

Your Ref :

Our Ref: CD/FSSD/12/02/03/01

Date : 10 Aug 2016

Registrar, Board of Architects
Registrar, Professional Engineers Board
President, Singapore Institute of Architects
President, Institution of Engineers, Singapore
President, Association of Consulting Engineers, Singapore

Dear Sir/Mdm

AMENDMENT TO FIRE CODE – FIRE SAFETY REQUIREMENTS FOR ENGINEERED TIMBER¹ BUILDING CONSTRUCTION

In Mar 2014, SCDF had issued a circular to allow the use of cross laminated timber for building construction, subject to a list of conditions imposed to mitigate the fire risks arising from such combustible construction². Following a recent review undertaken to support greater productivity efforts in the use of engineered timber, and further developments overseas regarding the use of engineered timber for construction, SCDF has revised the list of conditions for engineered timber building construction.

2. The revised fire safety requirements for engineered timber building construction can be found in Annex A.
3. This circular shall take effect on 10 August 2016, and will supersede the earlier circular dated 6 March 2014 on Fire Safety Requirements for Cross Laminated Timber Building Construction.

¹ Engineered timber refers to mass timber products that are manufactured according to established standards accepted by SCDF. Examples of mass timber products are cross laminated timber (CLT) and glued laminated timber (GLT) structural elements manufactured in accordance with EN 16351 and EN 14080 respectively.

² Clause 3.15.2 of the Fire Code requires all elements of structure to be constructed of non-combustible materials. A circular was issued on 6 Mar 2014 to relax this requirement and allow CLT (which is a combustible material) to be used as elements of structure of a building, subject to certain conditions.



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4. Please convey the contents of this circular to members of your Institution/Association/Board. The circular is made available in CORENET-e-Info: <http://www.corenet.gov.sg>. For any enquiry or clarification, please contact LTC Tong Hong Haey at 68481448 or email him at Tong_Hong_Haey@scdf.gov.sg.

Yours faithfully,

(transmitted via e-mail)

MAJ Tan Chung Yee
Fire Safety & Shelter Department
for Commissioner
Singapore Civil Defence Force

cc

CEO, BCA
CEO, URA
CEO, HDB
CEO, JTC
CE, SPRING Singapore
President, REDAS
President, IFE
President, SISV
President, FSMAS
President, SCAL
Honorary Secretary, SPM
SCDF Fire Safety Standing Committee
Fire Code Review Committee



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FIRE SAFETY REQUIREMENTS FOR ENGINEERED TIMBER BUILDING CONSTRUCTION

Pre-design stage

- (a) The Qualified Person (QP) responsible for the design of the engineered timber building project shall inform SCDF of the project prior to the design and construction of the project.
- (b) The QP responsible for the design of the engineered timber building project shall ensure that the engineered timber product is listed in accordance with the requirements of the product listing scheme.

Building design

- (c) The habitable height³ of any healthcare occupancy⁴ in an engineered timber building shall not exceed 12m, including mezzanine levels.
- (d) A fire safety performance-based (PB) approach shall be adopted in the design of any engineered timber building where its habitable height exceeds 12m.
- (e) The engineered timber building shall be fully protected by an automatic sprinkler system.
 - i. Exception: Sprinkler systems can only be exempted under the following circumstances:
 - (1) Alternative fire protection measures (eg. fully encapsulated timber elements) are provided to minimise fire damage to the timber structures, in lieu of the sprinkler system, and
 - (2) The building does not exceed 12m in habitable height, and
 - (3) The building is protected by an automatic fire alarm system compliant with CP 10 Code of Practice for Installation and Servicing of Electrical Fire Alarm Systems, and
 - (4) The building does not contain any healthcare occupancy.

³ The habitable height is the height measured from the lowest level of fire engine accessway or access road to the finished floor level of the highest habitable floor.

⁴ Healthcare occupancy refers to premises intended as the accommodation areas of a healthcare development such as hospital or nursing home. Occupants in healthcare premises often require some form of assistance during evacuation in fire emergencies.



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- (f) Where an automatic sprinkler system is required, the system shall be designed in accordance with CP 52 Code of Practice for automatic fire sprinkler system requirements. The automatic sprinkler system shall not be shared among different engineered timber buildings if the latter is under different occupier. If the external facade of the engineered timber building is unable to meet the stated performance in the prevailing Fire Code for prevention of external fire spread, the external facade shall be required to be protected by a deluge system in accordance to CP 52, or any other suppression system that is shown to be effective in preventing vertical fire spread.
- (g) The use of engineered timber for elements of structure shall be permitted only for areas above the floor slab of the ground floor. The ground floor slab and basement floors below it shall not have elements of structure constructed using engineered timber.
- (h) Essential escape provisions such as staircase shafts and lift shafts of an engineered timber building shall be constructed of non-combustible materials which achieve the necessary fire resistance rating.
- i. Exception: Engineered timber can only be used as elements of structure for essential escape provisions under the following circumstances:
- (1) The surfaces of engineered timber elements shall be protected by fire-rated board so that the composite element is able to achieve the necessary fire rating, and
 - (2) The building does not exceed 12m in habitable height, and
 - (3) The building does not contain any healthcare occupancy, and
 - (4) This exception shall not apply to staircase shelters designed to comply with the Technical Requirements for Storey Shelters.
- (i) Essential facilities for fire safety and fire-fighting operations (such as Fire Command Centre, fire pump rooms, generator rooms, and smoke-stop/fire-fighting lobbies) shall be separated from other areas of the engineered timber building project by non-combustible material or encapsulated engineered timber⁵, either of which must achieve the necessary fire resistance rating.
- (j) The use of flammable gas cylinders for cooking is not permitted in the engineered timber building premises if the engineered timber building has access to piped-gas supply for cooking.

⁵ Engineered timber elements protected with fire-rated boards.



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- (k) Where the usage of the building potentially involves the use of flammable gas cylinders (either for cooking, storage, factory production, etc) which may result in explosions, the use of engineered timber as elements of structure is not allowed unless the engineered timber building is designed to take into account the explosive actions based on EN 1991⁶ or other relevant internationally recognised standards, so as to manage the impact of such explosions on the building structure.
- (l) Residential engineered timber building projects shall fully comply with the technical requirements for household and storey shelters.
- (m) The engineered timber building project shall comply with the design & fire test performance requirements stipulated in European (EN) standards which include BS EN 1995, BS EN 1363, BS EN 1365 & other internationally recognised standards deemed appropriate and necessary by SCDF. In addition, the engineered timber building shall also comply with all other requirements in the prevailing Fire Code.

Building under construction

- (n) During the construction stage, the QP responsible for the engineered timber building project shall ensure that the engineered timber project work site complies with the Fire Safety Requirements for Buildings Under Construction in the prevailing Fire Code. In addition, there shall be no smoking or use of naked flames within the engineered timber project worksite.

Maintenance of automatic fire detection/suppression systems

- (o) Where automatic fire detection/suppression systems are installed, the engineered timber building owner shall undertake to engage a QP to conduct annual inspection of these systems and to submit inspection reports to SCDF⁷.

General compliance

- (p) Compliance with all the above requirements for an engineered timber building project does not exempt the owner of the engineered timber building from the need to obtain the necessary permits or approval of plans from the relevant authorities, including SCDF.

⁶ Although single occupancy houses not exceeding 4 storeys are exempted from such assessment of explosive actions in EN 1991, this exemption shall not apply for such engineered timber buildings in Singapore.

⁷ See Fire Safety (Fire Certificate)(Designated Buildings) Order 2016.



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