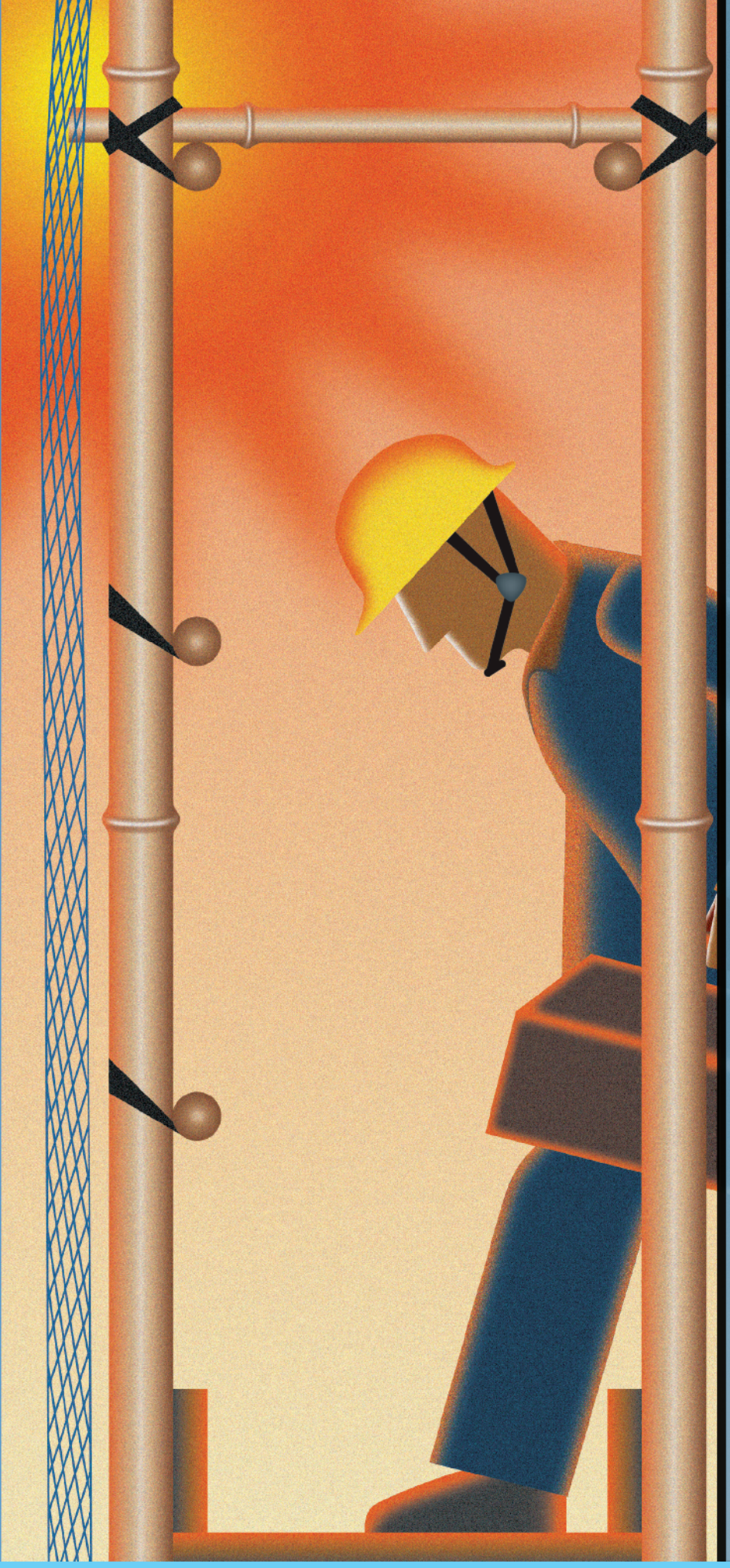

CODE OF PRACTICE FOR BAMBOO SCAFFOLDING SAFETY

Labour Department

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CODE OF PRACTICE

FOR

BAMBOO SCAFFOLDING SAFETY

Contents

1. Introduction

1.1 This Code of Practice for Bamboo Scaffolding Safety is issued by the Commissioner for Labour under Section 7A of the Factories and Industrial Undertakings Ordinance, Chapter 59. It provides practical guidance for the compliance with the requirements set out in Sections 6A & 6B of the Factories and Industrial Undertakings Ordinance and the requirements of the Construction Sites (Safety) Regulations regarding safety at work involving the erection, substantial addition, alteration, dismantling and use of bamboo scaffolds. The advice contained in this Code should not be regarded as exhausting those matters that need to be covered by the relevant safety legislation. Compliance with this Code of Practice does not confer immunity from relevant legal requirements.

1.2 This Code of Practice has a special legal status. Although failure to observe any provision of this Code is not itself an offence, that failure may be taken by a court in criminal proceedings as a relevant factor in determining whether or not a person has breached the relevant safety and health legislation under the Factories and Industrial Undertakings Ordinance.

1.3 Bamboo scaffolds can be used in different construction works. If in any special situation where the technical requirements in Section 5 of this Code of Practice need to be modified, the stability and strength of the scaffolds should be justified by recognised engineering principles and national/international standards or provisions so that equal or even higher safety standards can be achieved.

1.4 The statutory provisions referred to or cited in this Code are those in force on 19 October 2024.

2. Interpretation

Unless otherwise defined in this Code of Practice, the terms used in this Code of Practice have the same meaning as those in the Factories and Industrial Undertakings Ordinance and the Construction Sites (Safety) Regulations, and

2.1 "FIUO" is the abbreviation for the Factories and Industrial Undertakings Ordinance, Chapter 59.

2.2 "CSSR" is the abbreviation for the Construction Sites (Safety) Regulations, subsidiary legislation of the Factories and Industrial Undertakings Ordinance.

2.3 "competent person"

2.3.1 A competent person, in relation to any duty to be performed by such a person under the CSSR, means a person who is:

(a) appointed for that purpose by the contractor required by the CSSR to ensure that the duty is carried out by a competent person; and

(b) by reason of substantial training and practical experience, competent to perform the duty.

2.3.2 As a general guidance:

(a) 'substantial training and practical experience' of a competent person in respect of bamboo scaffolding refers to a person

(i) who has satisfactorily completed a formal training in bamboo scaffolding works such as an apprenticeship in the trade of bamboo scaffolder under Section 28 of the Apprenticeship Ordinance (Cap. 47) or 1-year full-time basic craft course on construction scaffolding works of the Hong Kong Institute of Construction (including former Construction Industry Council Training Academy (CICTA)), or other similar bamboo scaffolding training courses/ programmes, or has satisfactorily passed the trade test for bamboo scaffolder of the Construction Industry Council (CIC);

(ii) who possesses an experience of 10 years or more in bamboo scaffolding works (inclusive of experience under the formal training period); and

(iii) who has the ability to read and understand the scaffolding plan, design drawings, specifications and method statement of the scaffolding work in order to competently supervise the scaffolding work and certify that the scaffolding is in safe working order. He should also be capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary or hazardous to employees.

(b) A competent person should be appointed in writing and should have authorization to take prompt corrective measures to eliminate existing and predictable hazards mentioned above.

2.4 "trained workman"

2.4.1 A trained workman in respect of bamboo scaffolding refers to a scaffolder who is responsible for on-site erection, substantial addition, alteration and dismantling of bamboo scaffold under the immediate supervision of a competent person, and has satisfactorily completed a formal training in bamboo scaffolding works equivalent to any of those mentioned for a competent person or has satisfactorily passed the intermediate trade test for bamboo scaffolder of the CIC and possesses at least 1 year of experience in bamboo scaffolding works (inclusive of experience under the formal training period). This Code of Practice also recognises scaffolders who are registered skilled, semi-skilled, skilled (provisional) or semi-skilled (provisional) workers under the Construction Workers Registration Ordinance (Cap. 583) for the trade of bamboo scaffolder as trained workmen.

2.4.2 A trained workman in respect of truss-out bamboo scaffolding, in addition to the requirements set out in paragraph 2.4.1, refers to a person who holds a valid certificate of "Advanced Level Truss-out Scaffolder Safety Training" or "Intermediate Level Truss-out Scaffolder Safety Training" issued by the CIC. Please refer to paragraph 5.3.3(b) for the work that may be performed by the trained workman.

2.5 "Form 5" is a form approved by the Commissioner for Labour for the purposes of Regulation 38F(1) of the CSSR. A sample of the form is at Appendix I.

2.6 **"ladder"** includes a folding step-ladder.

2.7 **"place of work"** means any place which is used by any person for the purposes of

(a) construction work; or

(b) any work activities arising from, or in connection with, construction work,

and includes any place to which such a person has access whilst at work.

2.8 A **"professional engineer"** means an engineer of structural or civil discipline. He should be a corporate member under the constitution of the Hong Kong Institution of Engineers or equivalent and should have adequate training and experience, and be able to justify how and why the scaffold he designed can safely resist the imposed loads in accordance with recognised engineering principles.

2.9 **"safety belt"** includes a safety harness.

2.10 **"scaffold"** means any temporarily provided structure on or from which persons perform work in connection with operations or works to which the CSSR apply, 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, run, ladder or step-ladder (other than an independent ladder or step-ladder which does not form part of such a structure) together with any guard-rail, toe-board or other safeguards and all fixings, but does not include a lifting appliance or a structure used merely to support such an appliance or to support other plant or equipment.

3. Principal safety and health legislation relating to safe bamboo scaffolding in Hong Kong

The following is a summary of the statutory provisions in relation to safe bamboo scaffolding under the Factories and Industrial Undertakings Ordinance and its subsidiary legislation and the Occupational Safety and Health Ordinance. It is advisable to refer to the relevant ordinances and regulations for full details of the statutory provisions summarized in this part or referred to in other parts of the Code.

3.1 General duties provisions under the FIUO

Sections 6A and 6B of the Ordinance impose general duties on proprietors and persons employed with regard to the health and safety at work in industrial undertakings. In a construction site, these provisions do not only bind the principal contractor of the site. Subcontractors who are employers and who have management or control of construction activities within the site are also regarded as proprietors and are therefore bound by Section 6A. Besides, with regard to bamboo scaffolding work, workers using bamboo scaffolds and scaffolders, who are employed to work in the site are also bound by Section 6B.

3.1.1 Section 6A(1)

The general duties imposed on the proprietor of an industrial undertaking are to ensure, so far as is reasonably practicable, the health and safety at work of all persons employed by him at the industrial undertaking.

3.1.2 Section 6A(2)

These general duties extend to include five specific areas:

(a) The proprietor shall provide machinery, equipment, appliances and other plant that are, so far as is reasonably practicable, safe and without risks to health and must maintain them in that condition. He must also ensure that the systems of work are safe and without risks to health.

(b) The proprietor shall make adequate arrangements for ensuring, so far as is reasonably practicable, safety and absence of risks to health in connection with the use, handling, storage and transport of articles and substances.

(c) The proprietor shall provide such information, instruction, training and supervision as is necessary to ensure, so far as is reasonably practicable, the health and safety at work of all persons employed by him. The information to be provided should include information about the hazards in the workplace and the necessary precautions to be adopted.

(d) The proprietor shall ensure that, so far as is reasonably practicable, any place of work under his control is kept safe and without risks to health. This requirement covers not only buildings, but also includes, for example, open sites and temporary structures such as scaffolds. The proprietor shall also ensure, so far as is reasonably practicable, the provision and maintenance of means of access to and egress from the workplace that are safe and without risks to health.

(e) The proprietor shall provide and maintain for all persons employed by him a working environment that is, so far as is reasonably practicable, safe and without risks to health.

3.1.3 Section 6B(1)

The general duties imposed on every person employed at an industrial undertaking while at work are as follows:

(a) The person employed shall take reasonable care for the safety and health of himself and of other persons who may be affected by his acts or omissions at work.

(b) Also, he shall co-operate with the proprietor or other persons so far as is necessary to enable them to perform or comply with the safety duties or requirements imposed on them by the Ordinance.

