REDAS

DfS Good Practice Library

September 2025

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PREFACE

Since the 1st edition of the *REDAS DfS & WSH Good Practice Guide* was released in 2019, it has proven to be an invaluable resource for Developers and industry professionals alike. This is evidenced not just by the widespread use of the *Proforma* when Developers are seeking to engage a Design for Safety Professional (DfSP), but even the frequent inclusion of the entire *Good Practice Guide* in tender packages as a reference document.

Whilst the *REDAS DfS & WSH Good Practice Guide* was being updated to stay relevant to changes in the industry, it was also recognised that the sampling of DfS examples in the earlier *Good Practice Guide* should also be expanded to provide the industry with a larger array of reference situations and solutions where DfS can be applied.

The expansion has been partitioned into this *DfS Good Practice Library* as a companion document to the *Good Practice Guide*, and it is hoped that it will continue to grow in the years to come as a useful resource point for practitioners to reference.

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INTRODUCTION

This *DfS Good Practice Library* seeks to highlight examples of good design that have led to demonstrably improved safety for affected persons, be it for post-occupation patrons or maintenance personnel, or for workers during the course of the building's construction.

The examples showcased seek to go beyond compliance to prevailing regulations and standards already embedded in various statutes and codes. Rather, emphasis is placed towards common situations that are either not covered by existing codes, or where regulations are not so explicit or prescriptive. These situations are where DfS can play a big part in checking that sufficient safety considerations are taken, e.g. internal carpark/traffic safety measures (speed humps, signages, convex mirrors, road markings etc.) or provisions have been made for safe maintenance.

Areas covered by existing codes but not actively enforced through the submission/approval process or authority inspections (and therefore not common knowledge in the industry) are also key areas where DfS can provide additional reinforcement of safety requirements.

Examples also cover temporary works during Construction stage, where of particular concern are scenarios that are out of the norm (e.g. because of limited working space or unique design elements). The DfS process here would seek to reduce any temporary higher-risk situations or unfamiliarity on site, by adjusting either the temporary or permanent design elements to improve the risk scenarios.

The library is organised broadly along various trades (Architectural, Structural, M&E, Construction), but can also be referenced by Hazard Type (Physical, Biological etc.) and Stage of work (Detailed Design, Construction etc.).

This library is not meant to be an exhaustive one and should not be read as regulatory or binding -- it is meant to serve as an industry guidebook to developers for clarifying DfS and WSH concepts. Readers should still refer to the *WSH(DfS) Regulations* and the *WSH Guidelines (DfS)* for regulatory requirements.

PART I.
Architectural

A1

Hazard	Glass balustrade is in proximity of curved driveway.
Risk	Vehicle crashing through balustrade and falling onto level below.
Control Measures	Provide bollards capable of resisting appropriate impact load.
Type	Physical – Traffic accident
Trade	Architecture / C&S
Stage	Detailed Design

A2

Hazard	Solid boundary walls on both sides of carpark exit.
Risk	Drivers unable to see pedestrian approaching; resulting in traffic accident involving pedestrian.
Control Measures	1) Increase porosity of wall where possible. 2) Provide convex mirror to improve visibility for drivers. 3) Provide warning lights for pedestrian. 4) Provide warning signages to warn of approaching vehicles.
Type	Physical – Traffic accident
Trade	Architecture
Stage	Detailed Design

A3

Hazard	Lift lobby located next to driveway.
Risk	Drivers unaware of personnel coming out of lift lobby; resulting in traffic accident.
Control Measures	1) Design for wider driveway where possible. 2) Provide floor marking for pedestrian crossing to alert drivers. 3) Provide speed hump to slow down vehicles coming down the ramp.
Type	Physical – Traffic accident
Trade	Architecture
Stage	Schematic Design / Detailed Design

A4

Hazard	Maintenance spaces adjacent to carpark driveway.
Risk	Vehicles impacting door, equipment, or personnel during maintenance periods; Door swings outwards towards passers-by.
Control Measures	1) Paint floor markings to indicate door swing. 2) Painted chevrons to keep vehicles away. 3) Install bollards for additional warning at critical zones.
Type	Physical – Traffic accident
Trade	Architecture
Stage	Detailed Design

A5

Hazard	Escape door swinging into vehicular zone.
Risk	Traffic accident.
Control Measures	1) Design for wider driveway where possible. 2) Signage on door internal warning of traffic. 3) Floor markings to demarcate a safe zone for pedestrians.
Type	Physical – Traffic accident
Trade	Architecture
Stage	Schematic Design / Detailed Design

