:

Foundation, floors, roofs, floor and roof beams, roof trusses and arches, columns, load bearing walls, staircases, ramps and raker beams.

2. TERMINOLOGY

2.0 For the purpose of this standard the following definitions shall apply.

2.1 Element of Construction — A functional part of a building constructed from building materials and/or building components.

2.2 Services — The group of installations each of which supplies one or more services to a building.

2.3 Assembly — An aggregate of building components used together.

2.4 Building Component — A building product formed as a distinct unit having specified sizes in three dimensions.

2.5 Building Section — Building material formed to a definite cross-section but of unspecified length. Sections are usually manufactured by a continuous process, such as rolling, drawing, extruding or machining. Examples are angles, bars, tubes, battens, sheet, plate, wire and cable.

2.6 Co-ordinating Plane — A plane by reference to which a building component or assembly is co-ordinated with another.

2.7 Co-ordinating Space — A space bounded by co-ordinating planes allocated to a component, including allowances for tolerances and joint clearances.

2.8 Co-ordinating Dimensions — A dimension of co-ordinating space, which defines the relative positions of two or more components in an assembly, according to the characteristics of the components which are relevant to assembly.

2.9 Basic Size — The size by reference to which the limits of size are fixed.

3. GRADING OF COMPONENTS AND ASSEMBLIES

3.1 Depending upon the relative importance, the components or assemblies shall be given a grading, A, B, or C as follows:

Grading A — Components or assemblies for which dimensional co-ordination is essential.

Grading B — Components or assemblies which in some situations need to be dimensionally co-ordinated.

Grading C — Components or assemblies which do not require to be dimensionally co-ordinated.

4. CO-ORDINATING DIMENSIONS OF BUILDING COMPONENTS AND ASSEMBLIES

4.1 The recommended co-ordinating dimensions of building components and assemblies for functional group 1 — structure shall be as given in Table 1.

TABLE 1 RECOMMENDED CO-ORDINATING DIMENSIONS OF BUILDING COMPONENTS AND ASSEMBLIES FOR FUNCTIONAL GROUP 1 — STRUCTURE

(*Clause* 4.1)

Sl No.	Element of Construction	Assembly	Component	Grading	Co-ordinating Dimensions				Cross Reference to Other Functional Groups
					Length	Width	Height	Depth/ Thickness	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	Foundation			C	—	—	—	—	
ii)	Floors								
		Solid		A	√	√	—	√	3
		Hollow core		A	√	√	—	√	3
		Ribbed		A	√	√	—	√	3
		Joisted		A	√	√	—	√	3
		Built-up		A	√	√	—	√	3
			Decking	A	√	√	—	√	
			Sheets	A	√	√	—	—	2, 3
			Structural topping	A	—	—	—	√	
			Ribs	A	√	√	—	√	
			Sections, joists	A	√	√	—	√	
			Concrete formers (hollow block)	A	√	√	—	√	
			Concrete reinforcement, bar	C	—	—	—	—	
			Slab drop (as in flat slabs)	A	√	√	—	√	
			Fixing accessories	C	—	—	—	—	

	Formwork		A	—	—	—	—	
		Panels, preformed	A	√*	√	—	—	
		Sections	A	√*	—	—	—	
		Sheets	A	√*	√	—	—	2, 3
		Fixing accessories	C	—	—	—	—	
iii) Roofs								
	Solid		A	√	√	—	√	2
	Hollow core		A	√	√	—	√	2
	Ribbed		A	√	√	—	√	2
	Joisted		A	√	√	—	√	2
	Built-up		A	√	√	—	√	2
	Shell		A	√	√	—	—	2
		Decking	A	√	√	—	√	
		Sheets	A	√	√	—	—	2, 3
		Structural topping	A	—	—	—	√	
		Ribs	A	√	√	—	√	
		Sections, joists	A	√	√	—	√	
		Sections, common rafters	A	√	—	—	—	
		Sections, purlins	A	√	—	—	—	
		Concrete formers (hollow block)	A	√	√	—	√	
		Concrete reinforcement, bar	C	—	—	—	—	
		Slab drop (as in flat slab)	A	√	√	—	√	
		Fixing accessories	C	—	—	—	—	2, 3
	Formwork		A	—	—	—	—	
		Panels, preformed	A	√*	√	—	—	
		Sections	A	√*	—	—	—	
		Sheets	A	√*	√	—	—	2, 3
		Fixing accessories	C	—	—	—	—	
iv) Structural floor and roof beams								
	Solid		A	√	√	—	√	

*Net sizes of forms will be derived from component sizes.

(Continued)

TABLE 1 RECOMMENDED CO-ORDINATING DIMENSIONS OF BUILDING COMPONENTS AND ASSEMBLIES FOR FUNCTIONAL GROUP 1—STRUCTURE—*Contd*

Sl No.	Element of Construction	Assembly	Component	Grading	Co-ordinating Dimensions				Cross Reference to Other Functional Groups
					Length	Width	Height	Depth/ Thickness	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
iv)	Structural floor and roof beams—*Contd*	Hollow core		A	√	√	—	√	
		Built-up		A	√	√	—	√	
			Sections	A	√	√	—	√	
			Concrete reinforcement, bar	C	—	—	—	—	
			Concrete formers	A	—	√	—	√	
			Fixing accessories	C	—	—	—	—	2, 3
		Cased		A	√	√	—	√	
			Fire casings, preformed	A	√	√	—	√	3
			Sheets, fire resistant		√	√	—	—	2, 3
			Sections	A	√	—	—	—	
			Fixing accessories	C	—	—	—	—	2, 3
		Formwork		A	—	—	—	—	
			Panels, preformed	A	√*	√	—	—	
			Sections	A	√*	—	—	—	
			Sheets	A	√*	√	—	—	2, 3
			Fixing accessories	C	—	—	—	—	
v)	Structural roof trusses and arches								
		Truss							