3.2 Construction Sites (Safety) Regulations

The CSSR are to protect workmen in the construction industry. These regulations lay down legal requirements to ensure the safety, health and welfare of workmen on construction sites. In respect of scaffolding safety, contractors/ workmen are subject to the requirements of the following regulations:

3.2.1 Regulations 38A and 38AA

These regulations specify general provisions for ensuring safety of places of work, safe means of access to and egress from places of work and that no person gains access to any place on the site where any hazardous conditions are present.

3.2.2 Regulation 38B

This regulation requires that adequate steps such as the provision, use and maintenance of working platforms, etc. shall be taken to prevent any person from falling from a height of 2 metres or more.

3.2.3 Regulation 38C

This regulation requires the provision of safe scaffolds, ladders, etc. and ensures their use where work cannot be safely done on or from the ground or from part of a permanent structure.

3.2.4 Regulation 38D

This regulation requires that all the scaffolds, ladders, etc. shall be so designed, constructed, maintained and every part thereof so securely supported or suspended as to ensure that they are stable. Besides, all such scaffolds, ladders, etc. shall be made of suitable and sound materials of sufficient strength.

3.2.5 Regulation 38E

This regulation requires that only trained workmen with adequate experience and under the immediate supervision of a competent person shall erect, substantially add to, alter or dismantle scaffolds.

3.2.6 Regulation 38F

This regulation requires that a scaffold shall not be used unless it has been inspected by a competent person:

(a) before being taken into use for the first time;

(b) at regular intervals not exceeding 14 days immediately preceding each use of the scaffold;

(c) after any substantial addition, partial dismantling or other alteration, exposure to weather conditions likely to have affected its strength or stability or to have displaced any part,

and a report has been made by the person carrying out the inspection on Form 5 which includes a statement to the effect that the scaffold is in safe working order.

3.2.7 Regulation 38H

This regulation requires the use of safety nets and safety belts when it is impracticable to provide safe scaffolds.

3.2.8 Regulation 38I

This regulation requires that any workman who has been provided with a safety belt shall wear the safety belt and keep it attached to a secure anchorage.

3.2.9 Regulation 48

This regulation requires that suitable safety helmets shall be provided for every workman; and all reasonable steps shall be taken to ensure that no workman remains on site unless he is wearing a suitable safety helmet.

3.2.10 Regulation 49

This regulation requires that scaffolding materials and waste materials, tools and other objects, shall not be thrown, tipped or shot down from height. Where proper lowering by lifting appliances or gear is impracticable or demolition is being carried on, steps shall be taken to protect workmen from being hit by falling debris.

3.2.11 Regulation 52

This regulation requires that all platforms, gangways, etc. shall be kept clear of any loose materials that are not required for immediate use.

3.2.12 Third Schedule to the CSSR

This schedule relates to the protection of any person from falling from a height of 2 metres or more (see Appendix II for details).

3.3 Issue of improvement notice and suspension notice under the Occupational Safety and Health Ordinance

3.3.1 Section 9

This section empowers the Commissioner to serve on an employer or an occupier of premises where a workplace is located an improvement notice requiring the rectification of contravention against safety legislation within a specified period.

3.3.2 Section 10

This section empowers the Commissioner to serve on an employer who is responsible for, or an occupier of, premises where a workplace is located a suspension notice requiring suspension of an activity or use of premises or of any plant or substance where there is an imminent risk of death or serious bodily injury.

4. Managing safety and health at work involving erection, substantial addition, alteration, dismantling and use of bamboo scaffolds

A safety management system and a safe system of work should be developed, implemented and maintained for the safety and health at work of workers. Further reference should be made to the Factories and Industrial Undertakings (Safety Management) Regulation and the Code of Practice on Safety Management issued by the Labour Department. Among other things, the following actions should also be taken into account:

4.1 Design and initial planning

A construction project should be designed with safety in mind. This approach makes it possible to eliminate or minimize the work hazards by proper planning and design of the methods of construction, sequences of activities, coordination, etc.

4.1.1 During the design of a bamboo scaffold, attention should be paid in the following areas:

(a) The safety of scaffold and its erection/substantial addition/alteration/dismantling for all different stages of construction should be designed and planned well beforehand (including scaffolding plan, design drawings and relevant design information, etc.).

(b) The safe method of scaffolding devised should be kept under continual review.

(c) The strength and stability of the scaffold throughout all stages of scaffolding should be ensured.

(d) The strength of scaffolding members such as bamboo and log should be ensured. Reference should be made to the procedures laid down in relevant standards of the International Organization for Standardization or equivalent procedures for their sampling and mechanical testing.

(e) Realistic assessment of loadings on the scaffold at all work stages should be made. In considering the wind load on the scaffold, reference should be made to the Code of Practice on Wind Effects in Hong Kong 2019 issued by the Buildings Department.

(f) All decking units of working platforms should be designed to sustain the recommended minimum imposed loads for the types of work set out in the following table:

Minimum Imposed Loads			
Types of work	**Use of platform**	**Distributed load on platform**	**Concentrated load to be applied on plan over any square with a 300mm side and at the end portion of a cantilever**
Inspection and very light duty	Inspection, painting, stone cleaning, light cleaning and access	0.75 kN/m^2	2 kN
Light duty	Plastering, painting, stone cleaning, glazing and pointing	1.5 kN/m^2	2 kN
General purpose	General building work including brickwork, window and mullion fixing, rendering, plastering	2 kN/m^2	2 kN
Heavy duty	Blockwork, brickwork, heavy cladding	2.5 kN/m^2	2 kN
Masonry or special duty	Masonry work, concrete blockwork and very heavy cladding	3 kN/m^2	2 kN

(g) The use and allowable imposed loads of the working platform should be displayed at prominent positions of the working platform.

(h) Safe access to and egress from the working places should be provided.

(i) Additional features such as attachment points for ladders, working platforms, guard-rails and toe-boards should be provided for the protection of workers using the scaffold. Safety nets and safety belts should also be provided for the protection of scaffolders.

(j) Scaffolding components/materials/equipment should be handled, lifted, stored, stacked and transported safely.

(k) The time when the scaffold would be erected, substantially added to, altered and dismantled should be decided in the design and planning stage. The scaffold should be dismantled as soon as it is no longer required to be used.

(l) The structural condition of the parent structure where the bamboo scaffold is erected and adhered to should be assessed by a professional engineer.

4.1.2 Specification for scaffolding contract document:

(a) Specification for scaffolding contract document should incorporate particular requirements and essential information for the scaffolding work to be planned and implemented safely (for example, the provision of design drawings and relevant design information, use of working platform and method statement; phasing of work - particularly with other contractors; periodic maintenance; and repair of scaffold).

(b) Special requirements relating to compliance with safety legislation should be highlighted and, where appropriate, these items should be included in the Bills of Quantities.

(c) Depending on the size of the project and/or the complexity of the work involved, tenderers for the scaffolding work should be required to submit an outline scaffolding plan at tendering stage, giving sufficient information to demonstrate their intended safe system of work.

4.1.3 Coordination and communications:

(a) There should be close liaison between all relevant parties even at the design and planning stage.

(b) Effective lines and systems of communication should be devised for each stage of the scaffolding work and a person should be assigned to maintain effective communication.

4.1.4 Initial planning:

(a) Site considerations and risk assessment

Potentially hazardous site features and other aspects likely to impair safe scaffolding should be identified. The risk arising from each individual hazardous event should be evaluated according to its probability and consequence. The following special conditions of the site should be taken into account:

(i) The existence of overhead electric power lines.

(ii) The existence of overhead signboards or projections, particularly those in the urban areas.

(iii) The existence of buried services, including underground electric cables, gas or other fuel pipelines.

(iv) The existence of storage tanks.

(v) Restricted access to, and onto the site.

(vi) Restricted space for erection, manoeuvring, storage and, if required, for on-site pre-assembly or fabrication.

(vii) Low ground bearing pressures that may be due to, for example, made ground or existing underground services or structures.

(viii) The proximity and condition of other buildings and premises that may by itself or so-induced special wind effect (for example, funnelling effect) affect the planned method of scaffolding.

(ix) The shape and the structure of the building.

(x) The juxtaposition of the public and the site.

(xi) The activities of other contractors.

(xii) The chemical properties of gases, fluids or dust emitted from processes on or around the site.

(b) Preliminary method statement

The preparation of a preliminary method statement is an important part of planning for a safe system of work in scaffolding. Where appropriate, a preliminary method statement should include:

(i) the arrangements for coordination and the responsibilities and authority of supervisory personnel during scaffolding work;

(ii) the scaffolding sequences including erection, substantial addition, alteration and dismantling;

(iii) the methods of ensuring stability with due consideration of future construction activities (for example, trench work, external building services/facilities installation);

(iv) the detailed scaffolding work method which should ensure that the work could be carried out safely in different stages of construction;

(v) the construction tolerance;

(vi) the assessed maximum allowable loading (includes vertical and lateral loads) on the scaffold/working platform;

(vii) the provisions to prevent falls from height, including safe means of access and egress and safe places of work;

(viii) the protection from falls of materials, tools and debris, and the provision of catch-fans and protective screens at the scaffold;

(ix) the provision of suitable plant, tools and equipment;

(x) the arrangements for delivery, stacking, storing and movement on site for scaffolding components, materials and equipment;

(xi) the details of site features, layout and access; and

(xii) the contingency arrangements.

4.2 Selection of subcontractor for bamboo scaffolding work

4.2.1 If a subcontractor is to be engaged in bamboo scaffolding work, whether he would make adequate provisions for safety and health should be an important selection consideration. Selection criteria should also include the ability of the subcontractor in providing a good scaffolding plan.

4.2.2 During the process of selection, the subcontractor should be required to submit an outline scaffolding plan, giving preliminary information to demonstrate the intended safe system of work. Depending on the complexity of the project, the outline scaffolding plan should briefly describe items such as safety organization, communication, monitoring, equipment, facilities, emergency procedures, accident reporting, and accident investigation procedures.

4.2.3 After the subcontractor has been appointed, he is required to finalize a detailed scaffolding plan on the basis of the outline scaffolding plan if any, for agreement in writing. The detailed scaffolding plan should spell out the ways and means to carry out work safely and effectively in order to fulfil the objective of protecting workmen at work. The detailed scaffolding plan should also be incorporated into the safety plan of the main project.

4.3 Site management and procedures

4.3.1 Managing for safe erection/substantial addition/alteration/dismantling:

Safe working methods and practices on site should be ensured as follows:

(a) Preparation and use of a detailed method statement

The extent of detail in a detailed method statement will depend upon the size and/or complexity of the work, with a simple job requiring a simple method statement and repetitive tasks being covered by standard sheets. Preliminary method statement produced at the planning stage should be developed into a detailed method statement that should be incorporated into a detailed scaffolding plan. The whole method statement should be reviewed and updated as necessary so that it remains current. It should be distributed to all those concerned with the supervision of scaffolding work.

(b) Thorough and active contract coordination both on and off site

Coordination and liaison between parties should be maintained throughout the job. Any changes in previously agreed procedures must be verified by the person responsible for coordination as being safe before they are implemented. Matters that will contribute to safe scaffolding work on site, including the availability of information, plant and manpower, and the quality and supply of materials should also be coordinated.

(c) Implementation and maintenance of effective communications

To ensure that precautions for safe scaffolding outlined in the method statement are followed, lines of communication should be clearly designated, with the responsibility for implementing the method statement well defined.

(d) Contingency plan for adverse weather conditions

Weather conditions that could have an adverse effect on the scaffolding work such as rain, high wind, lightning or typhoon, and those causing poor visibility, such as fog, mist or glare should be constantly monitored.

If a decision is made to stop work, then measures should be taken to maintain the stability of the scaffold and the plant, equipment and works erected on the scaffold. Also, all personnel should be safely and efficiently evacuated from the scaffold. After the adverse weather, the scaffold should be inspected and certified in safe working order by a competent person and all the plant, equipment and works erected on the scaffold should be checked and confirmed to be in order before work is to be restarted.

