STANDARD INDUSTRI PEMBINAAN

(CONSTRUCTION INDUSTRY STANDARD)

CIS 22:2021

SAFE USE OF SCAFFOLDING IN CONSTRUCTION

Descriptors: scaffolds products standards, certification, marking and quality check.

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SAFE USE OF SCAFFOLDING IN CONSTRUCTION

CIDB MALAYSIA

CIS 22: 2021 Safe Use of Scaffolding in Construction

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COMMITTEE REPRESENTATION

This Construction Industry Standard (CIS) was managed and developed by the Construction Industry Development Board Malaysia with the assistance of the Technical Committee of Temporary Works, which comprises representatives from the following organisations:

Association of Consulting Engineers Malaysia
Board of Engineers Malaysia
BW Scaffold Industries Sdn Bhd
Construction Research Institute of Malaysia
Department Occupational Safety and Health
Doka Formwork Malaysia Sdn. Bhd.
Dscaff Engineering Sdn Bhd
Institution of Engineers Malaysia
IQRAMXPERT Sendirian Berhad
Jabatan Kerja Raya Malaysia
Malaysian Iron & Steel Industry Federation
Malaysian Occupational Scaffolding Association
Master Builders Association Malaysia
PERI Formwork Malaysia Sdn. Bhd.
Persatuan Kontraktor Bumiputra Malaysia
PLYTEC Formwork System Industry Sdn. Bhd.
Real Estate and Housing Developers Association
SGS Malaysia Sdn. Bhd.
Technological Association Malaysia

PREFACE

This Construction Industry Standard (CIS) was reviewed by the Technical Committee of CIS 22 and CIS 23. The review of this CIS is to compliment the scaffolding product compliance requirement which regulated in Lembaga Pembangunan Industri Pembinaan Malaysia (Amendment of Fourth Schedule) Order 2021.

This second edition cancel and replaces the 1st edition, of which it constitutes major revisions of:

1. scope of the standard, which focuses on the products standards regulated under the Fourth Schedule - Standards for Certification of Construction Materials;
2. the scaffolding quality check, which include Initial Site Quality Check (ISQC) and Schedule Site Quality Check (SSQC); and
3. product marking.

Compliance with this document does not in itself confer immunity from legal obligations.

SAFE USE OF SCAFFOLDING IN CONSTRUCTION

SECTION 1: GENERAL

1.1 Scope

This Construction Industry Standard covers the use of frame, tubular and modular scaffolding of metal-based material for the standards below:

i. MS 1462-1: Metal Scaffolding – Part 1: Prefabricated scaffolds - Specifications for steel frame scaffolding

ii. MS 1462-2-1: Metal Scaffolding – Part 2: Tubular (Tube and coupler) scaffolds – Section 1: Specifications for steel tubes.

iii. MS 1462-2-2: Metal Scaffolding – Part 2: Tubular (Tube and coupler) scaffolds – Section 2: Specifications for aluminium tubes.

iv. MS 1462-2-3: Metal Scaffolding – Part 2: Tubular (Tube and coupler) scaffolds – Section 3: Specifications for steel and aluminium couplers, fitting and accessories.

v. MS 1462-3-1: Metal Scaffolding – Part 3: Prefabricated scaffolds – Section 1: Specifications for steel and aluminium modular system scaffoldings.

vi. MS 1462-3-2: Metal Scaffolding – Part 3: Prefabricated scaffolds – Section 2: Particular methods of structural design for steel and aluminium modular system scaffoldings.

vii. MS 1462-4-1: Metal Scaffolding – Part 4: Temporary Works equipment – Section 1: Scaffolds-Performance requirements and general design.

viii. MS 1462-4-2: Metal Scaffolding – Part 4: Temporary Works equipment – Section 2: Information on materials.

ix. AS\NZS 1576.2 Scaffolding Part 2: Couplers and accessories

x. BS 1139-2.2:2009+A1 Metal scaffolding – Part 2: Couplers and fittings – Section 2.2: Couplers and fittings outside the scope of BS EN 74 – Requirements and test methods

It is in compliance with the regulatory requirements under Lembaga Pembangunan Industri Pembinaan Malaysia (Amendment of Fourth Schedule) Order 2021, Standards for Certification of Construction Materials[1].

Note:

[1] Products and standards listed in Lembaga Pembangunan Industri Pembinaan Malaysia (Amendment of Fourth Schedule) Order 2021 shall obtain the Perakuan Pematuhan standard (PPS) by CIDB before it could be used in the construction works. The construction works in the Lembaga Pembangunan Industri Pembinaan Malaysia Act 1994 (Act 520) means the construction, extension, installation, repair, maintenance, renewal, removal, renovation, alteration, dismantling, or demolition of:
(a) any building, erection, edifice, structure, wall, fence or chimney, whether constructed wholly or partly above or below ground level;
(b) any road, harbour works, railway, cableway, canal or aerodrome;
(c) any drainage, irrigation or river control works;
(d) any electrical, mechanical, water, gas, petrochemical or telecommunication works; or
(e) any bridge, viaduct, dam, reservoir, earthworks, pipeline, sewer, aqueduct, culvert, drive, shaft, tunnel or reclamation works, and includes:
(A) any works which form an important and integral part of or are preparatory to or temporary for the works described in paragraphs (a) to (e), including site clearance, soil investigation and improvement, earth-moving, excavation, laying of foundation, site restoration and landscaping; or
(B) procurement of construction materials, equipment or workers, necessarily required for any work described in paragraphs (a) to (e);

It also covers:

a) The engagement of Professional Engineers Temporary Works (PETW) in the design of scaffolding (includes analysis and design calculation, specification and working drawing) [2];

b) The declaration of Pendaftaran Pengendalian Bangunan dan Kerja Binaan Kejuruteraan to DOSH by the Contractor[3]; and

c) The engagement of Designated Person in the supervision of the erection, modification and dismantling of the scaffolding by a Contractor.

Note:

[2] The details of the classes can be referred in Appendix A. The classes are extracted from the Guidelines No. 001, Role and Responsibility of Professional Engineers for Temporary Works During Construction Stage, Board of Engineers Malaysia (BEM) 2015.

[3] Refer to the Guidelines for Approval of Design Scaffolding, DOSH, 2016.

This CIS is applicable for use of scaffolding in temporaryworks for classes[3] as below:

a) Class 1: minor temporary,
b) Class 2: major temporary works;
c) Class 3: temporary works that form part of permanent work and Building Operations and Works of Engineering Construction (BOWEC) requirements.

1.2 Normative References

This CIS incorporates dated and undated references as well as provision from other publications. For dated references, subsequent amendments to and/or revisions of any of the following publications are only applicable to this CIS when they are incorporated accordingly. For undated references, the latest edition of the normative references (including amendments) referred are applicable.

1. AS\NZS 1576.2 Scaffolding Part 2: Couplers and accessories
2. Board of Engineers Malaysia (BEM) Guidelines No. 001 - The Role and Responsibility of Professional Engineers for Temporary Works During Construction Stage
3. BS 1139-2.2 Metal scaffolding –Part 2: Couplers and fittings – Section 2.2: Couplers and fittings outside the scope of BS EN 74 – Requirements and test methods
4. Factories and Machinery Act 1967 [ACT 139] P.U. (A) 328/86 - Factories and Machinery (Building Operations and Works of Engineering Construction - BOWEC) (Safety)
5. Guidelines No. 001, Role and Responsibility of Professional Engineers for Temporary Works During Construction Stage, Board of Engineers Malaysia (BEM) 2015
6. ISO 450001 Occupational Safety and Health
7. Lembaga Pembangunan Industri Pembinaan Malaysia (Amendment of Fourth Schedule) Order 2021
8. Lembaga Pembangunan Industri Pembinaan Malaysia Act 1994 (Act 520)
9. MS 1462-1 Metal scaffolding - Part 1: Prefabricated scaffolds - Specification for steel frame scaffolding
10. MS 1462-2-1 Metal Scaffolding – Part 2: Tubular (Tube and coupler) scaffolds – Section 1: Specifications for steel tubes.
11. MS 1462-2-2 Metal Scaffolding – Part 2: Tubular (Tube and coupler) scaffolds – Section 2: Specifications for aluminium tubes.
12. MS 1462-2-3 Metal Scaffolding – Part 2: Tubular (Tube and coupler) scaffolds – Section 3: Specifications for steel and aluminium couplers, fitting and accessories.
13. MS 1462-3-1 Metal Scaffolding - Part 3: Prefabricated scaffolds - Section 1: Specification for steel and aluminium modular system scaffolding
14. MS 1462-3-2 Metal Scaffolding - Part 3: Prefabricated scaffoldings - Section 2: Particular methods

of structural design for steel and aluminium modular system scaffoldings
15. MS 1462-4-1 Metal Scaffolding - Part 4: Temporary works equipment - Section 1: Scaffolds - Performance requirements and general design
16. MS 1462-4-2 Metal Scaffolding - Part 4: Temporary works equipments - Section 2: Information on materials
17. Occupational Safety and Health Act 1994 (Act 514)
18. Perintah Khas Ketua Pemeriksa, Bilangan 1 Tahun 2020, Pengurusan Keselamatan Struktur Sementara (Perancah, Acuan dan Penyangga), Department of Occupational Safety and Health (DOSH)
19. Registration of Engineers Act 1967 (Amendments up to 2015) (Act 138)

1.3 Terms and Definitions

For the purpose of this CIS, the terms and definitions given in the Acts cited in this CIS, and the following apply:

1. "Contractor"
A person who carries out or completes or undertakes to carry out or complete any construction works.

2. "Designated Person"
A competent person appointed by a Contractor to carry out any supervision of work or inspection of materials for the erection, maintenance, modification, dismantling and maintaining of scaffolding.

3. "Competent Scaffolder"
A person who holds any of the classes certificate of competency from a recognised training centre by DOSH and registered as the Competent Scaffolder with DOSH.

4. "Professional Engineer"
Professional Engineers with a practicing certificate registered under subsection 10(2) of the Registration of Engineers Act 1967 [Act 138] (Amendment 2015).

