

**SINGAPORE CIVIL DEFENCE FORCE  
FIRE SAFETY & SHELTER DEPARTMENT  
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*Please quote our ref. no. in all future correspondences*

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President, Singapore Institute of Architects (SIA)  
President, Institution of Engineers, Singapore (IES)  
President, Association of Consulting Engineers, Singapore (ACES)  
President, Real Estates Development Association of Singapore (REDAS)  
Registrar, Board of Architects (BOA)  
Registrar, Professional Engineers Board (PEB)

Dear Sir/Mdm,

**PERMISSIBLE VARIATIONS FOR HOUSEHOLD SHELTER (HS)/STOREY SHELTER (SS) TECHNICAL REQUIREMENTS**

A review has been conducted by SCDF and BCA on the technical requirements for household shelter/storey shelter, to establish permissible variations for HS/SS technical requirements. Permissible variations are allowable alternative designs to compensate for shortfall in meeting HS/SS technical requirements without compromising protective requirements. This is to allow for greater flexibility in the design of HS/SS.

2 The permissible variations for HS and SS technical requirements are as given in **Annex A** and **Annex B** respectively. Adoption of these permissible variations in accordance with the conditions for acceptance is deemed as in compliance with the respective clauses of the HS/SS technical requirements. Henceforth, no waiver application will be required in cases that fulfil these permissible variations.

3 The permissible variations shall take immediate effect. We would appreciate it if you could disseminate the contents of this circular to members of your Institution of Association.

4 Please contact undersigned at 68481470 or LTC Cheok Poh Chin at 68481406, should you require further clarifications.



A PROUD MEMBER OF THE HOME TEAM



Yours Faithfully,

CPT Lee Geok Seng Raymond  
SSO Shelter Development  
for Commissioner, Singapore Civil Defence Force

cc

Members of FSSD Standing Committee

President, SISV

CEO, HDB  
Attn: Mr Lau Joo Ming

CEO, URA

CEO, BCA  
Attn: Deputy CEO (Building Control)  
Director (Special Functions)  
Deputy Director (CDSED)  
Senior Executive Engineer (CDSED)

A PROUD MEMBER OF THE HOME TEAM

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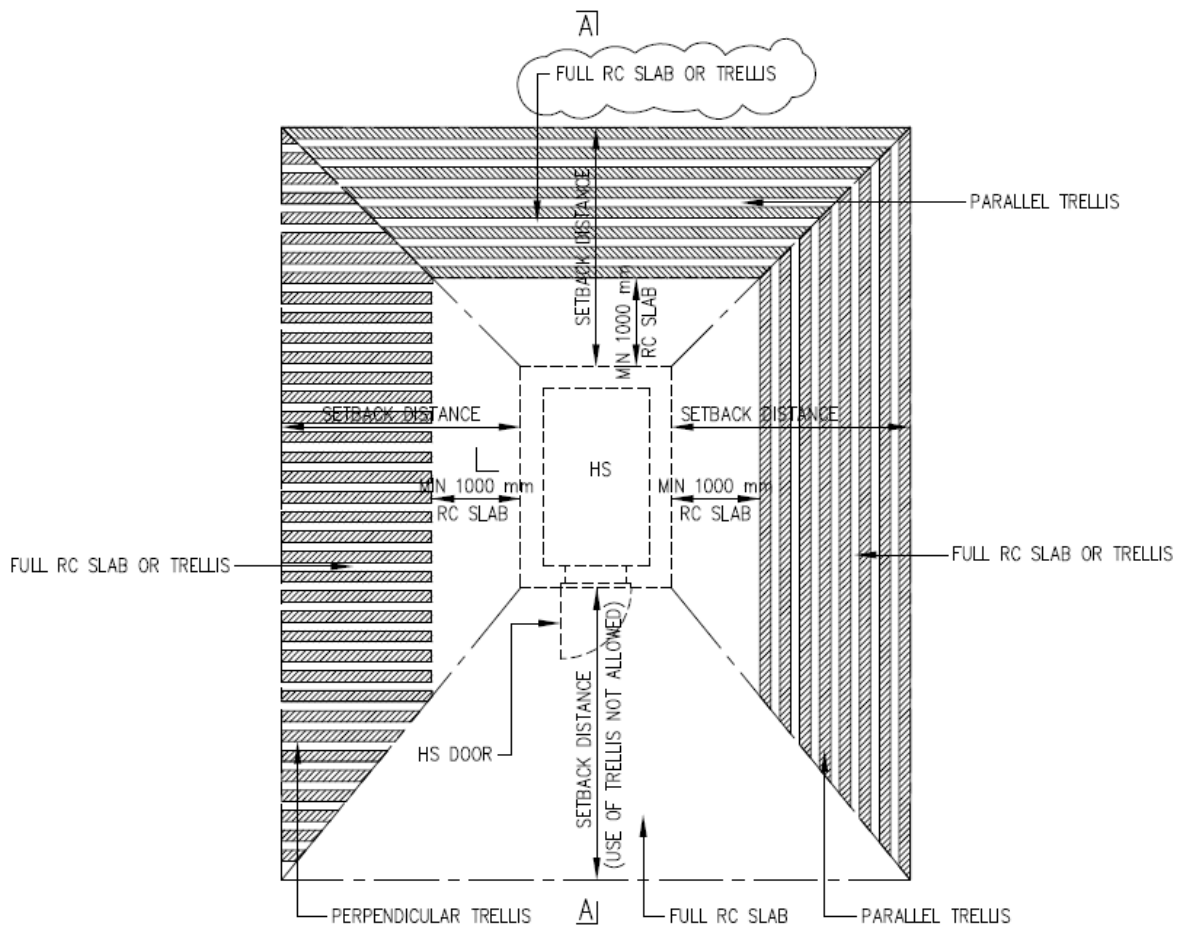
**Permissible Variations For Technical Requirements For Household Shelters**