A6

Hazard	Fencing beside driveway area not clearly visible.
Risk	Traffic accident and equipment damage.
Control Measures	Painted corner posts to provide visual warning of obstruction.
Type	Physical – Traffic accident
Trade	Architecture
Stage	Detailed Design

A7

Hazard	Access to underground confined spaces / detention tanks.
Risk	1) Traffic accident due to access location. 2) Risks associated with working in confined spaces.
Control Measures	1) Position the access locations away from main driveways where possible (e.g. on grass verge or service zones). 2) Position any associated control panels or equipment outside of the confined space to minimise the need to enter them.
Type	Physical – Traffic accident / Confined Space
Trade	Architecture / M&E
Stage	Detailed Design

A8

Hazard	Accessing and working in Confined Spaces.
Risk	1) Delay in escape during emergency due to limited egress. 2) Asphyxiation due to lack of air flow. 3) Limited natural light resulting in unsafe work conditions.
Control Measures	1) Clearly posted notice at the entrance of a confined space to warn persons of the hazards of the confined space. 2) Administrative documentation informing persons who are liable to be exposed to the hazards of the confined space, of the existence and hazards of the confined space.
Type	Physical – Confined Space
Trade	Architecture
Stage	Detailed Design

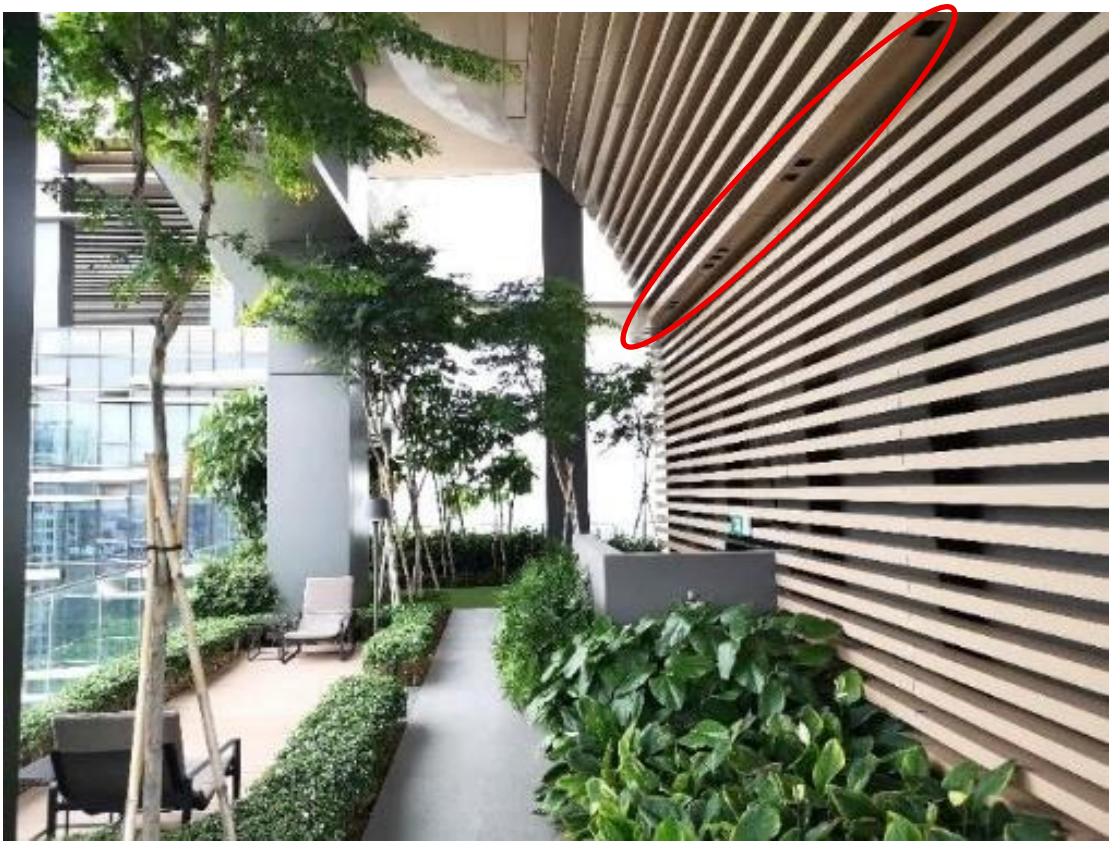
A9

Hazard	M&E services located at high-volume areas.
Risk	Workers falling from height during maintenance.
Control Measures	1) Provide catwalk to access services for maintenance. 2) Provide locked gate to prevent unauthorised access.
Type	Physical – Working at height
Trade	Architecture / M&E
Stage	Detailed Design

