

2 Space Standards & Dimensions

This section deals with the common elements of the healthcare facilities rather than individual rooms. For individual rooms refer to the Room Data Sheets (RDS) and Room Layout Sheets (RLS) provided and referenced in the relevant Functional Planning Units (FPU's) within these Guidelines.

The common elements include subjects related to corridor dimensions, ceiling heights, department sizes and efficiency.

2.1 Corridors

There are many schools of thought on minimum corridor widths and the underlying principles that should dictate them. This section includes the recommended minimum requirements with consideration given to the need to allow for the movement of mobile equipment such as trolleys, beds, wheelchairs, motorised carts, Automated Guided Vehicles (AGV's) etc. including the allowance for equipment to pass in opposite directions.

Fire Egress

A key principle in establishing the minimum corridor width is the requirement to allow a width that will not restrict egress in the event of an emergency evacuation procedure. These Guidelines for corridor widths do not represent the requirements of the mandatory Fire Safety codes as established by the relevant authorities such as Civil Defence, Fire Brigade, Municipality and others. The facility design needs to comply with the locally mandated Fire Safety codes in addition to these Health Facility Guidelines. Where one provision is more onerous than the other, the higher standard must prevail and compliance with both should be expected.

Key Considerations

Here is a summary of the considerations for corridor widths:

- Other Building Codes with jurisdiction over the facility may also specify minimum corridor widths with a different focus. The example of Fire Egress corridors was mentioned above. Another example would be general accessibility for disabled persons such as those using wheelchairs or those affected by vision or hearing impairment. The mandatory requirements of such Building Codes may also apply to healthcare facilities and must be considered. However, these Guidelines are concerned with a broader range of issues and the above Building Codes may not be sufficient. So, these Guidelines may exceed the requirements of the other building codes and should also be complied with.
- Health facilities may be planned with clearly designated staff-only and patient corridors. The requirements for patient corridors will not apply to staff-only corridors. However, if maximum flexibility is intended, within the clinical departments it may be more appropriate to apply the same corridor width guidelines to all areas including the staff-only corridors. This will allow any of the staff areas to be re-purposed in the future as a clinical area. For example it would be best if the corridors leading to the offices within the Intensive Care Unit (ICU) or Operating Unit be designed to the same dimensional standards as Patient Corridors.
- All corridor widths identified are clear of handrails and/ or crash rails or other items such as drinking fountains, hand wash basins, telephone booths, columns, vending machines and portable/ mobile equipment. An allowance of 100mm is recommended for handrails. This is a combination of the grab rail width and clear space behind it including some tolerance for construction errors.
- Equipment parked along corridors must not impede the traffic flow. Dedicated equipment bays should be provided with sufficient depth so that the equipment will not encroach into the clear corridor width. Ideally such equipment bays should be discretely placed on one side of cross-over corridors rather than the main corridors so that they are not fully exposed to the visitors and passing traffic. These recommendations do not apply to equipment which may be in transit and momentarily parked along a corridor such as food trolleys at the time of distribution to the bedrooms.
- AGV's (if any) traveling along corridors, should lead to designated parking bays. AGV's should not be parked along the corridors in a manner that obstructs the clear width of the corridors.
- Consideration should be given to the elimination of potentially dangerous 'blind spots' in

corridors serving mental health facilities. This is to prevent a situation where a disturbed patient can hide in a blind spot to surprise and possibly attach a member of staff.

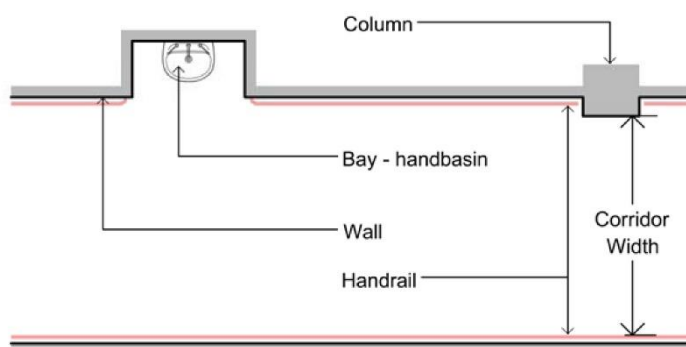


Figure 1.1: Corridor Plan – showing the width clear of handrails and obstructions

Corridor Widths

There are two types of corridors defined within these Guidelines:

Circulation Corridors- These are corridors within the Functional Planning Units (Departments)

Travel Corridors- These are the main arterial corridors which link the FPU's together and connect to lifts (elevators).

In patient areas such as Inpatient Units, Operating Units and Intensive Care Units, where beds, trolleys and stretchers will be moved regularly, minimum clear corridor widths of 2500mm are recommended.

Refer to Figure 1.2 to 1.4 below.

