Household Shelter Architectural Requirement Checklist:

- (1) The essential technical requirements that have impacts on the structural safety, performance and protection levels of the household shelters are listed in the Table.
- (2) The list shall be used as a guide to check that the plan submitted essential technical requirements.
- (3) For other technical requirements not in the list, they shall be referred to Technical Requirements for Household Shelters 2017.

Disclaimer: This checklist serves as a guide to qualified person in relation to the preparation of (i) Building Plans which will incorporate the architectural aspects of Civil Defence ("CD") Shelter Plans and (ii) Structural Plans which will incorporate the structural aspects of the CD Shelter Plans and are for informational purposes only. This checklist does not purport to be exhaustive or applicable to all situations and does not constitute professional advice. The Building and Construction Authority disclaims any liability (including any liability arising from negligence) arising in respect of any matter and the consequences of any act done or not done by any person in reliance on anything in or omitted from this checklist.

1	AREA, VOLUME AND DIMENSION OF HOUSEHOLD SHELTER	Clause or Table or Fig. in TRHS 2017
	Width and length Min internal width is 1.2m and max length of the HS is 4m.	Cl. 2.2.1
	HS Area & Volume HS area and volume. Max area of HS shall be ≤ 4.8m².	Cl. 2.2.1, Table 2.2.1(b) & (c)
	HS Height Min HS clear ht: 2.4m, max HS clear ht: 3.9m.	Cl. 2.2.2, Fig 2.2.2(a)
	HS Wall Min wall thickness for the different HS clear height.	Cl. 2.3.1, Table 2.3.1(a)
	HS Top-Most Slab Min HS top-most slab thickness is 300mm. If the HS top-most slab is protected (ie in landed house), then the slab shall be at least 250mm.	Cl. 2.3.2, Fig. 2.3.2
	HS Floor Slab 175mm for intermediate floor or 200 mm thick for ground floor.	Cl. 2.3.2, Fig. 2.3.2
2	SETBACK DISTANCE OF HOUSEHOLD SHELTER	
	Setback Distance Envelope Min setback distance envelope for the HS wall with door and HS walls, for different storey heights.	Cl. 2.4.3, 2.4.4, Table 2.4.3(a), 2.4.4(a), Fig. 2.4.3, 2.4.4(a-b)
	Air-well within Setback Distance Envelope Max length and area of air well abutting HS.	Cl. 2.4.1, Fig. 2.4.1(b-c)
	Trellis within Setback Distance Envelope Trellis to be provided 1m away from the nearest HS wall without HS door.	Cl. 2.4.3 (c), Fig. 2.4.3(c)
	Shielding Wall HS Wall to Offset Setback Distance Min shielding wall thickness and air gap (without HS door).	Cl. 2.4.5, Fig. 2.4.5 (a - g)
	HS in Basement HS wall abutting earth shall be at its full HS height.	Cl. 2.4.6, Table 2.4.6(a), Fig. 2.4.6 (a-c)

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	Common Wall for HS and Lift Shaft The common wall shall be the required HS wall thickness plus 50mm.	Cl. 2.4.7, Fig. 2.4.7(a)
3	BLAST DOOR, ELECTRICAL SERVICES AND VENTILATION SLEEVES OF HOUSEHOLD SHELTER	
	Blast Door Opening 700mm(W) x 1900mm (H) opening size in HS wall.	Cl. 2.5, Fig. 2.5.1(a-b)
	Shelter Door Nib Min. 150mm r.c. nib (cast-in-situ).	Cl. 2.5.2
	Shelter Door Frame Panel 300mm r.c. nib (precast) is provided at the edge of the door opening. See type 1, 2 and 3.	Cl. 2.5.2
	Electrical Services 2 power outlets (1 twin-gang or 2 single gang), 1 lighting point and 1 telephony outlet point are provided. The height of the service shall be min 450mm and not more than 1200mm high.	Cl. 2.7.1 to 2.7.4, Fig. 2.7.1
	Conduit sealing requirements Both ends of the conduits shall be fully sealed with approved sealing material of up to a depth of not less than 100mm into the conduits.	Cl. 3.6.1(e)
	Ventilation Sleeve (inside HS) Ventilation sleeve shall have a min. 700mm clearance from HS wall, and at least 1900mm and not more than 3600mm above the finished floor level and at least 300mm from the ceiling and edge of the internal wall. Ventilation sleeve which is located above the shelter door shall be at least 250mm from the edge of the door frame to the centre of the sleeve.	Cl. 4.2
	Ventilation Sleeve above false ceiling (outside HS) Accessible false ceiling provided panel (perforated) of 600mm x 600mm.	Cl. 4.3, Fig. 4.3.1 to 4.3.2
	HS Wall recess for HS door handle Length, width and depth in HS wall.	Cl. 2.13, Fig. 2.13
4	HS TOWER INCLUDING NS	
	NS in HS Tower Aggregate wall height of NS is not greater than 12m.	Cl. 2.8.1, Fig 2.8.1(a)
	Shielded and Unshielded NS Walls/ Columns NS walls/ columns shall be provided with required setback distance or structural redundancy.	Cl. 2.8.2
	Transfer structure supporting HS tower Transfer structure, (if any) must be directly supported on column or wall.	Cl.2.9, Fig. 2.9.1 (a-b)
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Storey Shelter Architectural Requirement Checklist:

- (1) The essential technical requirements that have impacts on the structural safety, performance and protection levels of the storey shelters are listed in the Table.
- (2) The list shall be used as a guide to check that the plan submitted fulfils essential technical requirements.
- (3) For other technical requirements not in the list, they shall be referred to Technical Requirements for Storey Shelters 2021.

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1	General	Clause or Table or Fig. in TRSS 2021
	a)Allocation of shelter space (i)Allocation of shelter space, shelter area and volume are clearly indicated. (ii) Each SS and NS compartment at every storey level is clearly indicated.	
	b)Table on SS data (i)Table showing SS area and SS vol. required and provided at each storey must be provided. (ii)Dwelling Units allocated in the SS, with the corresponding Nominal Occupancy and Total Nominal Occupancy at each storey must be shown in this table. (iii)Dwelling unit names in this table must tally with that shown on plan. (iv)The SS area and vol provided must comply with requirements.	Table 2.2.1
	c) Waiver	
	(i)Anything not covered in TR SS or not in compliance with TR SS must be cleared via SCDF waiver approval. (ii)Soft copy of the waiver approval letter issued by SCDF (where applicable) and supporting waiver documents and drawings are to be included in the submission. (iii)In the drawings, areas of non-compliance must be clouded and SCDF waiver letter date and reference number must be indicated on the clouded areas.	
2	Size and location	
	a)Max. internal SS area is 32m². b)Max. internal length of SS wall is 10m. c)Min. clear width of the staircase provided is 1200mm. d)Each dwelling unit served by the SS shall have at least 1 exit door at the same storey as the SS.	Cl. 2.2.1 Cl. 2.2.1 Fig. 2.2.1 (a) Cl. 2.4.1 Fig. 2.4.1
3	Setback Distance	
	(a)Setback distance envelope (i) Setback distance of SS wall must meet the minimum requirements as stipulated in the latest Technical Requirements of Storey Shelter. (ii)Setback distance envelopes must be clearly shown in the plans. (iii)Setback distance envelope must consist of full rc slab and provided at the SS ceiling level. (iv)The setback distance envelope shown on a particular storey plan are for the SS below and should be based on SS storey ht. below	Cl. 2.4.3 & Table 2.4.3