5. "Scaffolding"
Any temporarily provided structure on or from which persons perform work in connection with operations or works, and any temporarily provided structure which enables persons to obtain access to or which enables materials to be taken to any place at which such work is performed, and includes any working platform, gangway, skip, ladder or step-ladder which does not form part of such structure together with any guard-rail, toe-board or other safeguards and all fixing, but does not include a lifting appliance or a lifting machine or a structure used merely to support such an appliance or such a machine as to support other plant or equipment.

6. "Component"
Part of a scaffolding system, which cannot be dismantled further, e.g. a diagonal or a vertical frame.

7. "Consultant"
Professional Engineers with a practicing certificate registered with the Board of Engineers Malaysia (BEM) who are the Submitting Person (Qualified Person) to the Authority and Specialists and Professional Engineers (including specialist) whose names appear in the drawings used for tender or construction.

8. "Hazard"
A source or a situation with a potential for harm in terms ofhuman injury or ill health, damage to property,

damage to the environment or a combination of these.

9. “Horizontal frame”
A horizontal component connecting the horizontal members of two vertical frames, providing stiffness to a horizontal plane.

10.“Modular scaffolding system”
Scaffolding system in which transoms and standards are separate components, where the standards provide facilities at predetermined (modular) intervals for the connection for other scaffold components. It shall comply with MS 1462-3-1 and MS 1462-3-2.

11.“Perakuan Pematuhan Standard (PPS)”
A “Perakuan Pematuhan Standard” is certificate issued by CIDB for a particular product that has complied with standard(s) specified by CIDB for regulatory purpose under Lembaga Pembangunan Industri Pembinaan Malaysia (Amendment of Fourth Schedule) Order 2021.

12.“Professional Engineer for Temporary Works (PETW)”
The Professional Engineer (PE) with a practicing certificate employed by Contractors to carry out design, endorsement and supervision of temporary works.

13.“Scaffold system”
A set of interconnecting components, mostly purpose designed for the scaffold system, b) the assessed standard set of system configuration and c) the product manual.

14.“Steel frame scaffolding”
Scaffolding manufactured in such a way that the geometry of the scaffold is predetermined and the relative spacing of the principal members are fixed. It shall comply with MS 1462-1.

15.“System configuration”
Configuration of the scaffold system comprising a complete scaffold or a representative section from it.

16.“Transom”
Horizontal member normally in the direction of the smaller dimensions of the working scaffold.

17.“Tubular scaffolding system”
A scaffolding system that uses tubes as vertical posts, ledgers, transoms, bearers, braces and ties and to be connected/jointed with couplers. It shall comply with MS 1462-2-1, MS 1462-2-2 and MS 1462-2-3.

SECTION 2: ACTS AND REGULATIONS

2.1 GENERAL REQUIREMENTS

The manufacturers, suppliers, Contractors, PETW and the consultants shall follow the requirements in this CIS to ensure compliance to the acts and regulations, standards and design practice for safe use of scaffolding in construction.

2.1.1 Lembaga Pembangunan Industri Pembinaan Malaysia (Amendment of Fourth Schedule) Order 2021

CIDB is authorised to enforce and regulate construction products with the provisions of the Lembaga Pembangunan Industri Pembinaan Malaysia Act 1994 (Act 520)[4]. All construction materials/ products

and standards listed in the Lembaga Pembangunan Industri Pembinaan Malaysia (Amendment of Fourth Schedule) Order 2021 are required to obtain CIDB's Perakuan Pematuhan Standard (PPS).

Note:

[4] The related provisions of the Lembaga Pembangunan Industri Pembinaan Malaysia Act 1994 (Act 520) are:

a) "Section 33C - The Board shall, in the manner determined by the Board, certify the construction material used in the construction industry and specified in the Fourth Schedule is in accordance with the standard specified in that Schedule".

b) "Section 33D (1) - A person shall not deal or undertake to deal, whether directly or indirectly, with the construction materials specified in the Fourth Schedule unless the construction materials have been certified by the Board".

c) "Section 33D (2) - Any person who deals or undertakes to deal with the construction materials specified in the Fourth Schedule without the certification of the Board shall be guilty of an offence and shall, on conviction, be liable to a fine of not less than RM10,000 but not more than RM500,000".

2.1.2 Occupational Safety and Health Act 1994 (Act 514)

Occupational Safety and Health Act (OSHA)[5] specifies responsibilities to the Contractor to ensure the safety, health and welfare at work, and to the designers, manufacturers and suppliers on the safety and risk on the use of product at the work site.

Note:

[5] Part V of OSHA specified general duties of designers, manufacturers and suppliers under Section 20, Section 21 and Section 23 as follows:

Section 20. General duties of manufacturers, etc. as regards plant for use at work.

Section 21. General duties of manufacturers, etc. as regards substances for use at work.

Section 23. Penalty for an offence under section 20 or 21.

2.1.3 Factories and Machinery Act 1967 [ACT 139] P.U. (A) 328/86

Factories and Machinery (Building Operations and Works of Engineering Construction – (BOWEC) (Safety) - Regulation 1986 under Parts 4 of BOWEC, every Contractor and employer have the obligation:

a) To comply with such of the requirements of these Regulations as affect him or any person employed by him.
b) To comply with such of the requirements of these Regulations as relate to any work, act or operations performed or about to be performed by any such Contractor or employer.

A Contractor need to comply with this Act and engage Professional Engineer in Temporary Works (PETW) in the design (includes analysis and design calculation, specification and working drawing) and Designated Person in the erection, modification and dismantling of scaffolding.

2.1.4 Perintah Khas Ketua Pemeriksa, Bilangan 1 Tahun 2020, Pengurusan Keselamatan Struktur Sementara (Perancah, Acuan dan Penyangga), Department of Occupational Safety and Health (DOSH)

The order specify the Project Manager have the obligation to ensure the appointment of PETW, Designated Person and other employees to carry out the duties specified in Parts III and X, of BOWEC. The order also specifies no scaffolding shall be used before being inspected and secured by a Designated Person. All documents and records relating to temporary structures (scaffolding, formwork and supports) are updated and kept at the workplace for inspection purposes at any time.

SECTION 3: PRODUCTS AND PRODUCT STANDARDS, CERTIFICATION/ TEST REPORT AND MARKING

3.1 Product and Product Standards

The products and product standards for metal scaffolding systems and other scaffolding accessories are as in Table 1:

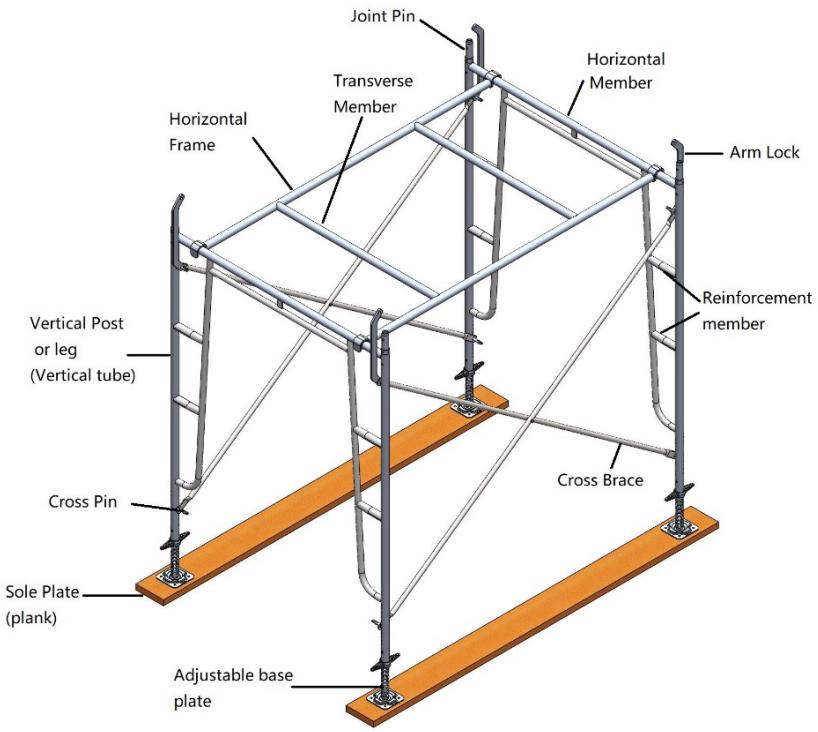
Table 1: Products and Product Standards for Metal Scaffolding Systems and Other Scaffolding Accessories

No.	Products	Standards
1.	Prefabricated scaffold (Steel Frame Scaffolding System)	MS 1462-1: Metal Scaffolding – Part 1: Prefabricated scaffolds - Specifications for steel frame scaffolding
2.	Tubular Scaffold (Tubes and Coupler/ Fittings System)	MS 1462-2-1: Metal Scaffolding - Part 2: Tubular (tube and coupler) scaffolds - Section 1: Specification for steel tubes
		MS 1462-2-2: Metal Scaffolding - Part 2: Tubular (Tube and coupler) scaffolds - Section 2: Specification for aluminium tubes
3.	Prefabricated Scaffold (Modular Scaffolding System)	MS 1462-3-1: Metal Scaffolding - Part 3: Prefabricated scaffolds - Section 1: Specification for steel and aluminium modular system scaffolding
		MS 1462-3-2: Metal Scaffolding - Part 3: Prefabricated scaffoldings - Section 2: Particular methods of structural design for steel and aluminium modular system scaffoldings
		MS 1462-4-1: Metal scaffolding - Part 4: Temporary works equipment - Section 1: Scaffolds - Performance requirements and general design
		MS 1462-4-2: Metal scaffolding - Part 4: Temporary works equipments - Section 2: Information on materials
4.	Coupler, fitting and accessories for scaffold	MS 1462-2-3: Metal scaffolding - Part 2: Tubular (tube and coupler) scaffolds - Section 3: Specification for steel and aluminium couplers, fitting and accessories
		BS 1139-2.2:2009+A1: Metal scaffolding –Part 2: Couplers and fittings – Section 2.2: Couplers and fittings outside the scope of BS EN 74 – Requirements and test methods
		AS\NZS 1576.2: Scaffolding Part 2:Couplers and accessories

3.1.1 Prefabricated scaffold (Steel Frame Scaffolding System)

The prefabricated steel frame scaffolding is covered under MS 1462-1**.** Figure 1, 2 and 3 provide illustrative features of a typical setup and component of this scaffold.

