PENGENALAN KEPADA IBS

Flat Pekeliling (1966)

Ir. Nor Azman Bin Ismail
CKAS JKR

PENGENALAN KEPADA IBS

1. Apa itu IBS?
2. Perbezaan IBS dengan Konvensional
3. Kelebihan IBS
4. Jenis IBS di Malaysia.
5. Pekeliling Berkaitan IBS.
6. Perlaksaanan IBS dalam JKR.
7. IBS Score.
8. Masalah perlaksaan di tapak.

APA ITU IBS ?

IBS (Industrialized Building System) adalah satu sistem atau kaedah pembinaan yang mana

- Komponen nya dihasilkan dalam keadaan terkawal dikilang atau tapak bina,
- Diangkut dan dipasang dalam kerja pembinaan
- Menggunakan peralatan dan pekerja yang minimum.

DEFINASI IBS

Hasil Komponen

Angkut komponen

Pasang dan bina ditapak

PEMBINAAN KONVENSIONAL

Bahan Binaan

Konkrit

Kayu dan formwork, scaffolding

Batu bata, pasir, keluli.

Jentera, mesin, peralatan kerja

Pembinaan

TAPAK BINA (ON STE)

PEMBINAAN KONVENSIONAL

- Tapak kotor (*Wet construction*)
- Tapak berserabut . (*messi*)

PEMBINAAN KONVENSIONAL

- Lebihan bahan binaan *(Construction waste)*
- Penggunaan buruh/tenaga kerja tinggi.

KAEDAH IBS

Bahan binaan

KONKRIT

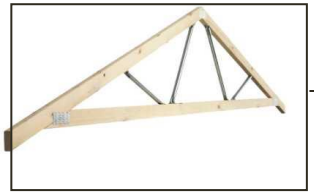
KAYU

BATA, KELULI

BLOK

Komponen di bina *(precast and prefabricated)*

Kekuda kayu dan besi



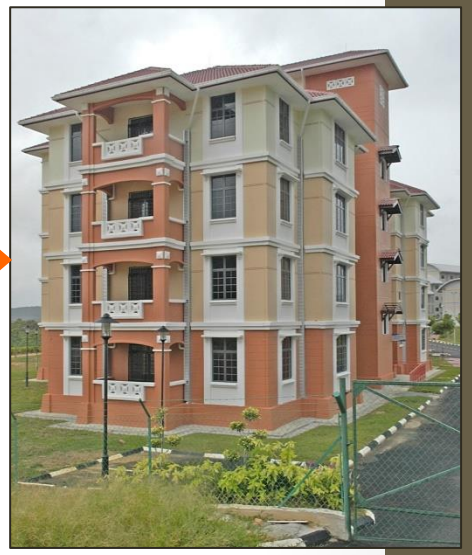
Panel dinding, lantai konkrit

Frame kayu tingkap dan pintu.

Precast tiang, rasuk, tangga

Luar Tapak (OFF-SITE

Pasang dan Bina



Tapak bina (ON-SITE)

Kenapa guna IBS ?

- **Senang digunakan/ urus (Easy Handling)**
  - Tidak memerlukan peralatan khas atau teknik untuk angkut, bawa dan pasang.

- **Pembinaan yang cepat**
  - Komponen dibuat terdahulu.
  - Komponen sedia untuk dipasang setelah tapak/asas siap.

- **Selamat**
  - Tapak lebih bersih dan kering.

Kenapa guna IBS ?

- Pekerja dapat diminimumkan.
- Penjimat kos peranca dan acuan.
- Kawalan kualiti yang baik.

  Komponen dibuat dan fabricate dikilang dalam keadaan terkawal

SISTEM IBS DI MALAYSIA

1. Sistem kerangka, panel , kekotak konkrit pra tuang

Precast beams and columns

Precast floor slabs

SISTEM IBS DI MALAYSIA

1. Sistem kerangka, panel , kekotak konkrit pra tuang

Precast concrete walls

Precast concrete boxes

SISTEM IBS DI MALAYSIA

2. Sistem Acuan (Reusable formwork)

SISTEM IBS DI MALAYSIA

3. Sistem Kerangka keluli

Steel beams and columns

Steel portal frames

SISTEM IBS DI MALAYSIA

3. Sistem Kerangka keluli

Steel roof truss (Hot roll/ cold formed)

SISTEM IBS DI MALAYSIA

4. Sistem kerangka kayu pasang siap.

Fabricated timber trusses

Fabricate timber frame (glulam)