S/No	Clause stipulated in Technical Requirements For Household Shelters 2008	Design Issue	Conditions for Acceptance
1	<p>Clause 2.3.3 The setback distances of HS wall shall comply with Table 2.3.3.</p> <p>Clause 2.3.4 The setback distances of HS wall shall comply with Table 2.3.4(a) or Table 2.3.4(b).</p>	<p>Provision of RC ceiling slab does not meet the minimum setback distance requirements.</p>	<p>Trellis constructed of RC or steel hollow sections may be used to make up for the shortfall in setback distance for three HS walls (where the HS door is not located). However, a minimum of 1000mm RC ceiling slab from the HS wall shall be provided (See <b>Figure 1</b>). A perpendicular or parallel trellis arrangement, or a combination of both, with respect to the HS wall concerned, shall comply with the geometrical configuration (See <b>Figure 1</b>).</p> <p>Provision of trellis to make up for shortfall in setback distance of HS wall with door is not allowed, i.e. RC ceiling slab with required minimum setback distance is to be provided.</p>
2	<p>Clause 4.2 The height of each opening, measured from the centre of the opening to internal finished floor level (FFL) of the HS shall be between 1900mm to 2600mm, as shown in Figure 4.2(b).</p>	<p>The installation of the ventilation sleeve opening(s) at height above 2600mm.</p>	<p>The location of ventilation sleeve(s) at height between 1900mm to 3600mm, measured from centre of the ventilation sleeve opening to internal FFL of the HS, is permitted (See <b>Figure 2</b>). If the location of the ventilation sleeve is to be in the false ceiling, access panel(s) of minimum size of 600mm x 600mm shall be provided, positioned directly below the ventilation sleeve and the ventilation sleeve shall be accessible with ladder.</p>

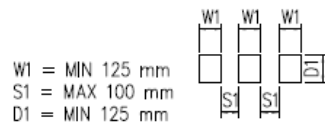
Permissible Variations For Technical Requirements For Storey Shelters

S/No	Clause stipulated in Technical Requirements For Storey Shelters 2006	Design Issue	Conditions for Acceptance
1	Clause 2.11.6 There shall be 200mm width reinforced concrete or steel nib provided around the MV shaft for inspection and maintenance of the blast hatch for layouts shown in Figure 2.11.1(b-1).	To fulfil the pressurization requirements for exit staircases, as specified in the Fire Code.	a. The reinforced concrete or steel nib around the MV shaft shall be of width of at least 125mm (See <b>Figure 3</b> ). b. The height of the blast hatch opening shall be 700mm, whereas its width shall be between 600mm-700mm.

