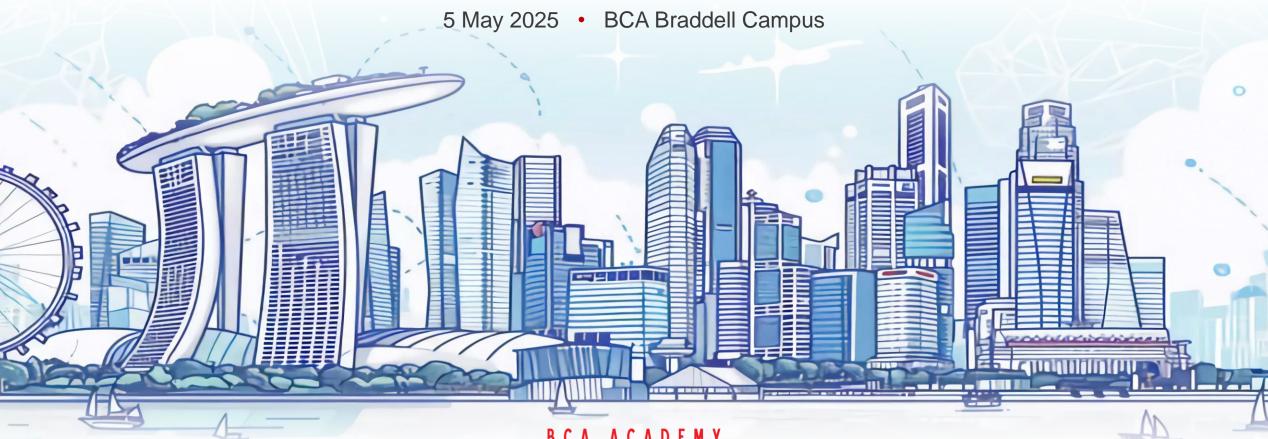


BCA Industry Sharing Session on BP/TOP Regulatory Updates 2025

GOOD DESIGN PRACTICES FOR A SAFE AND ACCESSIBLE BUILT ENVIRONMENT



Regulatory Updates on Building Plan Requirements

ER. RITA WONG

Senior Engineer

BUILDING PLAN & POLICIES DEPARTMENT BUILDING PLAN & MANAGEMENT GROUP





CONTENT

- ❖ GENERAL OBSERVATIONS ON COMMON NON-COMPLIANCES AT BUILDING PLAN SUBMISSION
- APPROVED DOCUMENT UPDATES







INSIGHTS ON BUILDING PLAN SUBMISSIONS DATA 2024

No. of BP submission Approx. 4000

Nos. of QP(BP)

Around 760

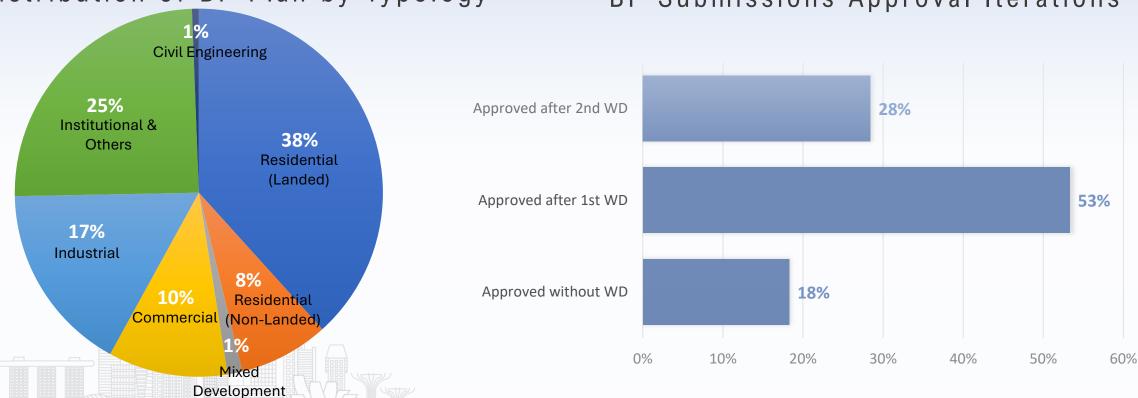
with at least 1 BP submissions

Observation:

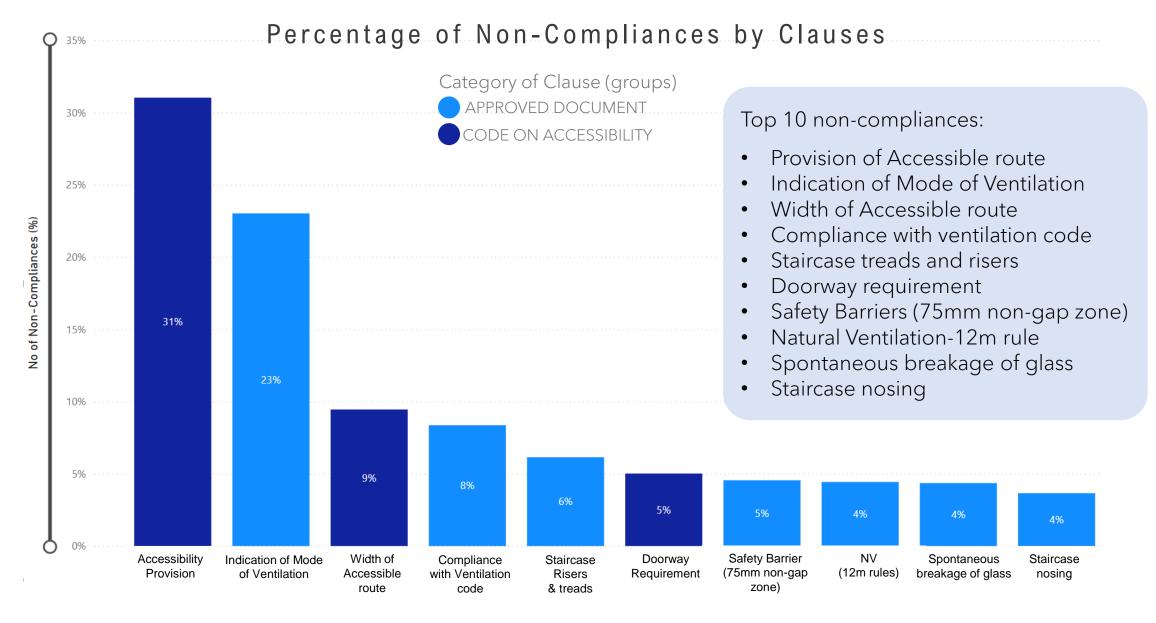
- More than 70% of BP Submissions are approved after ≤1 WD
- Professionals & Regulators to collectively strive towards approval with lesser or no WDs



BP Submissions Approval Iterations



BREAKDOWN OF NON-COMPLIANCES BY CLAUSES



COMMON NON-COMPLIANCES OBSERVED IN 2024

CODE ON ACCESSIBILITY IN THE BUILT ENVIRONMENT

Clause	Description
COA Cl. 2.1.1	Accessibility in the Built Environment



ACCESSIBILITY IN THE BUILT ENVIRONMENT

CODE ON ACCESSIBILITY CHAPTER 2 - Clauses 2.1.1

Performance Requirement

(Building Control Act, Fifth Schedule)

- ✓ Barrier-free access route to building or carpark
- ✓ Barrier-free access to all spaces for work or visit
- ✓ Accessible sanitary facilities
- ✓ Appropriate wayfinding guides.

IMPORTANT:

Indication of barrier-free access route to key amenities.

Clause 2.1.1 in Code

- ✓ All areas or levels must be made accessible for persons with disabilities and other intended users, including employees, visitors and the public,
- ✓ Functional Intent: Persons with disabilities wheelchair users, persons with ambulant mobility impairment and persons with sensory impairment and families with young children must be able to easily gain access to buildings and use their facilities, both as visitors and people who live or work in them.

KEY PRINCIPLE:

Even with constraints, accessibility must be provided to the maximum extent possible.

Principles

- ✓ Unless exempted by Code, all buildings must comply with accessibility.
- ✓ For buildings less than 5 storeys, accessibility is still required:
- ✓ Lift may not be provided if there's genuine spatial/structural constraint
 - ✓ Minimally, basic wheelchair accessibility must be provided at ground storey.
 - ✓ Accessibility for elderly and persons with sensory impairment to be provided to all floors.

ACCESSIBILITY IN THE BUILT ENVIRONMENT

CODE ON ACCESSIBILITY CHAPTER 2 - Clauses 2.1.1

Example 1: Shophouse

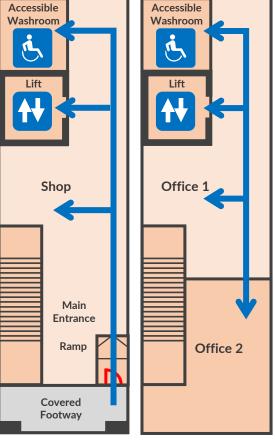
Scenario A: With lift provision

- ✓ Accesibility to be provided to all storeys including:
- ✓ Main entrance, lift lobby and accessible washrooms on all storeys

ALTERNATIVE SOLUTION:

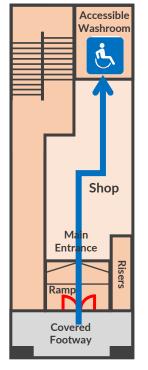
For sites with constraints. QP may consider kerb ramps with power operated doors.

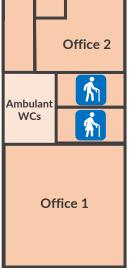
Main entrance door



Scenario B: Where lift is not possible*

- ✓ Minimally, basic wheelchair accessibility to be provided at 1st storey
- √ Wheelchair accessibility to upper storeys (including mezzanines and attics) may be exempted
- ✓ Accessibility for elderly and persons with sensory impairment to be provided (e.g. ambulant friendly toilet, tactile and braille signs at staircases)
 - Due to space or structural constraint









Upper Storey

1st Storey

Upper Storey

1st Storey

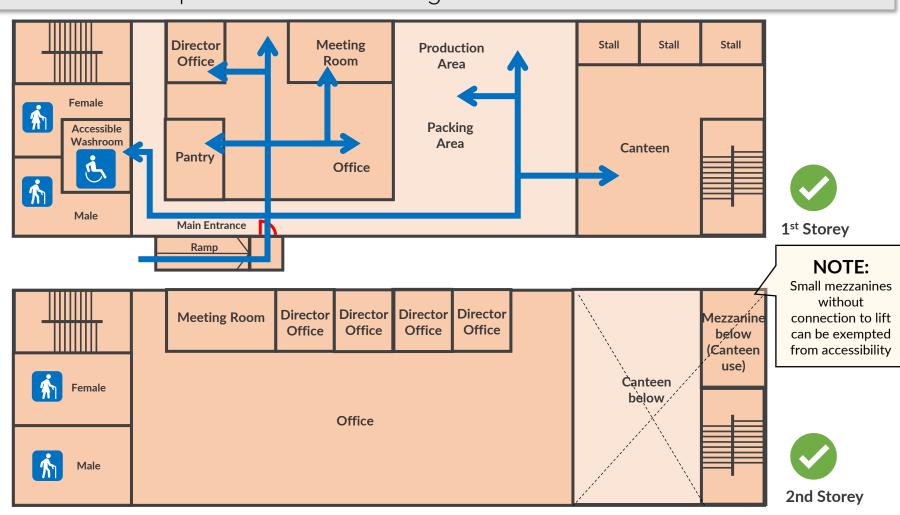
PROVISION OF ACCESSIBILITY INTO BUILDINGS

CODE ON ACCESSIBILITY CHAPTER 2 - Clauses 2.1

Example 2: Industrial Building

Scenario: Without lift provision (4 storeys and below)

- ✓ Minimally, accessibility to be provided at 1st storey
- ✓ Accessibility exempted for hazardous areas and production areas with heavy machinery
- Examples of non-exempted areas:
 - ✓ Office
 - ✓ Canteen
 - ✓ Rest areas, pantry
 - ✓ Production area
- ✓ Under 2025 Code, ambulantfriendly toilets are required.
- Main entrance door



COMMON NON-COMPLIANCES OBSERVED IN 2024

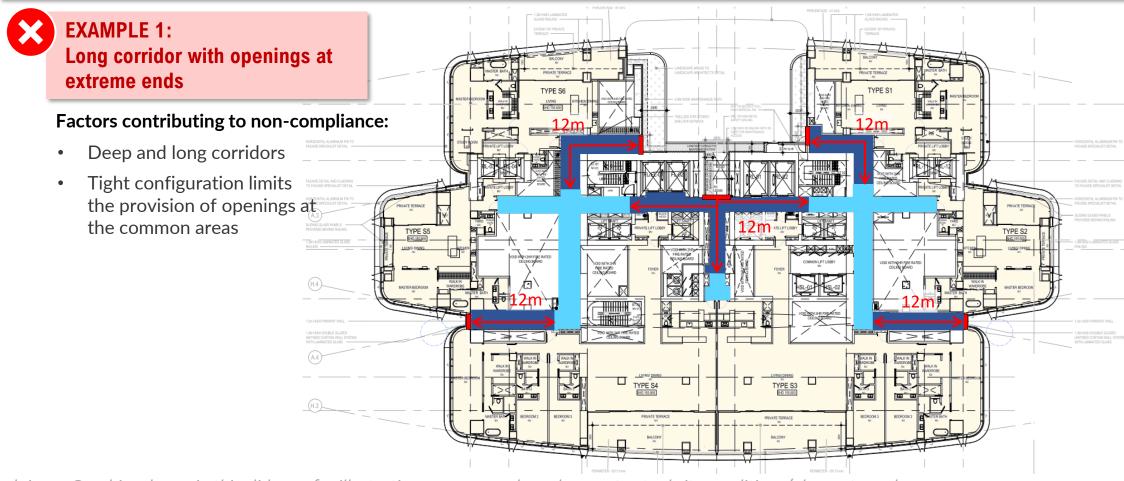
APPROVED DOCUMENT

Descri	escription				
natural	ventilation shall be located more than 12 metres from any window or				
All windows and openings intended for natural ventilation shall be located such that they open to a recess, exceeding 3.0m from the external building wall, and of minimum width 3.0m.					
	Height of airwell	Minimum airwell size (m2)			
	Not more than 30 m	10			
	For each additional 3m height, or part of, beyond 30 m	Add 1 to the minimum size of 10			
	No part natural opening All wind they op	natural ventilation shall be located more the opening that is used to ventilate the room. All windows and openings intended for not they open to a recess, exceeding 3.0m from minimum width 3.0m. Height of airwell Not more than 30 m For each additional 3m height,	No part of any room or space (other than a room in a warehouse) that is designed natural ventilation shall be located more than 12 metres from any window or opening that is used to ventilate the room or space. All windows and openings intended for natural ventilation shall be located such they open to a recess, exceeding 3.0m from the external building wall, and of minimum width 3.0m. Height of airwell Not more than 30 m 10 For each additional 3m height, Add 1 to the minimum size of		



AD SECTION G - Clause G.3.2.3

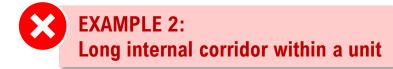
No part of any room or space (other than a room in a warehouse) that is designed for natural ventilation shall be located more than 12 metres from any window or opening that is used to ventilate the room or space.



Disclaimer: Graphics shown in this slide are for illustration purposes only and are not actual site conditions/drawn to scale.

AD SECTION G - Clause G.3.2.3

No part of any room or space (other than a room in a warehouse) that is designed for natural ventilation shall be located more than 12 metres from any window or opening that is used to ventilate the room or space.