Figure 1: A typical prefabricated steel frame scaffolding assembly[6]



Note:
[6] The drawing is included in this specification to illustrate the terms used and is not intended to show design details. The shape shown is not to be regarded as part of the specification.

Figure 2: A typical components of a steel frame scaffolding

a) Arm lock

b) Adjustable base plate

c) Catwalk (treadboard)

d) Cross brace

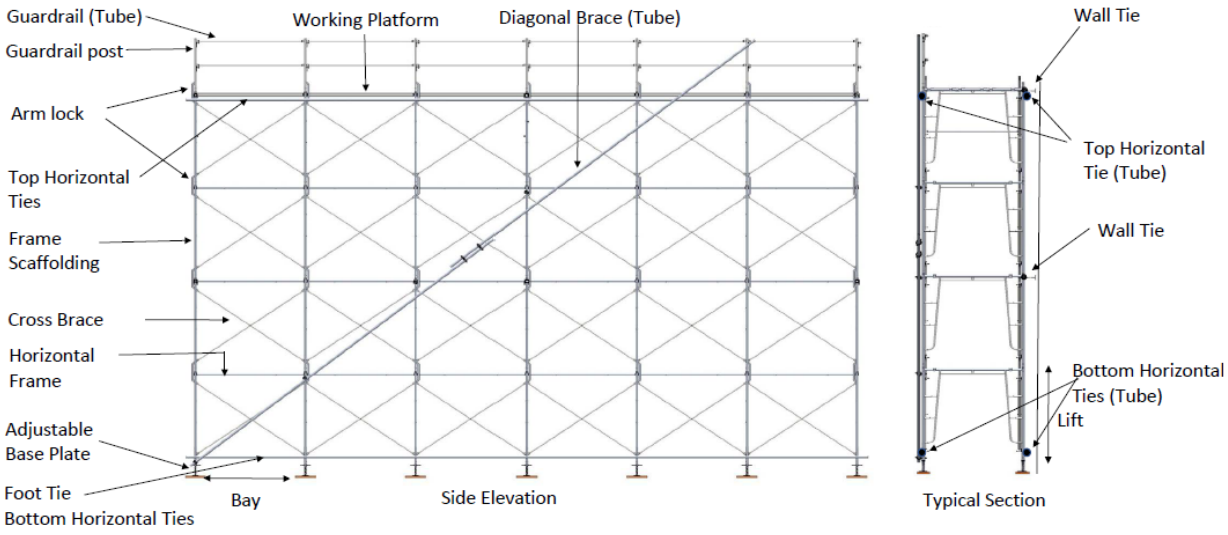
e) horizontal frame

f) Joint pin

g) U-head

h) Wall tie

Figure 3: Typical schematic fabricated steel frame scaffolding layout[7]



Note:
[7] Wall tie and diagonal brace subject to detailed design. The source is taken and modified from MS1462-1:2021

2) The material quality dimensions and tolerance for the steel frame scaffoldings is as in Table 2[8].

Table 2: Material quality, dimensions and tolerances for components of frame scaffoldings

Member	Component		Material quality	Dimensions (mm)		Tolerances (mm)	
				Outer diameter	Thickness	Outer diameter	Thickness
Vertical frame	Tubular vertical post and horizontal		STK 500 specified in JIS G3444 or equivalent	42.7	2.5	±0.25	±0.3
	Tubular reinforcement member		STK 400 specified in JIS G3444 or equivalent	27.2	2.0		
	Cross brace pin		SS 400 specified in JIS G3101 or equivalent	14.0	-	±1.0	-
Cross brace	Tubular brace member		STK 400 specified in JIS G3444 or equivalent	21.7	2.0	±0.25	±0.3
	Hinge pin		SWRM 22 specified in JIS G3505 (Low carbon steel wire rods) or equivalent	7.5	-	±0.7	-
Horizontal frame	Tube member		STK 500 specified in JIS G3444 or equivalent	42.7	2.5	±0.25	±0.3
	Tubular arm or traverse member		STK 400 specified in JIS G3444 or equivalent	34.0	2.3		
	Gripper fitting or hook		SS 400 specified in JIS G3101 or equivalent	-	8.0	-	±0.8
Catwalk or tread board	Catwalk member	Steel plate	SPHC specified in MS 1705 or equivalent	500*	1.2	-	±0.1
	Gripper fitting or hook		SS 400 specified in JIS G3101 or equivalent	-	8.0	-	±0.8
Adjustable base plate/ U-head	Threaded bar		SS 330 specified in JIS G3101 or equivalent	32**	-	-	-
	Plate for adjustable base plate		SS 330 specified in JIS G3101 or equivalent	120 x 120	5.4***	-	-
	Plate for U-head		SS 330 specified in JIS G3101 or equivalent	150 x 120	5.4***	-	-
	Adjusting nut		FCMB 310 specified in JIS G5702 (Blackheart malleable iron castings) or equivalent	-	-	-	-
Bracket	Vertical, lateral & diagonal member		SGP specified in JIS G3452 or SS 330 specified in JIS G3101 or equivalent	-	-	-	-
	Metal fittings	Bolt, nut & pin	SS 330 specified in JIS G3101 or equivalent	-	-	-	-
		Parts other than bolt, nut & pin	SPHD specified in MS 1705 or equivalent	-	-	-	-

Member	Component		Material quality	Dimensions (mm)		Tolerances (mm)	
				Outer diameter	Thickness	Outer diameter	Thickness
	Principal member		SGP specified in JIS G3452 or SS 330 specified in JIS g3101 or equivalent	-	-	-	-
	Gripper metal fittings	Bolt, nut & pin	SS 330 specified in JIS G3101 or equivalent	-	-	-	-
		Parts other than bolt, nut & pin	SPHD specified in MS 1705 or equivalent	-	-	-	-
	Metal fittings		SS 400 specified in JIS G3101 or equivalent	-	-	-	-
Joint pin	Tenon (95mm†)		SGP specified in JIS G3452 or equivalent	-	2.2	-	±0.2
	Collar (25mm†)			42.7	2.5	±0.25	±0.3
Arm lock			SS 330 specified in JIS G3101 or equivalent	38 (plate width)	3.1 (plate thickness)	-	±0.3
Global bracing system	Diagonal and horizontal tubular brace		STK 500 specified in JIS G3444 or equivalent	48.6	2.5	±0.25	±0.3
	Clamp or fitting	Body and cover	SPHD specified in MS 1705 or equivalent	42.7~48.6	3***	±0.1	-
		Bolt, nut and pin	SS 330 specified in JIS G3101 or equivalent	9** Include thread ridge	-	-	-
Side protection/ Guard rail	Tube member		STK 500 specified in JIS G3444 or equivalent	48.6	2.5	±0.25	±0.3
	Clamp or fitting	Body and cover	SPHD specified in MS 1705 or equivalent	42.7~48.6	3***	±0.1	-
		Bolt, nut and pin	SS 330 specified in JIS G3101 or equivalent	9** include thread ridge	-	-	-
Toe board	Board Member	Lipped channel	SPH equivalent specified in MS 1705 or	150*	1.2	-	±0.1

* Minimun width
** Minimum diameter
*** Mininum dimension
† Minimum length

Note:

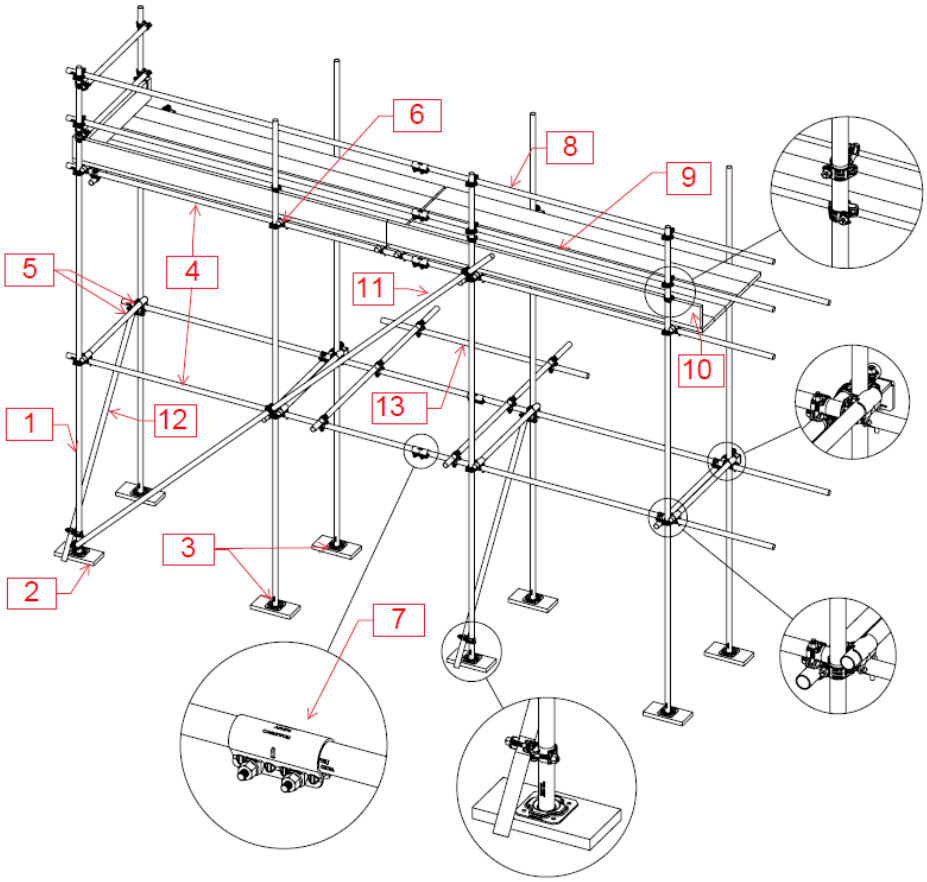
[8] Source from MS 1462-1: 2020

3.2.2 Tubular Scaffold (Tubes and Coupler/ Fittings System)

A tubular scaffolding is assembled using steel tubes covered under MS 1462-2-1 or aluminium tubes covered under MS 1462-2-2. The tubular tubes are fixed together by couplers, fittings and accessories covered under MS 1462-2-3.