		Sections	C	—	—	—	—	
		Fixing accessories	C	—	—	—	—	
	Arch		A	√	√	—	—	
		Bricks	B	√	√	√	—	2, 3
		Blocks	B	√	√	√	—	2, 3
		Fire casings, preformed	A	√	√	—	—	
		Sheets, fire resisting	A	√	√	—	—	2, 3
		Sections	A	√	—	—	—	
		Fixing accessories	C	—	—	—	—	
vi) Columns								
	Solid		A	√	√	√	—	
	Hollow		A	√	√	√	—	
	Built-up		A	√	√	√	—	
		Sections	A	√	√	√	—	
		Concrete reinforcement, bar	C	—	—	—	—	
		Fixing accessories	C	—	—	—	—	2, 3
		Bricks	B	√	√	√	—	2, 3
		Blocks	B	√	√	√	—	2, 3
		Concrete formers	A	—	—	√	—	
	Cased		A	√	√	√	—	
		Fire casings, preformed	A	√	√	√	—	3
		Sheets, fire resisting	A	—	√	√	—	2, 3
		Sections	A	√	—	—	—	
		Fixing accessories	C	—	—	—	—	2, 3
	Formwork		A	—	—	—	—	
		Panels, preformed	A	√*	√	—	—	
		Sections	A	√*	—	—	—	
		Sheets	A	√*	√	—	—	2, 3
		Fixing accessories	C	—	—	—	—	

*Net sizes of forms will be derived from component sizes.

(*Continued*)

TABLE 1 RECOMMENDED CO-ORDINATING DIMENSIONS OF BUILDING COMPONENTS AND ASSEMBLIES FOR FUNCTIONAL GROUP 1—STRUCTURE — *Contd*

Sl No.	Element of Construction	Assembly	Component	Grading	Co-ordinating Dimensions				Cross Reference to Other Functional Groups
					Length	Width	Height	Depth/ Thickness	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
vii)	Load-bearing walls								
		Solid (including cavity)		A	√	—	√	√	2, 3
			Bricks	B	√	√	√	—	2, 3
			Blocks	B	√	√	√	—	2, 3
			Lintels	A	√	√	—	√	2
			Sunshades	A	√	√	—	—	
			Bed blocks	A	√	√	√	—	
			RCC band	A	—	√	—	√	
			Panels, preformed	A	√	—	√	√	2
			Concrete reinforcement, bar	C	—	—	—	—	
			Fixing accessories	C	—	—	—	—	2, 3
			Concrete formers	A	√	—	√	—	
		Framed		A	√	—	√	√	
			Sections	A	—	√	—	√	
			Sheets	A	√	—	√	—	
			Fixing accessories	C	—	—	—	—	2, 3
		Formwork		A	—	—	—	—	
			Panels, preformed	A	√*	√	—	—	
			Sections	A	√*	—	—	—	
			Sheets	A	√*	√	—	—	
			Fixing accessories	C	—	—	—	—	2, 3

viii) Staircases (spiral, straight flight, half landing and quarter landing)								
	Solid		A	√	√	√	√	
	Joisted		A	√	√	√	√	
	Built-up		A	√	√	√	√	
		Flights and landings (combined)	A	√	√	√	√	
		Flights	A	√	√	√	√	
		Landings	A	√	√	—	√	
		Tread and riser (combined)	A	√	√	√	—	
		Treads	A	√	√	—	—	
		Waists, stringers or carriages	A	—	—	—	√	
		Concrete reinforcement, bar	C	—	—	—	—	
		Fixing accessories	C	—	—	—	—	2, 3
	Formwork		A	—	—	—	—	
		Panels, preformed	A	√*	√	—	—	
		Sections	A	√*	—	—	—	
		Sheets	A	√*	√	—	—	2, 3
		Fixing accessories	C	—	—	—	—	
ix) Ramps								
	Solid		A	√	√	√	√	3
	Hollow core		A	√	√	√	√	
	Ribbed		A	√	√	√	√	3
	Joisted		A	√	√	√	√	3
	Built-up		A	√	√	√	√	3
		Decking	A	√	√	—	√	
		Sheets	A	√	√	—	—	2, 3
		Structural topping	A	—	—	—	√	
		Ribs	A	√	√	—	√	
		Sections	A	√	√	—	√	
		Concrete formers	A	√	√	—	√	

*Net sizes of forms will be derived from component sizes.

(Continued)

TABLE 1 RECOMMENDED CO-ORDINATING DIMENSIONS OF BUILDING COMPONENTS AND ASSEMBLIES FOR FUNCTIONAL GROUP 1—STRUCTURE—*Contd*

Sl No.	Element of Construction	Assembly	Component	Grading	Co-ordinating Dimensions				Cross Reference to Other Functional Groups
					Length	Width	Height	Depth/ Thickness	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(ix)	Ramps—*Contd*								
			Concrete reinforcement, bar	C	—	—	—	—	
			Fixing accessories	C	—	—	—	—	2, 3
		Formwork		A	—	—	—	—	
			Panels, preformed	A	√*	√	—	—	
			Sections	A	√*	—	—	—	
			Sheets	A	√*	√	—	—	2, 3
			Fixing accessories	C	—	—	—	—	
x)	Raker beams (*see* 'Structural floor and roof beams' for cross section dimensional recommendations)			A	√	√	√	√	
			(*see* 'Structural floor and roof beams' for components)						

√ = This sign indicates that the dimension is required to be co-ordinated.
*Net sizes of forms will be derived from component sizes.

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