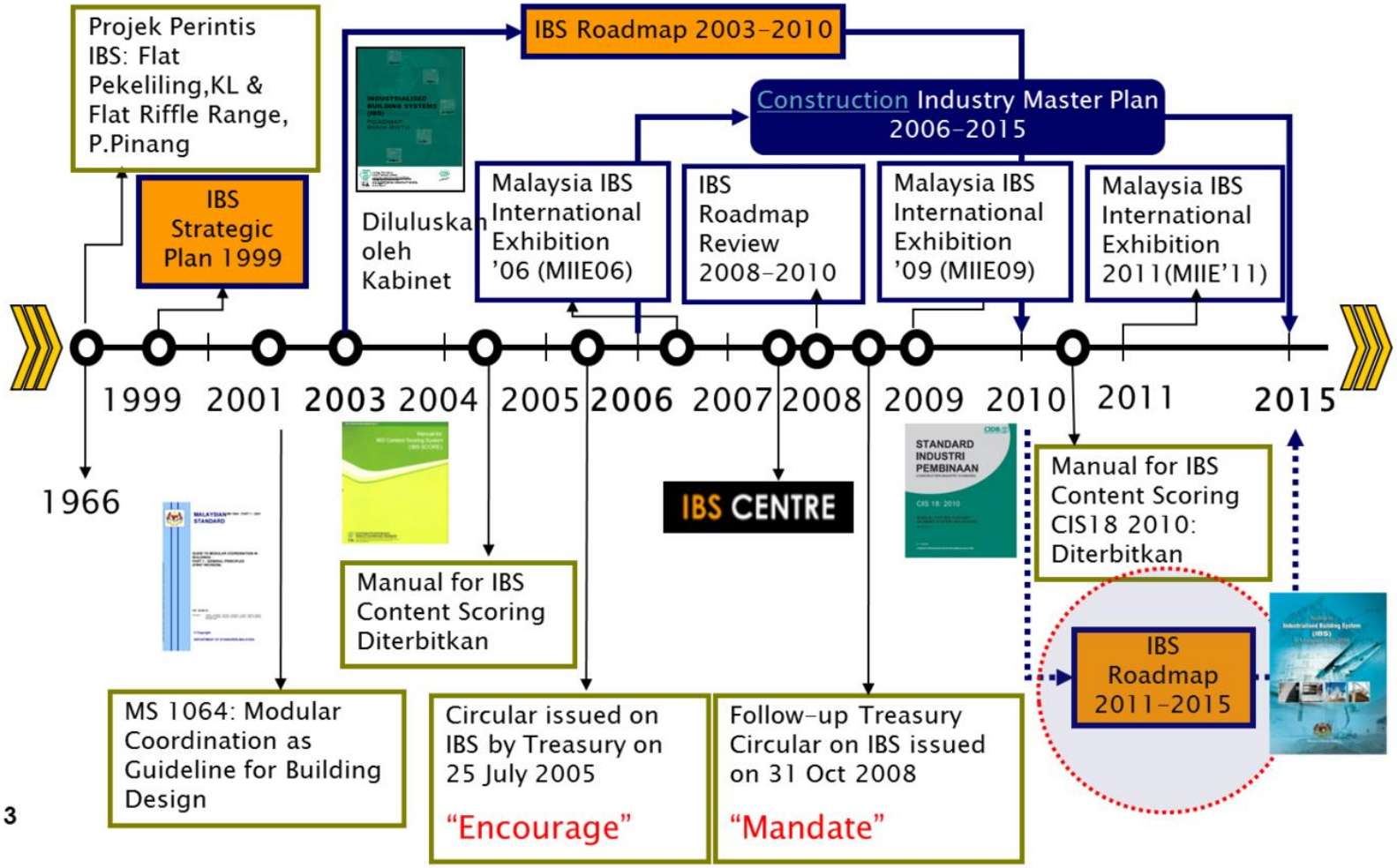
SISTEM IBS DI MALAYSIA

5. Sistem Blok

Interlocking bricks

Hollow block system

Pembangunan IBS di Malaysia



GARISPANDUAN IBS ?

SURAT PEKELILING PERBENDAHARAAN BIL.7 TAHUN 2008 (SPP 7/2008)

- **TUJUAN**

  Surat Pekeliling Perbendaharaan (SPP) ini bertujuan untuk memaklumkan kepada **semua Agensi** mengenai keputusan Kerajaan untuk melaksanakan kaedah Industrialised Building System (IBS) dalam pembinaan projek Kerajaan.

SURAT PEKELILING PERBENDAHARAAN BIL.7 TAHUN 2008 (SPP 7/2008)

2. Jemaah Menteri pada 29 Ogos 2003 telah bersetuju supaya *Roadmap Industrialised Building Systems 2003-2010* dijadikan dokumen *blueprint* sektor pembinaan Malaysia serta sumber rujukan sepenuhnya untuk semua pihak di dalam sektor pembinaan Malaysia menjelang tahun 2010. IBS merupakan satu sistem atau kaedah pembinaan yang mana komponennya dihasilkan di dalam keadaan terkawal (di kilang atau di tapak bina), diangkut dan dipasang dalam kerja pembinaan dengan penggunaan pekerja yang minimum di tapak. Objektif pelaksanaan kaedah IBS ini antaranya adalah untuk meningkatkan kualiti dan produktiviti pembinaan, menyeragamkan reka bentuk, mempercepatkan tempoh pembinaan serta mengurangkan kebergantungan kepada pekerja asing ke tahap 15% pada 2010 seperti disasarkan dalam *Roadmap* IBS.