(e) Provision of suitable staff

No scaffold shall be erected on the site or substantially added to, altered or dismantled except under the immediate supervision of a competent person and by trained workmen possessing adequate experience of such work (Regulation 38E of the CSSR). Training should be a continuing process with on-the-job instruction and formal training sessions provided as appropriate (refer to 4.6).

(f) Provision of protective equipment

Protective equipment that is necessary and appropriate for the work should be provided. Examples of protective equipment are: safety helmets with chin strap, safety nets and safety belts with suitable anchorage.

4.3.2 Preparing the site and the work

(a) Plans and drawings should be checked for matters relating to scaffolding safety before work is to be started.

(b) Other personnel should be excluded from scaffolding areas prior to and when the scaffolding work is in progress.

(c) Site inspection should be conducted to check the physical conditions, the hazards involved and other special features, and to ensure the scaffolding work is properly planned and coordinated in order to avoid incompatible work activities being carried out at the same time.

(d) The ground condition should be made firm, level and suitable.

(e) The maximum safe loading (includes vertical and lateral loads) imposed on the scaffold should be assessed, and strictly adhered to.

(f) The bamboo members should be checked for their fitness before despatching to the site. Defective materials should be prohibited to be used and should be removed from site as soon as possible. During their stay on site pending for removal, they should be properly labelled to show that they are defective and should not be used.

(g) A suitable place should be provided at the site for storage of bamboo members and the associated materials, tools or equipment. The storage area should be clearly shown on the site plans. The bamboo members should be stored in dry area and in vertical position to prevent the accumulation of waste water inside, thus causing them to decay. Also, they should be properly stacked and tied to prevent accidental displacement and collapse.

(h) Documents such as scaffolding plan, method statement, design drawings and relevant design information, and specifications of the scaffold, etc. should be made available to all parties concerned in good times. Moreover, the above-mentioned documents, or a copy thereof, should be kept in the construction site where the scaffold is located, and made available for inspection by relevant person and occupational safety officer.

4.4 Working places and access

4.4.1 Working platform of scaffold

(a) A method statement for construction of a working platform should be devised. Please refer to 4.3.1(a) on method statement.

(b) Guard-rails and toe-boards shall be installed at edges where persons are liable to fall from height. The guard-rails shall have adequate strength and be securely fixed. The height of a top guard-rail shall be between 900mm and 1,150mm above the platform. The height of an intermediate guard-rail shall be between 450mm and 600mm above the platform. Otherwise, the platform shall be protected by not less than 2 horizontal bamboo members of the scaffold spaced at intervals between 750mm to 900mm. The height of a toe-board shall be not less than 200mm (Third Schedule to the CSSR).

(c) The latest Guidelines on Planking Arrangement for Providing Working Platforms on Bamboo Scaffolds issued by the CIC should be observed in fulfilling the safety responsibilities of laying planks as working platforms on bamboo scaffolds so as to ensure safety at work on bamboo scaffolds. The following essential points should be taken into account in making the planking arrangement:

(i) Erecting bamboo scaffolds should conform to one of the following:

(1) Laying working platforms on every lift of a bamboo scaffold; or

(2) Erecting a suitable working platform at every working location on a lift where the entire scaffold is designed as closely spaced bamboo scaffold (for definition and drawings of closely spaced bamboo scaffold, please refer to the Guidelines on Planking Arrangement for Providing Working Platforms on Bamboo Scaffolds);

(ii) Taking into account the requirement in 5.3.2 below, providing suitable and adequate quantities of planks and toe-boards, and ensuring that they are of good construction, adequate strength and thickness for serving as working platforms on bamboo scaffolds at the exterior walls of buildings, so that all trades of workers can work on suitable working platforms continuously on bamboo scaffolds at the exterior walls of buildings;

(iii) Ensuring that the plank laying work is carried out safely and properly on site, and the planks are maintained in safe conditions;

(iv) Ensuring the strength and stability of the working platforms and the bamboo scaffolds are inspected by competent persons;

(v) Overseeing and supervising the proper use of the working platforms by the workers concerned;

(vi) Providing necessary safety information, instruction, training and supervision to the workers concerned;

(vii) Replacing defective parts of the plank or toe-board upon discovery of any damage; and

(viii) Performing their respective roles and duties as principal contractors and subcontractors.

4.4.2 Safety net

Provision of a workplace without risk of falling should always be the first consideration. However, if this is not practicable, safety nets and safety belts shall be used (Regulation 38H of the CSSR). Reference should be made to national/international standards or provisions for the standards of safety nets.

4.4.3 Safety belt and its anchorage

(a) In all the circumstances of the case, if it is impracticable to provide safety net, wearing of safety belt with effective anchorage system is required as the last resort for fall prevention (Regulation 38H of the CSSR). Further reference should be made to the Guidance Notes on Classification and Use of Safety Belts and their Anchorage Systems issued by the Labour Department. Under normal circumstances, a full body harness, as distinct from a general purpose safety belt, should be used. Reference should be made to national/international standards or provisions for the standards of safety belts.

(b) Please refer to the Guide on Construction and Work Safety of Truss-out Bamboo Scaffolds issued by the Labour Department for the requirements of anchorage to which the safety harness is attached, including fixed anchorages, transportable temporary anchor devices, and the inspections and tests on anchor devices and cast-in anchors.

4.4.4 Provision of catch-fan and protective screen

(a) At least a sloping catch-fan at not more than 15m vertical intervals to give a minimum horizontal projection coverage of 1,500mm should be provided. The sloping catch-fan should consist of timber boarding and a layer of galvanized metal sheeting, both of adequate thickness to capture and retain falling objects.

(b) A suitable receptacle should be provided within each catch-fan to trap falling objects. The weight of the receptacle should not affect the stability of the catch-fan.

(c) The sloping catch-fan and receptacle should remain in place until all works are completed.

(d) On the face of the scaffold, suitable protective screen (such as nylon nets, plastic sheeting, canvas, etc.) should be provided to confine falling objects. Protective net, screen, tarpaulin/plastic sheeting installed on the face of the scaffold should have appropriate fire retardant properties in compliance with a recognised standard. Examples of recognised standards are listed below for reference:

(i) GB 5725-2009 - Safety nets (or formerly GB 16909-1997 - Fine mesh safety vertical net);

(ii) BS 5867-2:2008 (Type B performance requirements) - Fabrics for curtains, drapes and window blinds - Part 2: Flammability requirements - Specification; and

(iii) NFPA 701:2019 (Test Method 2) - Standard methods of fire tests for flame propagation of textiles and films.

Other standards of equivalent fire retardant performance as per the above recognised standards may also be used.

4.5 Monitoring safety performance

4.5.1 Requirements on safety and health, particularly those relating to compliance with safety legislation, are advisable to be incorporated into the conditions of contract for engagement of subcontractor for bamboo scaffolding work or other subcontractors using the scaffold.

4.5.2 Regular records on the safety conditions of the scaffolding should be kept. Such records should consist of detailed information on work hazards, precautions taken, accident analysis and recommendations and these records should be constantly reviewed for hazard identification and improvement.

4.5.3 Workmen's feedback on the safety conditions of the site should be encouraged and as far as possible documented.

4.5.4 A monitoring system should be developed, implemented and maintained on site for checking the safety performance of the subcontractor for bamboo scaffolding work or other subcontractors using the scaffold against the requirements mentioned in 4.5.1.

4.6 Training of bamboo scaffolders

4.6.1 The objective of training is to increase the efficiency of workers and to improve safety performance in erecting, substantially adding to, altering, maintaining and dismantling scaffolds. The importance of ensuring that workers who erect, substantially add to, alter, maintain and dismantle scaffolds are fully competent is obvious, but the degree of skills which are required differ according to the duty to be performed. There is a great span of proficiency and experience required. Properly controlled training is therefore vital for safety and it would eventually attract a better type of man to make a career in the industry. Before training of the scaffolders is to be considered, they should be physically fit for the scaffolding work first.

4.6.2 Training of scaffolders needs to relate to basic site safety, familiarity with every day hazards and the requirements for a safe place of work. In general, training for scaffolders should start at ground level, where basic skills can be acquired, and when scaffolders are proficient, using those skills at increasing height would be appropriate. Training should continue after basic skills have been acquired to ensure that scaffolders are familiar with improvements in techniques, the use of newly developed equipment/materials, and to ensure that safe methods of work continue to be used.

4.6.3 When a new scaffolder is employed, the management should ascertain the previous safety training of him, and should not assume that any scaffolder has a particular skill or training without seeing some proof or demonstration. Induction training will be needed to explain such matters as the company's safety policy/organization, company safety rules, accident reporting requirements, etc. Besides, training/instruction would be necessary when the new scaffolder first starts on a project, to cover the particular requirements of the site such as emergency procedures, any special hazards and the safety aspects of the scaffold.

5. Technical requirements for safety in bamboo scaffolding

5.1 Materials

5.1.1 General requirements

(a) Sufficient material should be provided for and used in the construction of scaffolds.

(b) Scaffolding components should be of sound material, good construction, adequate strength and free from patent defects, and should be properly maintained.

(c) Timber (such as fir) so used should be of sound construction, adequate strength and free from patent defects.

(d) Boards and planks used in the construction of working platform should be straight-grained and free from large knots, dry rot, wormholes and other dangerous defects. Where necessary, they should be protected against splitting.

(e) These boards and planks should be unpainted so that any defects are readily visible.

5.1.2 Specific requirements

(a) Mao Jue should be used if bamboo members are used as standards. The effective diameter of these bamboo members should not be less than 75mm and the wall thickness should not be less than 10mm (see Figure 1 for details).

(b) Mao Jue should be used if bamboo members are used as ledgers on the first lift of the scaffold. The effective diameter of these bamboo members should not be less than 75mm and the wall thickness should not be less than 10mm (see Figure 1 for details).

(c) Kao Jue should be used for the rest of the ledgers, and all the transoms/putlogs, bracings and rakers of the same scaffold. The effective diameter of these bamboo members should not be less than 40mm (see Figure 1 for details).

(d) The effective diameter of a bamboo member refers to the smallest external diameter found along the bamboo member.

(e) Bamboo members used in the construction of scaffolds should be straight, sound and free from cracks, gnarls, irregular knots, dry rot, worm-eaten spots and other defects affecting the strength of the bamboo members.

(f) Bamboo of more than 3 years of growth should be used for scaffolding.

Reference should be made to the Guidelines on the Design and Construction of Bamboo Scaffolds issued by the Buildings Department for the material specification of bamboo members.

5.2 Support for bamboo scaffold

5.2.1 General requirements

(a) The ground or structure on which a scaffold is constructed should be solid, leveled and rammed to give a hard surface, and should be strong enough to keep the scaffold upright.

(b) The stability of the ground or supporting structure should be justified by recognised engineering principles. The soil should be compacted or consolidated and as far as practicable, water be drained off.

5.2.2 Specific requirements

(a) All standards of a scaffold should be adequately supported without risk of undue displacement. Points of contact between the standards and underlying works should comprise base plates connected to the feet of the standards, resting on distribution members if necessary.

(b) If the standards are supported by the ground, the ground should be treated to enhance even setting of the distribution members, and to ensure that the allowable bearing capacity of the ground will not be exceeded. There should be no cavities under the distribution members.

(c) On sloping supports, the standards should be effectively prevented from sliding. An appropriately shaped wedge should be inserted to the void between each standard's base plate and the sloping support to ensure tightness and verticality. To resist lateral loads, the base of the scaffold should further be adequately anchored to the sloping support.

(d) In situation where it is not practicable to provide a solid ground for foundation purposes, metal brackets or other means of suitable design should be used as support for each standard of the scaffold. These supports should be of adequate strength to hold the vertical and lateral loads imposed onto the scaffold and should be securely fixed onto the existing building/structure or the building/structure under construction. Metal brackets for supporting scaffolds should be securely installed onto the structural elements of a building with high quality anchor bolts. Metal brackets are recommended to meet the following requirements:

(i) Metal brackets should be made of Grade S275 Equal Angle or metal brackets of suitable size. All the steel angles should be welded with 5mm fillet welds. The metal brackets are preferably galvanized or painted with 2 layers of red lead primer; and

(ii) The concrete strength of the structural element to which the metal bracket is fixed should be not less than 25N/mm^2.