A10

Hazard	Rooftop equipment that requires regular maintenance.
Risk	Workers falling from height during maintenance.
Control Measures	1) Provision of safety barrier. 2) Permanent means of safe access, e.g. fixed cat ladder (with safety cage if more than 3m high) with lock for authorised access only. 3) OR shift equipment to lower roof if possible.
Type	Physical – Working at height
Trade	Architecture
Stage	Detailed Design

A11



Hazard	Sky garden with high ceiling.
Risk	Workers falling from height while replacing lighting or maintaining ceiling panels.
Control Measures	1) Locate lighting at low level which can be accessed using short ladder. 2) Use of aerial work platform for maintenance of ceiling.
Type	Physical – Working at height
Trade	Architecture / M&E
Stage	Detailed Design

A12

Hazard	Canopy with no edge protection.
Risk	Maintenance workers falling over the edge.
Control Measures	Provide anchor in middle of canopy for safety harness to prevent falling from height.
Type	Physical – Working at height
Trade	Architecture / Specialist Designer
Stage	Detailed Design

A13

Hazard	Maintenance of metal roofs with no edge barriers.
Risk	Workers falling from height during maintenance.
Control Measures	Provision of permanent horizontal rigid lifeline systems to allow for safe access.
Type	Physical – Working at height
Trade	Architecture / Specialist Designer
Stage	Detailed Design

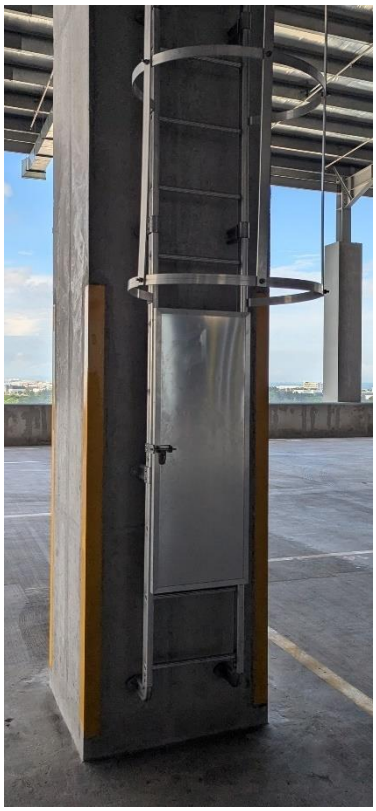
A14

Hazard	Maintenance of landscape roofs with no edge barriers.
Risk	Workers falling from height during maintenance.
Control Measures	Provision of permanent horizontal rigid lifeline systems to allow for safe access.
Type	Physical – Working at height
Trade	Architecture / Specialist Designer
Stage	Detailed Design

A15

Hazard	Cat ladder located at edge of roof.
Risk	Maintenance workers falling over the balustrade while climbing up/down cat ladder.
Control Measures	Replace balustrade with metal grill locally at the cat ladder to prevent workers from falling over the side of building.
Type	Physical – Working at height
Trade	Architecture
Stage	Detailed Design

A16



Hazard	Unauthorised access via permanent cat ladders.
Risk	Untrained persons accessing potentially unsafe areas with fall from height risk.
Control Measures	Cat ladders come with lockable panels/grills or retractable mechanism to prevent unauthorised use.
Type	Physical – Working at height
Trade	Architecture
Stage	Detailed Design

A17

Hazard	Horizontal fins in between façade panels.
Risk	Gondola too far from façade surface; workers unable to clean or maintain façade safely.
Control Measures	Provide gondola with counterweight which allows gondola to be positioned close to façade surface.
Type	Physical – Working at height
Trade	Architecture / Specialist Designer
Stage	Detailed Design

A18

Hazard	Maintenance of curved façade.
Risk	Gondola colliding with façade as it moves downwards; resulting in façade maintenance workers falling from height.
Control Measures	Provide building maintenance unit (BMU) with telescopic boom.
Type	Physical – Working at height
Trade	Architecture / Specialist Designer
Stage	Schematic Design / Detailed Design

A19

Hazard	Skylight (fragile surface).
Risk	Falling from height through surface.
Control Measures	1) Design for maintenance loading (indicate safe working load). 2) Markings/signages warning against stepping on surface. 3) Physical barriers to deter climbing.
Type	Physical – Working at height
Trade	Architecture / C&S
Stage	Detailed Design