Figure 4 and 5 provide illustrative features of a typical setup of a tubular scaffold and couplers for fixing the tubes together.

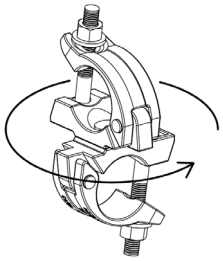
Figure 4: A typical component and layout of tubular scaffolding[9]



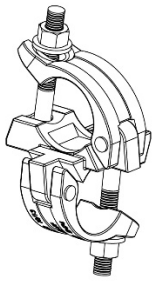
Key:			
1	Standards (tubes)	8	Guardrail
2	Sole-board	9	Boarded platform
3	Metal Base-plate	10	Toe-board
4	Ledgers (tubes)	11	Diagonal bracing
5	Transoms	12	Cross bracing
6	Right Angle Coupler	13	Reveal tie
7	Sleeve coupler		

Note:
[9] The drawing included in this specification for the purpose of illustrating the terms used and is not intended to show design details. The shape shown is not to be regarded as part of the specification.

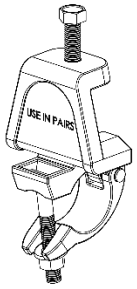
Figure 5: A typical couplers and fittings for tubular scaffolding



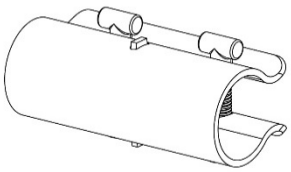
1. Swivel coupler



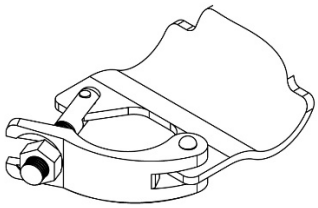
2. Right angle coupler



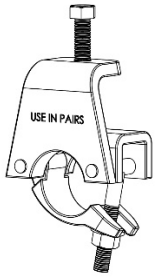
3. Swivel beam/ girder coupler



4. Sleeve coupler



5. Putlog coupler



6. Beam/ girder coupler

MS 1462-2-1 for steel tube and MS 1462-2-2 for aluminium tube covers tubesize and thickness as in Table 3.

Table 3 Dimensions and dimensional tolerance of tubes

Type of Tubes		Outside Diameter		Wall Thickness	
		Nominal	Tolerance	Nominal	Tolerance
Steel	Type 3	48.3 mm	+/-0.5 mm	3.2 mm	-10 %
	Type 4			4.0 mm	
Aluminium		48.3 mm	+/-0.5 mm	4.47 mm	+/- 0.56 mm

3.2.3 Prefabricated Scaffold (Modular Scaffolding System)

A modular scaffolding system shall be designed according to MS 1462-3-1**,** MS 1462-3-2 and MS 1462-4-1. The material is either steel or aluminium of outside diameter of 48.3mm with thickness and dimensional tolerance of tubes as given in Table 4[10].

Note:
[10] For tubes with other diameters, see MS 1462-4-1.

Table 4: Wall thickness and dimensional for tubes with an outside diameter of 48.3 mm[11]

	Nominal wall thickness *t* mm	Minus tolerance of the wall thickness mm
Steel (circular)	$2.7 \leq t < 2.9$	0.2
	$t \geq 2.9$	in accordance with EN 10219-2
Aluminium (circular)	$3.2 \leq t < 3.6$	0.2
	$3.6 \leq t < 4.0$	0.2
	$t \geq 4.0$	in accordance with EN 755-8

Note:
[11] Source from MS 1462-3-1: Clause 6.2.
For tube with other diameters, see MS 1462-3-1 Clause 4.2.1.3.

The modular scaffolding is specified with the width class and headroom classes as given in Table 5 and Table 6**.**

Table 5: Width classes for working areas[12]

Width class	W (in m)
W06	$0.6 \leq w < 0.9$
W09	$0.9 \leq w < 1.2$
W12	$1.2 \leq w < 1.5$
W15	$1.5 \leq w < 1.8$
W18	$1.8 \leq w < 2.1$
W21	$2.1 \leq w < 2.4$
W24	$2.4 \leq w$

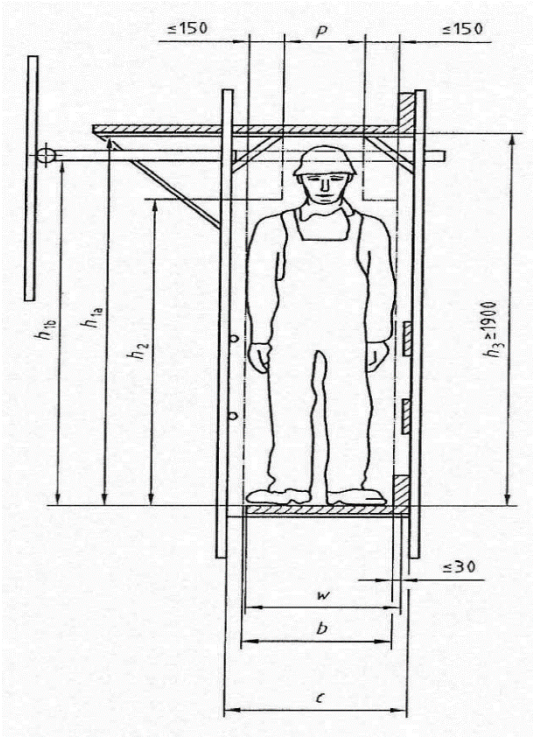
Note:
[12] Source from MS 1462-4-1:2013

Table 6: Headroom classes[13]

Class	Clear headroom		
	Between working areas h_3	Between working areas and transoms or tie members h_{1a}, h_{1b}	Minimum clear height at shoulder level h_2
H_1	$h_3 \geq 1.90$ m	$1.75\text{ m} \leq h_{1a} < 1.9\text{ m}$ $1.75\text{ m} \leq h_{1b} < 1.9\text{ m}$	$h_2 \geq 1.60$ m
H_2	$h_2 \geq 1.90$ m	$h_{1a} \geq 1.90\text{ m}$ $h_{1b} \geq 1.90$ m	$h_2 \geq 1.75$ m

Note:
[13] Source from MS 1462-4-1:2013

Figure 6: Requirements for headroom and width of working areas (for illustration purpose only for modular scaffolding system)[14]

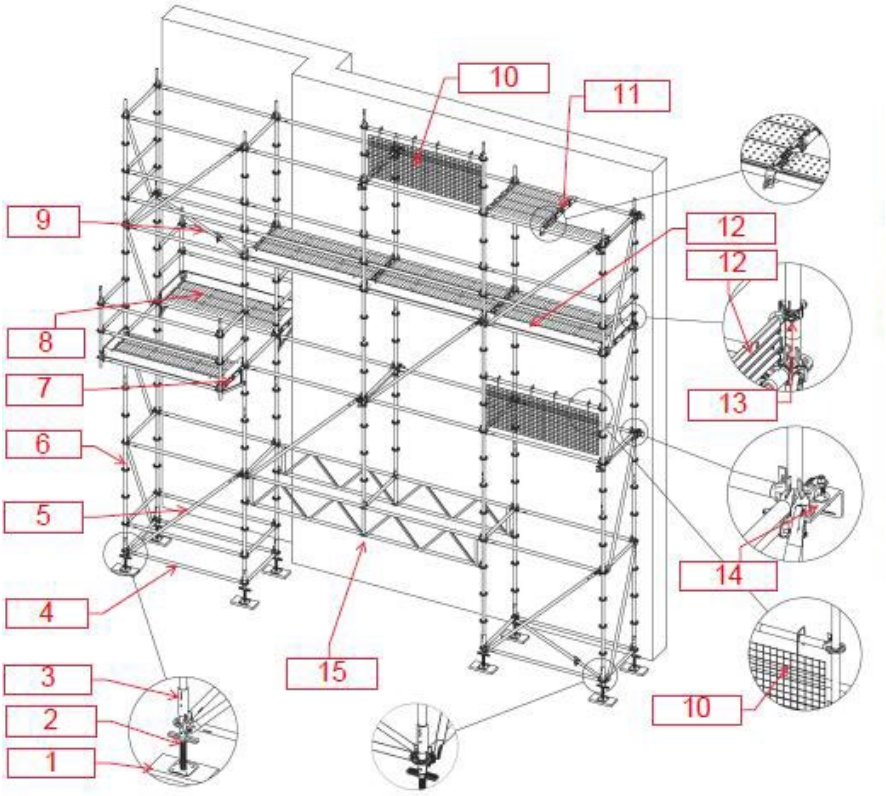


Key:	
b	free walking space, which shall be at least the greater of 500 mm and (c - 250 mm)
c	clear distance between standards
h_{1a}, h_{1b}	clear shoulder height
h_3	clear head height between working areas
p	clear head height width, which shall be at least the greater of 300 mm and (c - 450 mm)
w	width of the working area in accordance with Clause 5.2 MS 1462-4 -1:2013
h_s	Scaffold bay width, centre to centre of standards
b_s	Scaffold bay length, centre to centre of standards
l_s	Scaffold lift height
h_l	Bracing in vertical plane (transverse diagonal)

Note:

[14] Source from MS 1462-4-1:2013

Figure 7: Example of typical components of modular scaffolding system[15]



Key:			
1	Sole board	9	Plan brace
2	Screw jack	10	Mesh panel
3	Base collar	11	Mid-transom
4	Ledger	12	Interlocking toe board
5	Diagonal brace	13	Toe board retainer coupler
6	Standard	14	Wall tie bracket
7	Side bracket	15	Steel lattice girder w/ spigot
8	Steel plank		

3.2.4 Steel Frame Scaffold System

For steel frame scaffold system, the load test on the components of frame scaffolding system shall comply with MS 1462-1.