3. Sebagai langkah awal untuk melaksanakan penggunaan IBS, Kerajaan telah mengumumkan dalam pembentangan Bajet Tahun 2005 supaya penggunaan kaedah IBS dalam pembinaan rumah mampu milik termasuk pembinaan bangunan Kerajaan dipertingkatkan daripada 30% kepada 50% bermula tahun 2005. Bagi mencapai objektif pelaksanaan kaedah IBS yang telah ditetapkan, Kerajaan telah memutuskan keperluan untuk mempertingkat dan memperluaskan penggunaan IBS dalam projek Kerajaan.

SURAT PEKELILING PERBENDAHARAAN BIL.7 TAHUN 2008 (SPP 7/2008)

SURAT PEKELILING PERBENDAHARAAN BIL.7 TAHUN 2008 (SPP 7/2008)

➢ PELAKSANAAN IBS DALAM PROJEK KERAJAAN

- Menggunakan **sistem IBS terbuka *(Open System)***
  - penggunaan piawaian **Koordinasi Modular MS1064**.
  - **tidak menetapkan** penggunaan sesuatu sistem komponen IBS semasa proses perolehan.
  - Berdasarkan **katalog** dan **piawaian** yang **boleh digunapakai** oleh semua pihak **tanpa sekatan rekabentuk**. *(non-proprietary system)*

- Mempertingkatkan **kandungan komponen IBS > 70%**
  - *Manual For Industrialised Building System* (IBS) *Content Scoring System CIS 18:2010* – CIDB

The goals for the Roadmap :

- **To sustain the existing momentum of 70% IBS content for public sector building projects through to 2015**

- **To increase the existing IBS content to 50% for private sector building projects by 2015**

SURAT PEKELILING PERBENDAHARAAN BIL.7 TAHUN 2008

➢ PENGECUALIAN

Mana - mana pengecualian daripada peraturan yang ditetapkan dalam SPP hendaklah **dipohon oleh Pegawai Pengawal/Ketua Jabatan** dan mendapat **kelulusan bertulis** terlebih dahulu **daripada Ketua Pengarah Kerja Raya**,

- ❑ BAGI projek kerja bernilai **kurang daripada RM10** juta, pegawai pengawal boleh menentukan untuk pengecualian IBS.
- ❑ Kerja –kerja **pengubahsuaian bangunan** sedia ada dan tidak melibatkan pembinaan bangunan baru.
- ❑ Projek kerja yang dilaksanakan di kawasan **terpencil** atau **pedalaman** yang **tidak dapat diakses** oleh pengangkutan bagi projek IBS. (perlu kelulusan KPKR)

JKR Need Statement

2.0 Design Consideration

2.1 All structures shall be designed for the worst combination of loadings and additional loads, if any. All loads mentioned shall be combined in the most unfavorable way for design of structural member and the stability of the whole structure. Actual loadings also shall be obtained from catalogues/mechanical and electrical engineer/architect/ special requirements by the client.

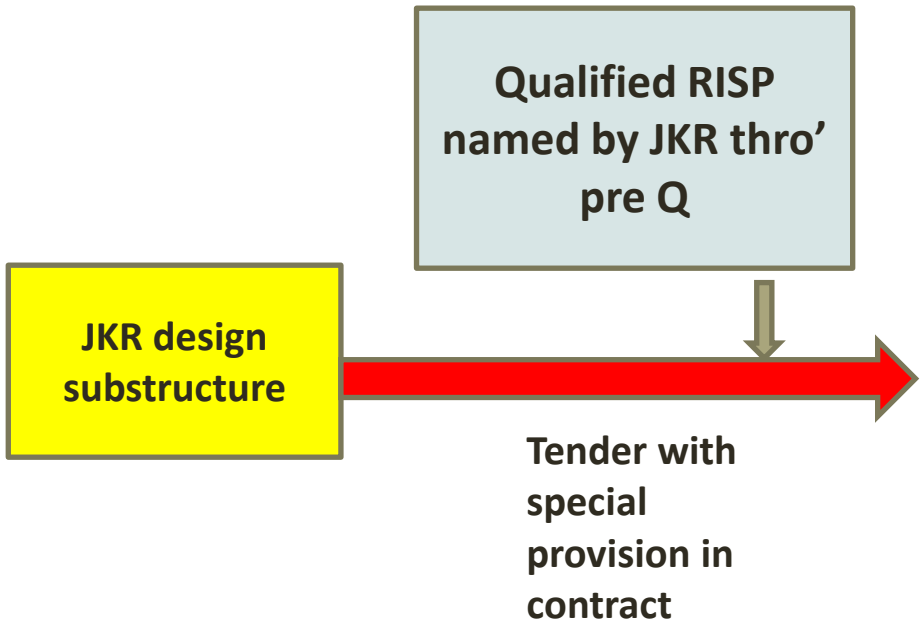
2.2 The Structural component design shall adopt the Modular Co-ordination approach using preferred dimensions so as to produce repetitiveness and regularity in the structural components.

2.3 All design must be based on the Industrialised Building System or unless otherwise exempted by the Government. The minimum IBS content for this project is fixed at 70%. However, the IBS Score for **Part 1: Structural Element** shall not be less than **40,** based on the Manual IBS Content Scoring System (IBS Score) by CIDB. The Contractor must ensure that all architectural and M&E works are well coordinated with the structural components.