A20

Hazard	Non-loadbearing fragile surfaces visible from above.
Risk	Mistaking surfaces to be loadbearing and stepping on them.
Control Measures	1) Signages warning of fragile surfaces. 2) Safety barriers to prevent accidental falling.
Type	Physical – Working at height
Trade	Architecture
Stage	Detailed Design

A21

Hazard	Non-loadbearing fire-rated boards used in service risers.
Risk	Mistaking surfaces to be loadbearing and stepping on them.
Control Measures	1) Signages warning of fragile surfaces. 2) Provision of mesh surface designed to take maintenance loading.
Type	Physical – Working at height
Trade	Architecture / C&S
Stage	Detailed Design

A22

Hazard	Change in floor level.
Risk	Trip and fall for users.
Control Measures	Provide paint markings warning users to mind the step.
Type	Physical – Slips, trips, and falls
Trade	Architecture
Stage	Detailed Design

A23

Hazard	Gaps between tiles on swimming pool footpath.
Risk	Trip and fall for users.
Control Measures	Provide warning signage for users to mind the gap.
Type	Physical – Slips, trips, and falls
Trade	Architecture
Stage	Detailed Design

A24

Hazard	Services running at floor level obstruct main access routes or escape paths.
Risk	Trip and fall for users.
Control Measures	1) Consolidate services where possible. 2) Crossover platforms to allow safe access over services.
Type	Physical – Slips, trips, and falls
Trade	Architecture / M&E
Stage	Detailed Design

A25

Hazard	Raised platform (less than 1m high) without safety barriers.
Risk	Workers missing the edge and falling over.
Control Measures	Paint the platform edge in contrasting colours for better visibility.
Type	Physical – Slips, trips, and falls
Trade	Architecture
Stage	Detailed Design