3.2.5 Modular Scaffold System

For modular scaffold system, the load test on the components of the modular scaffold system shall comply with MS 1462-3-2.

3.2.6 Tubular Scaffold System

For tubular scaffold system, the testing on the component of the tubular scaffold system shall comply with MS 1462-2-1, MS 1462-2-2 and MS 1462-2-3.

3.2.7 Access Between Levels

Safe means of access staircase shall be provided in the scaffold system and shall be secured against unintentional loosening and shall have a slip resistant surface and shall comply with MS 1462-4-1.

3.3 Product Certification/ Test Report

The manufacturer, supplier, Contractor or owner of scaffolding shall be responsible for the compliance of product and system to the relevant standards and shall make arrangements with an independent third-party certification body/ testing laboratory, which is recognised by CIDB for product certification or issuance of used product test report.

The certification shall be based on appropriate product standards for a scaffold system as declared by the manufacturer, which shall consist of:

a) a set of interconnecting complete components of the scaffold system;
b) the assessed standard set of system configurations; and
c) the product manual[16]

Note:
[15] The product manual is only applicable for the Modular Scaffolding System in accordance with MS 1462-3-1 and Steel Couplers in accordance with MS 1462-2-3.

Metal tubes, couplers and fittings (refer to relevant MS 1462) to be used in a scaffolding system may be certified separately for compliance to their appropriate product standards[16].

Note:
[16] A separate certification and approval for these materials to their product standard is required when produced separately by a manufacturer, which is different from the scaffolding manufacturer.

Any used scaffolds system shall comply to the test and sampling required in Clause 5.2: Quality Check and PPS Issuance[17].

Note:
[17] If the new/ used scaffolding material supplied by the manufacturer/ supplier has a valid PPS, further testing is not required for ISQC and SSQC.

A product certificate or test report issued by the certification body/ testing laboratory for new products and used products shall contain at least the following information in Table 7.

Table 7: Information required in the Product Certification and Test Report

New Product	Used Product
a) Name and address of the manufacturer b) Type of scaffolding system c) Standard complied	a) Name and address of the manufacturer/ supplier/ owner of the products b) Type of scaffolding system c) Standard complied d) Initial PPS Certification from the scaffolding manufacturer e) Project name and location f) CIDB Project Reference Number registered in CIMS CIDB g) Scaffolding stock quantity h) Delivery order of the scaffolding

Other relevant information may be included, subject to mutual agreement between the certificate holder and the certification body.

3.4 Perakuan Pematuhan Standard (PPS)

The manufacturer, supplier, contractor or owner shall be responsible to obtain 'Perakuan Pematuhan Standard' (PPS) by providing a valid product certification (for new scaffold system) and test report (for used scaffold system) and other valid documents required by CIDB.

The PPS is certificate issued by CIDB for a particular product that has complied with standard(s) specified by CIDB for regulatory purpose under Lembaga Pembangunan Industri Pembinaan Malaysia (Amendment of Fourth Schedule) Order 2021.

3.5 Product Marking

The manufacturer, supplier, contractor or owner of the products shall be responsible for the product marking.

Each scaffolding component and its accessory shall be legibly marked on the body (either embossed or using waterproof sticker) with the following information[18]:

a) The manufacturer's or supplier's name (embossed on body)
b) Year of manufacture (embossed on body)
c) Standard number (either embossed or using waterproof sticker)
d) CIDB PPS number (either embossed or using waterproof sticker)

Note:
[18] For product manufactured before 01.01.2017 or before the date of enforcement of this CIS, whichever is earlier, and where the actual date is not available, the date should be marked as "before 2017" (either embossed or using waterproof sticker). Any components and accessories at a construction site with illegible markings shall not be used and shall be removed from the site.

Marking shall be so arranged that it will remain legible for the life of the component. The size of the lettering may take into account the size of the component.

For small items, where it is not practical to mark even with a sticker on the component and have a valid

PPS, these items may be used and subjected to inspection by the Contractor's Designated Person and approval by PETW.

SECTION 4: PLANNING, PRODUCT APPROVAL, DESIGN AND DRAWING, MATERIAL SELECTION AND SUBMISSION

The Appendix B and C provides a flowchart for design and drawing construction according to the type of scaffolding and heights.

4.1 Planning for temporary work and Hazard Identification, Risk Assessment and Risk Control (HIRARC)

A Contractor shall be equipped with proper planning and conduct HIRARC[19] to ensure safety in the use of scaffolding. The risk level of scaffolding activities should be established and appropriate action should be taken.

Note:
[19] The risk level is referred to "Handbook for Hazard Identification, Risk Analysis & Risk Control". The risk levels are as follows:

a) HIGH: A HIGH risk requires immediate action to control the hazard as detailed in the hierarchy of control, Actions taken must be documented on the risk assessment form including date of completion.

b) MEDIUM: A MEDIUM risk requires a planned approach to controlling the hazard and applies temporary measure if required. Any action taken must be documented on the risk assessment form, including date of completion.

c) LOW: A risk identified as LOW may be considered as acceptable and further reduction may not be necessary. However, if the risk can be resolved quickly and efficiently, control measures should be implemented and recorded.

The person in charge and their responsibilities for the scaffolding are as in Table 8.

Table 8: Person in Charge and Their Responsibilities for the Scaffolding

Height	Person in charge and responsibility
For tubular scaffold height 40m and below and other types of scaffold height 15m and below	Contractor shall engage a Competent Scaffolder to deal with the preparation of working drawing, endorsement and supervision of the scaffolding related works.
For the tubular scaffold more than 40m and other type of scaffold more than 15m	Contractor shall engage a PETW to deal with the design (which includes structural analysis and design calculation, specification and working drawing), endorsement and supervision of the scaffolding.

4.2 CIDB Approval for Product - Perakuan Pematuhan Standard (PPS)

The manufacturer, supplier, contractor or owner shall be responsible to obtain 'Perakuan Pematuhan Standard' (PPS) by providing a valid product certification, test report (for new or used scaffolding) and other valid documents required by CIDB.

4.3 Design and Submission

Where design (which includes structural analysis and design calculation, specification and working drawing) is applicable and required under Class 2, Class 3 Temporary Works or BOWEC[20], it shall be designed, endorsed and supervised by a PETW.

Note:
[20] BOWEC Regulation 75. Design and Drawings of Scaffolds to be approved.

(1) Every metal tube scaffold exceeding 40 m in height and every other scaffold exceeding 15 m in height shall be constructed in accordance with the design and drawings of a Professional Engineer. All other metal tube scaffolds shall have their designs and drawings approved by the Chief Inspector.
(2) A copy of the design and drawings of the structure shall be submitted to the Chief Inspector for his record prior to the erection of the structure.
(3) A copy of the design drawings certified by the Professional Engineer shall be made available at the worksite for inspection by an Inspector."

Where required under BOWEC, submission of the endorsed design and drawing of the scaffolding to DOSH shall be under the responsibility of the Contractor. Notice in respect of building operation and works of engineering construction including scaffolding as required under Section 35 (1) of the Factories and Machinery (Notification, Certificate of Fitness and Inspection) Regulations 1970 shall be provided by the Contractor to DOSH before the commencement of the project.

SECTION 5: MATERIAL RECEIVING, QUALITY CHECK FOR PPS ISSUANCE, TESTING, ERECTION, SUPERVISION, INSPECTION, MAINTENANCE, MODIFICATION, DISMANTLING, STORAGE AND CARE

In general, scaffolding material and system are likely to be used repeatedly in its life cycle. Appendix D illustrates the flowchart from the process of receiving until the process of storage or scrapping the scaffolding.

5.1 Material Receiving

All scaffolding components and materials received at a construction site shall be visually inspected for damages and proper markings by the PETW/ Competent Scaffolder/ Designated Person.

Damaged or unmarked component shall be rejected and shall be removed from the construction site. The results of inspection shall be recorded in the scaffolding Receiving Inspection Form. Appendix F illustrates the Scaffolding Receiving Inspection Checklist Form Works that designed and endorsed by PETW/ Competent Scaffolder/ Designated Person.

5.2 Quality Check

There are two types of checks and PPS issuance for used scaffolding, which are:
a) Initial Site Quality Check (ISQC) and;
b) Schedule Site Quality Check (SSQC).

5.2.1 Initial Site Quality Check (ISQC)

ISQC is only applicable to used scaffolding and shall be carried out upon mobilization of scaffold material to the site[21].

The selection of sample shall be conducted by PETW/ Competent Scaffolder. The number of sampling and testing shall comply with the requirement in Table 9.

Note:
[21] For projects classified under temporary works Class 1 or building height not more than 15m, the test for ISQC is not required.

Table 9: Testing and sampling for ISQC

Testing	Type of Scaffolding	Number of samples	Sampling	
			Place	Sampling By
Testing required as in Appendix E	Steel Frame Tubular Modular	3 samples for each component for every 20,000 pieces or less of each component	Construction site	PETW / Competent Scaffolder

The test report shall be submitted by the Contractor to PETW/ Competent Scaffolder, who shall review the test results. All tested component shall comply with the requirements in Appendix E before the scaffolding is allowed to be erected at the construction site. The Contractor shall ensure the scaffolding comply to PETW/ Competent Scaffolder design specifications.

If the sample fails the ISQC, a second test shall be carried out on a new sample randomly selected by PETW. Should the second test fail too, the batch of scaffolding at the construction site shall be removed by the Contractor from the construction site.

5.2.2 Scheduled Site Quality Check (SSQC)

In order to verified the PPS for the scaffolding used in the same project, the SSQC is required maximum a year after the ISQC, or the last SSQC [22]. The sample size, frequency and testing shall comply with the requirement in Table 10.

Note:
[22] For projects classified under temporary works Class 1 or building height not more than 15m the test for SSQC is not required.