2.4 The following main Standards and Codes of Practice shall be applicable for all structural and geotechnical engineering works:

KAEDAH PERLAKSAAN IBS DALAM PROJEK JKR

RISP (Registered IBS service provider) 2011-2013



Contractor

a. Pricing at tender submission using architectural drawings.
b. Contractor to submit structural proposal.
c. Contractor to engage RISP to design, manufacture, install and assemble superstructural works.
d. Warranty in the design by contractor/ RISP

RISP (Registered IBS Service Provider)

- Adopting the concept of request for proposal by the contractor with the availability of manufacturers product in the market.
- Lower cost of producing structural design by using components already in the market.
- RISP approaches is developed to allow better delivery of projects

Problems with RISP

- Change of RISP
- Late in design and producing of contruction drawing.
- Changes in design affecting superstructure.
- Business deal between Contractor and RISP not finalised.
- Issues on in situ works.

JKR Designed
2015 onwards

JKR design substructure and superstructure using JKR/ CIDB katalog.

Tender.

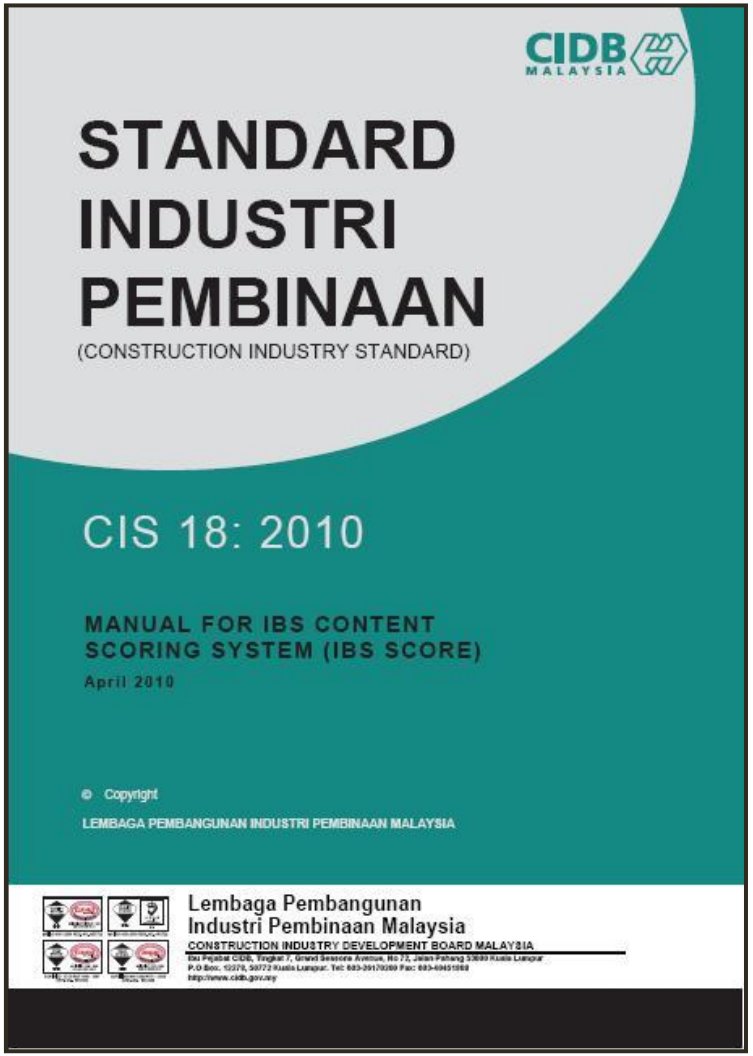
Contractor

a. Price the tender acoording to tender drawings.
b. Contractor allow to fabricate, manufacture, install and assemble superstructure works themselves or engage RISP superstructural works.
c. No warranty in the design is required.

JKR and CIDB Katalog

- Specific Sizes of precast components
- Specific capacities (M,V and N) of precast components
  - Half slabs
  - Beams
  - Columns
  - Walls
- Typical standard ties and connections.

IBS Score


CIDB
MALAYSIA
STANDARD
INDUSTRI
PEMBINAAN
(CONSTRUCTION INDUSTRY STANDARD)
CIS 18: 2010
MANUAL FOR IBS CONTENT
SCORING SYSTEM (IBS SCORE)
April 2010
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LEMBAGA PEMBANGUNAN INDUSTRI PEMBINAAN MALAYSIA
Lembaga Pembangunan
Industri Pembinaan Malaysia
CONSTRUCTION INDUSTRY DEVELOPMENT BOARD MALAYSIA

Objektif Manual *IBS SCORE*

Memberikan satu sistem penilaian yang sistematik

Antara perkara dalam manual ini adalah :

- **Formula *IBS Score***
- ***IBS Factor* bagi setiap elemen IBS yang digunakan**
- **Kaedah pengiraan *IBS Score***

Formula *IBS Score*

The formula

IBS SCORE = **SCORE FOR STRUCTURAL SYSTEMS**

\+

SCORE FOR WALL SYSTEMS

\+

SCORE FOR OTHER SIMPLIFIED CONSTRUCTION SOLUTIONS

$$50\sum\left[\frac{Q_S}{Q_{ST}}F_S\right] + 20\sum\left[\frac{Q_W}{Q_{WT}}F_W\right] + S$$