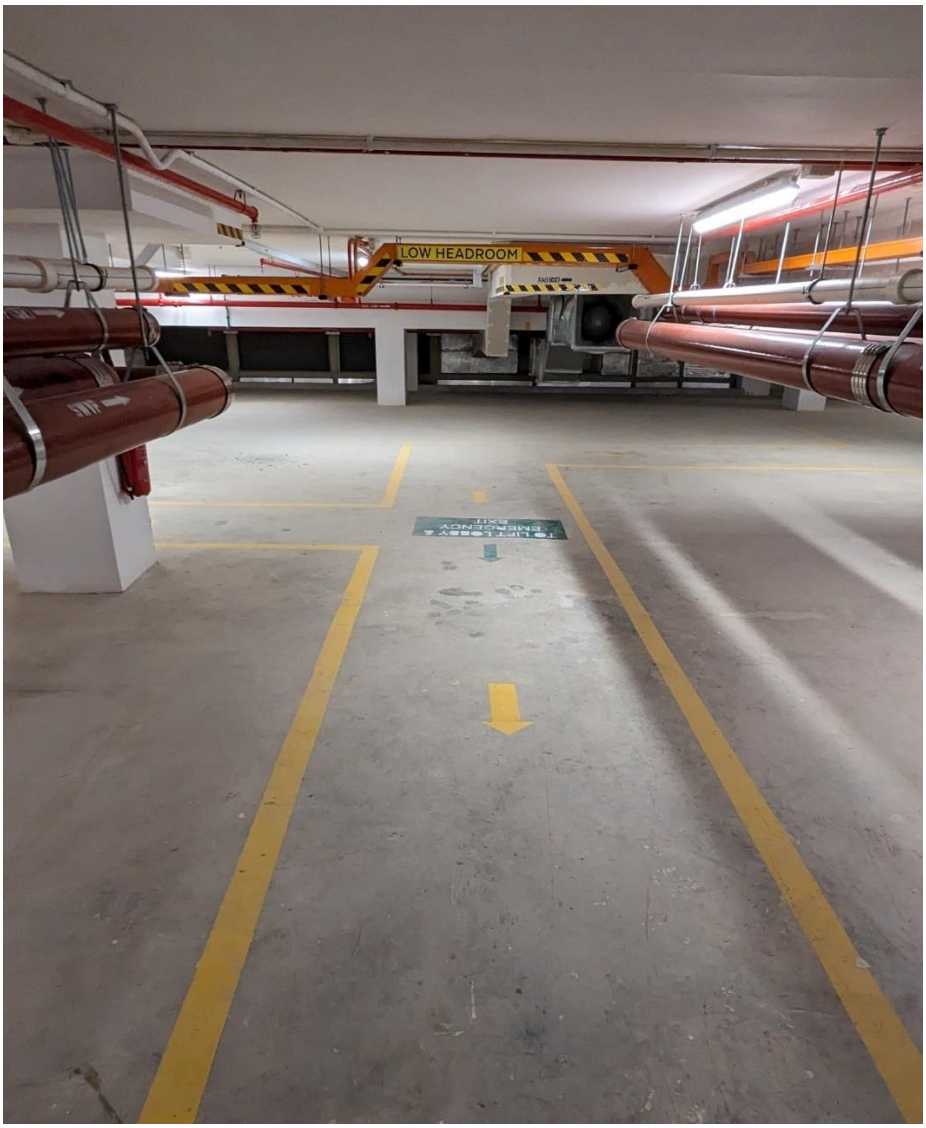
A26

Hazard	Exercise apparatus in swimming pool.
Risk	Apparatus toppling over with user exercising on it, resulting in injury or drowning.
Control Measures	Secure apparatus to swimming pool slab by bolting.
Type	Physical – Slips, trips, and falls; Drowning
Trade	Architecture / Specialist Designer
Stage	Detailed Design

A27

Hazard	Balustrade glass panels with sharp edges.
Risk	Abrasion on hands, especially if children run their hands along top edge.
Control Measures	Provide metal capping along top edge.
Type	Physical – Abrasion
Trade	Architecture
Stage	Detailed Design

A28



Hazard	Extensive maintenance double slab zones with multiple pathways.
Risk	Delay in escape during emergency due to limited egress.
Control Measures	1) Marked paths on the floor for main access routes. 2) Emergency escape indicators. 3) Provide adequate lighting and ventilation.
Type	Physical – Confusion
Trade	Architecture
Stage	Detailed Design

A29

Hazard	Opaque door swinging into high-traffic pedestrian paths.
Risk	Door swings outwards towards passers-by.
Control Measures	1) Design for wider corridor space where possible. 2) Paint/sticker floor markings to indicate door swing especially in areas of high pedestrian traffic. 3) Signage on door internal indicating to open door slowly.
Type	Physical – Impact injury
Trade	Architecture
Stage	Detailed Design

PART II.
Structural

S1

Hazard	Fibre wrapped column strengthening.
Risk	Impact to structural integrity due to unplanned drilling.
Control Measures	1) Provide warning signages on affected columns indicating “no drilling” locations. 2) Handover as-built drawings indicating fibre-wrapped column locations to building owner for future maintenance or demolition considerations.
Type	Physical – Building structure
Trade	C&S
Stage	Detailed Design / Construction

S2

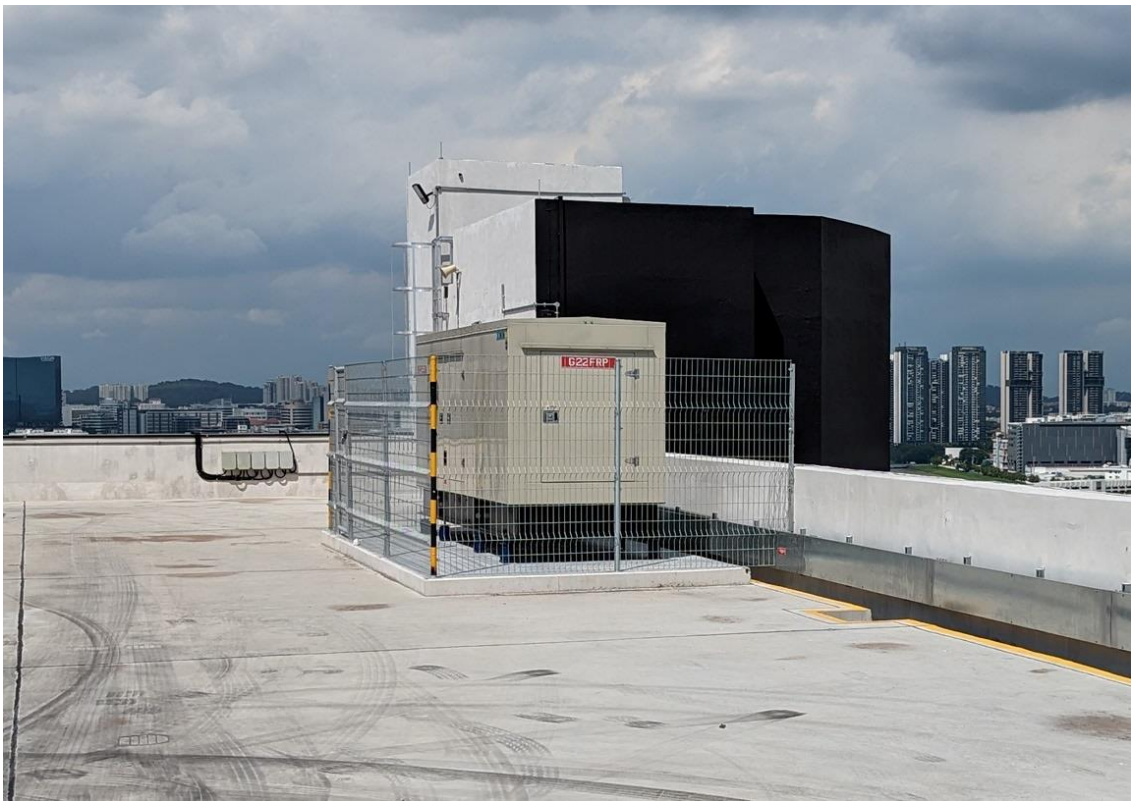
Hazard	Post-tension cables embedded in RC slab.
Risk	Release of stored energy through unplanned demolition during future A&A/ demolition works.
Control Measures	1) Provide markings on underside of slab indicating tendon locations. 2) Handover as-built drawings indicating tendon locations to building owner for future maintenance or demolition considerations.
Type	Physical – Building structure
Trade	C&S / Specialist Designer
Stage	Detailed Design / Construction