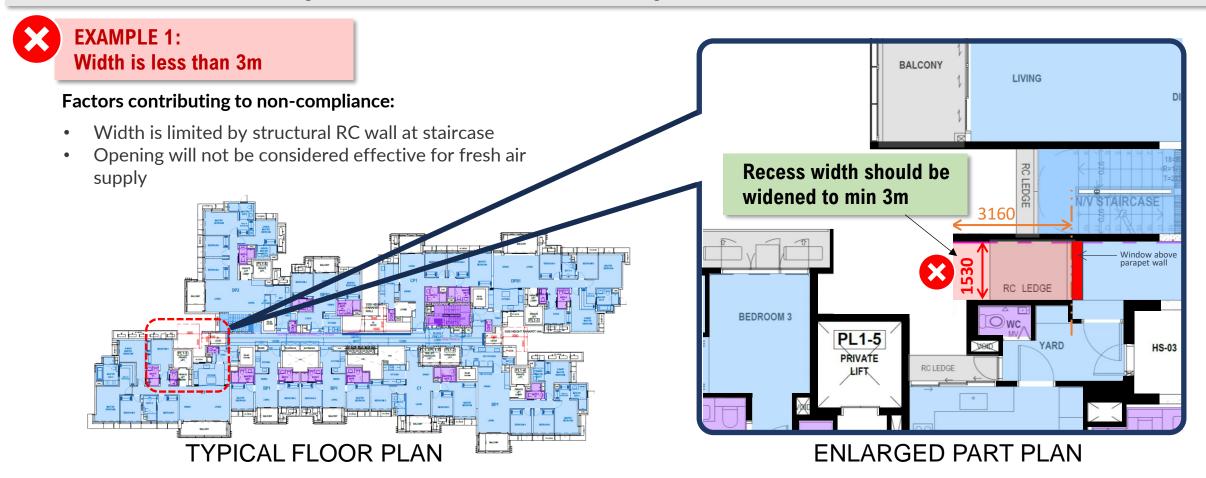
Factors contributing to non-compliance:

- Deep and long internal corridor
- End of the corridor terminates to a door with no through ventilation



AD SECTION G - Clause G.3.2.2.C

All windows and openings intended for natural ventilation shall be located such that they open to a recess, exceeding 3.0m from the external building wall, and of minimum width 3.0m.



Disclaimer: Graphics shown in this slide are for illustration purposes only and are not actual site conditions/drawn to scale.

AD SECTION G - Clause G.3.2.2.C

All windows and openings intended for natural ventilation shall be located such that they open to a recess, exceeding 3.0m from the external building wall, and of minimum width 3.0m.



Factors contributing to non-compliance:

- Width is limited by structural RC walls and RC columns
- Opening will not be considered effective for fresh air supply
- Review plans for 12m coverage from effective openings



Recess width should be widened to min 3m

TYPICAL FLOOR PLAN

COMMON NON-COMPLIANCES OBSERVED IN 2024

TECHNICAL REQUIREMENTS FOR HOUSEHOLD SHELTERS 2023 EDITION

Clause	Description
2	Determining Storey Height for Setback Distances of HS Walls
2.4.8	Void within Setback Distance of HS Walls (Without HS Door)
2.3.1	Wall Thickness of HS and NS



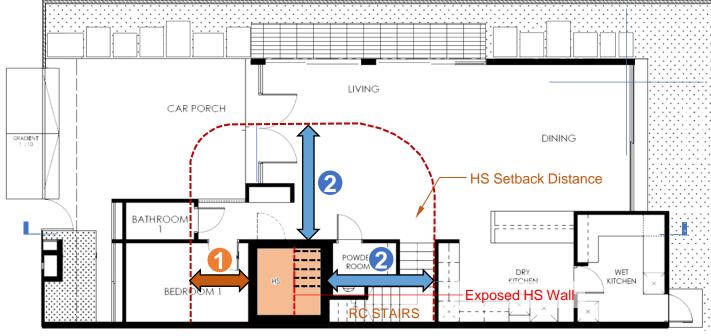
HOUSEHOLD SHELTERS CHAPTER 2

Determining Storey Height for Setback Distances of HS Walls

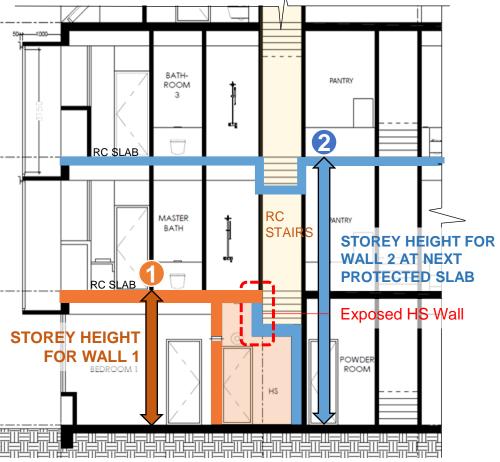
Semi-Detached House: Unprotected Wall

HS Wall 2 is encroached by stairs.

The upper part of Wall 2 is taken to be unprotected and therefore storey height needs to be considered at the next available protected storey.



1ST STY PLAN VIEW

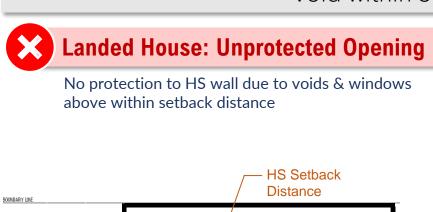


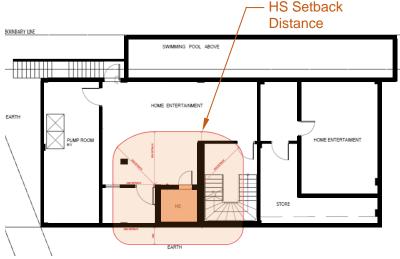
PART SECTION

Disclaimer: Graphics shown in this slide are for illustration purposes only and are not actual site conditions/ drawn to scale.

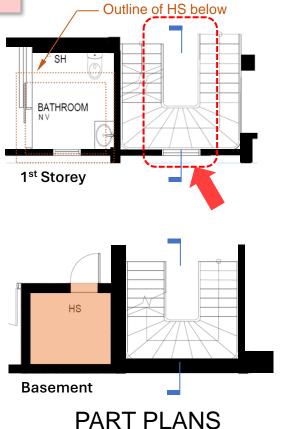
HOUSEHOLD SHELTERS CHAPTER 2 - Clause 2.4.8

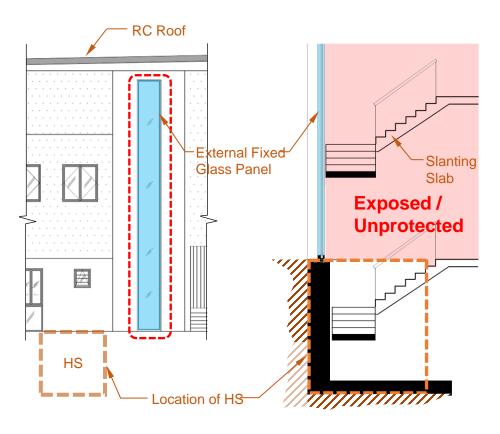
Void within Setback Distance of HS Walls (Without HS Door)





BASEMENT PLAN VIEW





PART ELEVATION

SECTION VIEW

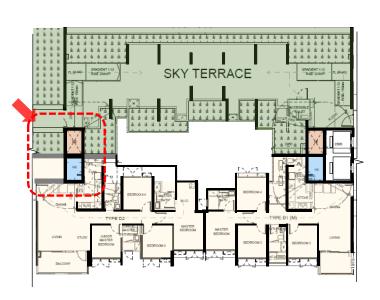
HOUSEHOLD SHELTERS CHAPTER 2 - Clause 2.4.8

Void within Setback Distance of HS Walls (Without HS Door)

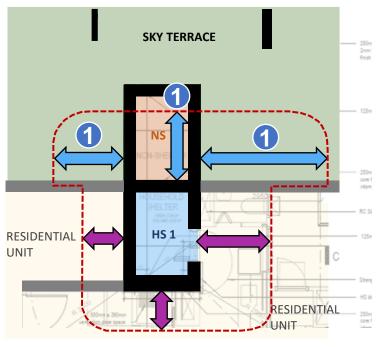


Non-landed residential: HS Tower with NS

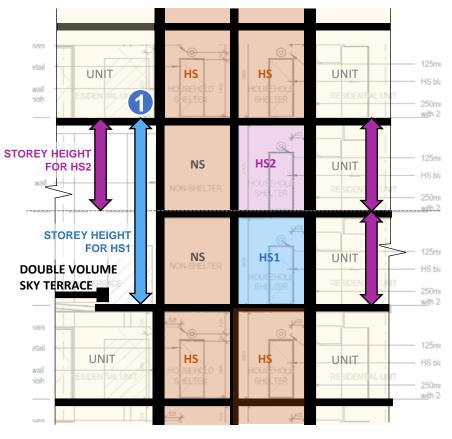
Identifying the storey height of NSs for the calculation of setback distance



PLAN AT SKY TERRACE



PART PLAN



PART SECTION

Disclaimer: Graphics shown in this slide are for illustration purposes only and are not actual site conditions/drawn to scale.

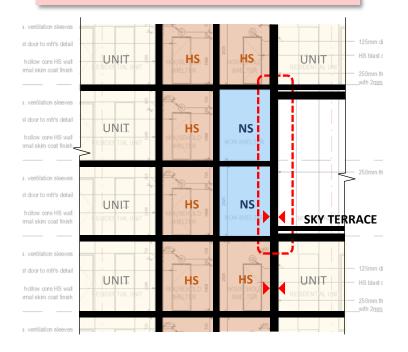
HOUSEHOLD SHELTERS CHAPTER 2 - Clauses 2.3.1

Wall Thickness of HS and NS

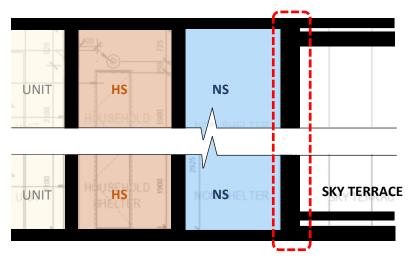
NS wall thickness follows the same wall thickness of the HS



Thicker wall requirement for NS wall



PART SECTION



PART SECTION

Table 2.3.1(b) Use of higher limits only for NS wall thickness

TABLE 2.3.1(b) MINIMUM HS AND NS WALL THICKNESS (FOR NON-LANDED DEVELOPMENTS)

Storey Height (mm)	HS Clear Height (mm)	Setback Distance of HS Wall (mm)	Wall Thickness (mm)
	2400 ≤ Ht ≤ 3000	≤ 6000	250
		> 6000	200
Ht ≤ 4000	3000 < Ht ≤ 3200	≤ 6000	275
		> 6000	225
	3200 < Ht ≤ 3900	≤ 6000	300
		> 6000	250
	2400 ≤ Ht ≤ 3000	≤ 7000	250
		> 7000	200
	3000 < Ht ≤ 3200	≤ 7000	275
4000 < Ht ≤ 6000		> 7000	225
	3200 < Ht ≤ 3900	≤ 7000	300
		> 7000	250
	2400 ≤ Ht ≤ 3000	≤ 8000	250
		> 8000	200
	3000 < Ht ≤ 3200	≤ 8000	275
$6000 < Ht \le 8000$		> 8000	225
	3200 < Ht ≤ 3900	≤ 8000	300
		> 8000	250
	2400 ≤ Ht ≤ 3000	≤ 9000	250
$8000 < Ht \le 10000$		> 9000	200
	3000 < Ht ≤ 3200	≤ 9000	275
		> 9000	223
	3200 < Ht ≤ 3900	≤ 9000	300
		> 9000	250

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APPROVED DOCUMENT UPDATES

❖ Updates to the Approved Document *Ver 7.07* (3 Mar 2025) applies to to all projects submitted to the Commissioner of Building Control (CBC) for approval on or after **01 Sep 2025**.

UPDATED SECTIONS

- B STRUCTURAL DESIGN AND CONSTRUCTION
- E STAIRCASES
- G VENTILATION
- H SAFETY FROM FALLING

- ENERGY EFFICIENCY
- K LIFTS AND ESCALATORS
- O PROTECTION FROM INJURY BY VEHICLES IN BUILDINGS

UPDATES TO APPROVED DOCUMENT

OVERVIEW

Intent

- Remove the reference to old, superseded Singapore/British Standards
 - Section B : Structural Design and Construction
 - Section H: Safety from Falling
 - Section O: Protection from Injury by Vehicles in Buildings
- To align with Amended BC regulations and Code on Accessibility
 - Section E : Staircases
 - Section K: Lift and Escalators
- Rules Relaxation
 - Section G: Ventilation
- To streamline energy efficiency requirements under the ES Regulations
 - Section I: Energy Efficiency

VENTILATION SECTION G

Rules relaxation

NEW VERSION 7.07

G.3.2 Natural ventilation

Note: Except otherwise stated in the following, any openable window or opening may be considered to be unobstructed and for the purposes of paragraph G.3.2.1, the effective open area may be taken as the entire area of the opening.

(c) For windows other than sliding types (e.g. top hung windows, casement windows) that are installed with a fixed restrictor which does not allow the opening of the window beyond a certain angle, the effective open area shall be determined in accordance with the following formula.

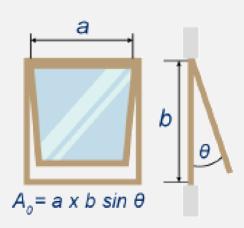
Effective open area = internal clear width X internal clear height X sin θ

Where:

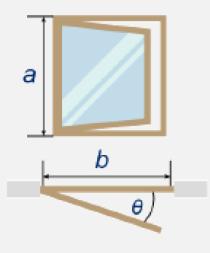
 θ (theta) is the maximum angle formed between the open edge of the window and the frame when the window is fully opened. Internal clear width is the unobstructed width of the window opening. Internal clear height is the unobstructed height of the window opening.

Illustrations:

Top-hung Window



Casement Window (Open Outward)



 A_0 = Effective open area (sqm) A_0 = a x b x sin θ

LIFTS AND ESCALATORS SECTION K

NEW VERSION 7.07

Definition added for clarity

K.2 Performance Requirement

K.2.2 A building comprising 5 or more storeys (including the ground level and any basement level) shall be provided with one or more passenger lifts.

Clarification:

Mezzanines and Attic floors are generally excluded from the storey count when determining minimum lift provisions. However, these floors must comply with the relevant requirements of the Code on Accessibility, where applicable.

QR Codes

Please scan the QR Codes for Approved Document version 7.07 and Understanding the Approved Document version 3.0

Approved Document V7.07



https://go.gov.sg/approveddocument

Understanding the Approved Document V3.0



https://go.gov.sg/understandingappdo

Thank You







Lightning Protection System (LPS) Plan Submissions

Implementation Date: 1 April 2026

ER. TAN KENG SWEE

Principal Engineer

BUILDING PLAN & POLICIES DEPARTMENT BUILDING PLAN & MANAGEMENT GROUP







CONTENT

- 1. OBJECTIVE
- 2. KEY DUTIES OF RELEVANT STAKEHOLDERS
- 3. LPS PLAN
- 4. LPS AMENDMENT & RECORD PLAN
- 5. LPS INSIGNIFICANT BUILDING WORKS
- 6. LPS PLAN CHECKLIST AND FAQ







OBJECTIVE

To inform the industry about the upcoming implementation of submission of Lightning Protection System (LPS) Plans.

Currently, the BC Regulations mandates the provision of a Lightning Protection System with the Design PE submitting the **as-Built LPS Plan during TOP/CSC Application** at Completion Stage.

To enhance upstream design coordination and minimise downstream non-compliances at project Completion Stage, the revised BC Regulations will now require the PE to submit the LPS Plan(s) upfront as part of Building Plan (BP) submission to BCA.