(b	Trellis	Fig. 2.4.3(d), (e), (f)
,	(i)The size (width x height) of trellis and clear spacing between trellis must be shown in the plan/section if it is used to address shortfall in setback distance.	
	(ii)Trellis can be rc or steel material.	
	(iii)If steel trellis is used, thickness of steel hollow section used must be min. 6mm and indicated as such. (iv)Trellis can only be erected after 1.2m rc slab from SS wall.	
	(v)Not permitted in front of SS wall with SS door.	
(c)	Downhang beam	Cl. 2.4.4 & Table 2.4.4
	(i) If down-hang beam has been used to comply with setback distance requirements, the dimension 'd' of down-hang beam used in the computation of effective storey ht. must be clearly shown in the section.	Ci. 2.4.4 & Table 2.4.4
	(ii) The horizontal extent of down-hang beam must be clearly shown in the plan as well.	
	(iii)Down-hang beam can be introduced either at the edge of the building line or within the setback distance.	
	(iv)If it is located within setback distance, it must be min. 1.2m away from SS walls without SS door, and min. 1.7m away from SS wall with door.	
	(v) For rc trellis/slab introduced beyond down-hang beam to comply with setback distance requirements, soffit of trellis/rc slab beyond down-hang beam must be flushed with bottom of downhang beam.	
(d	For functional voids and non-functional voids and service risers within shelter setback distance, requirements in TR SS must be complied with.	CI 2.4.6
4 SS	S/NS Wall	
a)	SS wall thickness	
	(i)SS wall thickness must correspond with the storey height, clear height of the staircase, and setback distance provided.	Table. 2.3.1
	according to Table 2.3.1 of TR SS, for SS wall length of 8m and below.	
	(ii)For SS wall length between 8m to 10m, SS wall thickness provided must follow that indicated in Table 2.3.1 of TR SS plus an additional 25mm. (iii)Max length of SS wall is 10m.	
	(iv)Generally, walls between NS and SS must be 300mm thick min.	
(b	SS/NS clear ht.	Cl. 2.2.2 & Table 2.3.1
	(i)Max SS/NS clear height is 3900mm. (ii)However, if SS/NS clear height is between 3400mm and 3900mm, SS/NS wall thickness may need to be increased according Table 2.3.1.	Ci. 2.2.2 & Table 2.3.1
	(iii)Min. SS/NS clear height is 2400mm.	
(c)	Transfer structure is not permitted to support storey shelter tower	
d)	SS tower	
	(i)All floor slabs external to SS tower must be structurally connected to SS/NS walls.	Cl. 3.4.2.2 (e)
	(ii)However, for NS walls, several NS can be stacked one on top of the other without the need for NS floor slab to be connected to the external floor slab, provided	Cl. 2.7.1
	the aggregate wall height of NS does not exceed 12m. (iii)Up to 2 opposite NS walls can be discontinuous to foundation; but shielded NS wall and non-shielded NS wall requirements must be complied with.	CI. 3.3.1
	(iv)Wall thickness of any SS or NS within the SS tower should not be less than the wall thickness of the SS or NS above it.	
e)	Shielding slab for NS walls	
	(i)Extent of shielding slab to protect NS wall of SS tower is clearly indicated on plan and vertical sections.	Cl. 3.3.3 & Fig. 3.3.3
	(ii)This length of this shielding slab must be provided at the ceiling level of the NS wall and should be min. 1/2 of the NS storey height. (iii)If the NS wall height is double/triple volume, then the NS storey height used must be based on this double/triple volume height.	
(f)	RC/steel trellis cannot be used to provide shielding of NS walls.	
)Where rc shielding slab requirements for NS walls cannot be complied with, min. NS wall thickness must be 300mm and QP(Struct) to indicate on building plans that	

5	SS/NS Slab	
	(a)The dimension and thickness of the strengthened slab outside and above entrance SS door are clearly indicated.	Cl. 2.5.5 & Fig. 2.5.5
	(b)The minimum thickness of the floor slab of the bottom-most SS and ceiling slab of the top-most SS is 300mm.	Fig 2.7.1
	(c)Generally, slab (including staircase waist) between SS & NS must be min. 300mm.	Fig 2.7.1
6	Shielding Wall	
	(a)200mm thick RC shielding wall must be provided in front of the entrance SS door, within the 45° influence zone. Configurations must comply with requirements stipulated in TR SS.	Cl. 2.5.4
	(b)There should be no refuse chute and gas risers facing SS door within the 45° influence zone in front of SS door as well.	Cl. 2.5.5
7	SS door	
	(a)A minimum 150mm RC nib is provided at the edge of the SS door opening and must be clearly indicated in the plan.	Fig. 2.5.3(a)
	(b)The net SS entrance door opening is 900mm by 1900mm.	Cl. 2.5.1(a)
	(c)For SS, only SS door design with fixed door kerb can be used. SS door with removable door kerb cannot be used.	Fig. 2.5.3(b)
	(d)All SS doors, rescue hatch and ventilation sleeves must be supplied by approved SS door supplier.	
8	Fixtures in Each Shelter Compartment:	
	(a)Electrical power socket (i)3 power socket outlets and 1 telephony outlet (FTP) are to be provided in each shelter compartment. (ii)One single power socket outlet must also be located near to the ventilation sleeve opening.	Cl. 2.6.2(a)
	(b)All light fittings must be fixed on ceiling slab and there should be no fittings on the SS walls, other than electrical services.	Cl. 2.6.3
	(c)No tiling or plastering is permitted on the internal face of SS walls and SS ceiling slabs. Only skim coat of up to 2mm is permitted on the internal face of SS walls and SS ceiling slabs.	Cl. 6.2 (d)
	(d)On internal SS floor slab, only floor tiles or floor finishes, which are laid on wet cement mortar, are permitted.	Cl. 7.2.1(a)
	(e)Skirting tiles laid on wet cement mortar are permitted up to a max. 100mm above the FFL of floor slab.	Cl. 7.2.1(b)
9	Ventilation Sleeves	
	(a)Clearance (i)The minimum clearance between the centerline of the ventilation sleeve opening and shelter wall/slab is 350mm. (ii)The minimum distance between the centerline of 2 ventilation sleeve openings is 1000mm. (iii)The minimum distance between the centerline of the ventilation sleeve opening and the edge of the shelter door is 275mm. (iv)The centerline of the ventilation sleeve opening is between 1900mm and 3550mm measured from the internal finished floor level of the staircase.	Fig. 4.2(a) & (b)
	(b)There should be no obstruction in front of and behind the ventilation sleeve within required clearances as stipulated in TR SS Chapter 4.	Fig. 4.3.1(a), (b)