Where:

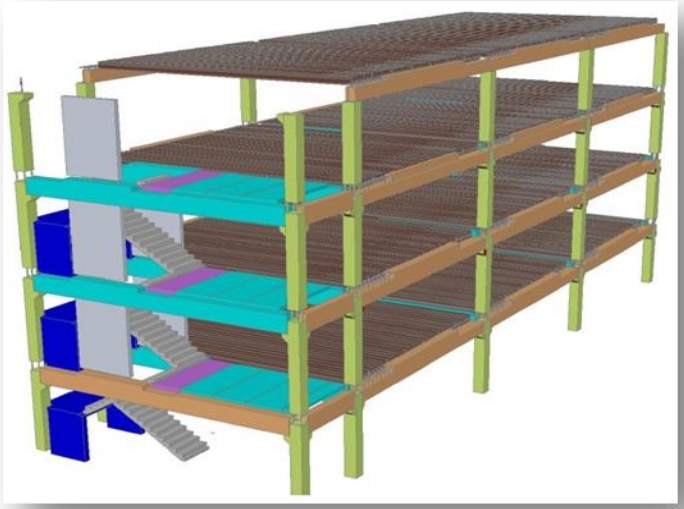
Σ	- Sum of
Q_S	- Construction area of a structural system
Q_{ST}	- Total construction area of building includes roof
F_S	- IBS Factor for structural system from Table 1 & Table 1A
Q_W	- Length of a wall system (external or internal wall)
Q_{WT}	- Total wall length (external and internal wall)
F_W	- IBS Factor for wall system from Table 2
S	- IBS Score for other simplified customer solutions from Table 3

BAHAGIAN 1 (SISTEM STRUKTUR)

Komponennya:

- ❑ Tiang
- ❑ Rasuk
- ❑ Lantai
- ❑ Struktur bumbung
- ❑ Struktur tangga.

- (*Kiraan berdasarkan keluasan binaan sistem struktur tersebut.)*
- *IBS factor in Table 1 and 1A*



BAHAGIAN 2 (SISTEM DINDING)

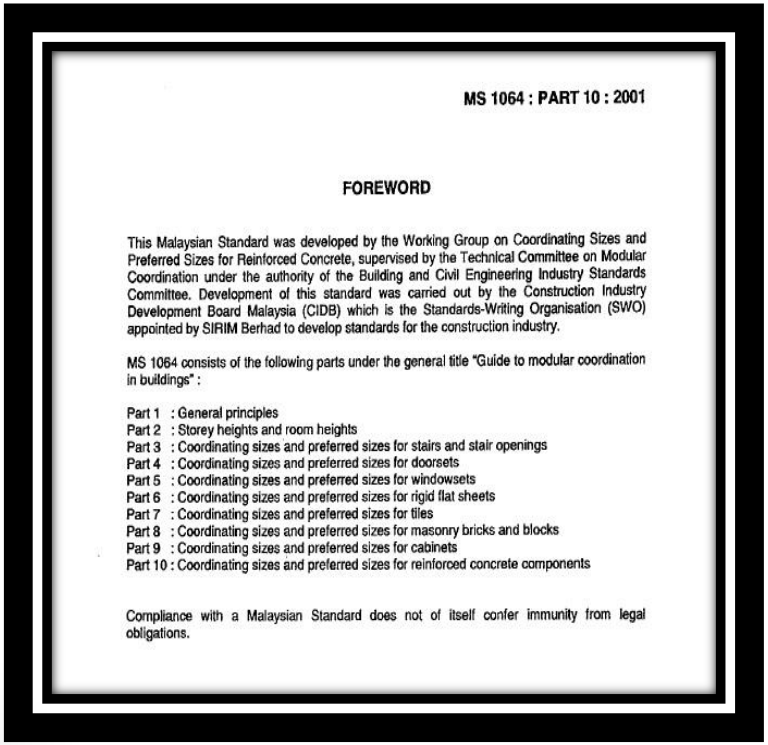
Komponentnya:

- ❑ Panel pra tuang
- ❑ Dry wall
- ❑ Panel kayu pasang siap

- (*Kiraan berdasarkan panjang binaan sistem struktur tersebut.)*
- *IBS factor in Table 2*

BAHAGIAN 3 (KAEDAH PEMBINAAN LAIN)