IMPLEMENTATION DATE

To give industry more time to familiarise with the LPS plan submission requirements, implementation will be phased out.

As a start, with effect from 1 April 2026, where developers are required to obtain Commissioner of Building Control ("Commissioner") approval of plans for the proposed building works and no such plans have been submitted to the Commissioner before 1 April 2026, developers of (a) proposed developments with gross floor area of 30,000m² or larger and (b) for which LPS building works are carried out on or after 1 April 2026, must obtain Commissioner's approval of LPS Plans (where applicable) before carrying out the LPS building works.



KEY DUTIES OF RELEVANT STAKEHOLDERS

I. The key duties of developers and builders are:

- a) Appoint a professional engineer registered under the Professional Engineers Act 1991 in the branch of electrical engineering **to prepare** the LPS plan(s) ("**PE(Design**)"); and
- a) Appoint a professional engineer registered under the Professional Engineers Act 1991 in the branch of electrical engineering **to supervise** the installation of the LPS and related building works ("LPS building works") ("PE(Supervision)").

Notes:

- a) Where no such engineer has been appointed by the Developer, the Builder is required to appoint an appropriate professional engineer for the LPS works;
- b) The professional engineer for preparation of plans and supervision of the works can be the same person.

II. Professional Engineers

1. Key duties of PE(Design) are:

- a) Prepare and submit LPS plan(s); and
- b) Ensure the LPS building works are designed in accordance with SS555 Singapore Standard for Protection Against Lightning.

2. Key duties of PE(Supervision) are:

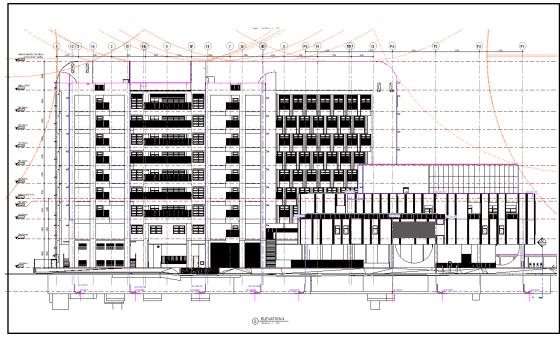
- a) Supervision of the LPS building works to ensure the LPS building works are carried out in accordance with the approved plans;
- b) Ensure the LPS building works are in accordance with SS555 Singapore Standard for Protection Against Lightning Part 1 to Part 3; and
- c) Submit Certificate of Supervision of LPS works during TOP/CSC application

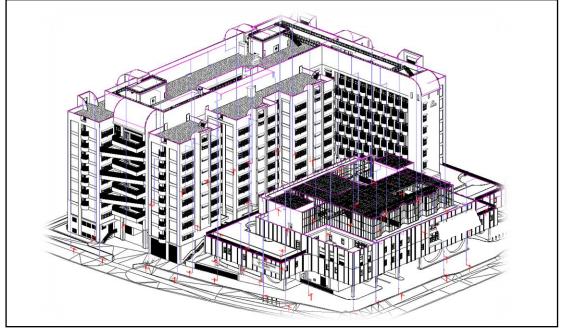


BIM and IFC-SG Requirement

LPS plans can be submitted in lightweight BIM format.

Project teams interested in 3D submissions can also consult BCA on submitting in IFC-SG format.

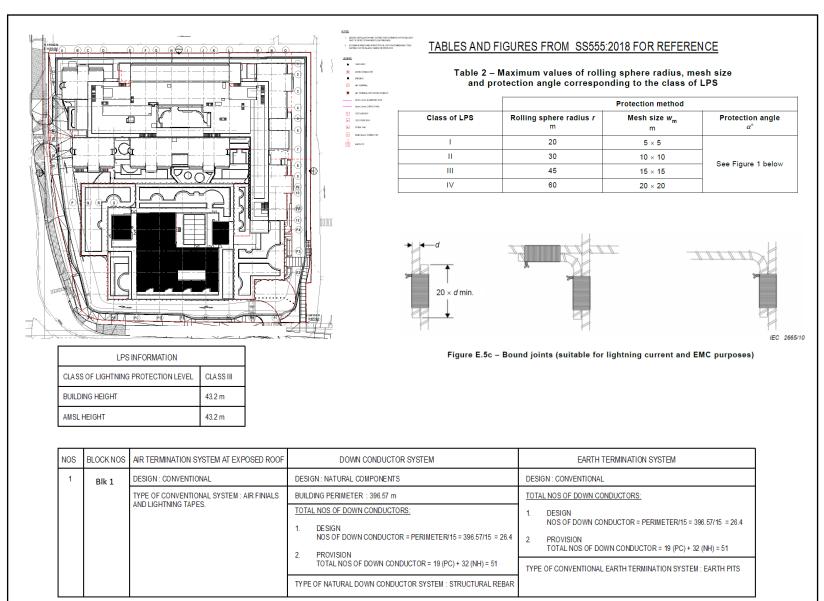




Lightweight BIM Format

IFC-SG Format

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Information to be shown on LPS Plan:

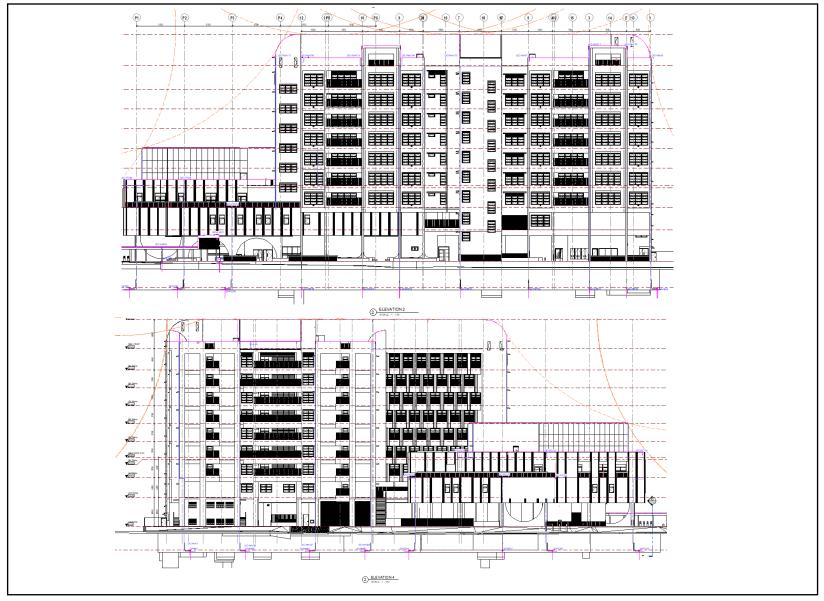
1. Site Plan

- Location and layout of the site with boundary lines
- Outlines of the buildings to be erected or building in which building works are to be carried out
- Class of LPS
- Legends
- Roof Perimeter \ Nos. of down Conductor
- Submission Number

2. Roof Plan

- Air-termination system
- Location of the down conductors

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Information to be shown on LPS Plan:

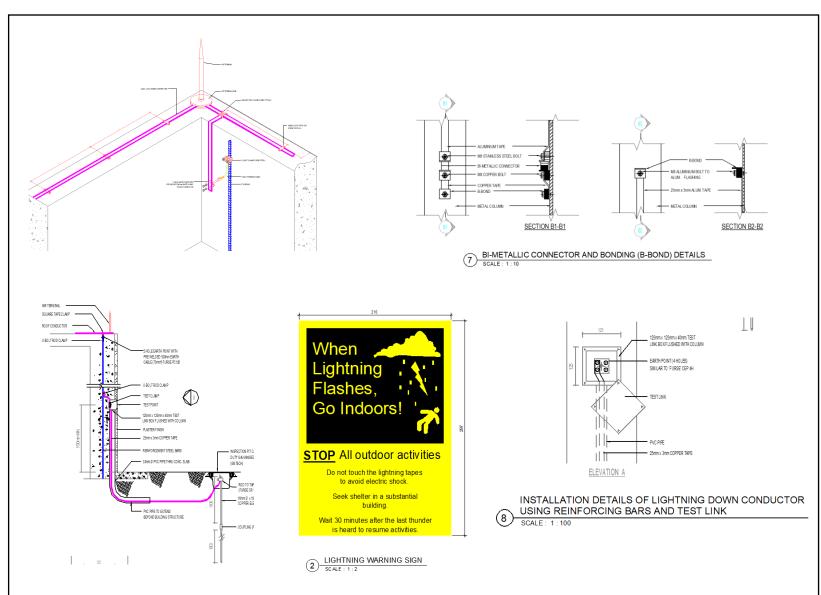
3. Elevations

- Zones of lightning protection provided by the airtermination network for the open roof spaces and the sides of the building
- Location of the down conductors

4. Floor Plans

 Floor plan of each storey where the earth electrodes are located

Disclaimer: Graphics shown in this slide are for illustration purposes only and are not actual site conditions/ drawn to scale.



Information to be shown on LPS Plans:

5. One or More Plans containing:

- Details and the location of the points where there is equipotential bonding between the air-termination system, downconductor system and earthtermination system
- Details and the location of the points where there is equipotential bonding of the lightning protection system to electrically conductive parts of the building (except mechanical and electrical services)

Disclaimer: Graphics shown in this slide are for illustration purposes only and are not actual site conditions/ drawn to scale.

SUBMISSION OF LPS AMENDMENT/RECORD PLANS

For material change(s) in LPS building works that deviate from the approved LPS plan, the Professional Engineer(Design) is required to submit an amendment plan and obtain approval from the Commissioner of Building Control ("Commissioner") prior to the commencement of the relevant LPS building works. For immaterial change(s) to LPS building works that deviate from the approved building plan, the PE(Design) is required to submit a Record Plan.

LPS Material Changes

- 1. Change in Class of LPS
- 2. Change in Building Height
- 3. Change in LPS design involving a change from conventional tapes to natural components or vice-versa
- 4. External Building Works are added to the approved plan

INSIGNIFICANT LPS BUILDING WORKS

LPS plan submission is not required for LPS building works involving one to one replacement or reinstatement of any LPS, or any repairs to any existing LPS, where these LPS building works are carried out on its own or together with other building works that do not require plan approval by the Commissioner of Building Control ("Commissioner").



LPS Checklist & FAQ

Please scan the QR Codes for more information on LPS Plan Submission Checklist, FAQ on LPS submission and Form BPD_CSC03.





Thank You







Good Practice Guide on Wind-driven Rain for High-rise Residential Developments

Published date: 1 March 2025

AR. CHRISTINA SEET

Senior Architect

CORENET X PROJECT OFFICE
BUILDING PLAN & MANAGEMENT GROUP







CONTENT

- 1. PURPOSE OF GUIDE
- 2. WDR AND ITS IMPACT ON BUILT ENVIRONMENT
- 3. OUTLINE OF CONTENT
- 4. KEY DESIGN STRATEGIES
- 5. DOWNLOAD A COPY OF THE GUIDE







OVERVIEW AND PURPOSE OF GUIDE

The Guide is produced by the WDR Taskforce initiated at the Inter-Agency Coordinating Committee, co-led by SIA and BCA, with members from URA, HDB, SCDF, REDAS & ACES.

The Guide provides a set of practicable passive design strategies to minimize the impact of WDR. Mitigation strategies and measures should be considered early in the upfront planning and design stages to minimize the need for ad-hoc downstream reactive interventions.

The recommendations of the Guide does not eliminate the effects of WDR. The relevant strategies applied should be calibrated in its implementation to meet the needs of each unique site context.

While incorporating design strategies to mitigate WDR, there is no change to the statutory responsibilities of Qualified Persons

Co-led by

















WIND-DRIVEN RAIN AND ITS IMPACT ON BUILT-ENVIRONMENT

Singapore is experiencing the effects of climate change with erratic and sudden changes in weather condition, from higher surface air temperatures to increased occurrences of lightning and intense rainfall. When coupled with strong winds, wind-driven rain can become a common occurrence. Extreme wind-driven rain occurrences has impacted the liveability of residential buildings in aspects not limited to the following:

- ponding in corridors;
- inadequate rainwater discharge thru' drainage system;
- slippery wet floor surfaces;
- rainwater seepage into lift shafts;
- deterioration of entrance door surface material;
- malfunctioning entrance lockset mechanism; and
- rainwater seepage into units

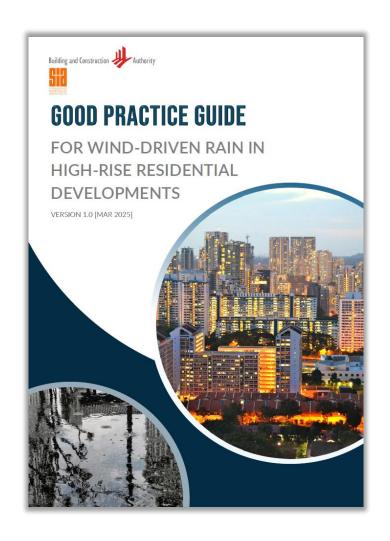




OUTLINE OF CONTENTS OF WDR GUIDE

The WDR Guide covers the below content:

- Acceptance criteria
- Site and form
- Building design considerations
 - Ventilation openings
 - Lift lobby
 - Material
 - Unit entrances
 - Internal unit layout
 - Drainage
- Simulations, test and on-site intervention
- References and resources for Industry



ACCEPTANCE CRITERIA

A recommended set of acceptance criteria during wet weather to demonstrate what should be expected in safeguarding usability of spaces in residential developments. Users are also expected to have taken reasonable measures to keep the spaces shielded from rain e.g. closed windows

Homeowners & MCSTs continue to play important roles in the regular maintenance & housekeeping of the property & facilities

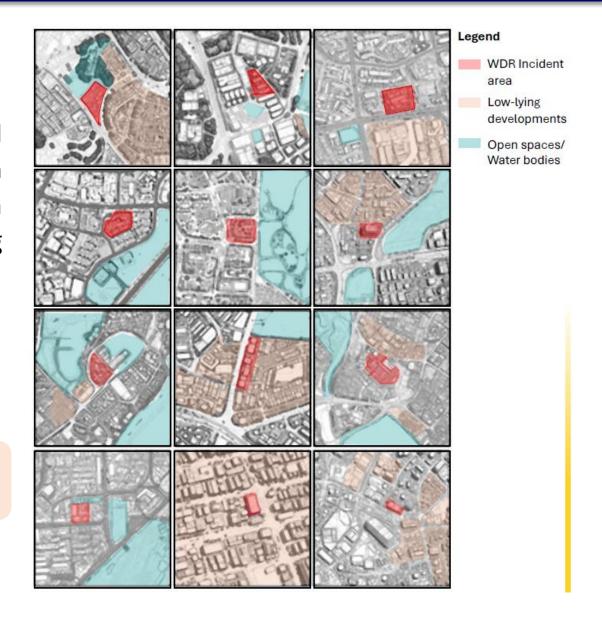
Type of space	Acceptance criteria	Considerations
Common areas e.g. Sky gardens	Splashing of rain	Amenities generally for non-wet weather activities
Corridor spaces	Some splashing of rain, water flowing in right direction towards outlet	Transient zone between units and vertical circulation towards other amenities
Lift entrance	No direct splashing of rain	To minimise residents' exposure to rain when entering and exiting the lift
Unit entrance	No direct splashing of rain, some wetness, no ponding	Ensure residents can manoeuvre, unlock doors & access units with minimal disruption
Unit living spaces	No wetness	Not to disrupt daily living
Unit balconies	Some splashing of rain	Naturally ventilated semi- outdoor transition zone between internal unit living space & outdoors

MICRO-CLIMATE

Based on the incidents recorded, non-landed residential developments can experience high velocity horizontal trajectory of wind-driven rain droplets into façade openings with the following conditions:

- adjacent open spaces such as open fields;
- adjacent water bodies; and
- low-lying surrounding developments

Projects at locations with similar site conditions may be prone or susceptible to WDR occurrences

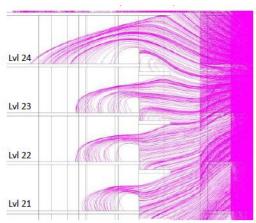


WDR EFFECTS ON HIGH-RISE RESIDENTIAL DEVELOPMENTS

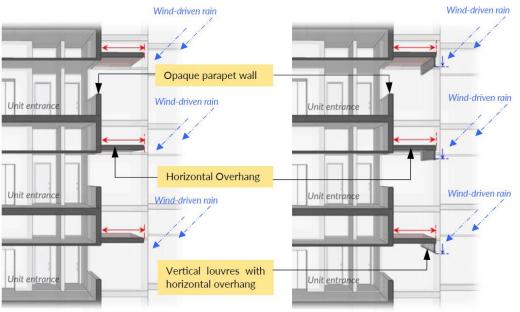
With reference to wind velocity profile, buildings located on higher topography & higher levels of the block generally experience higher wind velocities.