	(c)If ventilation sleeve opens into false ceiling space, there must be a perforated access panel directly below the ventilation sleeve as stipulated in TR SS Chapter 4. (d)All ventilation sleeves must be accessible from SS exterior.	Fig. 4.3.2
10	Rescue Hatch and Catladder	
	(a)For rescue hatch, there must be a min. 250mm rc nib between side of rescue hatch opening on the hinge side and nearest wall. For the other 3 sides, there must be a min. 150mm rc nib provided around the edge of the rescue hatch opening. All other clearances must follow that stipulated in the TR SS. (b)The size of the rescue hatch opening is 700mm x 700mm. (c)At typical storeys, rescue hatch on floor and ceiling slab must be min. 1400mm from each other. (d)Catladder details must follow that shown in TR SS.	Fig. 2.11.1(a) Fig. 2.11.1(c) Fig. 2.11.1(b) Fig. 2.11.2

Staircase Storey Shelter Architectural Requirement Checklist:

- (1) The essential technical requirements that have impacts on the structural safety, performance and protection levels of the storey shelters are listed in the Table.
- (2) The list shall be used as a guide to check that the plan submitted fulfils essential technical requirements.
- (3) For other technical requirements not in the list, they shall be referred to Technical Requirements for Storey Shelters 2021.

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1	General	Clause or Table or Fig. in TRSS 2021
	(a)Allocation of shelter space (i)Allocation of shelter space, shelter area and volume are clearly indicated. (ii)Vertical section with arrows pointing from internal SS door to internal SS door demonstrating the compartmentalization of each SS compartment in the staircase tower must be shown. (iii) Each SS and NS compartment at every storey level is clearly indicated.	
	b)Table on SS data (i)Table showing SS area and SS vol. required and provided at each storey must be provided. (ii)Dwelling Units allocated in the SS, with the corresponding Nominal Occupancy and Total Nominal Occupancy at each storey must be shown in this table. (iii)Dwelling unit names in this table must tally with that shown on plan. (iv)The SS area and vol provided must comply with requirements.	Table 2.2.1
	c) Waiver	
	(i)Anything not covered in TR SS or not in compliance with TR SS must be cleared via SCDF waiver approval. (ii)Soft copy of the waiver approval letter issued by SCDF (where applicable) and supporting waiver documents and drawings are to be included in the submission. (iii)In the drawings, areas of non-compliance must be clouded and SCDF waiver letter date and reference number must be indicated on the clouded areas.	
2	Size and location	
	a)Max. internal SS area is 32m². b)Max. internal length of SS wall is 10m. c)Min. clear width of the staircase provided is 1150mm. d)Each dwelling unit served by the SS shall have at least 1 exit door at the same storey as the SS. e)Travel distance between the SS door and the exit door (at the same storey of SS) of any dwelling unit served by the SS shall not exceed 40m.	Cl. 2.2.1 Cl. 2.2.1 Fig. 2.12.2(a), (b), (d) Cl. 2.4.1 Fig. 2.4.1
3	Setback Distance	
	(a)Setback distance envelope (i) Setback distance of SS wall must meet the minimum requirements as stipulated in the latest Technical Requirements of Storey Shelter. (ii)Setback distance envelopes must be clearly shown in the plans. (iii)Setback distance envelope must consist of full rc slab and provided at the SS ceiling level. (iv)The setback distance envelope shown on a particular storey plan are for the SS below and should be based on SS storey ht. below.	Cl. 2.4.3 & Table 2.4.3