S3

Hazard	Metal staircase construction and finishing works.
Risk	Workers and tools falling from height when executing works at high-level.
Control Measures	1) Design for off-site fabrication of steel elements to be assembled on-site at ground level. 2) Maximise use of standard bolt connections with minimal site welding/cutting required. 3) Assemble modules, install railings, and execute finishing works at ground level prior to hoisting.
Type	Physical – Working at height
Trade	C&S / Builder
Stage	Detailed Design / Construction

PART III.
Mechanical & Electrical

M1



Hazard	Replacement of genset.
Risk	Hoisting of heavy genset equipment.
Control Measures	1) Position the genset in an easily accessible location where possible (e.g. adjacent to driveway or ground floor). 2) If located on roof, position genset closer to an edge serviceable by a driveway below that can accommodate the required hoisting crane. 3) If covered by an M&E screening/trellis, detail it to be demountable to ease the replacement procedure.
Type	Physical – Falling objects
Trade	M&E / Architecture
Stage	Schematic Design / Detailed Design

M2

Hazard	Servicing of grease trap.
Risk	Traffic obstruction.
Control Measures	Position the access locations away from main driveways where possible (e.g. at service zones or carpark).
Type	Physical – Traffic accident
Trade	M&E
Stage	Detailed Design

M3

Hazard	Maintenance of heavy equipment suspended at high level.
Risk	Maintenance workers falling from height.
Control Measures	1) Permanent suspended catwalk-platform with safety barriers for safe access. 2) Cat ladder (with cage if more than 3m high) with lock for authorised access only. 3) Anchor points at any areas that cannot be protected by safety barrier.
Type	Physical – Working at height
Trade	M&E / Architecture
Stage	Detailed Design