30 %



MS 1064 : PART 10 : 2001

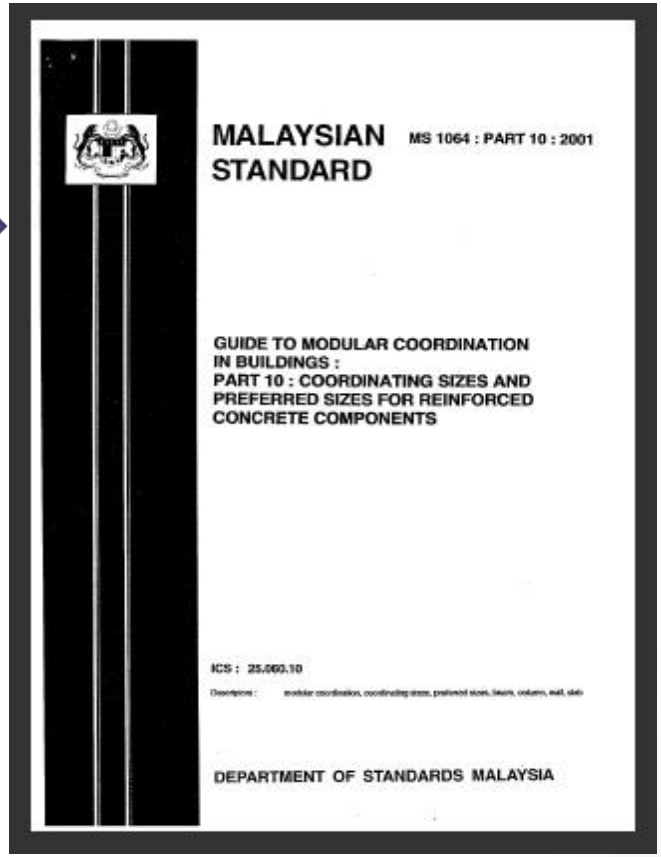
FOREWORD

This Malaysian Standard was developed by the Working Group on Coordinating Sizes and Preferred Sizes for Reinforced Concrete, supervised by the Technical Committee on Modular Coordination under the authority of the Building and Civil Engineering Industry Standards Committee. Development of this standard was carried out by the Construction Industry Development Board Malaysia (CIDB) which is the Standards-Writing Organisation (SWO) appointed by SIRIM Berhad to develop standards for the construction industry.

MS 1064 consists of the following parts under the general title "Guide to modular coordination in buildings" :

Part 1 : General principles
Part 2 : Storey heights and room heights
Part 3 : Coordinating sizes and preferred sizes for stairs and stair openings
Part 4 : Coordinating sizes and preferred sizes for doorsets
Part 5 : Coordinating sizes and preferred sizes for windowsets
Part 6 : Coordinating sizes and preferred sizes for rigid flat sheets
Part 7 : Coordinating sizes and preferred sizes for tiles
Part 8 : Coordinating sizes and preferred sizes for masonry bricks and blocks
Part 9 : Coordinating sizes and preferred sizes for cabinets
Part 10 : Coordinating sizes and preferred sizes for reinforced concrete components

Compliance with a Malaysian Standard does not of itself confer immunity from legal obligations.



MALAYSIAN STANDARD

MS 1064 : PART 10 : 2001

GUIDE TO MODULAR COORDINATION IN BUILDINGS :
PART 10 : COORDINATING SIZES AND PREFERRED SIZES FOR REINFORCED CONCRETE COMPONENTS

ICS : 25.060.10

DEPARTMENT OF STANDARDS MALAYSIA

SKOR IBS BAGI SISTEM STRUKTUR

$$50\sum\left[\frac{Q_S}{Q_{ST}}F_S\right]$$

- Skor maximun adalah 50%
- Qs/Qst adalah nisbah keluasan IBS dengan jumlah keluasan (ikut kiraan permukaan pelan)
- Fs ialah nilai faktor bagi kombinasi sistem lantai dengan rasuk/tiang dan bumbung yang digunakan dalam *Table 1 dan Table 2*

Skor IBS = 50 × Qs/Qst × Fs

Table 1. IBS Score For Structural Systems

SYSTEM	FLOOR / COLUMN / BEAM [5]	Precast concrete slab[1]	In-situ concrete on permanent metal formwork	In-situ concrete using reusable[3] system formwork	In-situ concrete using timber[4] formwork	Steel flooring system	Timber frame flooring system	No Floor[6]
CONCRETE	Precast column and beam	1.0	0.9	0.7	0.6	1.0	1.0	1.0
	Precast column and In-situ beams using reusable[3] system formwork	0.9	0.8	0.6	0.5	0.9	0.9	0.8
	Precast column and in-situ beams using timber[4] formwork	0.8	0.7	0.5	0.4	0.8	0.8	0.7
	Precast beams and in-situ columns with reusable[3] system formwork	0.9	0.8	0.6	0.5	0.9	0.9	0.8
	Precast beams and in-situ columns using timber[4] formwork	0.8	0.7	0.5	0.4	0.8	0.8	0.7
	In-situ column and beams using reusable[3] system formwork	0.7	0.6	0.5	0.3	0.7	0.7	0.6
	In-situ column and beams using timber[4] formwork	0.6	0.5	0.3	0.0	0.6	0.6	0.0
LOAD BEARING BLOCKWORK[7]	Vertical and horizontal member systems / structure	0.8	0.7	0.6	0.5	0.8	0.8	0.7
STEEL	Steel columns and beams	1.0	0.9	0.7	0.6	1.0	1.0	1.0

Notes :

1. Precast concrete slab include half slab, hollow core slab, and precast prestressed planks.
2. Precast concrete include products of factory precasting, site precasting or the useof tilt-up systems.
3. Reusable formworks include plastic, fibreglass, steel, aluminium and other metal formworks that can be used not less than 20 cycles.
4. Timber formwork means the timber components are sized, cut and fabricated in-situ to form the formworks and the required temporary works.
5. For structural system using Load Bearing Wall, whether precast or in-situ, the factor can be determined from the table by treating the wall as a wide column.
6. The IBS factor for tunnel formwork system is 0.6.
7. Load-bearing blockwork include interlocking block, concrete masonry unit, hollow block and lightweight block.
8. This is for structures without floor. Refer examples in Section 6
9. For other stuctural systems not mentioned in the table please refer to IBS Centre, CIDB for the IBS Factor.