For residential developments that adopt a slab block profile, this means ingress of wind-driven rain can affect lower levels, while topmost levels are most susceptible to severe penetration of WDR.

Due to the horizontal trajectory of raindrops from WDR, vertical elements such as vertical louvers/ fins and perforated screen perform better at mitigating WDR while the horizontal elements are more effective in reducing upward trajectory of WDR



Simulation showing trajectory & penetration patterns of WDR



Adoption of a hybrid of both horizontal and vertical façade to mitigate WDR

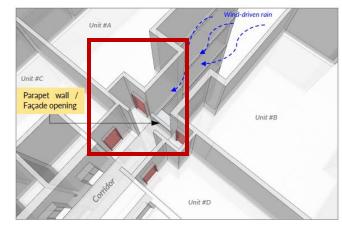


DESIGN CONSIDERATIONS FOR COMMON CORRIDOR SPACES

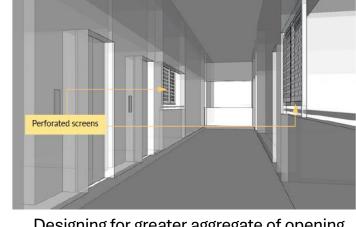
The following are examples of design considerations to mitigate rainwater ingress at areas prone to wind-driven rain, especially common corridors. These include:

- Entrance orientation
- Setback of entrances
- Sloped thresholds at lifts
- Installation of perforated screening

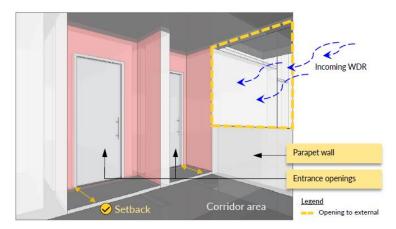
Building designers should be discerning in the adoption of strategies to strike an appropriate balance between mitigating water ingress and achieving the design intent



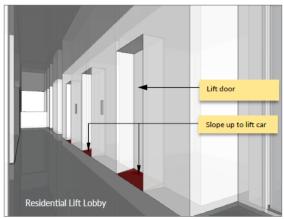
Orientating entrances away from openings



Designing for greater aggregate of opening than required for installation of perforated screening



Sufficient set back of entrances from corridor and external opening



Sloped threshold at lift lobbies

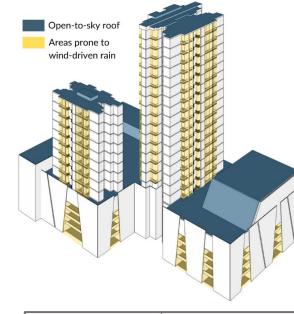


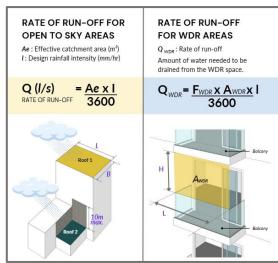
OVERALL DRAINAGE SYSTEM DESIGN FOR WDR PRONE AREAS

The Guide also complements the refreshed Singapore Standards SS525 through the provision of guidelines for the design of drainage systems.

It offers considerations for effective drainage of surface water from roofs, walls and spaces subject to wind-driven rain (WDR). The standard outlines recommended methods for the design and installation of gutters, downpipes, outlets and scuppers

The adoption of siphonic systems with compact piping and outlet sizes are specific to roof drainage systems. The same sizes should not be assumed to be effective when applied to weather exposed spaces in the intermediate levels of the development





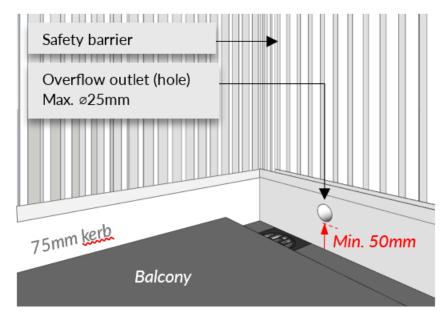


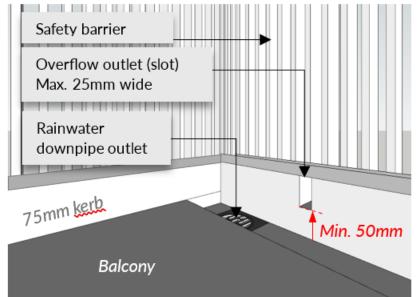
DRAINAGE DESIGN FOR WDR PRONE AREAS – BALCONY DESIGN

During heavy rainfall, the existing drainage system may prove inadequate to manage the volume of water.

To mitigate this, secondary solutions could be implemented such as overflow pipes or slot holes. These additional drainage points can help manage excess water when the primary drainage system is overwhelmed and prevent water from backflowing into the unit. These overflow holes should be positioned at least 50mm above the level of the rainwater outlet.

Building designers should take note not to obstruct the overflow pipes and slot holes for effective discharge





GOOD PRACTICE GUIDE ON WDR FOR HIGH-RISE RESIDENTIAL DEVELOPMENTS

Please scan the QR Code for a copy of the guide



https://go.gov.sg/wdrguide

Thank You







TOP/CSC Inspection Common Findings and Smart Initiatives

BENNY LAU

Senior Engineer

BUILDING CERTIFICATION & OPS PLANNING DEPARTMENT AUDIT & INSPECTION GROUP





CONTENT

- COMMON FINDINGS AND TRENDS FROM TOP/CSC
 & ENVIRONMENTAL SUSTAINABILITY INSPECTIONS
- * RECENT CIRCULAR AND REMINDERS
- ❖ SMART INITIATIVES FOR TOP/CSC INSPECTIONS





TOP/CSC INSPECTION COMMON FINDINGS AND TRENDS



INSPECTION COMMON FINDINGS OBSERVED IN 2024

TOP 10 SAFETY CRITICAL NON-COMPLIANCES

Lightning Protection System

Compliance to SS 555 (e.g. provision of LPS signage, bonding, LPS tape materials etc.)

Headroom

The headroom shall not be less than 2.0m.

Safety Barrier Height

A barrier must be at least 1m high.

Barrier Climbability

A barrier must be at least 850mm when measured from the last climbable toehold

Uniformity of Treads and Risers

A tolerance of 5mm between two consecutive steps in staircases.

Safety Barrier

There must not be any gap (75mm) at the lowest part of the barrier.

Barrier Gap Size

Size of opening in a barrier must be less than 100mm for non-industrial buildings

Safety From Falling

Appropriate measures shall be taken to prevent people from falling from a height of ≥1m

Riser Height

Height of riser shall not be more than 175mm

Ventilation

Natural ventilation or mechanical ventilation complying to SS553 must be provided.

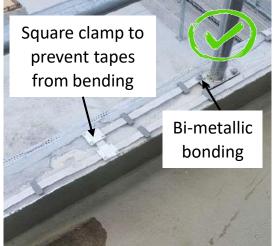
LIGHTNING PROTECTION SYSTEM

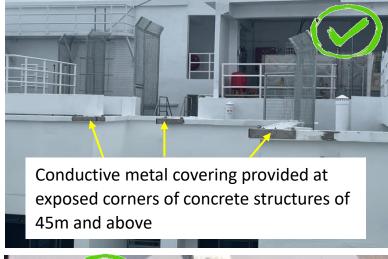
AD SECTION L - Clause L.3.1

Lightning Protection System to be designed and in accordance with SS 555.





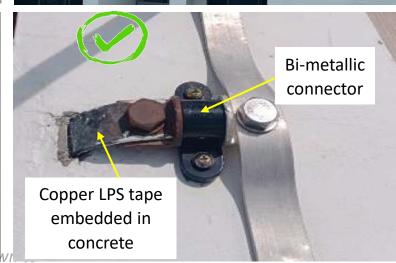












HEADROOM AND CEILING HEIGHT

AD SECTION C - Clause C.3.2.1

The <u>headroom</u> of every room, access route and circulation space shall <u>not be less than 2.0 metres</u>.



< 2.2m

pipes







Protruding windows are acceptable in circulation areas with provision of guardrail/planter strips but kept within the width of the guardrail and planter strip*

Disclaimer: Graphics shown in this slide are for illustration purposes only and are not actual site conditions/ drawn to scale.

< 2.2m

^{*} the protrusion should not reduce the width of accessible route

SAFETY FROM FALLING

AD SECTION H - Clause H.3.2.1 and H.3.4A.1

A barrier must have a height no less than the height specified in paragraph H.3.2.1 or 850mm when measured from the last climbable toehold



Barrier height is less than 850mm when measured from last climbable toehold

No measure taken to prevent fall

Barrier height is less than 1m when measured from foothold*

Surface with gradient gentler than 45deg and is at least 150mm (L) x 150mm(W) is considered a foothold



RISERS AND TREADS

AD SECTION E - Clause E.3.4.4

The risers and treads within each flight of stairs shall be of uniform height and size



SIZE OF OPENING

AD SECTION H - Clause H.3.4.1

There must not be any gap, from the finished floor level to a height <u>no less than 75 mm</u>, at the lowest part of a barrier.

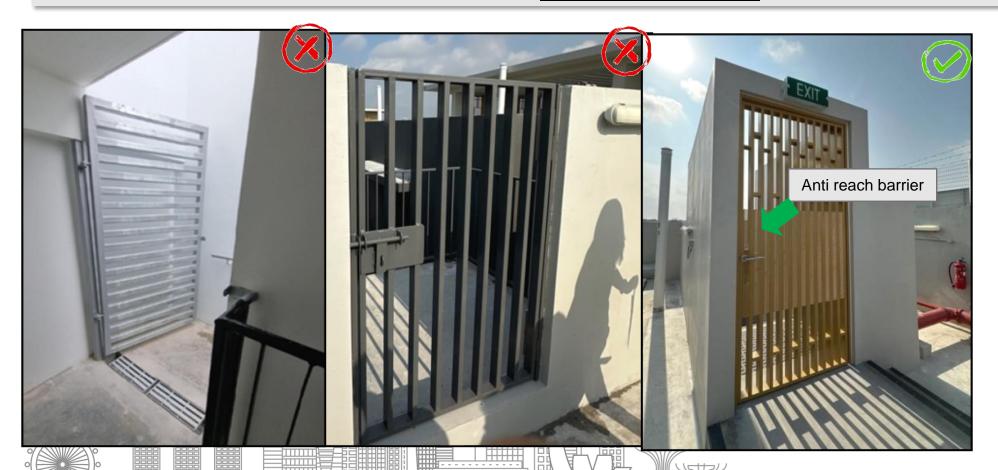


SAFETY FROM FALLING

AD SECTION H - Clause H.2.2

Other common NC

The requirements in paragraphs H.2.1, H.2.1A and H.2.1B do not apply to any roof or maintenance area which is <u>not easily accessible</u>



Maintenance door shall be equipped with:

- ✓ Self-closing mechanism
- ✓ Self locking system
- ✓ Access control system

LIFTS AND ESCALATORS

AD SECTION K - Clause **K.3.1** AC 2019 - Clause **4.8.2.6**

Other common NC

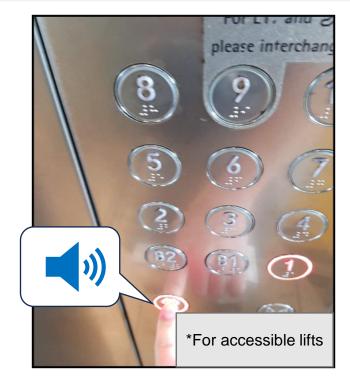
Lifts and Escalators are provided with a video recorder A momentary audible announcement must be provided to signal each call registered and the storey reached.



Approved Document

provided with a video recorder that has the following minimum specifications –

- a. Capacity to record 24 hours a day, 7 days a week;
- b. Capture footage of the entire lift car including in-car floor indicator, lift car door(s) and landing area outside the lift car in front of the lift doors:
- c. Frame rate of at least 6 frames per second;
- Video resolution of at least 352 x 240 pixels or CIF CCTV resolution; and
- e. Storage of video footage for at least 30 days;



ACCESSIBLE WASHROOMS & ALIGHTING AND BOARDING POINTS

AC 2019 - Clause **5.2.1** AC 2019 - Clause **3.3**

Other common NC

ACCESSIBLE INDIVIDUAL WASHROOMS



Common findings for accessible washrooms:

• Missing items such as hooks, mirror, bidet spray, call bell, etc.

- Missing horizontal bar on door
- No min. 300mm space on push side for door due to basin obstruction

PASSENGER ALIGHTING AND BOARDING POINTS





ENVIRONMENTAL SUSTAINABILITY INSPECTION COMMON FINDINGS AND TRENDS



INSPECTION COMMON FINDINGS OBSERVED IN 2025

BUILDING CONTROL (ENVIRONMENTAL SUSTAINABILITY) REGULATIONS 2008

Requirement	Description under ES Code 4 th edition
NRB02-2(a)	Building entrances and door openings [between conditioned spaces and] building exterior or non-airconditioned spaces and the like shall be provided with doors that are equipped with automated technology or self-closing devices.
NRB06-4(a)	Air handling units (AHUs) of cooling capacity greater than 35 kW shall be floor mounted as stipulated in SS 553.



Q: For warehouses, under NRB02-2 "Openings between Conditioned and Non-Conditioned Spaces", if automatic self-closing roller shutter cannot be implemented, what else can done?

- Roller shutters might remain open while the airconditioning is operating.
- To prevent air leakage, implement notification system (e.g. audible alarms / warning lights) as reminder to close shutters after use.



Light is on (center) when the roller shutter is opened (left) and off when closed (right).

BCA INDUSTRY SHARING SESSION ON BP/TOP PRACTICES AND REGULATORY UPDATES 2025

Q: Will **AHUs mounted on platforms** be acceptable to comply with NRB06-4?

AHUs are deemed as floor mounted if they sit on platform with clear path to a floor that is accessible by lift or staircase, to the building exterior.

Provide non-labour intensive means to transport AHU fan/motor out of the building for maintenance

AHU on platform accessible by staircase for regular maintenance

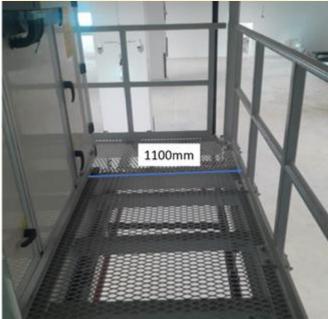
not actual site conditions/drawn to scale.

Level 1 AHU

Lifting points provided to allow chain blocks to be used to transport AHU fan/motor



QPs are reminded to meet AHU clearance requirements, and relevant provisions (e.g. platforms serving as exit passageway to meet fire code).