# Permissible Variations To Civil Defence Shelter Technical Requirements

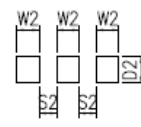


## PLAN



W1 = MIN 125 mm  
S1 = MAX 100 mm  
D1 = MIN 125 mm

### PERPENDICULAR TRELLIS

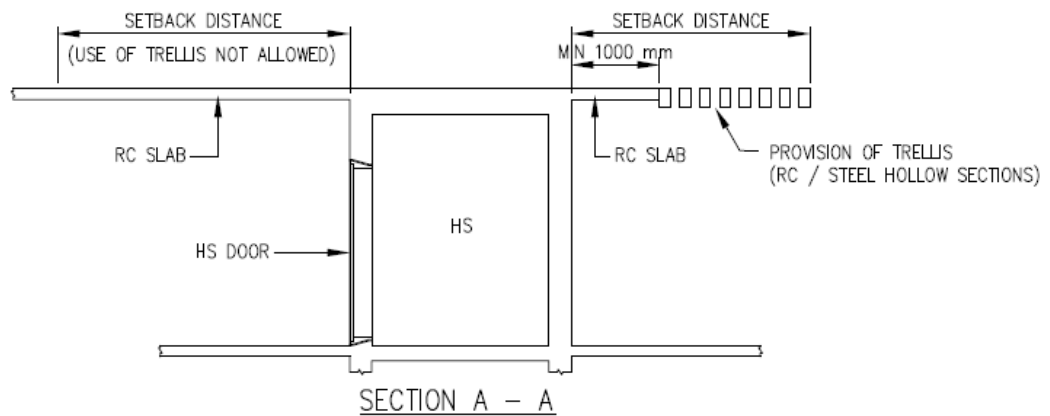


W2 = MIN 125 mm  
S2 = MIN 62.5 mm  
D2 = AT LEAST 2 TIMES OF S2

### PARALLEL TRELLIS

#### NOTE:

THICKNESS OF STEEL HOLLOW SECTIONS SHALL BE AT LEAST 6 mm