Table 10: Testing, frequency and sampling for SSQC

Testing	Scaffolding Type	Number of samples	Sampling	
			Place	Sampling By
Testing required as in Appendix E	Steel Frame Tubular Modular	3 samples for each component For every 40,000 pieces or less of each component <u>Frequency:</u> Every twelve (12) months	Construction site	PETW/ Competent Scaffolder

The test report shall be submitted by the Contractor to PETW/ Competent Scaffolder, who shall review the test results. All tested component shall comply with the requirements in Appendix E before the scaffolding is allowed to be erected at the construction site.

If the sample fails the SSQC, a second test shall be carried out on a new sample randomly selected by PETW/ Competent Scaffolder. Should the second test fail too, the batch of scaffolding at the construction site shall be removed by the Contractor from the construction site.

5.3 Erection, Supervision, Inspection, Maintenance, Modifications, Dismantling, Storage and Care

The erection[23], modification and maintenance[24] of scaffolding shall be performed by Competent Scaffolders[25] under a direct supervision of a competent Designated Person, engaged by the Contractor.

The scaffold shall be inspected[26] by a competent Designated Person, engaged by the Contractor and the Inspection Record as example in Appendix G shall be maintained. The scaffold shall be properly tagged with Green Tags or Red Tags as example in Appendix H and Appendix J.

The dismantling shall be performed by Competent Scaffolders under a direct supervision of a Designated Person, engaged by the Contractor. The Contractor or scaffold owner should provide good storage and care for the dismantled components[27].

Note:

[23] BOWEC "Regulation 74. Supervision of Work and Inspection of Material.

(1) No scaffold shall be erected or be substantially altered or be dismantled except under the direct supervision of a Designated Person.
(2) All materials to be used for the construction of scaffolds shall be inspected by a Designated Person on each occasion before being used."

[24] BOWEC "Regulation 73. Maintenance**.**

(1) Every scaffold shall be properly maintained and every part thereof shall be kept so fixed, secured or placed in position as to prevent, as far as is practicable, accidental displacement.
(2) No scaffold or part thereof shall be partly dismantled and allowed to remain in such a condition that it is capable of being used unless either-
(a) the scaffold continues to comply with these Regulations; or
(b) a prominent warning notice in the national language indicating that the scaffold or part thereof is not to be used, is affixed near any point at which the scaffold or part, as the case may be, is liable to be approached for the purpose of use."

[25] Competent Scaffolder can be described as a person who has attended and passed the course and obtained a scaffold competency certificate from a recognised training centre by DOSH. The level of Competent Scaffolders as determined by DOSH is illustrate in Appendix J.

[26] BOWEC "Regulation 85. Inspection of Scaffolds.

(1) Subject to the provision of these Regulations, no scaffold shall be used unless:
(a) it has been inspected by a Designated Person within the preceding seven days; and
(b) it has been inspected by a Designated Person since its exposure to weather conditions is likely to have affected its strength or stability or to have displaced any part; and
(c) the results of such inspection are entered by the Designated Person into a register which is to be kept at the worksite for inspection by an Inspector.
(2) The provisions of paragraph *(a)* of sub-regulation (1) of this regulation shall not apply to a scaffold where no part of which has been erected of more than seven days, and a trestle scaffold or a scaffold from no part of which a person is liable to fall more than 3 metres."

[27] Storage and Care for Scaffolding After Dismantling.
The Contractor or the scaffold owner should provide a proper place for storage and care to ensure the scaffold continues to comply with product standards after dismantling or not in use and should have a proper instruction for maintenance and repair of components. Any component that are badly corroded or damaged that could not be refurbished should be discarded and removed from the site.

Appendix A
(Informative)

The Classification of Temporary Works

(source from: Guidelines No:001, Board of Engineers Malaysia
The Role and Responsibility of Professional Engineers for Temporary Works During Construction Stage

1. Classification of Temporary Works

The Temporary Works is classified into three main classes, namely:

Class 1: Minor Temporary Works
Class 2: Major Temporary Works
Class 3: Temporary Works that form part of Permanent Works

Class 1: Minor Temporary Works

Class 1 Temporary Works (Minor)" means temporary works that when subject to any failures, defects or losses of serviceability, would unlikely affect the public and workers safety and life. Other than those already listed below, the Consultant and Contractor shall discuss and itemize the temporary works for each project prior to construction.

Class 1 Temporary Works will not require professional engineer's endorsement but still subject to compliance with other relevant guidelines, laws and Act.

Class 2: Major Temporary Works

"Class 2 Temporary Works (Major)" means temporary works that when subject to any failures, defects or losses of serviceability would likely affect public and workers safety and life. The Consultant and Contractor shall discuss together and determine the temporary works that fall into this class. As Class 2 Temporary Works carry similar level of risk to life as permanent works, it therefore shall be given same respect on safety as that of Permanent Works.

Class 2 Temporary Works shall be designed, endorsed and supervised by a Professional Engineer for Temporary Works (PETW). Owner and Consultant shall state and specify clearly in the tender and contract document to the Contractor that the Contractor shall have Professional Engineer for Temporary Works (PETW) to design, endorse and supervise the Class 2 Temporary Works. It shall be the responsibilities of the Consultant who are the submitting person (qualified person) to the Local Authorities or other Government agencies (e.g. JKR etc.) and as designer of Permanent Works to ensure the Contractor comply with these requirements to safe guard public interest and safety.

Class 3: Temporary Works that form part of Permanent Works

"Class 3 Temporary Works" means temporary works that form part of Permanent Works are temporary works that are hazardous to life in which any failure, defect or loss of serviceability would seriously affect the public and workers' safety and life. The Class 3 temporary works that form part of the Permanent Works (e.g. basement retaining wall, top down construction, temporary cut slopes that later become part of permanent slopes, tunnelling etc). The Consultant shall determine the temporary works in construction the fall into this class. As Class 3 Major Temporary Works carry similar level of risk to life as permanent works, they shall then be given the same respect in regards to safety as Permanent Works.

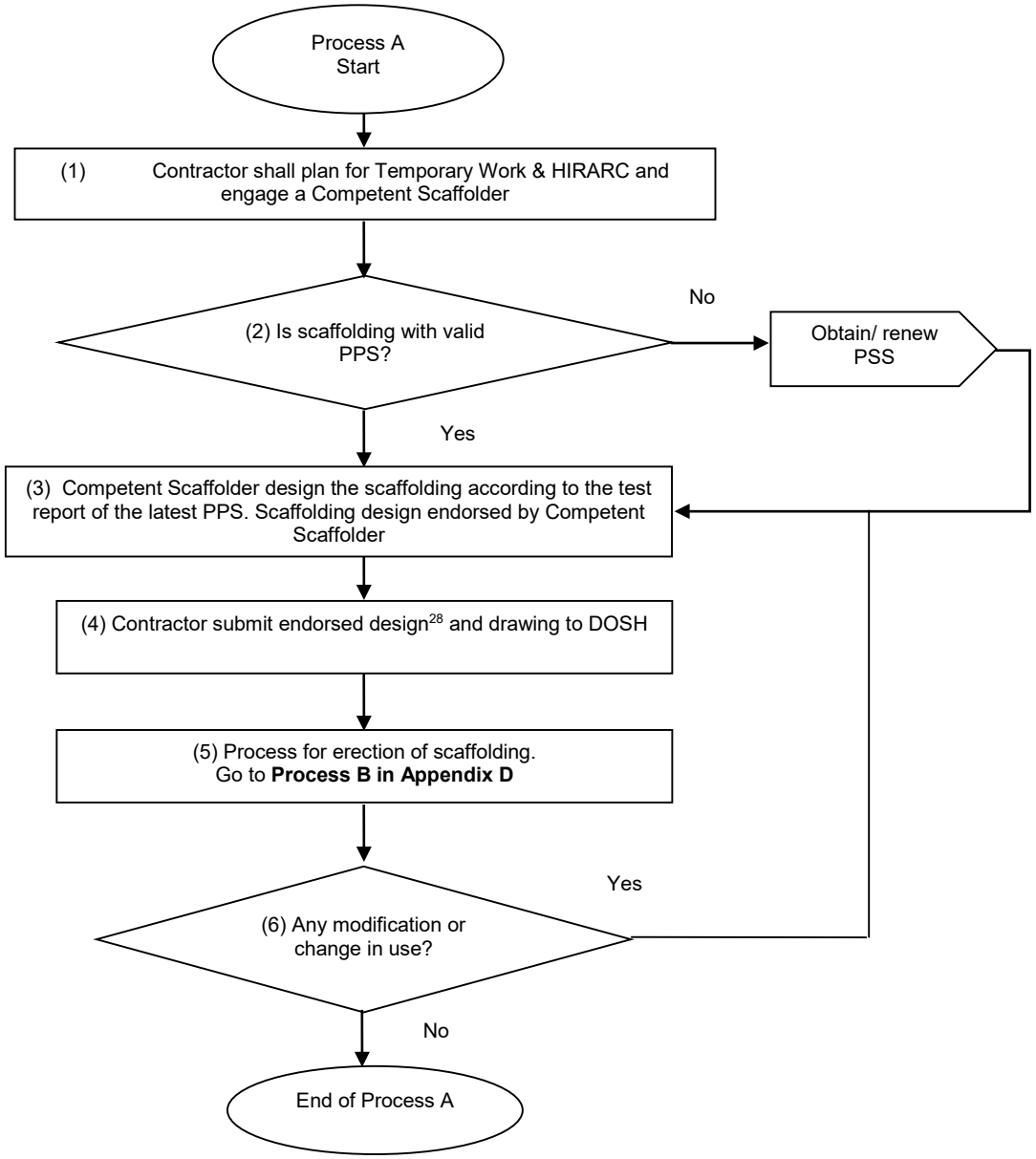
Class 3 Temporary Works that form part of Permanent Works shall be designed, endorsed and supervised by the Consultant, who is the submitting person (qualified person) to the Local Authorities or other Government agencies (e.g. JKR, etc.). The Consultant shall ensure that the design of the Class

3 temporary works (includes analysis, calculations, drawings and specifications) shall be structurally stable with sufficient details for construction and buildable by Contractor with considerations of construction sequence at site and safe. The design, calculations, reports and drawings of Class 3 temporary works shall be enforced by the Consultant and to be submitted to the Authorities. Only Professional Engineer registered with BEM in their respective discipline with the relevant experiences on similar works shall carry out the works to safe guard public interest and safety.