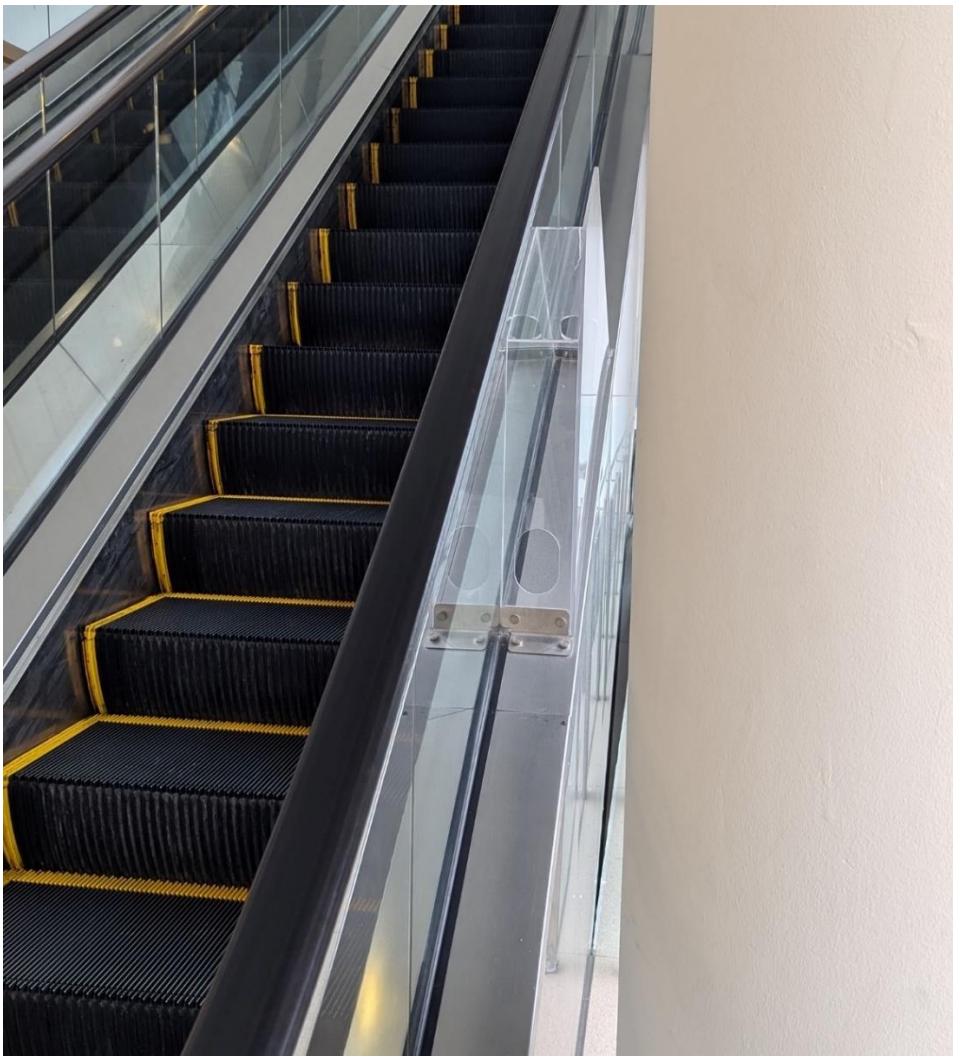
M4

Hazard	Maintenance of heavy equipment.
Risk	Maintenance workers falling from height.
Control Measures	1) Locate heavy equipment that requires frequent maintenance on the floor level whenever possible. 2) Restrict access for maintenance personnel only.
Type	Physical – Working at height
Trade	M&E
Stage	Detailed Design

M5

Hazard	Maintenance of overhead services.
Risk	Maintenance workers falling from height.
Control Measures	1) Consolidate services as far as possible to minimise the zones where servicing needs to take place. 2) Ensure no permanent obstructions below where servicing requires equipment (e.g. scissor lift, platform ladder) or temporary scaffolding to access services above.
Type	Physical – Falling from height
Trade	M&E
Stage	Detailed Design

M6



Hazard	External facing ledge of escalator.
Risk	Climbing on unprotected ledge and falling from height.
Control Measures	1) Install anti-climbing device. 2) Cautionary signages to warn against climbing.
Type	Physical – Falling from height
Trade	M&E / Specialist Designer
Stage	Detailed Design

PART IV.
Construction

C1

Hazard	Installation of air-conditioner ledge railing at height.
Risk	Railing or workers falling from height during installation.
Control Measures	Install railing at ground level before entire precast unit is lifted into position.
Type	Physical – Working at height; Falling objects
Trade	Builder / Specialist Designer
Stage	Pre-Construction

C2

Hazard	Hoisting/Installation of external façade at height.
Risk	Precast components or workers falling from height during hoisting/installation.
Control Measures	1) Design connection points to be fixed from interior to minimise risk of falling from height. 2) Design connection details that minimise the number of components to be fixed and limit the height of each component to 3.1m. 3) Design lifting points with centre-of-gravity considered and marked.
Type	Physical – Working at height; Falling objects
Trade	Builder / Specialist Designer
Stage	Pre-Construction

C3

Hazard	Installation of PPVC units at the top level.
Risk	Workers falling over the edge of PPVC units during installation.
Control Measures	1) Install temporary handrails along top edges of PPVC before being lifted into position. 2) Workers to use vertical ladder with railing and secured firmly to climb onto PPVC. 3) Workers to put on safety harness and anchor it to handrails while working on top of PPVC.
Type	Physical – Working at height
Trade	Builder / Specialist Designer
Stage	Pre-Construction / Construction

C4

Hazard	Installation of PPVC units at the top level.
Risk	Workers falling over the edge of PPVC units during installation.
Control Measures	Install modular perimeter safety screens that can be jacked up with each subsequent installation level.
Type	Physical – Working at height
Trade	Builder / Specialist Designer
Stage	Pre-Construction / Construction