IBS Factor Untuk Sistem Struktur Bumbung

Table 1A provides the IBS factor, Fs for various types of roof system.

Table 1A. IBS Factor for Roof Structural Systems – Fs

NO	ROOF SYSTEM	IBS FACTOR
a.	Prefab timber roof truss	1.0
b.	Prefab metal roof truss	1.0
c.	Precut(1) metal roof truss	0.5
d.	Timber roof trusses(2)	0.0

Notes :

1. Precut means the metal section are cut and sized in factory but assembled in-situ.
2. Timber roof trusses means the timber components are cut, sized and fabricated in-situ to form the formworks and the required temporary works

SKOR IBS BAGI SISTEM DINDING

$$20\sum\left[\frac{Q_W}{Q_{WT}}F_W\right]$$

- Skor maximun adalah 20%
- Qw/Qwt adalah nisbah panjang dengan jumlah panjang sistem IBS
- Fs ialah nilai faktor untuk sistem dinding dalam *Table 2*

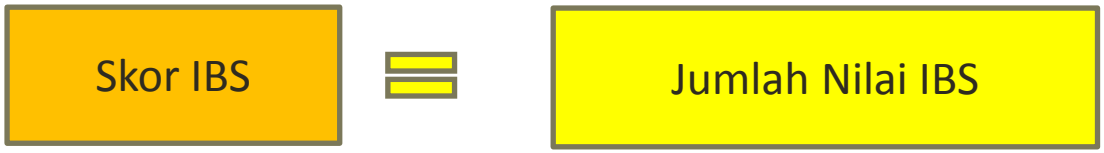
Skor IBS = 20 × Qs/Qst × Fs

Table 2. IBS Factor for Wall Systems

NO	WALL SYSTEM	IBS FACTOR
1	Precast concrete panel [1]	1.0
2	Wall cladding [2]	1.0
3	Prefabricated timber panel	1.0
4	Full height glass panel [3]	1.0
5	Dry wall system [4]	1.0
6	In-situ concrete with reusable [5] system formwork	0.5
7	In-situ concrete with timber [6] formwork	0.0
8	Blockwork system [7]	0.5
9	Pre-assemble brickwall / blockwall [8]	1.0
10	Common brickwall	0.0

SKOR IBS BAGI KAEDAH PEMBINAAN LAIN

- Skor maximun adalah 30%
- Formula ini mengambilkira kaedah pembinaan atau penyelesaian yang dapat menyumbang kepada objektif *Industrilialisation* melalui standardisasi dan ulangan.
- Berdasarkan jumlah keseluruhan nilai peratusan kaedah pembinaan IBS yang melebihi 50%.



SECTION 3 : PREFERRED SIZES FOR REINFORCED CONCRETE COMPONENTS

3.1 Scope

This Section specifies series of preferred sizes for reinforced concrete components to be used for buildings. The components included in this part are beams, columns, walls and slabs.

3.2 Specifications

The preferred sizes are categorised for various types of reinforced concrete components according to their intended function and use in a structural building system. Sizes mentioned are overall nominal dimensions, which shall account for joints and tolerances. The joint gap thickness, where applicable shall be specified by the manufacturer to suit these applications.

3.2.1 Beams

The dimensions of preferred sizes for beams are shown in Table 5. They are either for in-situ or precast constructions.

Table 5. Dimensions of preferred sizes for reinforced concrete beams

Types of buildings	Width	Depth
Residential	150 200 250 300	300 350 400 450 500 550 600
Non- Residential	200 250 300 350 400 500 600	400 450 500 550 600 700 800

NOTE. The dimensions of preferred sizes in the above table are recommended sizes for the respective product dimensions. Engineers are to carry out detailed design according to the relevant design code and select the appropriate preferred dimensions for its intended use. Dimensions larger than stipulated in the table can be used but preferably with the increment according to the recommendations.

MS 1064 : PART 10 : 2001

3.2.2 Columns

The dimensions of preferred sizes for columns are indicated in Table 6.

Table 6. Dimensions of preferred sizes for reinforced concrete columns

Width	Length
150 200 250 300 350 400 450 500 550 600 650 700 750 800	150 200 250 300 350 400 450 500 550 600 650 700 750 800

NOTES:

1. The dimensions for preferred sizes in the above table are recommended sizes for the respective product dimensions. Engineers are to carry out detailed design according to the relevant design code and select the appropriate preferred dimensions for its intended use. Dimensions larger than stipulated in the table can be used but preferably with the increment according to the recommendations.