The Contractor can propose alternative design if the method of construction is to be modified of changed but he must engage a Professional Engineer for Temporary Works (PETW) to design, endorse, submit the alternative design (with calculations, drawings, specifications, method of statement, work procedures, etc.) to the Consultant. The Professional Engineer for Temporary Works (PETW) who endorses the alternative design of these temporary works shall be responsible and liable for the design and supervision of the alternative design. The Consultant shall be responsible to review the design concept by the PETW. Only the alternative design that has been reviewed and approved by the Consultant is allowed to be constructed at site.

Appendix B
(Normative)

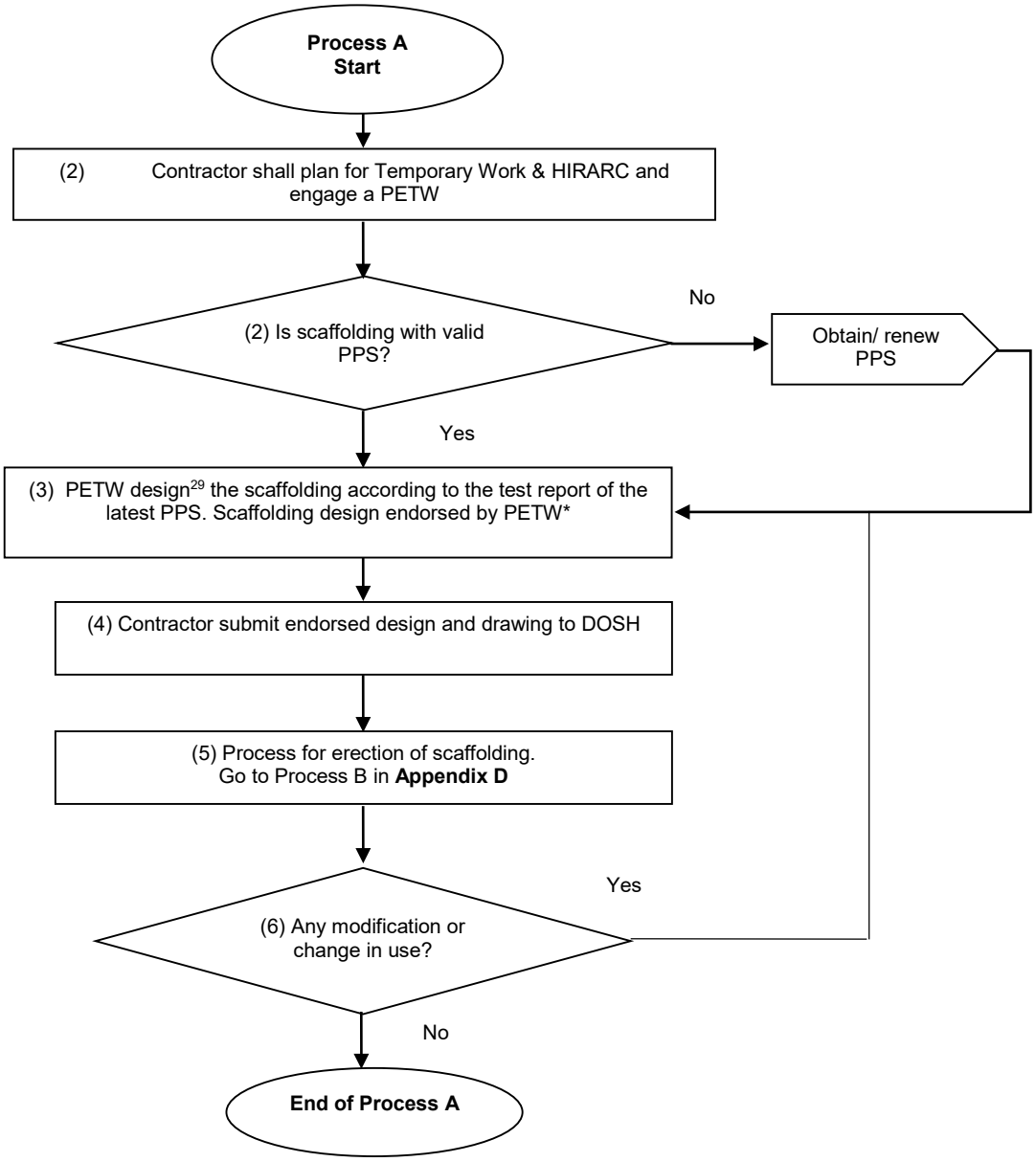
Process A: Flowchart for Design and Drawing Approval for Construction of Tubular Scaffolding height 40m and below other types of scaffolding height 15m and below



Note:
[28] Design includes analysis and design calculation, specification and working drawing. The Competent Scaffolder engaged by a contractor shall carry out the design and endorsement of the scaffolding

Appendix C
(Normative)

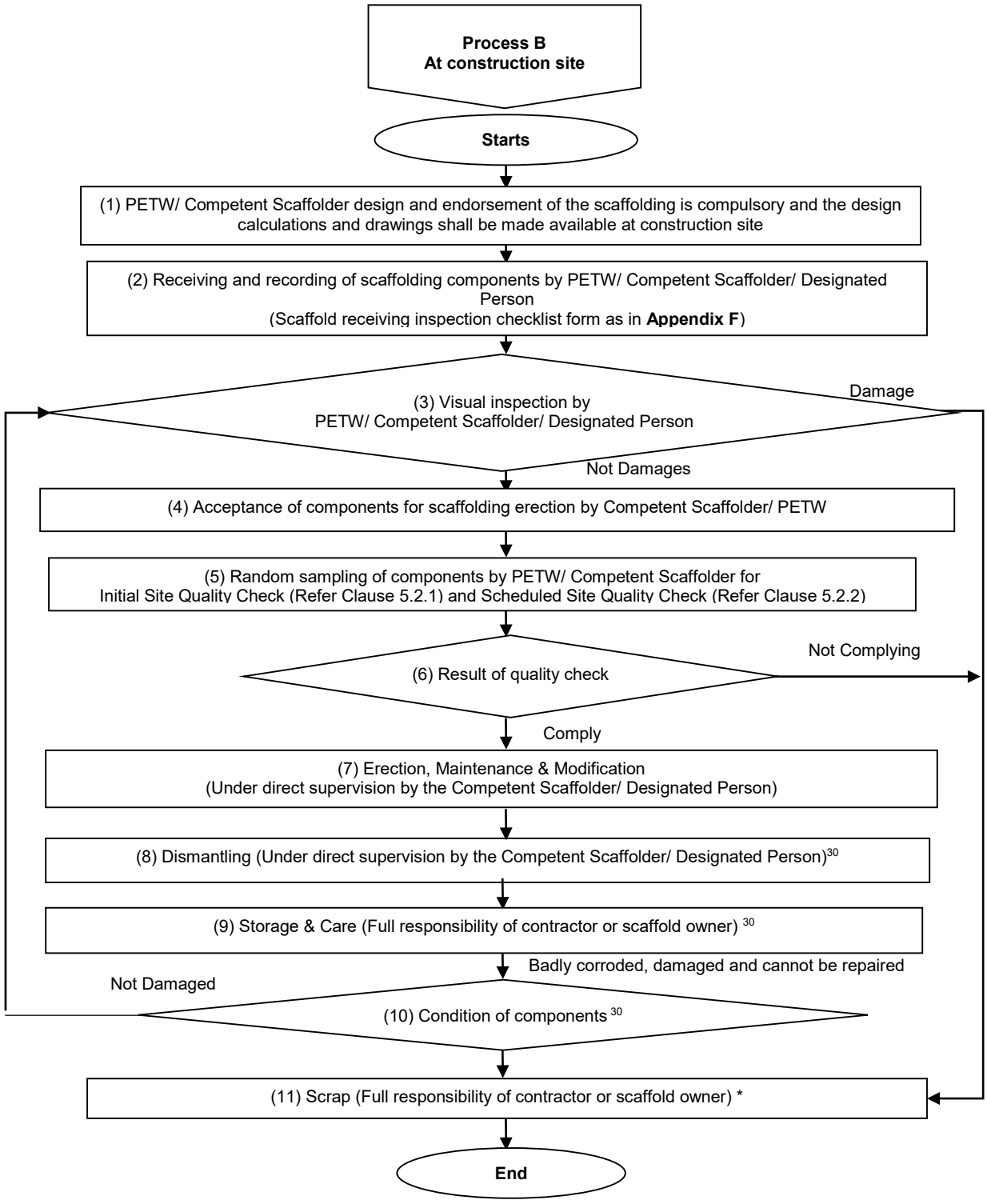
Process B: Flowchart for Design and Drawing Approval for Construction of Tubular Scaffolding height more than 40m and other types of scaffolding height more than 15m



Note:
[29] Design includes analysis and design calculation, specification and working drawing. The PETW engaged by a contractor shall carry out the design and endorsement the scaffolding

Appendix D
(Normative)

Process B: Flowchart for Receiving and Inspection of Material, Quality Check, Testing, Erection, Supervision, Inspection, Maintenance, Modification, Dismantling, Storage and Care of Scaffolding



Note:
[30] Process (8), (9) and (10) shall be under the responsibility of the contractor or scaffold owner to ensure good care for the scaffold in anticipation of its repeated use.