(e) The anchor bolts for installing metal brackets are recommended to meet the following requirements:

(i) The anchor bolts should have a tensile capacity greater than 7kN. The installation details and procedures of anchor bolts should be in strict accordance with the manufacturer's recommendations.

(ii) Anchor bolts used should be tested to ascertain their quality. The test load should be 1.5 times the working load and should be maintained for at least 3 minutes. The distance between the reaction legs of the pull-out test equipment and the centre of the bolt should be at least 8 times the bolt diameter to prevent assistance of support reactions against the pull-out test force. No sign of separation or failure in concrete and the bolt should be observed during the test. Anchor bolts should be selected from metal brackets at different locations for sample testing, while the sampling rates are recommended as follows: 10% or not less than 5 (whichever is the greater).

5.3 Erection/substantial addition/alteration of bamboo scaffold

5.3.1 General requirements

(a) Bamboo scaffolds shall be erected, substantially added to, or altered by trained workmen under the immediate supervision of a competent person (Regulation 38E of the CSSR). Immediate supervision by competent person should be carried out under safe condition and focused on monitoring the safety condition of the scaffold and the safety of trained workmen. The competent person should not engage in the bamboo scaffolding work at the same time.

(b) Work should be started from the bottom level to the top level and from the interior part to the exterior part. The height of the bamboo scaffold erected at any side should not be higher than the topmost part of the building/structure by one storey.

(c) The standards of the scaffolds should be plumbed.

(d) The width of any working platform of the scaffold shall be not less than 400mm (Third Schedule to the CSSR).

(e) Every working platform shall be closely planked, boarded or plated, or of open metal work without any interstice exceeding 4,000mm^2 (Third Schedule to the CSSR).

(f) Every board or plank forming part of a working platform shall be of sound construction, adequate strength and free from patent defects (Third Schedule to the CSSR). The plank should be straight-grained, sound and free from irregular knots, dry rot, wormholes, cracks and other defects affecting its strength. Also, the board should be sound and free from cracks and other defects affecting its strength.

(g) Every board or plank forming part of a working platform shall be not less than 200mm in width and not less than 25mm in thickness or not less than 150mm in width when the board or plank exceeds 50mm in thickness (Third Schedule to the CSSR).

(h) Every board or plank forming part of a working platform shall not protrude beyond its end support to more than 150mm. Otherwise, it is sufficiently secured to prevent tipping. It shall rest on at least 3 supports unless, taking into account the distance between the supports and the thickness of the board or plank, the conditions are such as to prevent undue or unequal sagging (Third Schedule to the CSSR).

(i) Every side of a working platform shall be provided with suitable guard-rails. The height of a top guard-rail shall be between 900mm and 1,150mm above the platform. The height of an intermediate guard-rail shall be between 450mm and 600mm above the platform. Otherwise, the platform shall be protected by not less than 2 horizontal bamboo members of the scaffold spaced at intervals between 750mm to 900mm (see Figure 2 for details) (Third Schedule to the CSSR).

(j) Toe-boards and end toe-boards shall be suitably fixed to all working platforms and shall have a minimum height of 200mm (Third Schedule to the CSSR). They should be placed inside the standards.

(k) Space between platform and wall of a building or structure should be as small as practicable. Guard-rails and toe-boards should be provided if there is a risk of falling from height.

(l) Working platforms should be cleared of debris like concrete waste regularly.

(m) Working platforms should not be overloaded and the load should be evenly distributed.

(n) No shock loading on the platforms should be allowed.

(o) The scaffold should be effectively braced to ensure stability of the whole structure.

(p) The bracings should extend from the base to the top of the scaffold.

(q) If electrical equipment such as power hand tools or electric installation including lighting is to be used on the scaffold, they should be of proper design and installation to prevent electrical hazard.

(r) Where a scaffold is erected adjacent to a road or pathway, overlay or screen nets must be erected to envelop the scaffold for the protection of person or vehicular traffic against falling objects.

(s) Safe access to and egress from place of work should be provided for the scaffolders and the users of the scaffold. One way of providing a safe access to and egress from a scaffold is to provide a safe gangway between the existing building/structure and the scaffold. Access and egress provided should be used and no climbing along the standards/ ledgers of the scaffold should be allowed. When access to and from scaffold layers is required, the requirements of a safe access and egress are as follows:

(i) Access and egress openings constructed on consecutive scaffold layers must be positioned in an off-set pattern, and an appropriate number of access and egress openings positioned in accordance with working requirements (see Figure 3).

(ii) Access and egress openings must be well covered when not in use. Each covering provided for an opening shall be so constructed as to prevent the fall of persons, materials and articles, and clearly and boldly marked to show its purpose or securely fixed at an appropriate position (see Figure 3).

(iii) Where additional bamboo members are erected as foot-hold members for scaffolder or the users of the scaffold to climb from one layer to another ('rungs'), the spacing between two adjacent rungs should comply with overseas or international standards or regulations, such as British Standard BS EN 131-1:2015+A1:2019, such spacing should be not less than 250mm and not more than 300mm (see Figure 3).

(iv) If the scaffold's width is too narrow, such that access and egress openings cannot be positioned in an off-set pattern, other practicable methods should be considered to provide sufficient and appropriate safe access and egress (see Figure 3).

(t) When a scaffolder or workman has to work in a place where it is impracticable to erect a safe working platform or to provide safe access and egress, the use of safety nets and safety belt attached to a secure anchorage point or an independent lifeline throughout the work is required. Bamboo members should not be used for anchorage purpose. Further reference should be made to the Guidance Notes on Classification and Use of Safety Belts and their Anchorage Systems issued by the Labour Department.

(u) Unauthorised alteration of bamboo scaffold (including putlog) by scaffolders or workers of other trades is prohibited.

5.3.2 Specific requirements

(a) Proper working platforms shall be provided for construction works involving working at height so as to ensure that the works can be carried out safely. The simplest and practical means to provide a proper working platform is the provision of proper wooden planks/ boards on a double-row bamboo scaffold with transoms between the rows.

(b) For a scaffold less than 15m in height (including all or part of the standards of the scaffold supported by the metal brackets fixed on the structural elements of a building), if more than 2 consecutive layers of working platforms are used at the same time at any bay (space between two adjacent standards along the face of a scaffold) for light duty purpose or more than 1 working platform for heavy duty purpose, the stability of the scaffold should be verified by a professional engineer.

(c) The distance between two adjacent standards on the same scaffold plane should not be greater than 1.3m, while for between two adjacent transoms, the distance should not be greater than 0.75m. Furthermore, the distance between two ledgers (i.e. distance between the upper one or lower one) should not be greater than 1.2m and the height of the boarded lift for forming working platform should be between 1.9m to 2.1m (see Figure 1 for details).

(d) The working platform of the double-row bamboo scaffold shall be at least 400mm wide. Where it is impracticable by reason of limitation of space to provide a working platform of such width, the working platform shall be as wide as is reasonably practicable (see Figure 2 for details) (Third Schedule to the CSSR).

(e) For every scaffold erected, there should be bracings provided all over it (i.e. in the case of a double-row bamboo scaffold, bracings should be provided for both the inner and outer scaffold planes). Each bracing section should consist of two bamboo members that are tied in a 'X' shape over the section of scaffold to be braced. The horizontal span of each 'X' shape bracing section should not be greater than 9m. Besides, the two bamboo members forming each 'X' shape bracing section should not be erected at more than 60° from the horizontal level, and preferably be at 45° from horizontal level (see Figure 4 for details). Each bracing must be tied to the standards and ledgers of the scaffold.

(f) An effective lateral restraint takes the form of putlog which consists of a metal tie and a bamboo strut. It secures the scaffold to the face of building/structure (see Figure 4 and Figure 5). To safeguard structural stability of bamboo scaffolds, including under extreme weather conditions, putlogs should be provided at a horizontal spacing not greater than 3.0m. At a height less than 100m above ground, the vertical spacing of putlogs should not be greater than 6.3m while at a height of 100m or more, the vertical spacing should

not be greater than 4.2m. Besides, putlogs should comply with the following requirements:

(i) Ledger/standard and anchor bolt can be connected by a metal tie. Anchor bolts should be installed on the sound structural elements of the external wall of a building (see Figure 5 for details of metal tie arrangement). The requirements of the metal ties and anchor bolts are as follows:

(1) The metal tie should be made of a mild steel bar of at least 6mm diameter with a yield strength of 250N/mm^2 and a minimum elongation of 15% or a bundle of mild steel wires or other materials (metal brackets) with equivalent tension capacity and mechanical properties should be used.

(2) The anchor bolts used should be with a tensile capacity of greater than 7kN. The installation details and procedures of anchor bolts should be in strict accordance with the manufacturer's recommendations.

(3) The anchor bolts installed should be tested to ascertain their quality. The test load should be 1.5 times the working load and should be maintained for at least 3 minutes. The distance between the reaction legs of the pull-out test equipment and the centre of the bolt should be at least 8 times the bolt diameter to prevent assistance of support reactions against the pull-out test force. No sign of separation or failure in concrete and the bolt should be observed during the test. Anchor bolts of putlogs should be selected at different locations of the scaffold for sample testing, while the sampling rates are recommended as follows: 5% or not less than 5 (whichever is the greater).

(ii) At every position of ties, a short length of bamboo of effective diameter not less than 40mm (acts as a strut) should be connected between the inner scaffold and the building face to restrict the inward movement of the scaffold (see Figure 5 for details of putlog arrangement).

(g) When a bamboo scaffold having a height 7m or below, bamboo rakers should be provided and connected from the ground to the third lift or fourth lift of the scaffold. The angle of the rakers from ground should approximately be equal to 60°. Each raker should be tied to both the standard and the transom of the scaffold (see

Figure 6 for details). For every 7m apart horizontally or less on the scaffold, there should be one such raker provided. In exceptional case when the scaffold is less than 7m in width, two such rakers should be provided near the two ends along the width of the scaffold. To prevent any movement of the rakers, they should be inserted into the ground for not less than 500mm or be securely fixed in position by suitable means.

(h) The two ends of the transoms on the double-row scaffold should protrude beyond the ledgers for not less than 300mm. All the inner edge of the working platform of the scaffold should be as close to the facade of the building/structure as is practicable.

(i) All the fastenings between bamboo members should be tight and secure. Fastening of bamboo members between standards and ledgers, or ledgers and transoms, or for bracings/rakers, etc. should be tied by either nylon or bamboo strips of adequate strength. For standard, ledger and transom to be tied together, any two of them should be tied up first and then the remaining one should be tied up on top of them.

(j) Nylon strips of adequate strength should be used for fastening and connecting standards, ledgers, transoms, bracings/rakers and ties together to form scaffold. For example, nylon strips of width 5.5mm to 6mm and length 2m should be used, and their tensile strength should be greater than 50kg with rate of elongation less than 20%. Besides, the strips should be anti-aging. All knots should be tightened with at least 5 rounds of nylon strips. The ends of the nylon strips should be crossed and twisted to form a single twisted end which passes through the knot twice to give one round turn for proper anchorage to ensure properly knotting.

(k) Alternatively, bamboo strips may be used for tying purposes. Normally, the bamboo strips should be 0.5mm to 1mm in thickness and 5mm to 7mm in width. They should be stored in places that can shelter from rain, and should also be free from corrosive substances such as cement or soda powder, etc. Also, they should be soaked with water completely for a full day's time before use.

(l) For connection between two bamboo members, the following length of overlap should be observed:

(i) 1.5m to 2m for standards; and

(ii) at least 2m for ledgers and bracings/rakers (see Figure 7 for details).

Besides, the distance between two fastenings on the overlapping portion of the bamboo members should not be greater than 300mm, and the 'tail' of one bamboo member should be connected to the 'head' of the other.

(m) All the ledgers, bracings, rakers, ties and transoms should not be used for hanging equipment, tools and materials.

(n) For a scaffold greater than 15m in height, it should be designed and approved by a professional engineer.

(o) Unless otherwise specified, 5.3.2(f)(i)(3) and 5.3.2(g) shall not apply to truss-out bamboo scaffold.