C5

Hazard	Logistical complications arising from use of concrete pump for cast-in-situ, especially at high levels.
Risk	Workers, tools, and equipment falling from height when executing works at high-level.
Control Measures	Use pre-cast elements (slabs, beams, columns) in place of cast-in-situ to eliminate the need for pumping concrete to high level.
Type	Physical – Working at height; Falling objects
Trade	Builder
Stage	Pre-Construction / Construction

C6

Hazard	High-level link bridge construction and finishing works.
Risk	Workers and tools falling from height when executing works at high-level.
Control Measures	1) Assemble as many structural elements and railings as possible on ground level prior to hoisting to prevent high-risk work at height. 2) Execute as much finishing work as possible on ground level, including painting and running of M&E services to reduce the time required for works to be executed at height. 3) Pre-install any underside ceiling panels prior to hoisting.
Type	Physical – Working at height; Falling objects
Trade	Builder / C&S
Stage	Pre-Construction / Construction

C7

Hazard	Construction works in close proximity to operational vehicular/pedestrian zones.
Risk	Objects falling from height onto vehicles/pedestrians below.
Control Measures	1) Design for temporary crash deck over risk zone catering to expected loads. 2) Temporary diversions during hoisting of materials over the decking or when high-risk work is being executed in the vicinity.
Type	Physical – Falling objects
Trade	Builder
Stage	Pre-Construction / Construction

C8

Hazard	Vertical transportation of workers during construction.
Risk	Workers and tools falling from height when using vertical transportation.
Control Measures	1) Plan for early installation of permanent access (e.g. ceiling mounted work platforms, walkways and stairways), to reduce the use of ladders or scaffolds. 2) Complete permanent staircases/lifts first so they can be used during construction stage.
Type	Physical – Falling from height; Falling objects
Trade	Builder
Stage	Pre-Construction / Construction

C9

Hazard	Non-standard floor-to-floor heights requiring use of customised formwork for slab casting.
Risk	Unusual sequencing with high-risk scenarios resulting in injury/death to workers.
Control Measures	1) Standardise floor plates and floor-to-floor heights. 2) Use of modular Table Form to construct typical floors. 3) Plan for temporary voids to allow quick lifting of Table Form between floors, reducing the need for repeated dismantling and reassembling.
Type	Physical – Falling from height; Falling objects
Trade	Builder / Architect
Stage	Schematic Design / Pre-Construction / Construction

C10

Hazard	Lack of access for heavy lifting during construction.
Risk	Materials and heavy elements falling from height.
Control Measures	1) Optimise the building layout to allow heavy lifting by tower cranes during construction. 2) Plan for proper access for erection and dismantling of tower crane with adequate spacing between blocks. 3) Plan and provide for customised foundation for lifting equipment (e.g. crawler cranes) to minimise settlement and failure of support.
Type	Physical – Falling objects
Trade	Builder / Architect
Stage	Schematic Design / Pre-Construction

References

Workplace Safety and Health (Design for Safety) Regulations 2015
Workplace Safety and Health Guidelines – Design for Safety
Code of Practice on Workplace Safety and Health (WSH) Risk Management

Workplace Safety and Health Act 2006
Workplace Safety and Health (Risk Management) Regulations
Workplace Safety and Health (General Provisions) Regulations
Workplace Safety and Health (Scaffold) Regulations 2011
Workplace Safety and Health (Work at Heights) Regulations 2013
Workplace Safety and Health (Confined Spaces) Regulations 2009
Code of Practice for Working Safely at Heights
Workplace Safety and Health Guidelines – Anchorage, Lifelines and Temporary Edge Protection Systems
Workplace Safety and Health Guidelines – Personal Protective Equipment for Work At Heights
Workplace Safety and Health Guidelines – Working safely on roofs

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The Real Estate Developers' Association of Singapore (REDAS), established in 1959, is Singapore's premier business association in the real estate and development industry.

Representing some 300 members comprising developers, builders, consultancies and professionals, bankers, REITs and fund managers, REDAS plays a relevant role in the real estate industry.

REDAS actively engages regulators, policy makers and stakeholders to promote best practices and to support the growth of a vibrant and progressive real estate industry in Singapore. The Association also organises seminars and courses to strengthen capabilities and competencies of members as well as events and study and business trips to facilitate connection and explore opportunities.

The Association is led by a committed team of Management Committee Members who are business leaders of reputable and established property organisations.

REDAS members are committed to enhancing Singapore's position amongst the top ranks of one of the world's most attractive and liveable cities which is environmentally and economically sustainable for present and future generations.

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