BCA INDUSTRY SHARING SESSION ON BP/TOP PRACTICES AND REGULATORY UPDATES 2025

NRB06 Maintenance of Building Cooling System

Chillers

- NRB6-1(a) In front of chiller: ≥2m
- NRB6-1(b) Between chillers' plinth: ≥1.2m
- NRB6-1(c) Above chiller: ≥1.5m

Pump Systems

- NRB6-2(a) Clearance space around pumps: ≥0.6m
- ➤ NRB6-2(b) Above pumps and their motors : ≥1m

Cooling Towers

- ➤ NRB6-3(a) Cooling tower: ≥600mm platform/catwalk with staircase access for cooling tower facing with fins
- NRB6-3(b) Above cooling tower: ≥2m

Air Distribution System

- NRB6-4(a) ≥ 35kW AHU to be floor mounted.
- NRB6-4(b) 4 AHU access space: Ranging from 1m to 600mm
 - i. AHU door entrance clearance: ≥1.0m
 - ii. AHU Cooling coil pipe and filter access: ≥800mm
 - iii. AHU Fan access: ≥800mm
 - iv. AHU side and back clearance: ≥600mm



• ≥0.6m clearance space around pumps

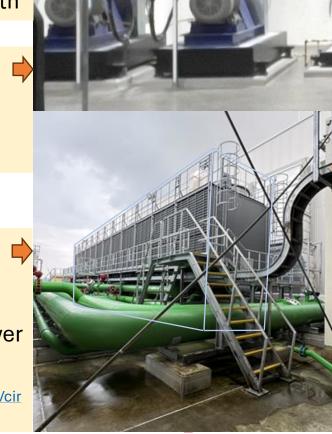
 ≥1m above pumps and their motors

 Cooling tower with platform/catwalk with staircase access

≥2m above cooling tower

(Refer to BCA Circular, released on 22 Mar 2024 for more details

https://corenet.gov.sg/media/2391958/circular_es-code-_gm_22mar2024.pdf)



Please refer to the FAQ on BC(Environmental Sustainability) for more details:



https://www1.bca.gov.sg/do cs/default-source/docs-corpbuildsg/sustainability/faq-onenvironmental-sustainabilityrequirements.pdf

FAQ

- Building Control (Environmental Sustainability)
 Regulations 2008
 - [Regulatory Requirements for New Buildings and Existing Buildings Undergoing Major Additions and Alterations (A&A)]
- Building Control (Environmental Sustainability)
 Regulations 2013
 [Regulatory Requirements for Existing Buildings]
- Periodic Energy Audit and BCA Energy Auditor Scheme
- Mandatory Energy Improvement Regime

RECENT CIRCULAR AND REMINDERS



RECENT CIRCULAR AND REMINDERS

<u>Issued on 2 Dec 24</u>: Required Site Conditions and Completion of CONQUAS and QM Assessments <u>before</u> <u>TOP/CSC Inspection.</u>

OBSERVATIONS ON UNACCEPTABLE SITE CONDITIONS

- Increasing number of sites calling for inspections pre-maturely.
- Liveability issues observed during TOP inspection (Water seepage, damaged flooring etc.).
- All building works must be completed and residential developments must be in liveable condition.











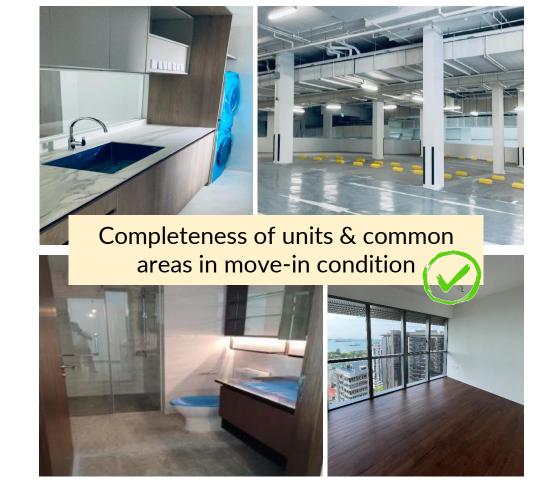




<u>Issued on 2 Dec 24</u>: Required Site Conditions and Completion of CONQUAS and QM Assessments <u>before</u> <u>TOP/CSC Inspection.</u>

COMPLETION OF CONQUAS AND QUALITY MARK ASSESSMENTS

- Project are required to complete all relevant assessments before applying for TOP/CSC inspections (under T&Cs for CONQUAS/QM).
- With effect from 1st June 2025, BCA would not proceed with TOP/CSC inspections if CONQUAS/QM assessments have not been completed.
- Developers and QPs to ensure the following requirements are met before applying for TOP/CSC inspections:
- a) Ensure all building works are completed and in a liveable state; and
- b) Ensure all CONQUAS/QM assessments (if applicable) are completed.



<u>Issued on 2 Dec 24</u>: Required Site Conditions and Completion of CONQUAS and QM Assessments <u>before</u> <u>TOP/CSC Inspection</u>.

CONSEQUENCE OF INCOMPLETE SITE

- False declaration of incomplete works and non-compliance with the regulatory requirements is an offence under Section 43A of the BC Act
- Immediate termination of TOP/CSC inspection and requiring a re-inspection
- Restricting Express TOP/CSC inspections and applications for current and future projects
- Requiring the submission of 360 Captures of the project prior to re-inspection and before the inspection of future projects



<u>Issued on 2 Dec 24</u>: Required Site Conditions and Completion of CONQUAS and QM Assessments <u>before</u> TOP/CSC Inspection.

UNACCEPTABLE SITE CONDITIONS

 No safe and proper access to or within the project sites













<u>Issued on 2 Dec 24</u>: Required Site Conditions and Completion of CONQUAS and QM Assessments <u>before</u> **TOP/CSC Inspection**.

UNACCEPTABLE SITE CONDITIONS

- No safe and proper access to or within the project sites
- Incomplete building works, approved document and accessibility requirements











<u>Issued on 2 Dec 24</u>: Required Site Conditions and Completion of CONQUAS and QM Assessments <u>before</u> <u>TOP/CSC Inspection</u>.

UNACCEPTABLE SITE CONDITIONS

- No safe and proper access to or within the project sites
- Incomplete building works, approved document and accessibility requirements
- Liveability issues













Reminder on Circular Ref. BCA BC APPBCA-2017-01

- Approval of plans detailing the framing and fixing of engineered building façade and safety barriers are required under the BC Act.
- QPs are reminded to submit listings of engineered façade and safety barriers during application for TOP/CSC.

Reminder on Circular Ref. APPBCA-2022-19

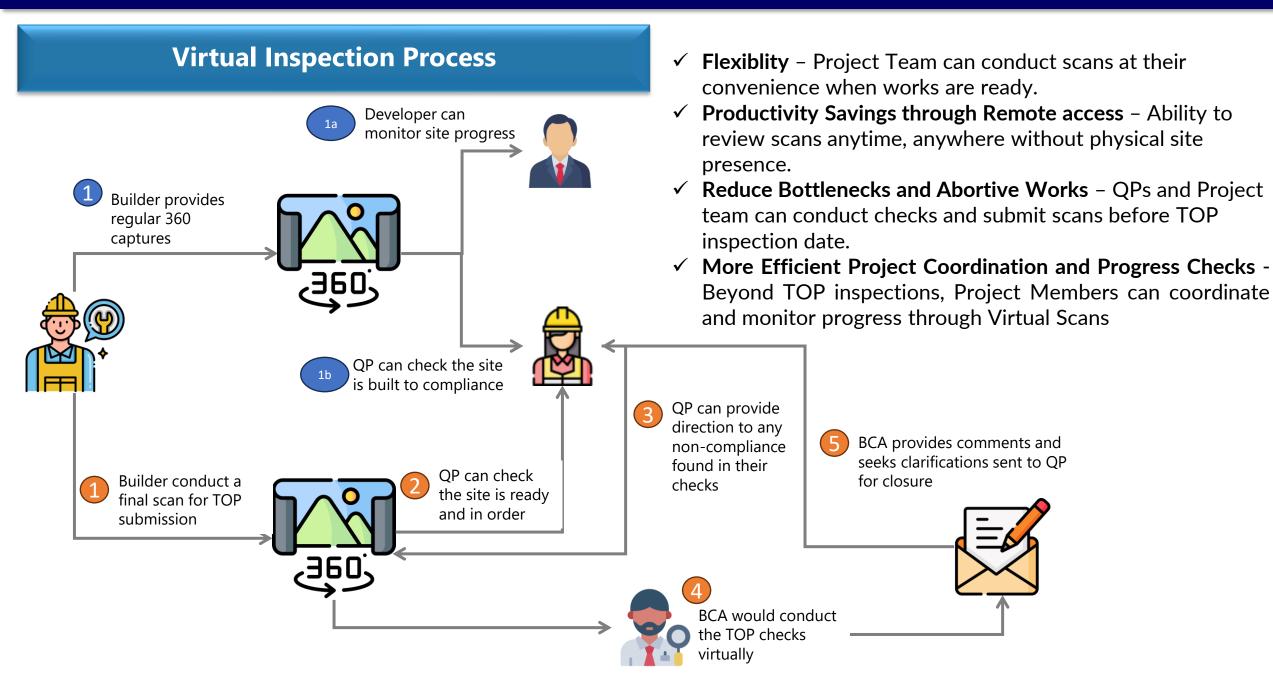
- Projects to obtain CSC clearances within two years from BCA TOP issuance.
- Where unable to meet the timeline, QPs are to:
 - a) Update technical agencies on the list of regulatory requirements that have not been complied; and
 - b) Set out a schedule of timeline to meet the requirements





SMART INITIATIVES FOR TOP/CSC INSPECTIONS





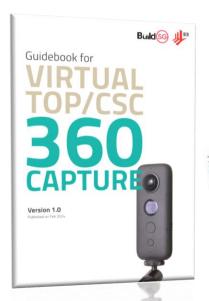
BCA INDUSTRY SHARING SESSION ON BP/TOP PRACTICES AND REGULATORY UPDATES 2025

Virtual TOP Journey

BCA worked with JTC to pioneer virtual inspection at SemiconSpace in 2022.

Thru the experience, shape the virtual TOP process and requirements





Developed the guidebook for VI for industry to adopt the processes.





Mega projects like PDD adopted a hybrid Virtual TOP inspection where the project was divided into areas covered by virtual inspections and key areas covered under physical inspection.

2023



Pilot with Teambuild at Keat Hong Verge to work out Virtual inspection for HDB projects



Inaugural Smart inspection Seminars to share the use of virtual 360 capture as an alternate TOP inspection 2024



Pilot with CDL at City Square Mall A&A to complete inspections with the mall's continuous operation.

BCA-HDB focus group sessions to share with builders on virtual TOP processes 2025



Working closely with Solution Providers on R&D to advance 360-degree capture technologies

VIRTUAL TOP





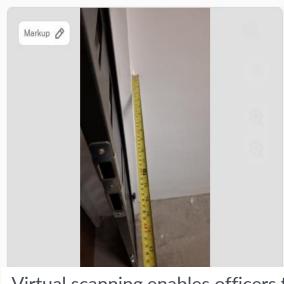


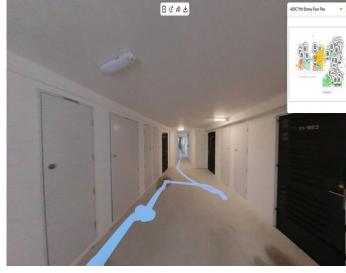
Grove Spring @ Yishun











Virtual scanning enables officers to annotate issues directly onto the scan, allowing the project team to rectify them immediately.



Savings of up to ~60% in the inspection process

BCA completing their inspection process within 3 days

More than 50 projects have completed virtual inspections with the support of industry partners

OUR PARTNERS



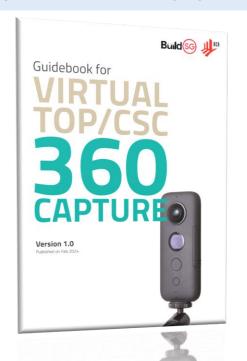






Guidebook for Virtual TOP/CSC

The Guidebook help guide on the different processes in a virtual inspection for TOP/CSC to help answer the key questions that the industry have.





Pre-consultation between project team and BCA officers

Capturing (by project team)

Inspection (by BCA officer)

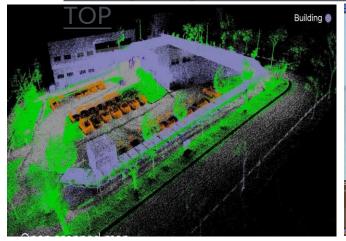
What's next

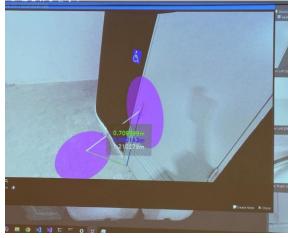


Developing Al automation in Virtual inspection



Setting out guideline for other VI technologies for





Exploring with solution providers to develop auto detection and measurements of items in the Virtual inspection scans to reduce the clearance time Exploring other technologies like LiDAR that can overcome limitations (accuracy of dimensions). Development of guidelines for Virtual Inspection (LIDAR) process to enable an alternative for Virtual Inspection apart from 360 captures

SMART INSPECTION SEMINAR

HARNESSING DATA FROM OPS TECH ENABLED INSPECTIONS FOR BUSINESS IMPACT

For GPEs, Developers, QPs, Builders & Solution Providers



22 May 2025, 9am to 5pm BCA Academy

WHAT TO EXPECT:

Seminar, 9am to 12noon:

- ✓ Agencies' plans for the industry
- ✓ Industry success stories

Vendor tradeshow and tech talks, 130pm to 5pm:

- ✓ Various solution providers in one place
- ✓ Live demonstrations
- ✓ Networking opportunities

Thank You







Evidence-Based Approach for Inspection of CD Shelters for TOP/CSC Application

ER. TEOH HOW MENG

Senior Engineer

ENGINEERING & ENFORCEMENT DEPARTMENT AUDIT AND INSPECTION GROUP







CONTENT

- OBJECTIVE
- RECAP ON CIRCULAR ISSUED ON 2 SEP 2024
- CD SHELTER INSPECTION REPORT
- VIDEOS OF COMMISSIONING TESTS
- CERTIFICATE OF SUPERVISION OF CD SHELTER
- AUDIT INSPECTIONS
- CONCLUDING REMARKS







OBJECTIVE

- 1) Recap the circular issued on the implementation of the evidence-based approach for CD shelter inspections for TOP/CSC application.
- 2) Share requirements of evidence-based submissions for CD shelter inspections for TOP/CSC application.
- 3) Share good practices and learning points for evidence-based submissions to facilitate smoother TOP/CSC application process.



RECAP ON CIRCULAR ISSUED ON 2 SEP 2024

CHANGES TO TOP/CSC APPLICATION PROCESS

1

Evidence-based Approach for CD Shelter Inspections

With effect from 1 Jan 2025, an evidence-based approach for CD shelter inspections has been implemented for all landed houses built for the owners' own use.

2

Submission as part of TOP/CSC Application

- 1. CD Shelter Inspection Report
- 2. Videos of Commissioning Tests
- 3. Certification of Supervision (COS) of CD Shelter

3

Audits

Commissioner of Building Control (CBC) would conduct audit inspections as appropriate.