5.3.3 Truss-out bamboo scaffold (single lift type)

(a) These scaffolds are generally used in circumstances when it is not possible, not advisable and not cost-effective to erect a scaffold from the ground level. Examples are, the repairing of the water tower of air-conditioning unit installed outside the facade of a tall building; the water-proofing work of upper windows; or the minor maintenance, repair, renovation and decoration work on the facade of a similar tall building. These works are often very short in duration and with light loading on it. The usual form of the scaffold is a single lift truss-out bamboo scaffold with the overall height not exceeding 6m and that it is supported by a scaffold structure such as a truss-out structure projecting from the facade of a building/structure and the whole scaffold is totally dependent upon the existing building/structure for support.

(b) The work that a trained workman may perform:

(i) erection, substantial addition, alteration and dismantling of entire truss-out bamboo scaffold should the workman holds a valid certificate of "Advanced Level Truss-out Scaffolder Safety Training";

(ii) erection, substantial addition, alteration and dismantling of truss-out bamboo scaffold should the workman holds a valid certificate of "Intermediate Level Truss-out Scaffolder Safety Training", but not including those work for metal brackets at the base of scaffold and the ledgers and transoms above the metal brackets, unless the trained workman:

(1) holds a valid certificate of "Certificate in Safety Enhancement to Erection & Dismantling of "Truss-out Bamboo Scaffolds"" issued by the CIC;

(2) possesses at least 1 year of experience in erection, substantial addition, alteration and dismantling of truss-out bamboo scaffold after obtaining a certificate of "Intermediate Level Truss-out Scaffolder Safety Training"; and

(3) is under the on-site supervision of a trained workman who holds a certificate of "Advanced Level Truss-out Scaffolder Safety Training".

(c) General requirements

(i) The building that the truss-out scaffold is to be erected should be examined to ensure that it can stand the support of the scaffold. Strictest control should be exercised on the loads applied to the truss-out scaffold. Hence, the scaffold should be designed by a professional engineer to cater for the vertical self-weight of the scaffold, its imposed load and the loads resulting from wind forces.

(ii) Whenever there is an internal restraining scaffold for the truss-out scaffold, it should be designed by a professional engineer to cater for the resulting horizontal forces and be securely locked into the building to prevent inward and outward movement.

(iii) As truss-out bamboo scaffold is a light duty scaffold, Kao Jue will generally suffice. The requirements for the scaffolding materials such as the bamboo for standards, ledgers, rakers and transoms, etc. are the same as those mentioned in 5.1.

(iv) The ledgers at bottom must be supported by metal brackets fixed on the structural elements of a building.

(v) Apart from the above requirements, other general requirements to be followed are the same as those mentioned in 5.3.1(a) to (c) and (o) to (u).

(vi) Reference should be made to the Guide on Construction and Work Safety of Truss-out Bamboo Scaffolds issued by the Labour Department for the other requirements on truss-out bamboo scaffolds (including special truss-out bamboo scaffolds).

(d) Specific requirements

(i) The truss-out scaffold should be supported on structural elements on the outside wall and is prohibited to rest on decorative structure of the building. The metal brackets are essential to the overall stability of a bamboo scaffold that they are supporting. All steel brackets should be securely installed to the structural elements of a building with high quality anchor bolts and are recommended to meet the following requirements:

(1) Metal brackets for truss-out bamboo scaffolds should be made of Grade S275 Equal Angle or Circular Hollow Section, or steel brackets of suitable size. The steel angles or circular hollow sections should be welded with 5mm fillet welds, and are preferably galvanized or painted with 2 layers of red lead primer.

(2) Each metal bracket for supporting truss-out bamboo scaffolds must be installed with at least 3 anchor bolts. The anchor bolts should have a tensile capacity greater than 7kN. The installation details and procedures of anchor bolts should be in strict accordance with the manufacturer's recommendations.

(3) The horizontal spacing between the metal brackets should not be greater than 1.3m; and

(4) The concrete strength of the structural element to which the metal bracket is fixed should be not less than 25N/mm^2.

(ii) Rakers should be erected to form the truss-out bamboo scaffolds and the angle between the raker and the facade of the building/structure should not be greater than 30° (as shown in Figure 8).

(iii) Spacing between the two ledgers should not be greater than 1.2m.

(iv) The requirements for the formation of working platform with guard-rails of the truss-out bamboo scaffolds are the same as those mentioned in , 5.3.1(d) to (n) and 5.3.2(a), (b) and (d).

(v) To safeguard structural stability of bamboo scaffolds, including its status under adverse weather conditions, putlogs should be provided at spacings not greater than 3m both horizontally and vertically. Other requirements to be followed are the same as those mentioned in 5.3.2(f)(i)(1), (2) and 5.3.2(f)(ii).

(vi) For those load-bearing tying points of the scaffold, they should be tied up with steel wires of adequate strength.

(vii) There should be a tight control on the loading of the scaffold during the execution of work on it. All the materials and tools should be placed at the inner side of the working platform on the scaffold (i.e. the side adjacent to the facade of the building/ structure) to maintain the stability of the scaffold.

(viii) For dismantling of the scaffold, the scaffolder should start the work from non load-bearing parts to load-bearing parts.

(ix) Apart from the above requirements, other specific requirements to be followed are the same as those mentioned in 5.3.2(c), (h) to (k) and (m).

6. Inspection, maintenance and dismantling of bamboo scaffolding

6.1 Inspection and maintenance of bamboo scaffolds

6.1.1 The scaffold shall not be used on a construction site unless the scaffold has been inspected by a competent person before being taken into use for the first time and at regular intervals not exceeding 14 days immediately preceding each use (Regulation 38F of the CSSR).

6.1.2 Contractors shall take the necessary precautions so far as is reasonably practicable to ensure the structural strength and stability of scaffolds preceding the adverse weather conditions such as typhoons or strong monsoons. The precautions include but not limited to the following requirements:

(a) The competent person should carry out thorough inspection prior to such weather conditions and any other weather conditions that could have an adverse effect on the scaffolding work such as strong wind or typhoon and make improvement or enhancement over the bamboo scaffolds as required.

(b) Prior to the occurrence of typhoon or strong winds, the competent person should also ensure the protective screen of bamboo scaffolds were lowered and tied up or removed, and remove the materials kept on the bamboo scaffolds.

6.1.3 The scaffold shall also be inspected by a competent person since exposure to weather conditions likely to have affected its strength or stability or to have displaced any part (Regulation 38F of the CSSR). Such weather conditions would be heavy rain, storm, etc. affecting its strength and stability.

6.1.4 The competent person should check the strength and stability of the scaffold and ascertain that there are no defects and deterioration and determine whether the scaffold is safe, secure and safe for workers to stay on or it needs to be repaired, in order to prevent the overturning or collapsing of part of or the whole scaffold and endanger other workers working in the vicinity. Inspection may be done more frequently depending on the usage and conditions of the scaffold, activities that contractors (including sub-contractors) carried out on the scaffold, etc.

6.1.5 Defects found during the inspection should be rectified immediately. The scaffold shall not be used unless a report has been made in Form 5, which specifies the location and extent of the scaffold on the site and includes a statement to the effect that the scaffold is in safe working order, by the competent person carrying out the inspection referred to in 6.1.1 to 6.1.3 above (Regulation 38F of the CSSR).

6.2 Dismantling of bamboo scaffolds

6.2.1 The dismantling work shall be done by trained workmen under the immediate supervision of a competent person (Regulation 38E of the CSSR). Immediate supervision should be carried out by the competent person under safe condition and focus on monitoring the safe condition of the scaffold and the safety of trained workmen. The competent person should not engage in the bamboo scaffolding dismantling work at the same time.

6.2.2 Sufficient time should be allowed for the dismantling work to be conducted safely.

6.2.3 The scaffold to be dismantled should be checked for its strength and stability beforehand.

6.2.4 No components, which endanger the stability of the remaining structure, should be removed. Unless necessary precautions have been taken, all the ties and bracings should be remain secured in positions.

6.2.5 If dismantling has reached the stage at which a critical member has to be removed, for example, a tie or a brace, the stability of the structure should be assured by fixing a similar or otherwise adequate member in place lower down before the member to be taken out is removed.

6.2.6 All the stacked materials and debris placed on the scaffold should be removed.

6.2.7 Dismantling sequence should be planned and that sequence of dismantling sections of the scaffold should be logical and determined with due consideration of the scaffolders' safety. Dismantling work should be carried out according to the plan. Because changes may have been made in a scaffold structure during its working life, it is not safe to assume that dismantling can be carried out in the reverse order to the erection. The scaffold, especially its tying and bracing, should be inspected prior to dismantling. Also, the procedure of dismantling should be orderly and planned and should proceed generally from the top in horizontal sections.

6.2.8 If the scaffold is defective, it should be made good before dismantling commences.

6.2.9 Scaffolds should not be dismantled in vertical sections from one end towards the other unless special consideration is given to ties and bracings.

6.2.10 A scaffold might have been temporarily stabilized during construction by rakers that have been subsequently removed. If the level of the lowest tie point is high, temporary rakers or other structurally adequate means of supports should be built up from the ground to achieve stability of the partly dismantled scaffold.

6.2.11 Safe access to and egress from the place of work should be provided for the scaffolders.

6.2.12 The scaffold to be dismantled should be fenced off at the ground level/ public area to prevent persons entering the work area and warning notices should be posted up in the vicinity.

6.2.13 Steps shall be taken to ensure that scaffolding materials are not thrown, tipped, or shot down from a height where they are liable to cause injury to any person on or near the construction site; and where practicable, properly lowered in a safe manner by means of a lifting appliance or lifting gear (Regulation 49 of the CSSR). Scaffolding materials should include the bamboo members, the scaffold boards or planks, etc.

6.2.14 All materials should be lowered to the ground or delivered indoor and not stored on the scaffold. In the case where the pavement is not to be obstructed and scaffolding materials have to be stored on the lowest lift awaiting collection, this lift should be stiffened and fully braced or propped by rakers, by using the materials recovered from the upper lifts.

6.2.15 Every scaffolder involved in the dismantling work at height should wear safety belt attaching to suitable and sufficient anchorage and suitable fixings, for example, the provision of an independent lifeline that extends from an independent anchorage point to which a lanyard of a safety belt is attached using a fall arresting device. Scaffold members, pipes or window frames should not be used for anchorage purpose. Whenever practicable, safety nets for fall protection of scaffolders should be used. Further reference should be made to the Guidance Notes on Classification and Use of Safety Belts and their Anchorage Systems issued by the Labour Department.

6.2.16 All the trades on the site should coordinate and collaborate closely with the contractor engaging in scaffold dismantling work regarding the safety precautions necessary during various stages of the work.

僱主或承建商姓名或名稱
Name or Title of Employer or Contractor .....
.....
.....
建築地盤地址
Address of Site .....
.....
.....
開始施工日期
Work Commenced Date
.....

表 格 五
FORM 5

[規例第 38F(1)條]
[reg. 38F(1)]

建築地盤(安全)規例
棚 架
每十四日一次或在其他場合執行的檢查結果報告

本表格乃由勞工處處長爲施行建築地盤(安全)規例第 38F(1)條而認可

Construction Sites (Safety) Regulations

SCAFFOLDS
REPORTS OF RESULTS OF FORTNIGHTLY OR OTHER INSPECTIONS

Form approved by the Commissioner for Labour for the purposes of regulation 38F(1) of the Construction Sites (Safety) Regulations

有關棚架的說明或所在地點 Description or location (1)	檢查日期 Date of inspection (2)	檢查結果 註明該座棚架是否處於安全操作狀態 Result of inspection State whether the scaffold is in safe working order (3)	檢查者簽署及職階 Signature and designation of person who made the inspection (4)

任何合資格檢驗員或合資格的人，如向承建商交付他明知有任何要項屬虛假的證明書或報告，即屬犯罪；一經定罪，可處罰款二十萬元及監禁十二個月。
Any competent examiner or competent person who delivers to a contractor a certificate or makes a report which is to his knowledge false as to a material particular shall be guilty of an offence and shall be liable on conviction to a fine of $200,000 and to imprisonment for 12 months.