2. For preferred column height, refer to MS 1064 : Part 2.

Table 3. IBS Score for Other Simplified Construction Solutions

No	DESCRIPTION	UNIT	IBS SCORE	
			PERCENTAGE OF USAGE	
			50% ≤ x <75%,	75% ≤ x ≤100%
1	**UTILISATION OF STANDARDISED COMPONENTS BASED ON MS 1064**			
	i) Beams [1]	Nos	2	4
	ii) Columns [1]	Nos	2	4
	iii) Walls [1]	m	2	4
	iv) Slabs [1]	m^2	2	4
	v) Doors [2]	Nos	2	4
	vi) Windows [3]	Nos	2	4
2	**REPETITION OF STRUCTURAL LAYOUT**			
	a) For building more than 2 storeys			
	i) Repetition of floor to floor height	Nos	1	2
	ii) Vertical repetition of structural floor layout	Nos	1	2
	iii) Horizontal repetition of structural floor layout	Nos	1	2
	b) For building 1 or 2 storeys			
	Horizontal repetition of structural floor layout	Nos	3	6

Notes :

1. Refer to MS 1064 : Pt 10 : 2001 Coordinating sizes and preferred sizes for reinforced concrete components. Values to use from the tables : beams and columns – width & depth, walls – width(thickness), slab-thickness.
2. Refer to MS 1064 : Pt 4 : 2001 Coordinating sizes and preferred sizes for door sets.
3. Refer to MS 1064 : Pt 5 : 2001 Coordinating sizes and preferred sizes for window sets.
4. Precast finished component/product means component that does not needs any finishes after installation on site such as plaster, skim coating and painting.
5. For structure using load bearing wall system, (without beams & columns) 8 marks is given automatically.
6. For non-concrete beams, columns, and slabs, 4 marks is given automatically for each component.
7. Other labour reducing products. Please provide details in the submission.

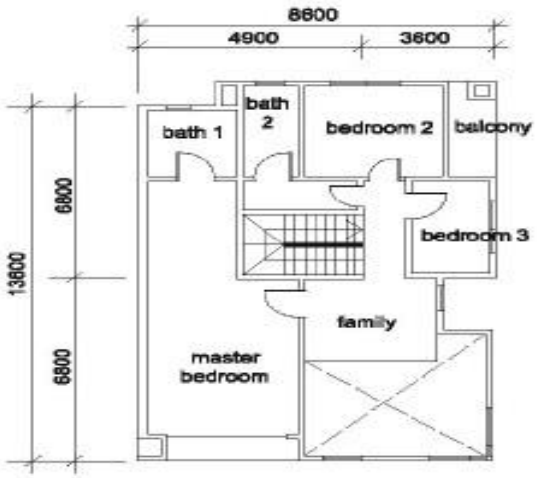
5.0 IBS Score Calculation Examples

In this section a number of examples are given to illustrate the calculation methods for determining the IBS score for various types of building.

5.1 Example 1:

Double Storey Terrace House.

Typical layout floor plan for one unit is as shown.



Say, from measurement taken from drawings:

1) Construction area

i)	Construction area ground floor	=	117.0 m^2
ii)	Construction area 1st floor	=	117.0 m^2
iii)	Construction roof area	=	117.0 m^2
	Total construction area	=	351.0 m^2

2) Structural Systems

i)	Beams:	Precast concrete beams
ii)	Columns:	In-situ concrete using steel formworks
iii)	Floor slab:	Precast half slabs floor
iv)	Roof truss:	Prefabricated timber roof truss.

3) Wall System

i)	Internal wall:	Precast concrete panel
ii)	External wall:	Precast block works

From the information given the calculation can be tabulated as follows

ELEMENTS	AREA (m^2) or Length (m)	IBS FACTOR[1]	COVERAGE	IBS SCORE
Part 1: Structure Elements				
Precast beams + in- situ column with reuseble formwork + precast concrete half slab floor. Ground floor area = 117.0m^2	117.0 m^2	0.9	(117 / 351) =0.33	0.33 x 0.9 x 50 =14.9
Precast beams + in-situ column with reuseble formwork (no floor) 1st floor area = 117.0m^2	117.0 m^2	0.6	(117 / 351) =0.33	0.33 x 0.6 x 50 =9.9
Roof truss using prefab roof truss Roof area = 117.0m^2	117.0 m^2	1.0	(117/351) =0.33	0.33 x 1.0 x 50 =16.5
Total Part 1	**351.0 m^2**		**1.00**	**41.3**
Part 2: Wall System				
External wall using concrete blockworks	87.8m	0.5	(87.8/167) =0.52	0.52 x 0.5 x 20 =5.2
Internal wall using precast concrete panel	79.5m	1.0	(79.5/167) =0.48	0.48 x 1.0 x 20 =9.6
Total Part 2	**167.3m**		**1.00**	**14.8**
Part 3: Other simplified construction solutions				
i) 60% beam sizes follow MS 1064 Part 10: 2001			60%	2
ii) 100% of column sizes follow MS 1064 Part 10: 2001			100%	4
iii) 80% of door sizes follow MS 1064 Part 4: 2001			80%	4
iv) Horizontal repetition of structure = 100%			100%	6
Total Part 3				**16**
IBS CONTENTS SCORE OF PROJECT (Part 1 + Part 2 + Part 3)				**72.1**

[1] Refer to respective tables for IBS Factors

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