Our Reference: APPBCA-2024-12

2 September 2024

For enquiries, please contact: Audit and Inspection Group (#10-01) Tel: 1800 3425 222 (1800-DIAL-BCA or use our Online Feedback Form at: https://www.bca.gov.sg/feedbackform

See Distribution List

Dear Sir/Madam

CHANGES TO TEMPORARY OCCUPATION PERMIT (TOP) / CERTIFICATE OF STATUTORY COMPLETION (CSC) APPLICATION PROCESS:

- SUBMISSION OF CIVIL DEFENCE SHELTER INSPECTION REPORT/SUPPORTING EVIDENCE FOR LANDED HOUSE BUILT FOR THE OWNER'S OWN USE DURING APPLICATION FOR TOP/CSC
- SUBMISSION OF CERTIFICATE OF SUPERVISION OF BUILDING WORKS IN RESPECT OF CIVIL DEFENCE SHELTER(S) FOR ALL DEVELOPMENT PROJECTS DURING APPLICATION FOR TOPICSC

Objective and Current Approach

- 1 This circular informs the industry of the changes related to the TOP/CSC application for all development projects with Civil Defence shelter (CD shelter) including household, storey, public and transit shelters.
- 2 Currently, the Qualified Person (QP) is required to obtain the Approval of Commissioning of CD Shelter before applying for TOP for all development projects.

Evidence-based Approach for Landed House Built for the Owner's Own Use

3 As part of our continuous efforts to improve the current TOPICSC application processes, an evidence-based approach for inspection of CD shelters for TOPICSC application will be implemented for all landed houses built for the owners' own use. The QP appointed for the supervision of CD shelter works shall submit the CD shelter inspection report (see attachment in <u>Annex A</u>) and videos of commissioning tests (see attachment in <u>Annex B</u>) to the Commissioning Control ("CBC") as part of the TOPICSC application. TOPICSC will only be issued if the CD shelter works comply with all applicable requirements. CBC would carry out sample audit inspections as appropriate.

Submission of Certificate of Supervision of Building Works in respect of CD Shelter(s) for All Development Projects with CD Shelter including Household, Storey, Public and Transit Shelters

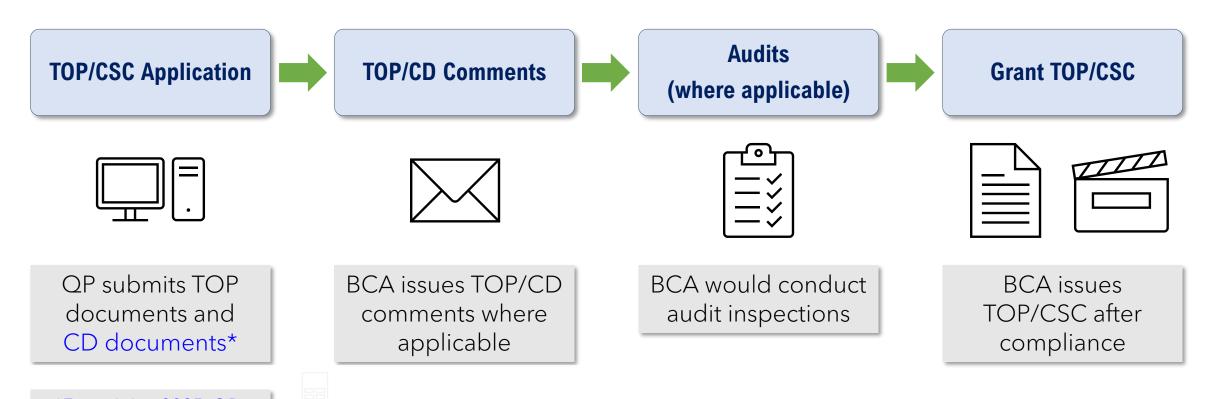
4 In addition to the current Certificate of Supervision of Building Works, supervising QPs appointed for the structural, architectural, and, where applicable, mechanical and electrical works in

52 Jurong Gateway Road #11- 01 Singapore 6085 Tel: 1800 3425 222 | Fax: (65) 6334 4287



RECAP ON CIRCULAR ISSUED ON 2 SEP 2024

TOP/CSC APPLICATION WORKFLOW as of 1 Jan 2025



*From 1 Jan 2025, QPs shall submit CD documents as part of TOP/CSC application.

CD DOCUMENTS SUBMISSION

AS PART OF TOP/CSC APPLICATION

CD Shelter Inspection Report



Sect. 1: Project Information

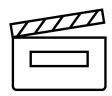
Sect. 2: Site Inspection Report

Sect. 3: Commissioning Tests

Sect. 4: As-built HS Setback Dimension

Sect. 5: QP's Declaration

Videos of Commissioning Tests



Light Penetration Test Chalk Mark Test Air-tightness Test

COS of CD Shelter



By QP (architect) By QP (structure)

Let's begin with this part

SECTION 1: PROJECT INFORMATION

QP shall provide accurate project details, including list of approved shelter plans and HS position.

Project Reference No.	AXXXX-00001-2023		
Project Title	PROPOSED ERECTION OF 3-STOREY ENVELOPE CONTROL TERRACE HOUSES WITH ATTIC AT 12 ABC ROAD SINGAPORE (POSTAL CODE)		
House Unit No.	12		
List of Approved BP/CD Plans & Date	BP01 approved on 18/05/2023		
List of Approved ST/CS Plans & Date	ST02 approved on 28/06/2023		
SCDF Waiver (if any) & Date	Please tick: ☐ Yes ✓ No Date and description of waiver granted (if "Yes" is ticked): NIL		

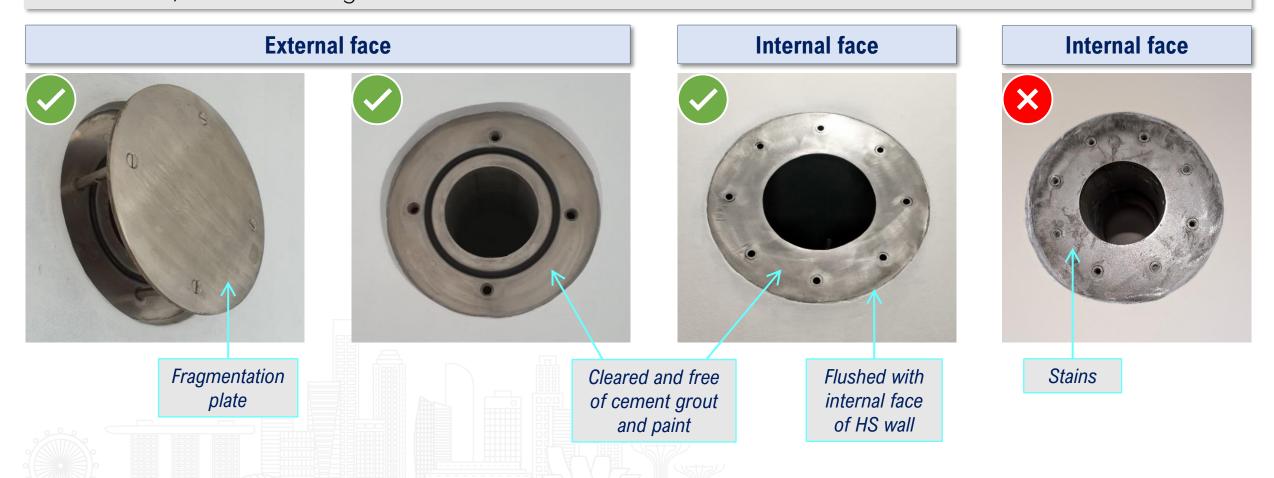
Project details

	HS position		
HS Position	Please tick where relevant to the project development: Reinforced concrete roof/clay tiled roof within setback distance Metal roof within setback distance Skylight within setback distance Air well within setback distance Reinforced concrete staircase within setback distance Metal/timber staircase within setback distance Glass/metal lift core within setback distance Shielding wall within setback distance		

(Note: QP shall provide accurate project information to facilitate smoother TOP/CSC application process.)

SECTION 2: SITE INSPECTION REPORT

Both external and internal face of ventilation sleeve shall be cleared and free of cement grout and paint.
 The inner flange of ventilation sleeve shall be flushed with internal face of the HS wall.

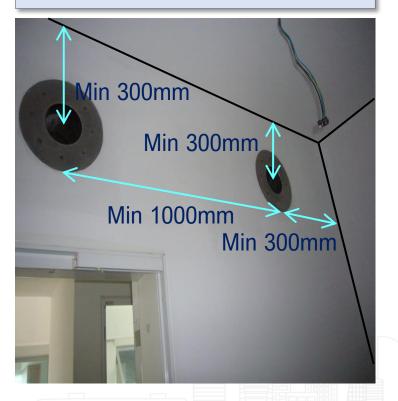


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SECTION 2: SITE INSPECTION REPORT

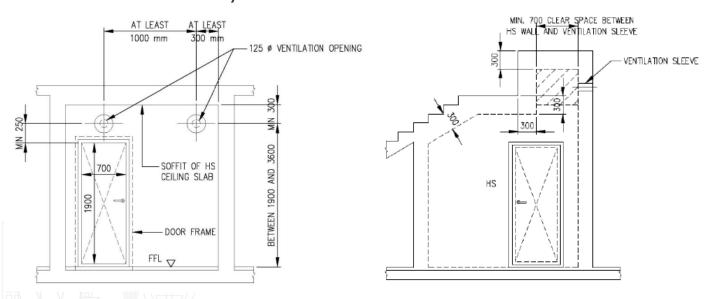
Ventilation sleeves (inside HS) shall be positioned to meet the minimum requirements.

Position of ventilation sleeve



Minimum Requirements

- a. 300 mm from any surrounding wall and ceiling slab.
- b. 1900 mm above HS finished floor level.
- c. 1000 mm apart
- d. 700mm from any internal structural element.



SECTION 2: SITE INSPECTION REPORT

Ventilation sleeves (inside HS) shall be positioned to meet the minimum requirements.

Distance from wall



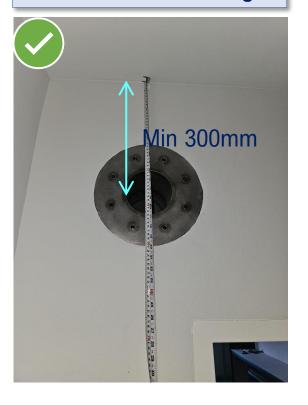
Distance in between



Distance from wall



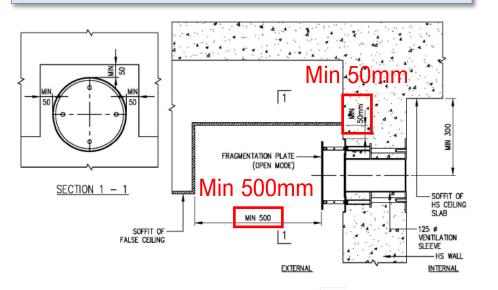
Distance from ceiling



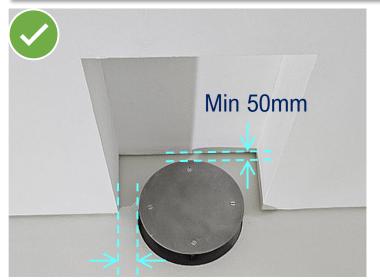
SECTION 2: SITE INSPECTION REPORT

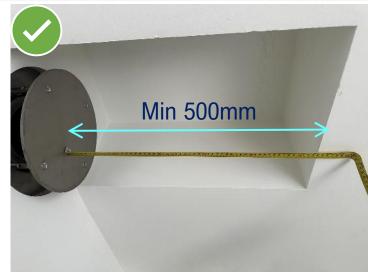
Clearances in front of and beside the fragmentation plate shall be at least 500mm and 50mm respectively.

Minimum clearance for fragmentation plate



Adequate clearance for fragmentation plate



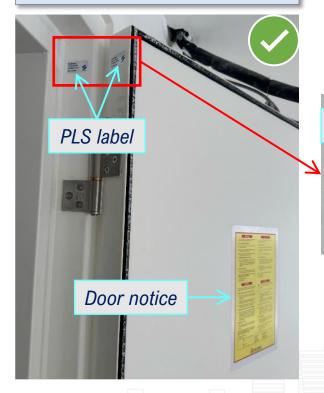


Min 50mm

SECTION 2: SITE INSPECTION REPORT

PLS label and HS door notice shall be pasted on the door and door frame.

PLS label and door notice



Closeup photo of PLS label

(Note: Closeup photo showing serial number of PLS label.)

PLS label permanently pasted



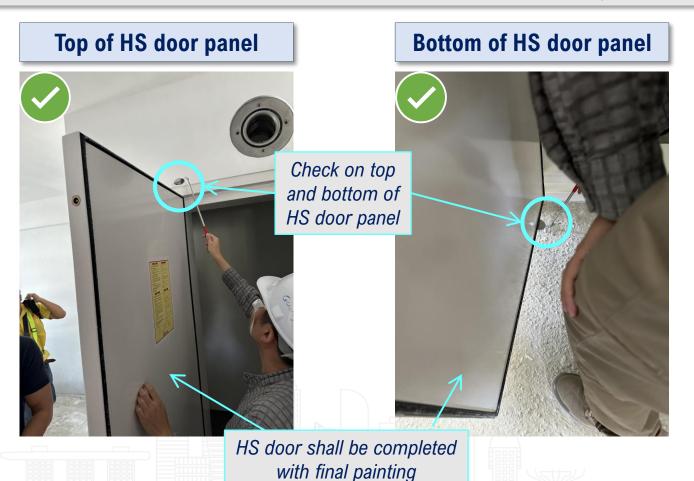
PLS label temporary pasted



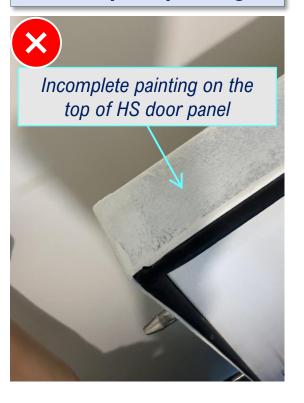
Disclaimer: Graphics shown in this slide are for illustration purposes only and are not actual site conditions/ drawn to scale.

SECTION 2: SITE INSPECTION REPORT

HS door and door frame shall be completed with final painting.



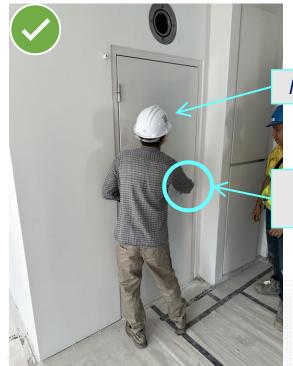
Incomplete painting



SECTION 2: SITE INSPECTION REPORT

- 1) HS door shall be able to close and lock in CD mode as shown in the door notice.
- 2) Handle shall be secured properly such that it is not loose or jammed from turning.

HS door in closing mode

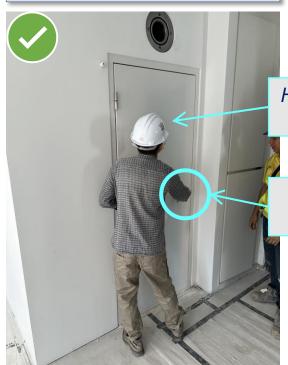


HS door is able to close

Door handle in close position



HS door in CD mode



HS door is able to lock in CD mode

Door handle in lock position



SECTION 2: SITE INSPECTION REPORT

There shall be a minimum 150mm reinforced concrete nib next to the nearest vertical edge of the door frame.

Minimum nib distance Min 150mm MIN 150 mm -(REINFORCED 700 HS DOOR SHALL BE OPENED AT LEAST 90" PLAN

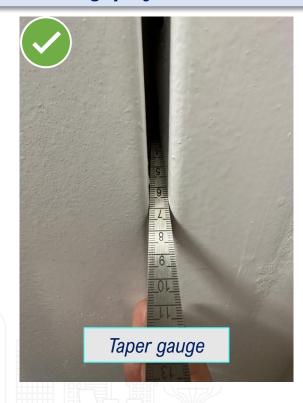


SECTION 2: SITE INSPECTION REPORT

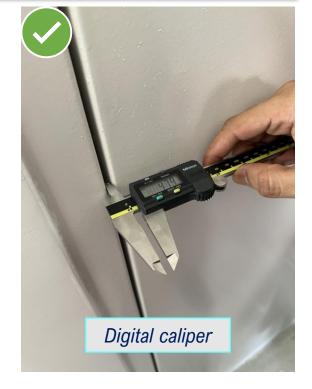
The maximum gap shall not be more than between the door and door frame 6mm along door with hinges and 7mm along door with locking pins.