CSSR-F5

Appendix II

Third Schedule to the Construction Sites (Safety) Regulations - Requirements with which certain safety equipment must comply

1. Width of working platforms, gangways and runs

(1) Subject to subsections (2) and (3), the width of any working platform, gangway or run shall be not less than 400 millimetres.

(2) Subject to subsection (3), the width of any gangway or run used for the movement of materials shall be not less than 650 millimetres.

(3) Where it is impracticable by reason of limitations of space to provide a working platform, gangway or run of the width required by subsection (1) or (2), then, in lieu of complying with that subsection, the working platform, gangway or run shall be as wide as is reasonably practicable.

2. Working platforms, etc. to be closely boarded, etc.

(1) Subject to subsection (2), every working platform, gangway and run shall be closely boarded or planked.

(2) Subsection (1) shall not apply to a working platform, gangway or run

(a) consisting of open metal work having interstices none of which exceeds 4,000 square millimetres in area; or

(b) the boards or planks of which are so secured as to prevent their moving and so placed that the space between adjacent boards or planks does not exceed 25 millimetres,

if there is no risk of persons below the platform, gangway or run being struck by materials or articles falling through the platform, gangway or run.

3. Boards and planks in working platforms, gangways and runs

Every board or plank forming part of a working platform, gangway or run shall

(a) be of sound construction, adequate strength and free from patent defect;

(b) be of a thickness capable of affording adequate security having regard to the distance between the supports and be not less than 200 millimetres in width and not less than 25 millimetres in thickness or not less than 150 millimetres in width when the board or plank exceeds 50 millimetres in thickness;

(c) not protrude beyond its end support to a distance exceeding 150 millimetres unless it is sufficiently secured to prevent tipping;

(d) rest securely and evenly on its supports; and

(e) rest on at least 3 supports unless, taking into account the distance between the supports and the thickness of the board or plank the conditions are such as to prevent undue or unequal sagging.

4. Coverings for opening

Every covering provided for an opening shall be

(a) so constructed as to prevent the fall of persons, materials and articles; and

(b) clearly and boldly marked as to show its purpose or be securely fixed in position.

5. Height of toe-boards, etc.

The height of a toe-board or other similar barrier shall be not less than 200 millimetres.

6. Height of guard-rails

Subject to section 7, the height of a guard-rail above any place of work on a working platform, gangway, run or stairway shall be

(a) in the case of a top guard-rail, not less than 900 millimetres and not more than 1,150 millimetres;

(b) in the case of an intermediate guard-rail, not less than 450 millimetres and not more than 600 millimetres.

7. Exception to section 6

Section 6 shall not apply to a working platform on a bamboo scaffold if the platform is protected by not less than 2 horizontal bamboo members of the scaffold spaced at intervals between 750 millimetres to 900 millimetres.

8. Temporary removal, etc. of guard-rails, etc.

(1) Guard-rails, toe-boards and barriers may be removed or remain unerected for the time and to the extent necessary for the access of persons or the movement of materials or other purposes of the work concerned, but shall be replaced or erected as soon as practicable after the expiration of that time.

(2) Toe-boards shall not be required for stairs.

Appendix III

Reference

1. Code of Practice on Safety Management (Labour Department, Hong Kong)
2. Guide on Construction and Work Safety of Truss-out Bamboo Scaffolds (Labour Department, Hong Kong)
3. Guidance Notes on Classification and Use of Safety Belts and their Anchorage Systems (Labour Department, Hong Kong)
4. Guidelines on the Design and Construction of Bamboo Scaffolds (Buildings Department, Hong Kong)
5. Code of Practice on Wind Effects in Hong Kong 2019 (Buildings Department, Hong Kong)
6. Guidelines on Planking Arrangement for Providing Working Platforms on Bamboo Scaffolds 2014 and 2017 (Construction Industry Council)
7. Guidelines on Safety Enhancement of and Notification Arrangement for Truss-out Bamboo Scaffolds (Construction Industry Council)
8. Safety Techniques for Construction & Installation Workers: Pictorial Manual on the Operations (Publisher for Construction Industry, People's Republic of China, 1988)
9. Handbook on Construction Methods (Publisher for Construction Industry, People's Republic of China, 1999)
10. Construction Scaffolding Operations (Guangzhou Publicity & Education Centre for Labour Protection, 1989)
11. Safety Techniques for Construction Scaffolding Operations (Shanghai Municipality Publicity and Education Centre for Labour Protection, 1989)
12. BS 5867-2:2008 Fabrics for curtains, drapes and window blinds. Flammability requirements. Specification
13. Janssen, J.A. 1987, Building with Bamboo, Eindhoven, Netherlands
14. Janssen, J.A. 1991, Mechanical Properties of Bamboo, Kluwer Academic Publisher

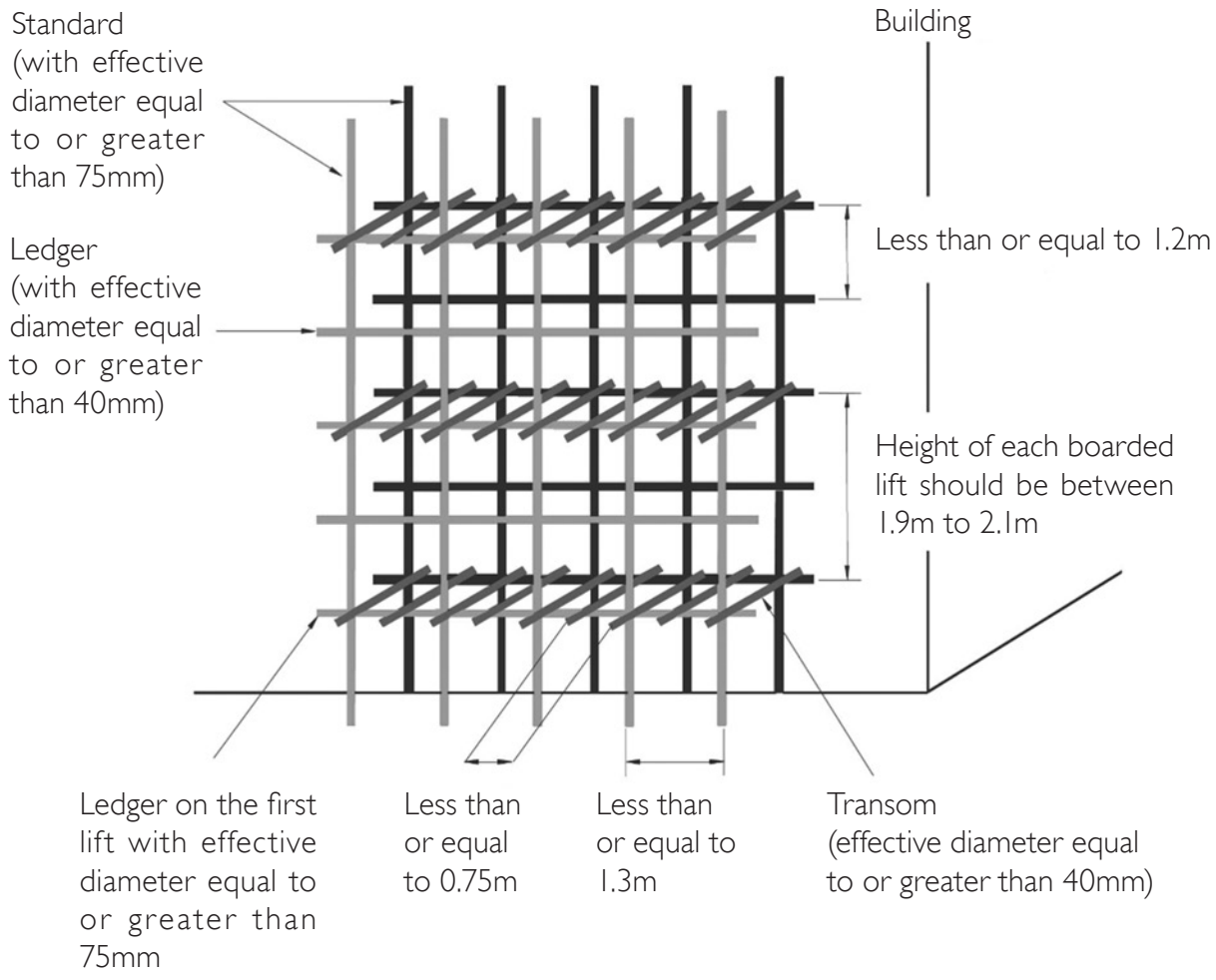
15. BS EN 795:2012 Personal fall protection equipment. Anchor devices

16. BS EN 131-1:2015+A1:2019 Ladders Terms, types, functional sizes

17. GB 5725-2009 — Safety nets

18. NFPA 701:2019 (Test Method 2) - Standard methods of fire tests for flame propagation of textiles and films

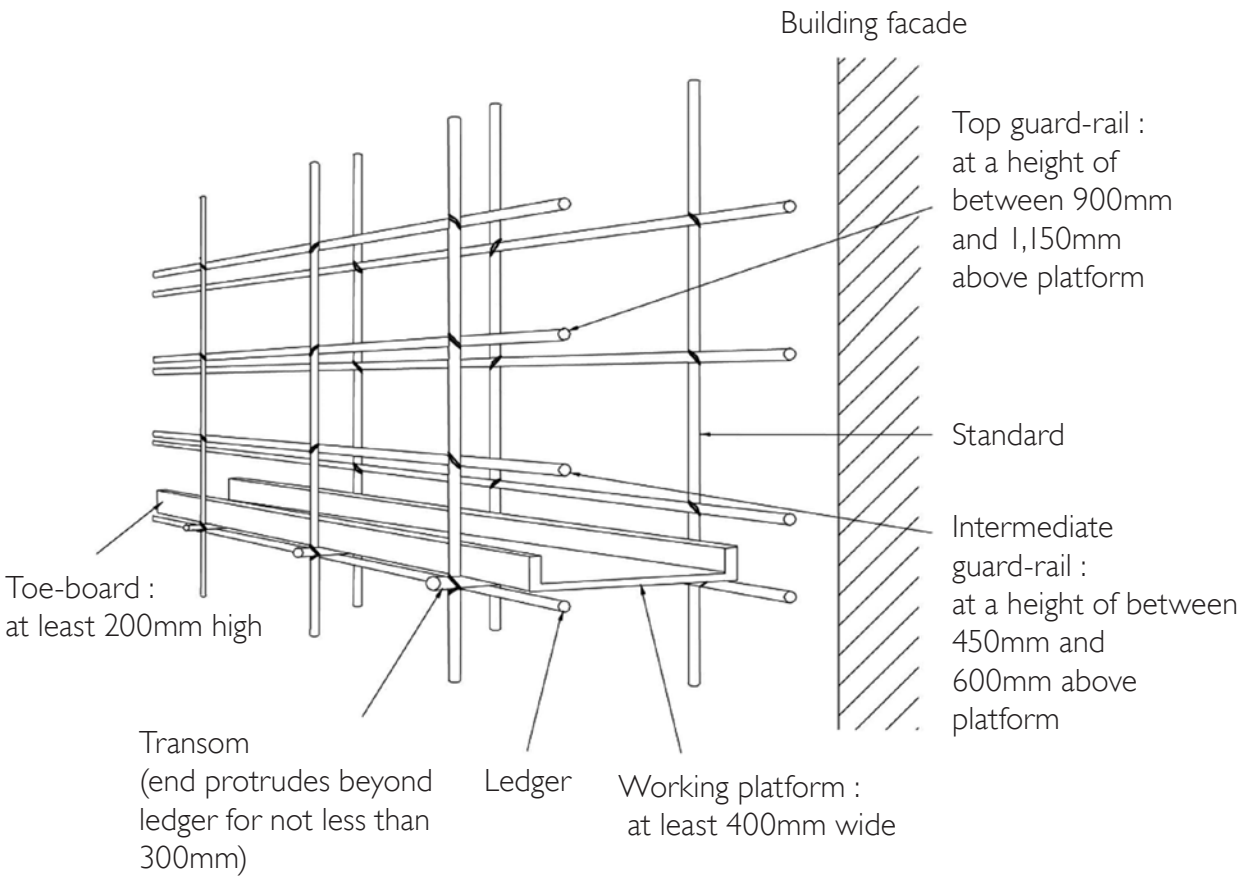
Figure 1: Showing a double-row bamboo scaffold with recommended erection standards (not to scale)



Note:

For all standards and the ledgers on the first lift of the scaffold, the wall thickness of these bamboo members should not be less than 10mm.