(b)Trellis		Fig. 2.4.3 (d),(e), (f)
(i)The size (width x height) of trellis and clear spacing between trellis mu	st be shown in the plan/section if it is used to address shortfall in setback distance.	3 - (-)/(-)/(/
(ii)Trellis can be rc or steel material. (iii)If steel trellis is used, thickness of steel hollow section used must be	min from and indicated as such	
(iii) steel trellis is used, thickness of steel nollow section used must be (iv) Trellis can only be erected after 1.2m rc slab from SS wall.	min. 6mm and indicated as such.	
(v)Not permitted in front of SS wall with SS door.		
(c) Downhang beam		
	equirements, the dimension 'd' of down-hang beam used in the computation of effective	Cl. 2.4.4 & Table 2.4.4
storey ht. must be clearly shown in the section. (ii) The horizontal extent of down-hang beam must be clearly shown in the	ne plan as well	
(iii)Down-hang beam can be introduced either at the edge of the building		
(iv)If it is located within setback distance, it must be min. 1.2m away from		
(v) For it trellis/slab introduced beyond down-hang beam to comply with flushed with bottom of downhang beam.	setback distance requirements, soffit of trellis/rc slab beyond down-hang beam must be	
(d) For functional voids and non-functional voids and service risers within shelter ser	tback distance, requirements in TR SS must be complied with.	Cl. 2.4.6
4 SS/NS Wall		
a)SS wall thickness		
(i)SS wall thickness must correspond with the storey height, clear height according to Table 2.3.1 of TR SS, for SS wall length of 8m and below.	of the staircase, and setback distance provided	Table. 2.3.1
, ,	ust follow that indicated in Table 2.3.1 of TR SS plus an additional 25mm.	
(iii)Max length of SS wall is 10m.		
(iv)Generally, walls between NS and SS must be 300mm thick min.		
(b)SS/NS clear ht.		
(i)Max SS/NS clear height is 3900mm.		
(ii)However, if SS/NS clear height is between 3400mm and 3900mm, SS (iii)Min. SS/NS clear height is 2400mm.	NNS wall thickness may need to be increased according Table 2.3.1.	Cl. 2.2.2 & Table 2.3.1
(c)Transfer structure is not permitted to support storey shelter tower.		
d)SS tower		
(i)All floor slabs external to SS tower must be structurally connected to S	a	Cl. 3.4.2.2 (e)
the aggregate wall height of NS does not exceed 12m.	and without the need for the hoof stab to be confined to the external hoof stab, provided	Cl. 2.7.1
(iii)For staircase storey shelter, all walls must be continuous to foundation	n, including internal SS wall.	Cl. 3.3.1
(iv)However, discharge openings are permitted at fire discharge levels.(v)Wall thickness of any SS or NS within the SS tower should not be less	s than the wall thickness of the SS or NS above it	Cl. 2.3.1(b)
		S.: 2.5(2)
e)Shielding slab for NS walls	ted on plan and continue	
(i)Extent of shielding slab to protect NS wall of SS tower is clearly indication: (ii)This length of this shielding slab must be provided at the ceiling level		Cl. 3.3.3 & Fig. 3.3.3
(iii) If the NS wall height is double/triple volume, then the NS storey heigh		5 5.5.6 & Fig. 6.6.0
(f)RC/steel trellis cannot be used to provide shielding of NS walls.		
	NS wall thickness must be 200mm and OP/Struct\ to indicate on building plans that	
(g)Where rc shielding slab requirements for NS walls cannot be complied with, min. redundancy check for non-shielded NS wall requirements will be complied with.	113 Wall trickless must be 300mm and QF (Struct) to indicate on building plans that	