Check on door gap by either measuring tool





OR



Disclaimer: Graphics shown in this slide are for illustration purposes only and are not actual site conditions/drawn to scale.

OR

SECTION 2: SITE INSPECTION REPORT

1) Socket outlets for lighting switch, telephony (RJ45) and power points (2nos or twin) shall be installed.
2) All open ends of conduit shall be sealed with sealant to a minimum depth of 100mm.

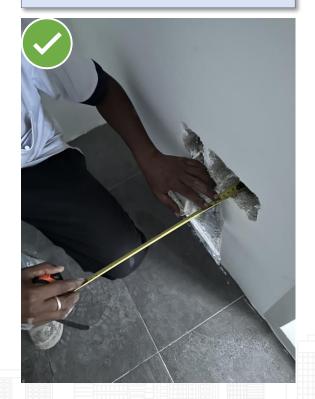
Telephony outlet (RJ45) Power point (twin or two single)

Conduit for services cables Conduit sealed with sealant

SECTION 2: SITE INSPECTION REPORT

Galvanised steel encasement for telephony, power point and lighting switch shall be placed within 40 mm measured from internal surface.

Measurement



Closeup photo of measurement



SECTION 3: COMMISSIONING TESTS

Door supplier, attendance list and group photo shall be provided.



Door supplier

Door Supplier

(E.g. Nam Lee, Prefab, Yong Tai Loong, etc.)

Yong Tai Loong



Attendance List

Attendance list

Attendees who attended and witnessed the commissioning tests shall be recorded. QP's representative shall be architect or engineer in civil engineering discipline. S/No Name Company Role (E.g. QP, QP's representative, (Note: QP / QP's rep must be present.) Builder, Competent tester, etc.) Mr. QP ABC Architects Pte Ltd 1 QP / QP's representative Mr. Builder DEF Construction Pte Ltd Builder Mr. Tester XYZ Pte Ltd Competent tester NA NA Door supplier

(Note: Group photo is mandatory.)



Group photo of attendees



Disclaimer: Graphics shown in this slide are for illustration purposes only and are not actual site conditions/ drawn to scale.

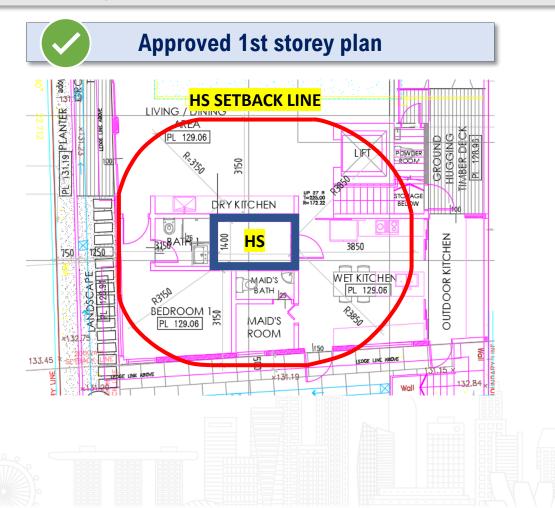
SECTION 3: COMMISSIONING TESTS

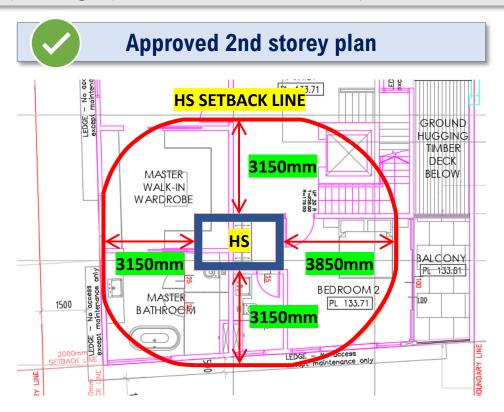
Results of commissioning tests shall be recorded.

	Results of commissioning tests	(Note: Videos of commissioning tests	
	esults of Commissioning Tests deos of commissioning tests for each commissioned unit shall be endorsed and submitted as s	upporting evidence.	shall be recorded and submitted as supporting evidence.)
Co	ommissioning Test	Result	
1)	Light penetration test	Passed	
	The test is considered to have passed if no light could be seen from the inside of HS.	•	Indicate result of light penetration test
2)	Chalk mark test	Passed	
	The test is considered to have passed if there is an unbroken and uniform transfer of the chalk markings onto the door seal when the door is closed and re-opened.	•	Indicate result of chalk mark test
3)	Air-tightness test	Passed	
	The HS is pressurised by pumping air into the HS such that there is a pressure difference of 250 Pa* between inside and outside of HS. The HS is considered to have passed the test if the pressure gauge shows more than or equal to 50 Pa after 45 seconds.	Start pressure : 30 mm End pressure : 24 mm Pressure drop : 6 mm	Indicate result of air-tightness test
	*The pressure gauge used should have a dial size with a scale of 0 to 50mm or 0 to 500Pa. (Note: 1 mm = 10 Pa).		

SECTION 4: AS-BUILT HS SETBACK DIMENSION

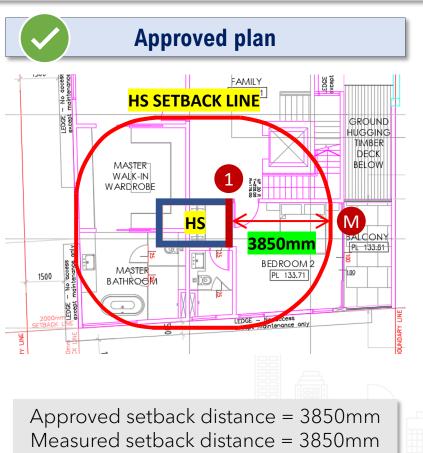
Compliance of as-built HS setback shall be verified, and photographic evidence shall be provided.





SECTION 4: AS-BUILT HS SETBACK DIMENSION

Compliance of as-built HS setback shall be verified, and photographic evidence shall be provided.

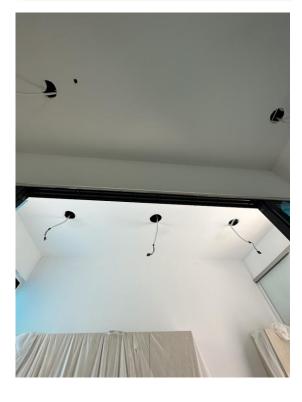






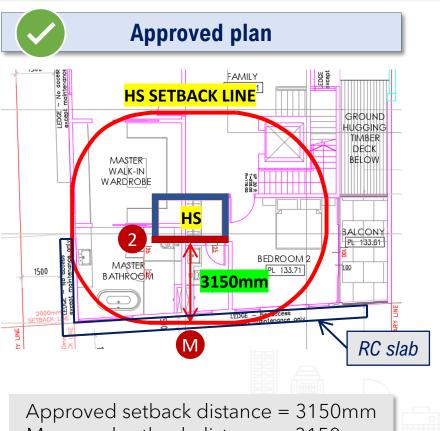






SECTION 4: AS-BUILT HS SETBACK DIMENSION

Compliance of as-built HS setback shall be verified, and photographic evidence shall be provided.



Measured setback distance = 3150mm



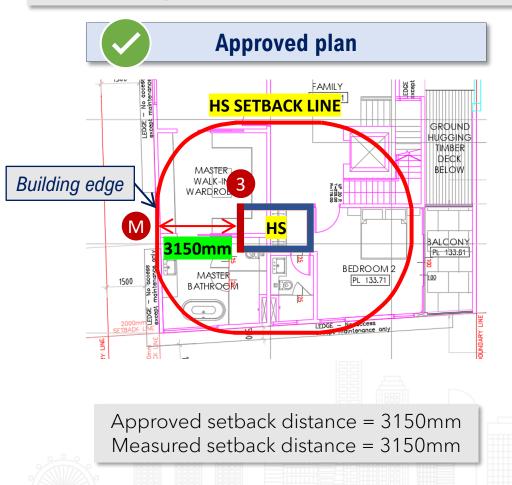






SECTION 4: AS-BUILT HS SETBACK DIMENSION

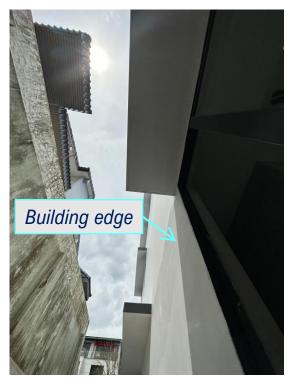
Compliance of as-built HS setback shall be verified, and photographic evidence shall be provided.





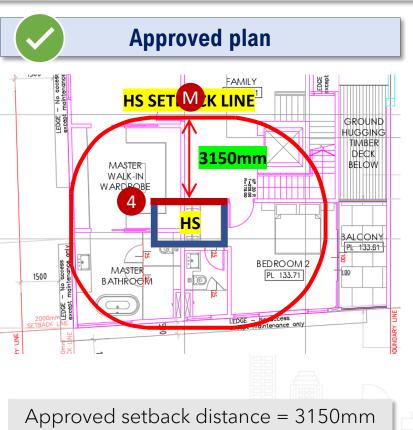


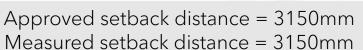




SECTION 4: AS-BUILT HS SETBACK DIMENSION

Compliance of as-built HS setback shall be verified, and photographic evidence shall be provided.

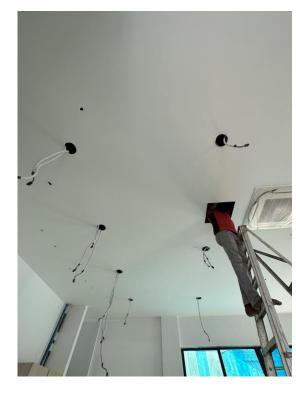












SECTION 5: DECLARATIONS AND CERTIFICATIONS BY QP

QP shall endorse and submit the CD shelter inspection report.



Declarations and Certifications by QP

a) I declare that I have been appointed as the Qualified Person under section 8 or 11 of the Building Control Act 1989 ("BC Act") to supervise the carrying

b) I declare and certify that I have

Indicate date of inspection 1

- I declare and certify that the building works in respect of the HS are completed based on my inspection of the completion HS on 8/02/2025 (date). I declare and certify that the building works in respect of the HS are carried out and completed in accordance with:-
- (i) the provisions of the BC Act and BC Regs;
- (ii) the plans approved by the CBC in respect of the HS and the conditions under which the plans have been approved by the CBC;
- (iii) the provisions of the Civil Defence Shelter Act 1997; and
- (iv) the provisions of the "Technical Requirements for Household Shelters" issued under the Civil Defence Shelter Act 1997.
- d) I understand and acknowledge that the CBC will be relying on my declarations and certifications, as set out herein, when assessing whether to grant approvals, permits and issue any other documents under the Building Control Act 1989 and building regulations in respect of the building works for the HS. I declare that the information stated in this Report, including any accompanying documents and/or information, are true, complete and correct and are based on facts and information that are true and accurate.

X

Common oversight

Missing date of inspection

c) I declare and certify that the building works in respect of the HS are completed based on my inspection of the completion HS on ______(date). declare and certify that the building works in respect of the HS are carried out and completed in accordance with:-

Name of QP and signature

signature

Mr. QP
Name and Signature of QP

Name and Signature of QP

Date

Name of QP and signature

Indicate date of report

Date

CD DOCUMENTS SUBMISSION

AS PART OF TOP/CSC APPLICATION



CD Shelter Inspection Report



Sect. 1: Project Information

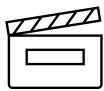
Sect. 2: Site Inspection Report

Sect. 3: Commissioning Tests

Sect. 4: As-built HS Setback Dimension

Sect. 5: QP's Declaration

Videos of Commissioning Tests



Light Penetration Test Chalk Mark Test Air-tightness Test

Let's move on to this part

COS of CD Shelter

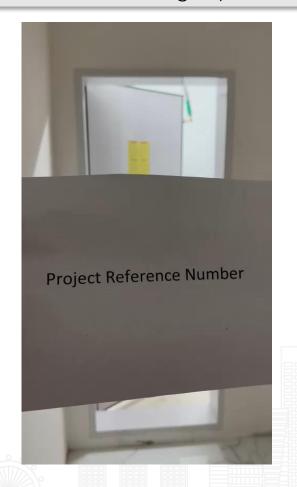


By QP (architect)
By QP (structure)

VIDEOS OF COMMISSIONING TESTS

LIGHT PENETRATION TEST

Light penetration test shall be recorded and submitted as supporting evidence.



Sequence of video footage



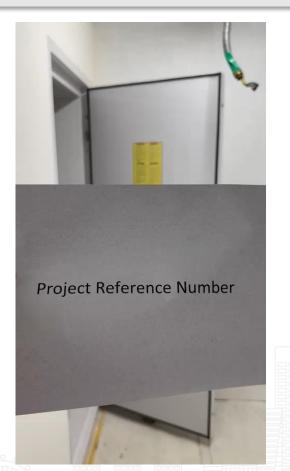
Passing requirement

No light could be seen from the inside of HS.

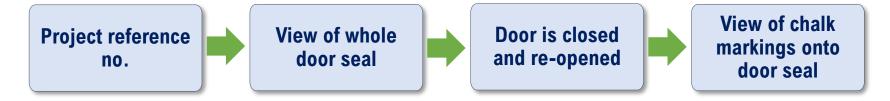
VIDEOS OF COMMISSIONING TESTS

CHALK MARK TEST

Chalk mark test shall be recorded and submitted as supporting evidence.



Sequence of video footage



Passing requirement

Unbroken and uniform transfer of the chalk markings onto the door seal when the door is closed and re-opened.

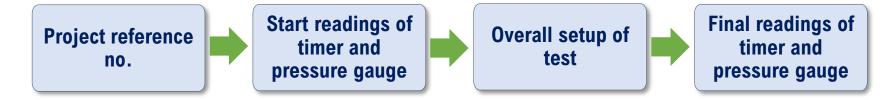
VIDEOS OF COMMISSIONING TESTS

AIR-TIGHTNESS TEST

Air-tightness test shall be recorded and submitted as supporting evidence.



Sequence of video footage



Passing requirement

- 1. HS is pressurised such that there is a pressure difference of 250 Pa between inside and outside of HS.
- 2. Pressure gauge shows more than or equal to 50 Pa after 45 seconds. (Note: 1 mm = 10 Pa).

CD DOCUMENTS SUBMISSION

AS PART OF TOP/CSC APPLICATION

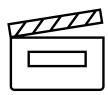


CD Shelter Inspection Report



Videos of Commissioning Tests





COS of CD Shelter



Sect. 1: Project Information

Sect. 2: Site Inspection Report

Sect. 3: Commissioning Tests

Sect. 4: As-built HS Setback Dimension

Sect. 5: QP's Declaration

Light Penetration Test Chalk Mark Test Air-tightness Test By QP (architect)

By QP (structure)

Let's move on to this part



CERTIFICATE OF SUPERVISION OF CD SHELTER

CHANGES TO TOP/CSC APPLICATION PROCESS



Requirements of submission

Both QP (architect) and QP (structure) are required to submit the COS of CD Shelter as part of the TOP/CSC application.



AND



QP (architect)

Common misunderstandings

Only QP (architect) submits the COS of CD Shelter.



No submission by either QP.

Totally miss out!