Figure 2: Showing the proper working platform of a double-row bamboo scaffold (not to scale)



Note:

(i) Each scaffold board should be not less than 200mm in width and not less than 25mm in thickness or not less than 150mm in width when board exceeds 50mm in thickness.

(ii) Height of guard-rails shall not apply to a working platform on a bamboo scaffold if the platform is protected by not less than 2 horizontal bamboo members of the scaffold spaced at intervals between 750mm to 900mm.

Figure 3: Access and Egress Openings from the Structure to Closely Spaced Bamboo Scaffold, Erection of Additional Members as Foot-holds and Scaffolding Access and Egress Openings in Off-set Pattern (Not to scale)

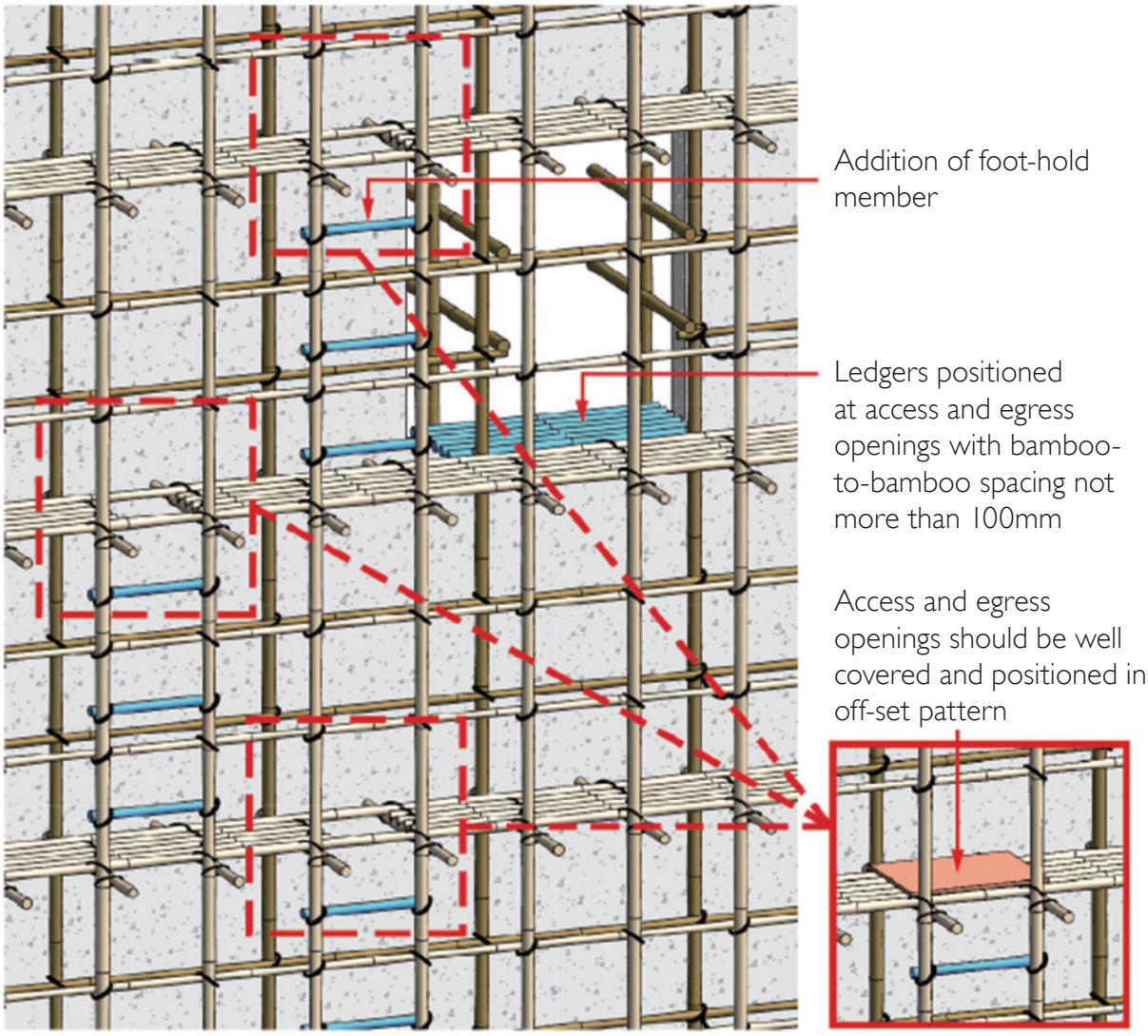
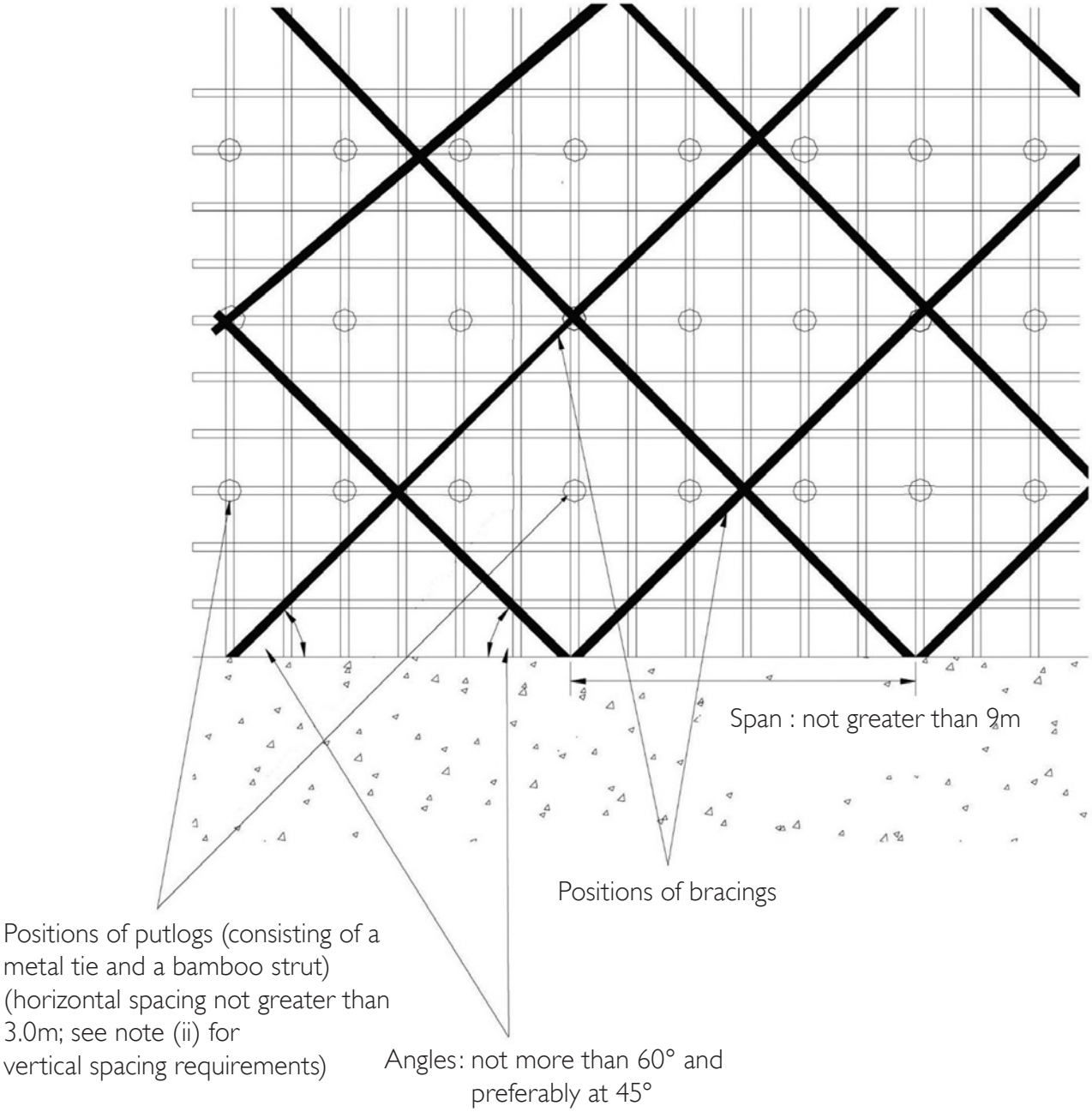


Figure 4: Showing the positions of putlogs and bracings for bamboo scaffold (front elevation - not to scale)



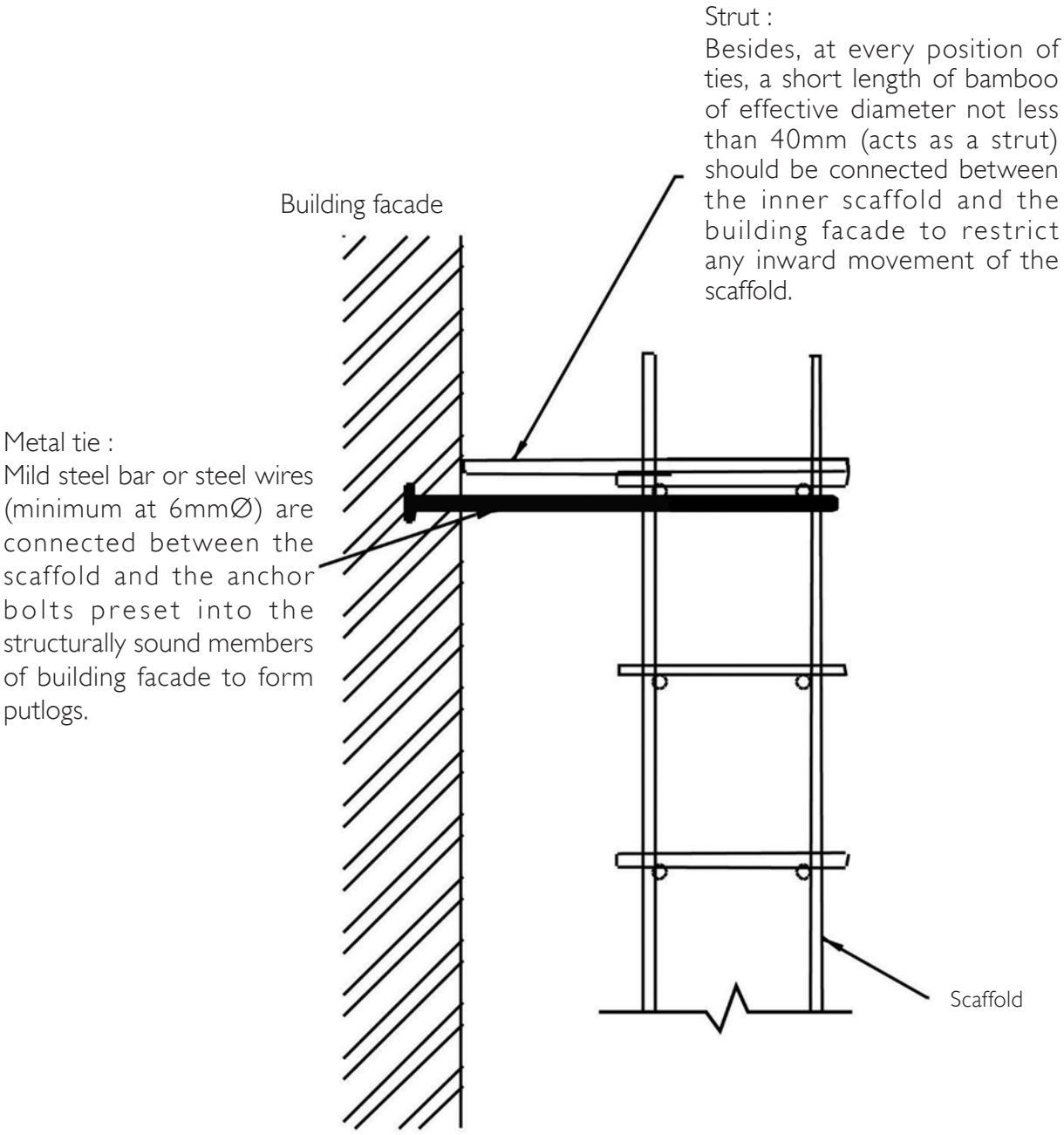
Note:

(i) Positions of transoms are not shown.