Appendix E
(Normative)

Testing Required for Initial Site Quality Check (ISQC) and Schedule Site Quality Check (SSQC)

No.	Scaffold Type	Standard	Clause	Component/ Class/Type	Type of mandatory test	Number of samples (minimum)	Compliance/ Characteristic value
1.	Steel Frame Scaffolding	MS 1462-1	Table 2	Vertical frame (Tubular vertical post and horizontal member)	Tensile test	3	Minimum: Yield: 355 MPa Tensile strength: 500 MPa
			Annex E2	Vertical frame	Compressive strength of vertical tubes	3	Individual: 73.5kN (1800mm or lower) Individual: 68.6kN (exceeding 1800mm)
			Annex F	Cross brace	Compressive strength	3	Individual: 7.3kN
			Table 2	Joint pin	Dimension	3	<u>Tenon</u> -Minimum length=95mm <u>Collar</u> -Minimum length =25mm -Outer diameter=42.7mm -Outer diameter tolerance= ±2.5mm
			Annex H1	Catwalk	Deflection and bending strength	3	Average: (width of catwalk in mm x 0.0108) kN minimum The vertical deflection of any individual sample shall not exceed 10mm.
			Annex J	Adjustable base plate	Proof load test	3	Minimum value: 59.8kN
			Annex P	Clamp (Cross type)	Strength	3	Mean value: 15.7 kN Minimum value: 14.7 kN
				Clamp (adjustable type)	Strength	3	Mean value: 10.8 kN Minimum value: 9.8 kN

No.	Scaffold Type	Standard	Clause	Component/ Class/Type	Type of mandatory test	Number of samples (minimum)	Compliance/ Characteristic value
2.	Tubular (steel tubes)	MS 1462-2-1	7.2 10.1	Tube (Type 3 and/or Type 4)	Tensile	3	Minimum: Yield: 235MPa Max:340-520Mpa Elongation: min. 24%
			7.2 10.2	Tube	Flattening	3	Visual observation
	Tubular (aluminium tubes)	MS 1462-2-2	3.3	Tube	Tensile	3	Minimum: Yield: 255 N/mm2 Tensile: 295 N/mm2 Elongation: 7%
3.	Right angle coupler	MS 1462-2-3	Table 8 7.2.1	Class A Class AA Class B Class BB	Slipping force	3	Accordance to Coupler Class specified value in Table 8
4.	Swivel coupler			Class A Class B	Slipping force	3	Accordance to Coupler Class specified value in Table 8
5.	Parallel coupler			Class A Class B	Slipping Force	3	Accordance to Coupler Class specified value in Table 8
6.	Sleeve coupler			Class A Class B		3	Accordance to Coupler Class specified value in Table 8
7.	Putlog coupler	BS 1139-2.2	7.2 Annex A.2	-	Slip resistance	3	Displacement reached minimum value: 2mm. Slip resistance shall not less than 1.04kN

No.	Scaffold Type	Standard	Clause	Component/ Class/Type	Type of test	Number of samples (minimum)	Compliance/ Characteristic value
8.	Flange clamp (rigid and swivel)	AS/NZS 1576.2	Section 4.7 Appendix L	Rigid flange clamps Swivel flange clamps	Strength test	6	Minimum failure force: 30kN
			Section 4.7 Appendix M		Slip test through flange clamps	3	Slippage of tube not more than 6mm
9.	Aluminium right-angle coupler/ swivel/ sleeve	BS 1139-2.2	6.2	Class A	Slipping force	3	Refer MS 1462-2-3 Table 2 Class A
10.	Modular General requirement: Comply to Manufacturer's specifications	MS 1462-3-1	6	Standards	Tensile test	3	MS EN 10219 compliance based on grades MS EN 10210 compliance based o grades
				Transom/ ledger	Tensile test	3	MS EN 10219 compliance based on grades MS EN 10210 compliance based o grades
		MS 1462-4-1	5.7 Annex B	Jack base	Axial force	3	Compliance to: Annex B.4 Axial force

No.	Scaffold Type	Standard	Clause	Component/ Class/Type	Type of test	Number of samples (minimum)	Compliance/ Characteristic value
		MS 1462-3-1 MS 1462-4-1	8.7 6.3	Platform	Concentrated load, F1 Deflection	3	Accordance Load class in Table 3 of MS 1462-4-1 and 6.3.1 Elastic deflection of platform units: Deflection shall not exceed 1/100 of its span
		MS 1462-3-1 MS 1462-4-1	8.7 6.3		Concentrated load, F2 Deflection	3	Accordance Load class in Table 3 of MS 1462-4-1 and 6.3.1 Elastic deflection of platform units: Deflection shall not exceed 1/100 of its span

Appendix F
(Normative)

Scaffolding Receiving Inspection Checklist Form
Works that designed and endorsed by PETW/ Competent Scaffolder/ Designated Person[31]

SCAFFOLD RECEIVING INSPECTION CHECKLIST FORM					
Name of Project					
Location/Address					
CIDB PPS NO.					
Supplier's Name					
Delivery Date		D. O Number		Delivery Time	
No.	Item	Quantity	Acceptability Checking		Remarks
		(pieces)	Accepted	Not Accepted	
Total					
Checked by Designated Person		**Approved by PETW/ Competent Scaffolder :**			
Signature:		Signature:			
Name :		BEM/ DOSH Registration Stamp:			
Designation:		Name:			
Date:		Date:			

[31]This form is a typical example of a checklist form. It shall have at least the information as shown in the example.

Appendix G
(Normative)

Scaffolding Inspection Checklist Form[32]

SCAFFOLDING ERECTION/ MODIFICATION INSPECTION CHECKLIST				
Inspection No. :		**Date :**		
Contractor :		**Time :**		
Project & Address. :		**Area :**		
Location :		**Drawing No. :**		
No	**Description**	**Yes**	**No**	**Remark**
1	**PETW/ COMPETENT SCAFFOLDER ENDORSED DRAWINGS AND CALCULATION**			
	a) Scaffolding erected as PETW/ Competent Scaffolder endorsed drawings			
2	**FOUNDATION**			
	a) Scaffolding erected on firm ground			
	b) Ground properly compacted			
	c) Scaffolding not endangered by open excavation			
3	**SOLE PLATES**			
	a) Proper sole plates used			
4	**BASE PLATES**			
	a) Base plates are fitted to all standards			
5	**ALIGNMENT OF SCAFFOLD**			
	a) Standards or frames vertical			
	b) Ledgers and transoms levelled			
6	**SCAFFOLDING COMPONENT CONNECTION**			
	a) Connections are tightened and secured			
7	**BRACING**			
	a) Braces are tightened and secured			
8	**WALL TIE**			
	a) Wall tie placed in position as per drawing.			
9	**WORKING PLATFROM**			
	a) Working platforms are secured or locked			
10	**TOE BOARDS**			
	a) Toe boards are fixed and secured			
11	**LADDER/STAIR**			
	a) Ladders/stairs are securely attached to the scaffold			
12	**GUARD-RAIL**			
	a) Guard-rails are fixed and secured			
General comments:				
Inspected by Competent Scaffolder: DOSH Registration Stamp : Name : Date :				

[32] This form is a typical example of a checklist form. It shall have at least the information as shown in the example.

Appendix H
(Normative)

Green Tagging for Updating Scaffolding Installation and Maintenance[33]

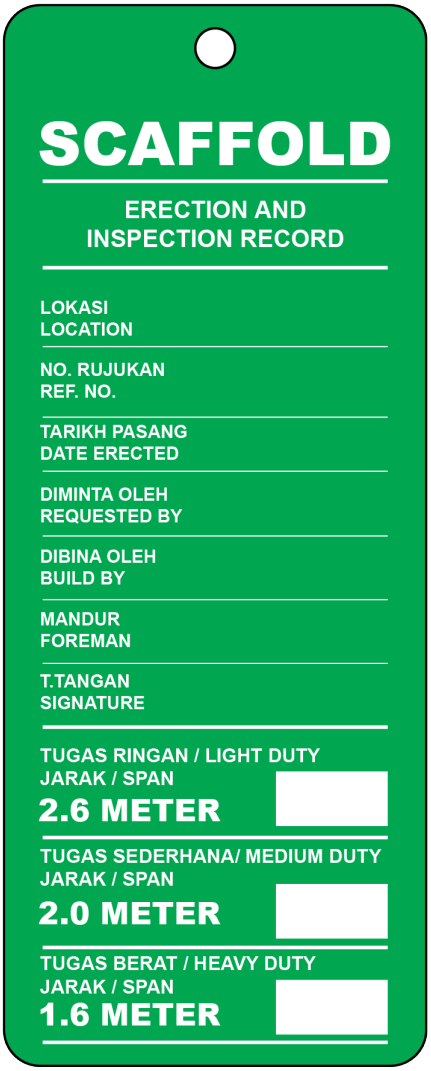


Figure HI. Front page of the green tag

Figure H2. Back page

Note:

[33] Typical Green Tag - It shall contain minimum information, as shown in the example above. The Contractor or owner shall be responsible for the design, use and maintenance of the Green Tag. The designed Green Tag shall enable it to be securely installed on the scaffold, clearly visible and contains language that could be understood by users of the scaffold. Where necessary, the Green Tag may contain other information appropriated to type and use of the scaffolding.

Appendix J
(Normative)

Red Tagging - Scaffolding Installation and Maintenance

Figure J1. Typical Red Tag to prevent use of uncompleted scaffolding

Appendix K
(Normative)

Designated Person Competency Level[34]

LEVEL	TYPE OF SCAFFOLD
Level 1/ Basic	1. Independent 2. Mobile tower scaffold 3. Static tower scaffold 4. Birdcage scaffold 5. Putlog/ Single line scaffold 6. Trestle scaffold
Level 2/ Intermediate	1.Truck access/ gantry (tension and compression) 2.Truss-out (spur) 3. Barrow ramp 4. Cantilever scaffold 5. Cantilever catch platform (protective fan) 6. Outrigger scaffold
Level 3/ Advance	1. Hung scaffold 2. Slung scaffold 3. Suspend scaffold

Note [34]
Level 1,2,3 or Basic, Intermediate and Advance Level Certification is determined by the National Occupational Skills Standard, Jabatan Pembangunan Kemahiran.

REFERENCES

1. Handbook for Hazard Identification, Risk Assessment & Risk Control (HIRARC) (2nd reprint 2015) - Master Builders Association Malaysia

2. CIS 22: Safe Use of Scaffolding in Construction (2017) – Construction Industry Development Board Malaysia

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