CERTIFICATE OF SUPERVISION OF BUILDING WORKS IN RESPECT OF CIVIL DEFENCE SHELTER(S) [Building Control Act 1989]

Date	Click or tap to enter a date.
	(DD/MM/YYYY)
То	Commissioner of Building Control
	52 Jurong Gateway Road, #11-01
	Singapore 608550

INTRODUCTION

- This form is to be digitally signed by the appointed Qualified Person responsible for the building works in respect
 of the civil defence shelter(s) in the project.
- Supervising QPs appointed for the structural, architectural, and, where applicable, mechanical and electrical works in respect of CD shelter(s) are required to submit the Certificate of Supervision of Building Works in respect of CD Shelter(s) during application for TOP/CSC.
- 3. This form may take you 2-3 mins to complete.

PARTICULARS OF PROJECT ("Project") AND BUILDING WORKS IN RESPECT OF CIVIL DEFENCE SHELTER(S) IN THE PROJECT

Project Reference Number		
Project Title		
December of Building Words to		
Description of Building Works in respect of the Civil Defence Shelter		
respect of the civil belefice shelter		
Location Description		
List of Approved Plans in respect of		
the Civil Defence Shelter		
Date of Completion of Civil Defence	Click or tap to enter a date.	
Shelter Works	(DD/MM/YYYY)	
Date of Inspection of Civil Defence	Click or tap to enter a date.	
Shelter Works by appointed QP	(DD/MM/YYYY)	
No. of Household Shelter(s)		
Completed		
No. of Storey Shelter(s) completed		
		Page 1 of

AUDIT INSPECTIONS



BCA would conduct audit inspections as appropriate





Disclaimer: Graphics shown in this slide are for illustration purposes only and are not actual site conditions/ drawn to scale.

CONCLUDING REMARKS

- 1) Evidence-based approach for CD shelter inspections for TOP/CSC application has been implemented for all landed houses built for the owners' own use.
- 2) Adopt good practices from shared examples as benchmarks for future submissions to facilitate smoother TOP/CSC application process.
- 3) QPs are to uphold their duties and responsibilities under the BC Act, ensure CD shelters comply with the requirements, and submit accurate and complete documents with true declarations.



Thank You







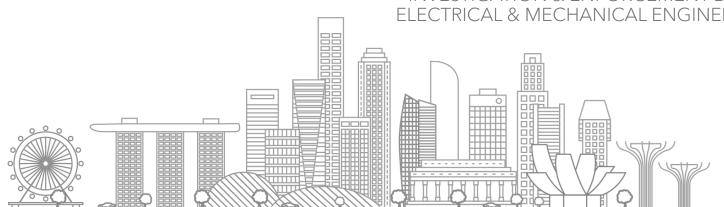
New Building Control (Fixed Installations) Regulations 2025

FI Plans Submission

ER. DESMOND ANG

Senior Engineer

INVESTIGATION & ENFORCEMENT DEPARTMENT ELECTRICAL & MECHANICAL ENGINEERING GROUP







OBJECTIVE

To provide an overview on some changes in regulatory requirements for fixed installations in buildings







AGENDA

- BUILDING CONTROL (FIXED INSTALLATION) REGULATIONS
- ❖ FIXED INSTALLATION PLANS SUBMISSION
- CHANGES TO PTO APPLICATION
- REMINDER ON SS550:2020 REQUIREMENTS RELATED TO BUILDING INTERFACE





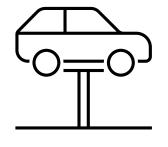


WHAT ARE "FIXED INSTALLATIONS"?









Mechanised Car Parking Systems



- The BC (Fixed Installation) Regs, BC (Reportable Matters) Regs, BC (Exempt Fixed Installations and Fixed Installation Works) Order and the corresponding provisions in the amendments to the BC Act, will be implemented on <u>1 July 2025</u>.
- Apply to FI works that are:
 - i) carried out on or after 1 July 2025; and
 - ii) not part of building works for which an application to the CBC for approval of plans of the building works was submitted before 1 July 2025.

Link to Circular:

https://www1.bca.gov.sg/docs/default-source/docs-corp-regulatory/lifts-and-escalators-legislation/circular---bc-(fi)-regs-(final).pdf?Status=Master&sfvrsn=6acad25b 4



Current

Design

Installation

Operation & Maintenance

Alteration & Replacement

Standards





Design standards/ codes prescribed under Approved Document; no need for plan submission. Certify compliance to standards by **Specialist Professional Engineers** (SPEs) upon completion of works.

Periodic maintenance;
Owner to appoint service contractor to maintain according to prescribed requirements.

Owner notify BCA in writing before work commences.

Building Control Act

Renewal of PTO annually: Contractor conduct examination, inspection & testing (EIT) in presence of SPE.

Contractor conduct EIT in presence of SPE. SPE certify the works.

BMSM (Lift, Escalator and Building Maintenance) Regs 2016





Design

Installation

Operation & Maintenance

Alteration & Replacement

Standards



contractor carry out FI

works in accordance with

Fixed installation

approved plans.

Periodic maintenance;

Owner appoint service contractor to maintain according to prescribed requirements.

Renewal of PTO annually: **QP** supervise the contractor's examination, inspection & testing of FI.



Owner notify BCA in writing before work commences.

BMSM (Lift, **Escalator and** Building **Maintenance**) **Regs 2016** will be repealed

Type testing of lift model and safety components.

Qualified Person (QP) prepare and certify plans to be submitted for approval.

 QP supervise the contractor's examination. inspection, testing & commissioning (EITC) of FI after completion.

QP prepare and certify plans to be submitted for major A/R works, supervise contractor's EITC of FI after works completion.

Entire process to come under the BC (FI) Regs

To tighten L&E safety standards right from the start:

Design to be approved before installation in accordance to approved plans \rightarrow minimise noncompliances downstream, difficult to rectify later on.



FI PLANS SUBMISSION











Requirements

- Developer appoint Qualified Person (QP), to prepare and submit fixed installation (FI) plans to BCA for approval.
- Design plans are to comply with the prevailing code requirements.



Roles of Stakeholders for FI Plans Submission



Developer



FI Works Contractor



QP (Plans)

- Appoint FI Works
 Contractor and QP
 (Plans)
- Obtain an approval of the plans prior to the commencement of the FI works
- Submit relevant documents to the QP (Plans)
- Ensure the validity and the completeness of the documents
- Ensure that FI works are designed in accordance with regulatory requirements
- Submit plans for approval on behalf of the developer



Are the relevant stakeholders onboarded early? Is there sufficient time catered for BCA's review?

SUBMISSION REQUIREMENTS

- Includes <u>site plans</u>, <u>floor plans</u>, <u>lift shaft</u> <u>drawings</u>, <u>escalator structural drawings</u>, <u>MCPS</u> <u>design drawings</u>
- Also includes type testing certificates for lift model and safety components, as well as proof test documents for escalators
- Refer to the **Second Schedule** in the BC (FI)
 Regs for the full list of submission requirements



BUILDING INFORMATION MODELLING (BIM) REQUIREMENT

- Projects with more than 5,000 sqm in Gross Floor Area (GFA) need to be submitted in BIM
- Make use of Generic BIM family lift/esc components models to prepare models
- Refer to BIM Guide (https://www1.bca.gov.sg/regulatory-info/lifts-escalators/building-information-modelling-for-fixed-installation-design-plans-submission)



WHEN TO SUBMIT

Obtain BP approval

Submit Fl plans Obtain Fl plans approval

Commence FI works



Disclaimer: Graphics shown in this slide are for illustration purposes only and are not actual site conditions/ drawn to scale.

HOW TO SUBMIT

- For projects that are onboard CORENET X (i.e. submitting URA permit application, BP, ST plans etc via CORENET X), FI Plans Submission through CORENET X
- For other projects, submission through FormSG
- Documents will have to be encrypted using Netrust token

Training sessions will be conducted for Plans submission QPs (26 and 28 May).

LAPSING OF PLANS APPROVAL

- The fixed installation works should start within 24 months after obtaining the FI plans approval
- Otherwise, the plans approval will lapse
- The developer or the QP should take the initiative to update BCA on the project status, if the installation works cannot commence due to any exceptional situations



CHANGES TO PTO APPLICATION

Requirements

- BCA will select sites for inspection during PTO application
- If selected for inspection, the PTO application will be put on hold while BCA conducts an inspection on the FI works. This is similar to the current TOP process
- The PTO application will only be processed upon clearing the inspection
- The rest of the application process remains largely unchanged

Roles of Stakeholders for PTO Application



Developer



FI Works Contractor



QP (Supervisor)

- Appoint FI Works
 Contractor and QP
 (Supervisor)
- Obtain a PTO prior to operation

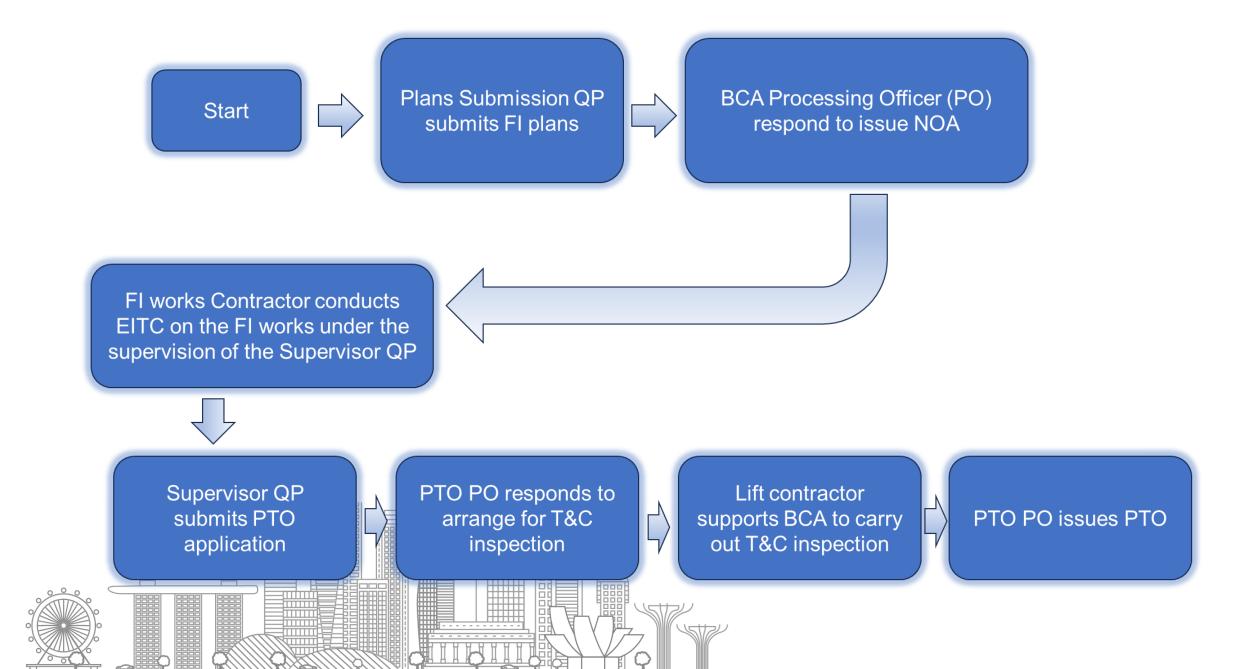
- Carry out Examination, Inspection, Testing and Commissioning (EITC) of FI
- Facilitate inspection by BCA

- Supervise EITC
- Declare and Certify that EITC has been carried out in his/her supervision and is in accordance with regulatory requirements
- Apply for PTO on behalf of the developer



Is the site ready for BCA's inspection?

Is there sufficient time catered for BCA's inspection?



GETTING READY

- Developer to know who to appoint
- Building works QP and Builder to take note of the impact to project timeline



FAQs

Can the Plan submission QP and the Supervisor QP be the same person?

Yes. It is acceptable for the QP roles to be taken up by the same person or two different persons.

Who can appoint the Plan submission QP and the Supervisor QP?

The QPs can be appointed by the developer, or the builder on behalf of the owner. Otherwise, they can be appointed by the FI works contractor on behalf of the developer.

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FAQs

If there are no BP or ST plans submission required for the project, do I need to submit FI plans?

FI plans will still be required for such cases, so long as the FI works commence on or after 1 Jul 2025

What will be the requirements if my plans approval lapsed after 24 months?

You would be required to resubmit the plans for approval prior to the commencement of the FI works. The design of the FI works will be reviewed based on the prevailing code during the resubmission.

FAQs

If my project has many phases and the first phase has already commenced work, will the other phases of the same project be excluded from the new regime?

If the other FI works in your project will only commence work on or after 1 Jul 2025, and there are no BP or ST plans submitted for these FI works before that date, FI plans submission will be required.



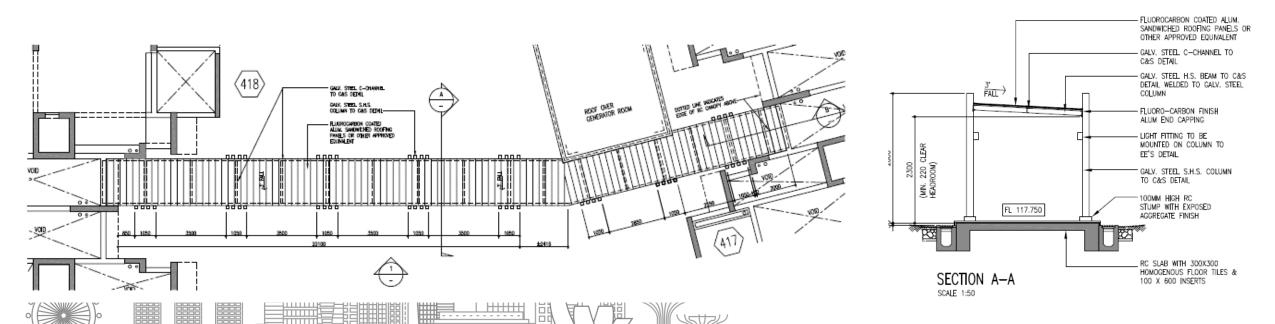
FOR FURTHER INFORMATION

- Webpage (https://www1.bca.gov.sg/regulatory-info/lifts-escalators-legislation/fixed-installation-regulations) with the following guides to be published:
 - FI Plans Submission Regime Guide
 - Submission Guide for FormSG and CNX
 - Guidelines for obtaining PTO for new Fixed Installations



Proper access to machinery spaces/motor room

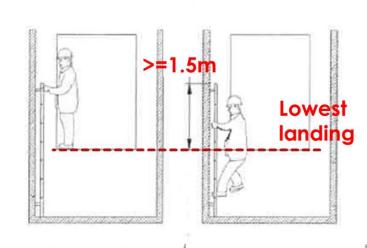
Motor room to be provided with a sheltered passage way of at least a clear width of 1.0m and a clear height of 2.0m



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Lift well requirements

- An access door (required for pit depth ≥ 2.50m) or a ladder shall be provided to access the lift pit
- Lift wells shall be adequately ventilated at the top of the shaft to the external air







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Safe Workspace On Car Top

Min. 2 refuge spaces (of the same type) complying to the following:

Table 3 - Dimensions of refuge spaces in headroom

Туре	Posture	Pictogram	Horizontal dimensions of the refuge space	Height of the refuge space
			(m x m)	(m)
1	Upright	3-2	0,40 x 0,50	2,00
2	Crouching	3-1m-1 -2	0,50 x 0,70	1,00



Safe Workspace In Lift Pit

Min. 2 refuge spaces (of the same type) complying to the following:

Туре	Posture	Pictogram	Horizontal dimensions of the refuge space (m x m)	Height of the refuge space (m)
1	Upright	3 2 2	0,40 x 0,50	2,00
2	Crouching	3 <u>1m</u> 2	0,50 × 0,70	1,00
3	Laying	3 0,5 m 2	0,70 x 1,00	0,50





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Thank You