(ii) At a height less than 100m above ground, the vertical spacing of putlogs should not be greater than 6.3m while at a height of 100m or more, the vertical spacing should not be greater than 4.2m.

(iii) Each bracing must be tied to the standards and ledgers of the scaffold.

Figure 5: Showing the details of putlogs (metal ties/struts) arrangement of a double-row bamboo scaffold (side elevation - not to scale)



Note:

(i) For building under construction, structural anchors for the putlogs can be preset into the structurally sound members of building facade.

(ii) For existing building, structural anchors can be provided by expansion type anchor bolts set into the structurally sound members of building facade.

Figure 6: Showing the position of rakers for bamboo scaffold of height 7m or below (side elevation - not to scale)

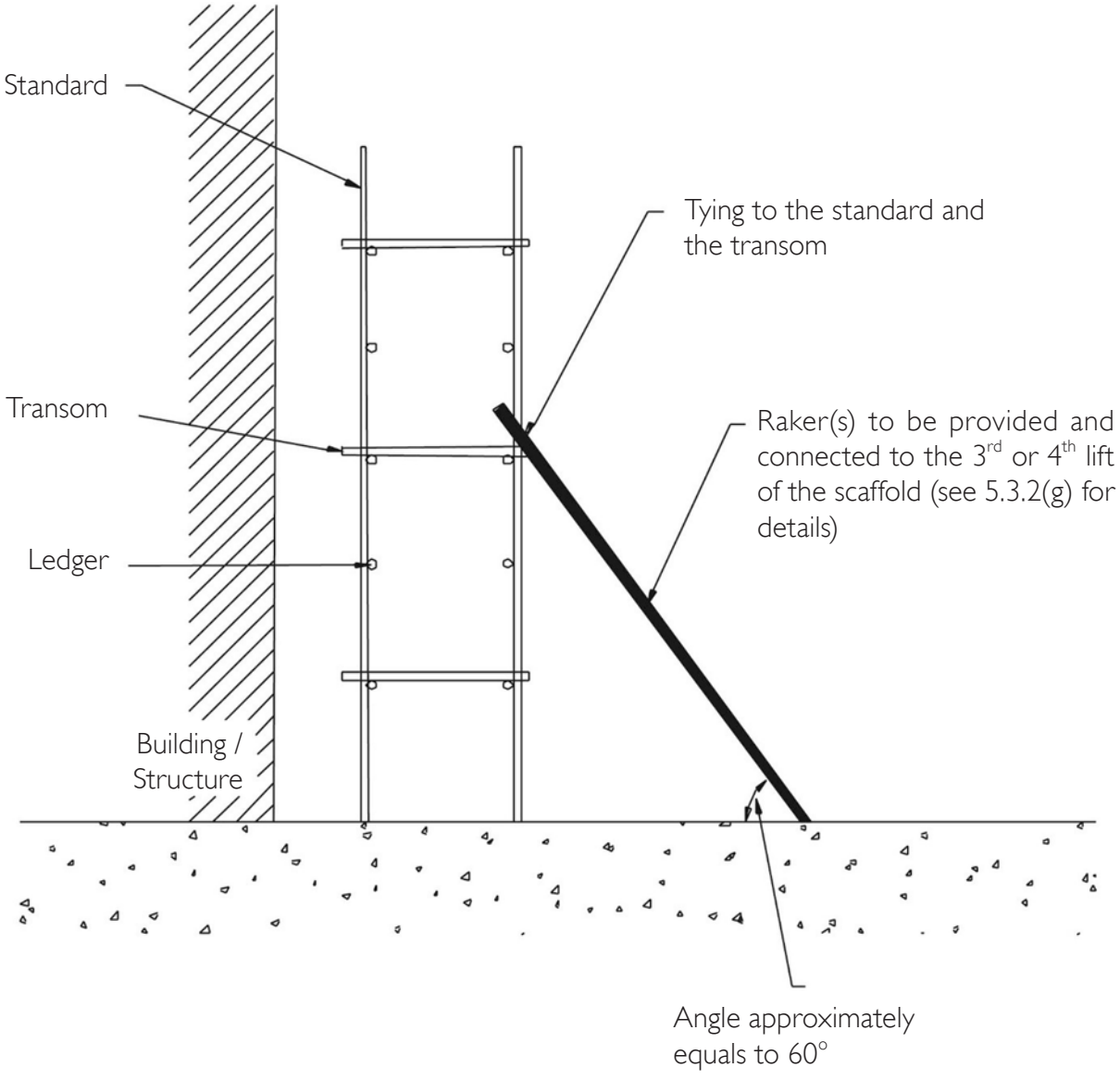


Figure 7: Showing the proper connection of bamboo members for bracings/rakers, ledgers, standards used in the erection of bamboo scaffold (not to scale)

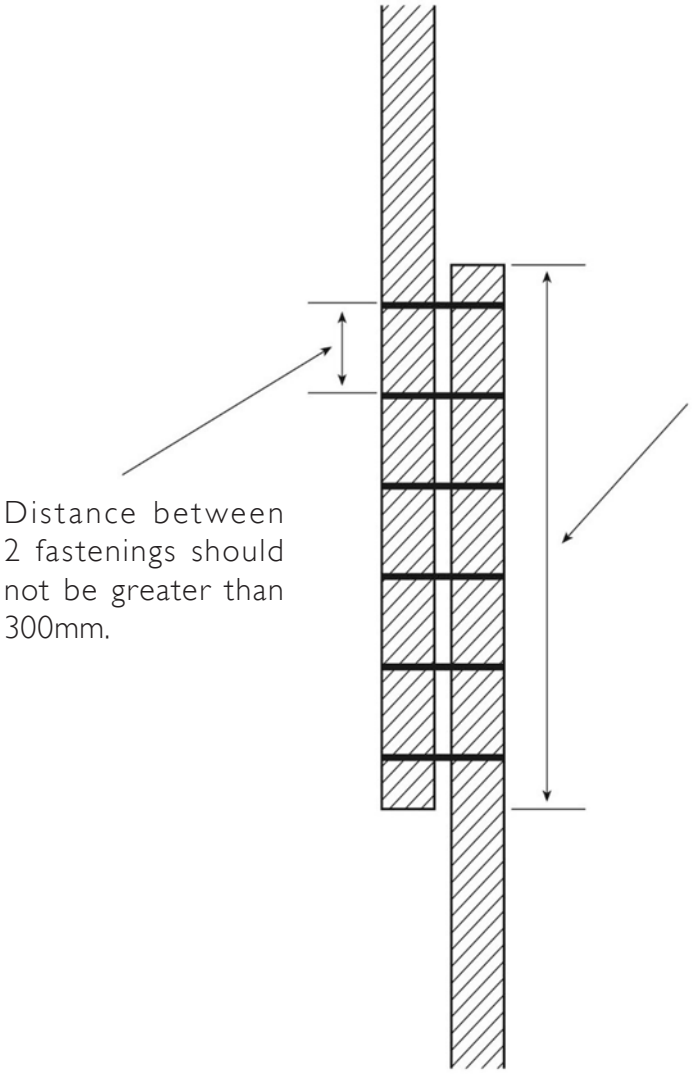
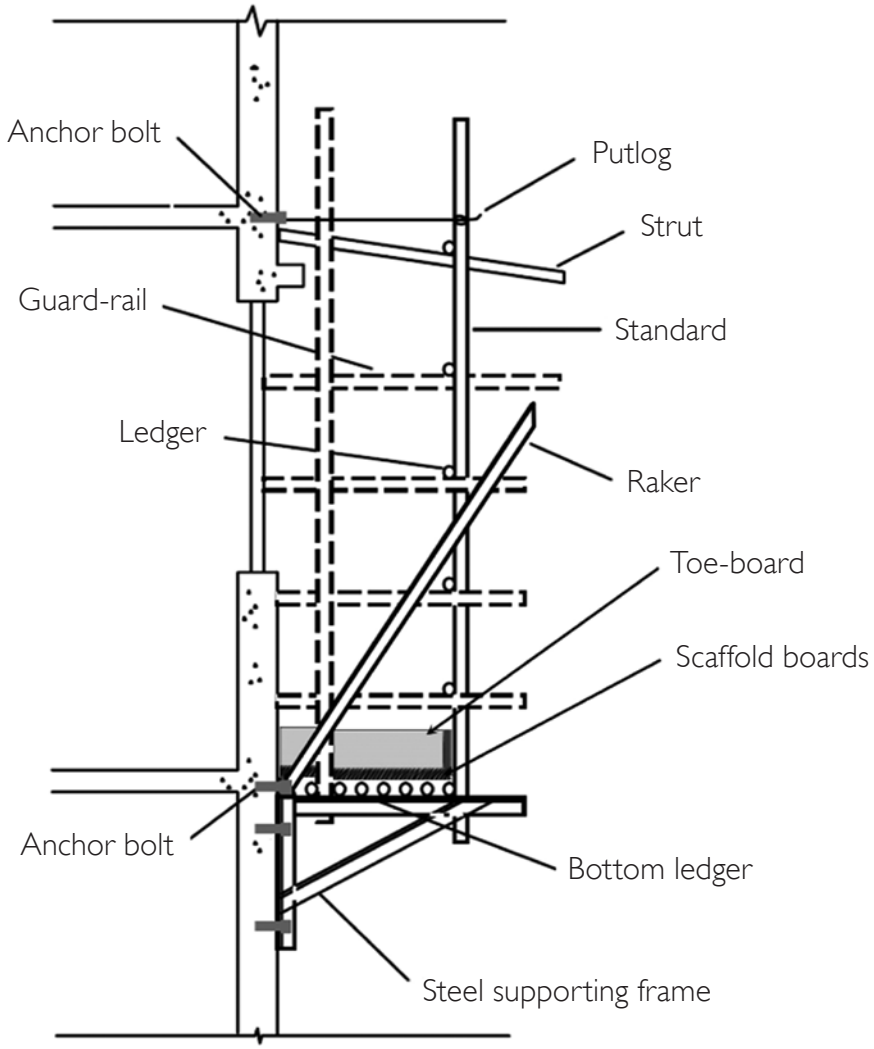


Figure 8: Truss-out bamboo scaffold (side elevation - not to scale)



Note:

(i) For the top guard-rail: at a height between 900mm and 1,150mm above platform.

(ii) For the intermediate guard-rail: at a height between 450mm and 600mm above platform.

Enquiry and complaints

Enquiry

If you wish to enquire about this Code of Practice or require advice on occupational safety and health (OSH) matters, please contact the Occupational Safety and Health Branch of the Labour Department through:

Telephone : 2559 2297 (auto-recording service available outside office hours)

Fax : 2915 1410

E-mail : enquiry@labour.gov.hk

Information on the services offered by the Labour Department and on major labour legislation is also available on our website at https://www.labour.gov.hk. The latest OSH information can be obtained through the Labour Department's "OSH 2.0" Mobile Application. For details on the services offered by the Occupational Safety and Health Council, please call 2739 9000.

Labour Department Website

"OSH 2.0" Mobile Application

Complaints

If you have any complaints about unsafe operations and environments at workplaces, please call the Labour Department's OSH complaint hotline at 2542 2172 or fill out and submit an online OSH complaint form on our website. All complaints will be treated in the strictest confidence.

Online OSH Complaint Form

Occupational Safety and Health Branch
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