5	SS/NS Slab	
	(a)The dimension and thickness of the strengthened slab outside and above entrance SS door are clearly indicated.	Cl. 2.5.5 & Fig. 2.5.5
	(b)The minimum thickness of the floor slab (including staircase waist) of the bottom-most SS and ceiling slab (including staircase waist) of the top-most SS is 300mm.	Fig. 2.12.1(a)
	(c)Generally, slab (including staircase waist) between SS & NS must be min. 300mm.	Fig. 2.7.1
6	Shielding Wall	
	(a)200mm thick RC shielding wall must be provided in front of the entrance SS door, within the 45° influence zone. Configurations must comply with requirements stipulated in TR SS.	Cl. 2.5.4
	(b)There should be no refuse chute and gas risers facing SS door within the 45° influence zone in front of SS door as well.	Cl. 2.5.5
7	SS door	
	(a)A minimum 150mm RC nib is provided at the edge of the SS door opening and must be clearly indicated in the plan.	Fig. 2.5.3(a)
	(b)The swing direction of the internal SS door is in the direction of exit travel to the ground floor.	Cl. 2.5.1(a)
	(e)The net SS entrance door opening is 900mm/1000mm by 2055mm.	Fig. 2.5.3(b)
	(d)The net opening size for internal SS door is 1000mm by 2055mm.	Fig. 2.5.3(d)
	(e)For staircase SS, only SS door design with removable door kerb is used.	
	(f)As precast SS door frame is usually used in staircase SS, ventilation sleeve should be indicated to be min. 750mm away from nearest side of SS door opening, to avoid being within connection between SS door frame and cast-insitu SS wall.	
	(g)All SS doors, blast hatch and ventilation sleeves must be supplied by approved SS door supplier.	
8	Fixtures in Each Shelter Compartment:	
	(a)Electrical power socket (i)3 power socket outlets and 1 telephony outlet (FTP) are to be provided in each shelter compartment, with at least 1 power socket outlet at mid-landing of staircase. (ii)One single power socket outlet must also be located near to the ventilation sleeve opening.	Cl. 2.6.2(b)
	(b) All light fittings must be fixed on ceiling slab and there should be no fittings on the SS walls, other than electrical services and staircase railings.	Cl. 2.6.3
	(c)No tiling or plastering is permitted on the internal face of SS walls and SS ceiling slabs. Only skim coat of up to 2mm is permitted on the internal face of SS walls and SS ceiling slabs.	Cl. 6.2 (d)
	(d)On internal SS floor slab, only floor tiles or floor finishes, which are laid on wet cement mortar, are permitted.	Cl. 7.2.1(a)
	(e)Skirting tiles laid on wet cement mortar are permitted up to a max. 100mm above the FFL of floor slab.	Cl. 7.2.1(b)

9	Ventilation Sleeves	
	(a)Clearance (i)The minimum clearance between the centerline of the ventilation sleeve opening and shelter wall/slab is 350mm. (ii)The minimum distance between the centerline of 2 ventilation sleeve openings is 1000mm. (iii)The minimum distance between the centerline of the ventilation sleeve opening and the edge of the shelter door is 275mm. (iv)The centerline of the ventilation sleeve opening is between 1900mm and 3550mm measured from the internal finished floor level of the staircase.	Fig. 4.2(a) & (b)
	(b)There should be no obstruction in front of and behind the ventilation sleeve within required clearances as stipulated in TR SS Chapter 4.	Fig. 4.3.1 (a),(b)
	(c)If ventilation sleeve opens into false ceiling space, there must be a perforated access panel directly below the ventilation sleeve as stipulated in TR SS Chapter 4.	Fig. 4.3.2
	(d)All ventilation sleeves must be accessible from SS exterior.	
10	Blast Hatch and MV shaft and Air plenum above MV shaft	
	(a)A minimum 150mm RC nib is provided around the edge of the vertical blast hatch openings and they are clearly indicated in the plan. (b)For topmost horizontal blast hatch, there must be a min. 250mm rc nib between hinge side of blast hatch opening and nearest wall. All other clearances must follow that stipulated in the TR SS. (c)The size of the blast hatch opening is 700mm for the side with hinge and 600mm or 700mm for the other adjacent sides. (d)Blast hatch must be at min. 1m above internal FFL of staircase floor slab. (e)Horizontal RC ledge with 125mm projection is provided in the MV riser all round and at the same level with the landing slab. (f)The thickness of the protective slab and wall for the MV opening at the top-most level is 400mm. (g)MV shaft wall thickness must be min. 200mm. (h)Air plenum above MV shaft at roof level must be designed in the way stipulated in TR SS.	Fig. 2.12.2(a), (b) & (d) Fig. 2.12.6(c) & (d) Cl. 2.12.6(d) Fig. 2.12.2(c) Fig. 2.12.2(c) Fig. 2.12.6(c) & (d) Fig. 2.12.2(c) Fig. 2.12.6(a) & (b) or Fig. 2.12.6 (c) & (d)