**FIGURE 1: USAGE OF TRELLIS (RC/STEEL HOLLOW SECTIONS) FOR 3 HS WALLS**

## Permissible Variations To Civil Defence Shelter Technical Requirements

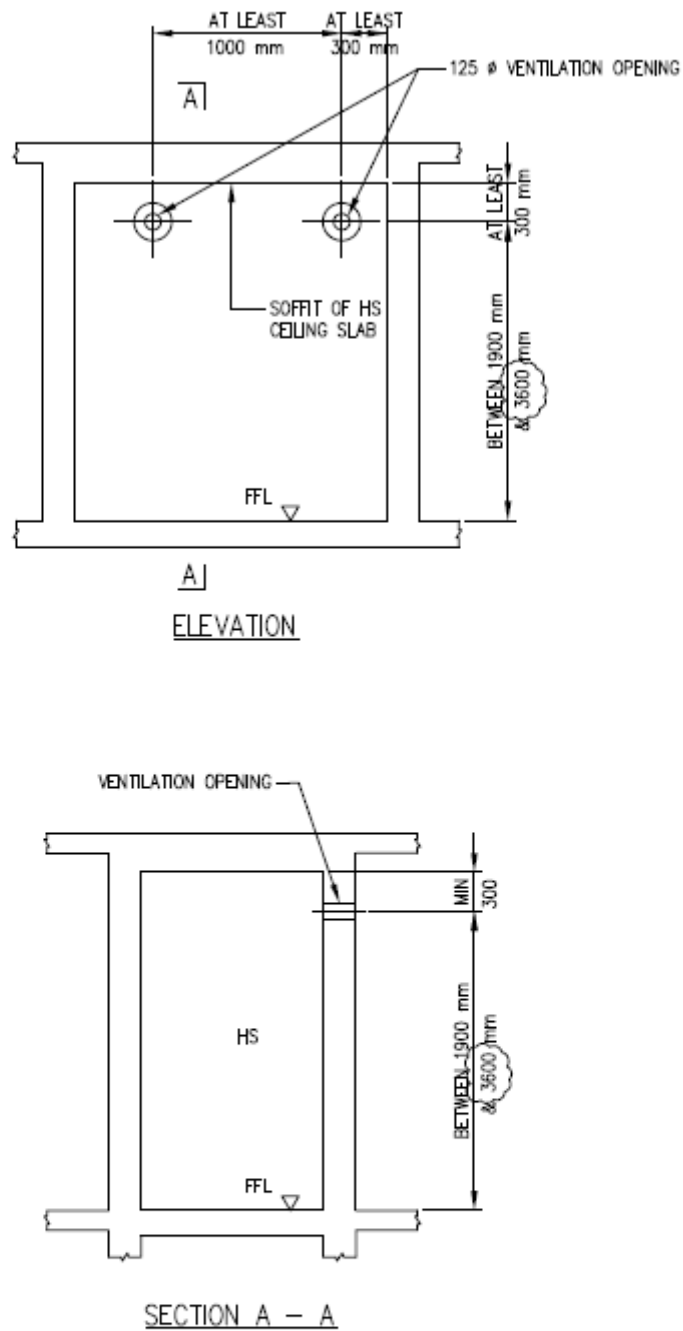
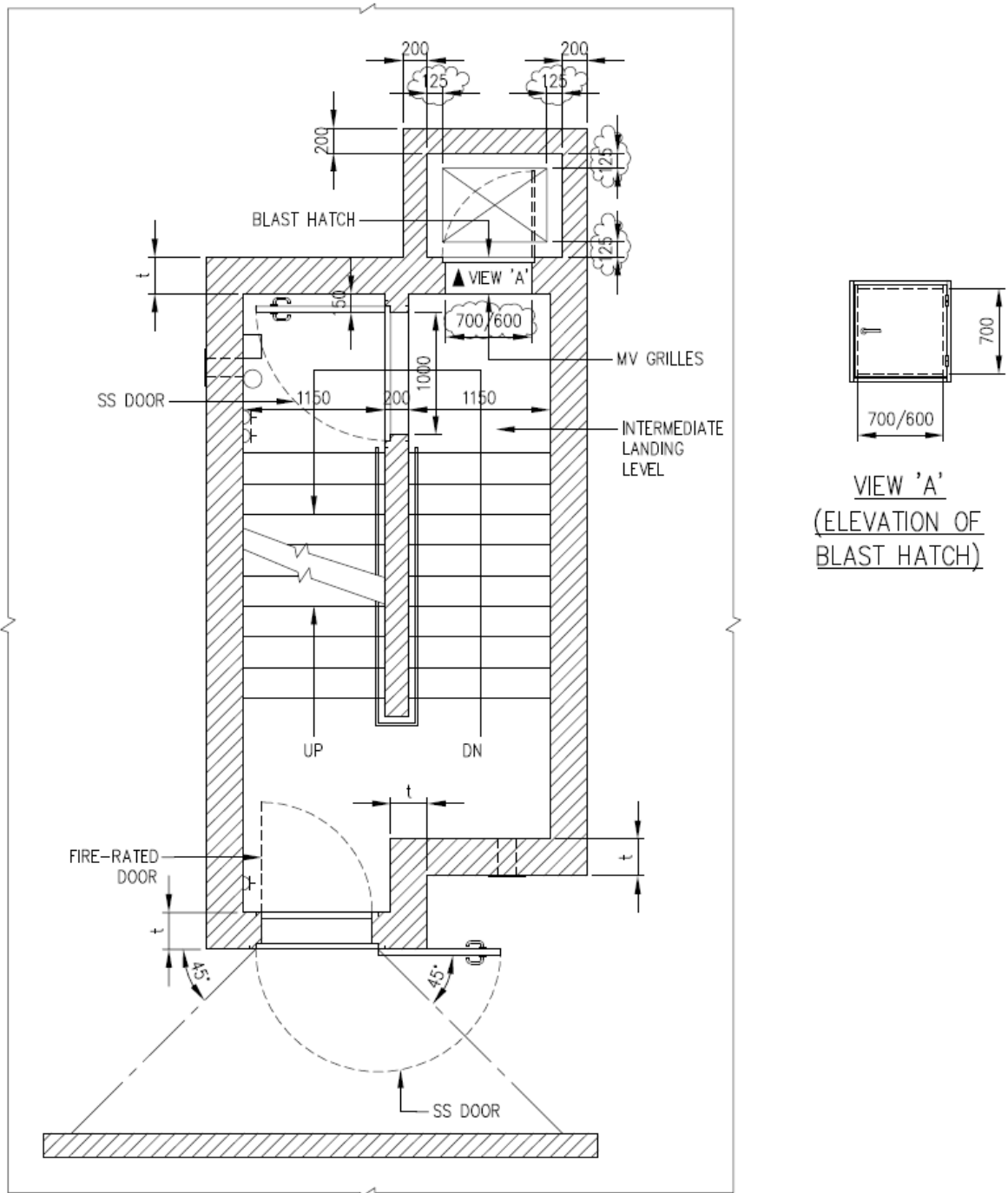


FIGURE 2: HEIGHT OF VENTILATION SLEEVES BETWEEN 1900 mm TO 3600 mm

## Permissible Variations To Civil Defence Shelter Technical Requirements



PLAN OF STAIRCASE STOREY SHELTER

NOTE:

WALL THICKNESS,  $t$  (TO FOLLOW TABLE 2.4 OF THE DESIGN GUIDELINES)

**FIGURE 3: WIDTH OF NIB IN MV SHAFT**