



Systemic Safety Alert **Truss-out Bamboo Scaffold Safety**

Major systemic safety problems

Truss-out bamboo scaffolds (TOSs) are widely used in building repair and maintenance works. Many fatal/ serious fall-of-person accidents, however, occurred in the course of the erection, substantial addition, alteration, dismantling and use of TOSs due to the attribution of one or a combination of the following major systemic safety problems:

- failure to conduct task-specific risk assessments and to formulate appropriate method statements for the “erection/ substantial addition/ alteration/ dismantling/ use of TOSs”;
- lack of design drawings, specifications of supporting brackets/ anchor bolts/construction materials, and method statements for the “erection/ substantial addition/ alteration/ dismantling/ use of TOSs”;
- lack of control and monitoring to ensure conformity with the TOSs design drawings/ specifications and method statements;
- failure to provide suitable fall arresting systems/ personal protective equipment and ensure the proper use of such;
- absence of suitable and safe working platforms/ means of supports on TOSs; and
- failure to provide adequate safety information, instruction, training and supervision.

Accident prevention measures¹

Registered Safety Officers (RSOs) should advise their employers/ clients to:

- (i) appoint a competent person to conduct task-specific risk assessments to identify any foreseeable hazards associated with the work;
- (ii) draw up the specifications of TOSs, and formulate method statements with proper sequence of work as well as appropriate safety precautions to be taken in detail to eliminate or mitigate the hazards identified. Factors to be considered include but not limited to the following:

¹ For details of fall prevention measures, please refer to the “Overview of Work-at-Height Safety” issued by the Labour Department.



- TOSs should be designed by a professional engineer to cope with their self-weights, loads to be imposed and extra loads resulting from wind forces;
- structural characteristics of external walls should be duly considered prior to the erection of TOSs so as to ensure that they can support the loads;
- safe means of access to and egress from the workplace for erection/ substantial addition/ alteration/ dismantling/ use of TOSs shall be provided and properly maintained;
- TOSs should be adequately supported on construction materials such as structural walls, and prohibited from resting on decorative structures of a building;
- each metal bracket must be fitted by three or more anchor bolts with particular attention to the following aspects:
 - metal brackets should be made of Grade S275 Equal Angle or Circular Hollow Section, or steel brackets of suitable size;
 - the concrete strength of the structural element to which a metal bracket is fixed should be not less than 25N/mm^2 ;
 - appropriate anchor bolts should be selected according to the strength of construction materials and the anchor bolts should have a tensile capacity greater than 7kN;
 - anchor bolts should be installed in strict accordance with the installation details and procedures specified by the manufacturers;
 - diameter and depth of boreholes as well as tightening torque of anchor bolts must meet the installation requirements set out by the manufacturers;
 - depth of the boreholes must be adequate and should fully penetrate into construction materials (e.g. concrete walls). Plastering on the external walls should not be relied on for load bearing purpose;
 - anchor bolts should be fixed at appropriate positions. The distance between the holes for installing the anchor bolts and the edge of the wall and the distance between the holes should also meet the requirements of the manufacturers of the anchor bolts. Fixing of a metal bracket to the bottom edge of the tie beam should be avoided; and
 - the horizontal spacing between the metal brackets should not be greater than 1.3m;
- putlogs should be provided at spacings not greater than 3m both horizontally and vertically;
- unauthorised alteration of TOSs (including putlogs) by scaffolders or workers of other trades is prohibited;



- all components of TOSs are of sound materials, good construction, adequate strength and free from patent defects.
- (iii) ensure that the TOSs are erected, substantially added to, altered or dismantled by trained workmen with adequate experience who hold a valid certificate of "Advanced Level Truss-out Scaffolder Safety Training" or "Intermediate Level Truss-out Scaffolder Safety Training" issued by the Construction Industry Council (CIC);
- (iv) ensure that the trained workman who hold a valid certificate of "Intermediate Level Truss-out Scaffolder Safety Training" is not allowed to perform those work for metal brackets at the base of scaffold and the ledgers and transoms above the metal brackets, unless the trained workman:
- holds a valid certificate of “Certificate in Safety Enhancement to Erection & Dismantling of “Truss-out Bamboo Scaffolds”” issued by the CIC;
 - 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
 - is under the on-site supervision of a trained workman who holds a certificate of “Advanced Level Truss-out Scaffolder Safety Training”;
- (v) ensure that TOSs are erected, substantially added to, altered or dismantled under the immediate supervision of a competent person who is appointed by the contractor for this purpose. The competent person should not engage in the bamboo scaffolding work at the same time, and should focus on the safety condition of scaffold and the safety of the trained workmen;
- (vi) provide every workman engaged in “erecting/ substantially adding/ altering/ dismantling/ use of TOSs” with a suitable full body harness that is attached continuously to a suitable and secure anchorage, such as a fixed anchorage, a transportable temporary anchor device or an independent lifeline with a suitable fall arrester, and ensure the proper use of them²;
- (vii) not attach the safety harness to an object which is not designed for securing safety harness, such as window frames, water pipes or scaffolding members, etc.;

² For details of Safety Belts and their Anchorage Systems, please refer to the “Guide on Construction and Work Safety of Truss-out Bamboo Scaffolds” issued by the Labour Department



- (viii) take necessary precautions so far as reasonably practicable to ensure the structural strength and stability of TOSs preceding the adverse weather conditions such as typhoons or strong monsoons. The precautions include carrying out thorough inspection by the competent person prior to such weather conditions and make improvement or enhancement over the TOSs as required;
- (ix) provide all personnel involved with necessary safety information, instruction and training to ensure that they are familiar with method statements, safety measures and have fully understood their roles and responsibilities; and
- (x) exercise adequate monitoring and effective supervision to ensure that the above safety measures are strictly implemented, followed and maintained.

Registered Safety Auditors (RSAs) should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.

DISCLAIMER

This Systemic Safety Alert (“the Alert”) is issued to draw the attention of interested parties to the relevant systemic safety problems and accident prevention measures necessary to protect people engaging in similar works activities. The material contained in the Alert constitutes general guidance only. It does not reduce, limit, or replace, any legal obligations upon any person to comply with any statutory duties under relevant legislation. Users such as Managers and Supervisors should make their own evaluation of the information contained in the Alert to determine if it can be applied to their own situations and practices. The Labour Department does NOT accept any responsibilities for any loss or damage resulting from the use of or failure to use the information contained herein.