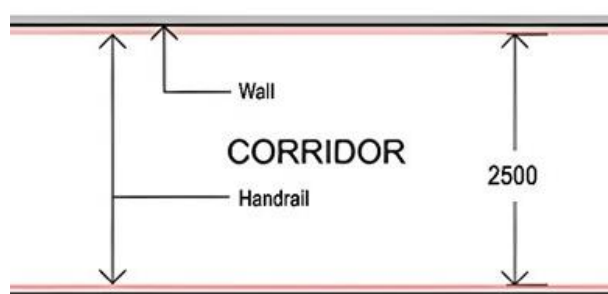


Figure 1.2: Corridor plan showing minimum clearance for patient corridors in FPUS

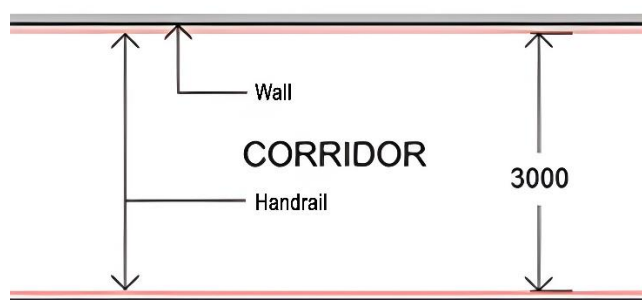


Figure 1.3: Corridor plan showing minimum clearance for travel corridors

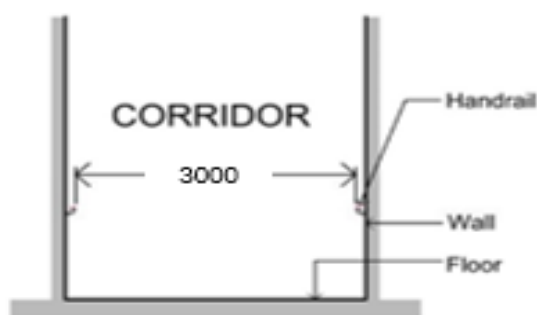


Figure 1.4: Corridor plan showing minimum clearance

In certain situations, such as Critical Care units (ICU, CCU, HDU, PICU) involving the movement of patients on beds with multiple attachments and accompanying staff, it is recommended that the minimum clear circulation corridor be increased from 2450mm to 2600mm. This provision is optional but highly recommended.

Similarly, the main clean circulation corridor of the Operating Unit leading to the operating rooms may be increased in width from 2450mm to 2800mm. This provision is optional but highly recommended.

Travel Corridors which lead to any departments which permit patient access or movement of beds and trolleys should have a minimum clear width of 2450mm. In large facilities consideration should be given to increasing this width to 3000mm.

Where the movement of beds and trolleys is not expected, any circulation corridors which may be used by a patient for any purpose should not be less than 1850mm. For example, this may apply to corridors within the Outpatient Unit or any of the administrative areas where the patient access is expected such as the Admission Unit.

In staff-only areas where the entry of patients is neither expected nor permitted, the minimum clear width of corridor can be 1200mm. If such corridors are over 12m in length then they should have a minimum clear width of 1500mm.

Where an existing building is being redesigned, corridor widths that are smaller than the recommend dimensions may be permitted by local Authorities. However, special considerations should be given to emergency egress and evacuation which can never be compromised.

Automatic Guided Vehicles (AGV's) commonly share the corridors with humans. Typically, AGV's only use travel corridors. If a corridor is designated as a route for AGV's, its width should be no less than 4000mm but ideally 5000mm in dedicated back-of-house areas.

Summary of corridor widths:

Corridor Type	Minimum Clear Width	Bed/ Trolley movement	Patient movement	Staff movement	Remarks
Patient Corridor	2450	Yes	Yes	Yes	Required
Critical Care	2450	Yes	Yes	Yes	Ideal 2600
Operating Unit	2450	Yes	Yes	Yes	Ideal 2800
Travel Corridor	2450	Yes	Yes	Yes	Ideal 3000
Patient Corridor	1850	No	Yes	Yes	Allow for ambulance stretcher access in emergencies
Staff Corridor	1200	No	No	Yes	Ideal 1500
AGV Corridor	4000	Yes	Yes	Yes	Ideal 5000 in BoH areas
Existing Corridor	TBD	Yes	Yes	Yes	As permitted by local Authorities

Doorways

In all corridors special consideration must be given to the width of doorways into connecting rooms. Corridors may need to be widened at the entry to rooms to allow for beds/ trolleys to turn into the room.

Corridor widths to permit turning are demonstrated in the diagrams below. .

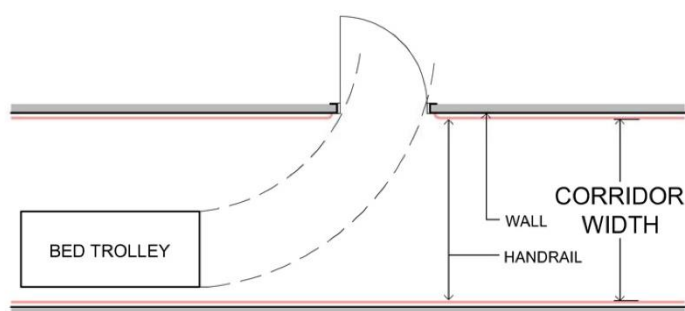


Figure 1.5: Corridor width permits turning into a room

In the diagram shown above, corridor width is sufficient for a bed trolley can be manoeuvred to enter a room for which the entry door is located on corridor wall.

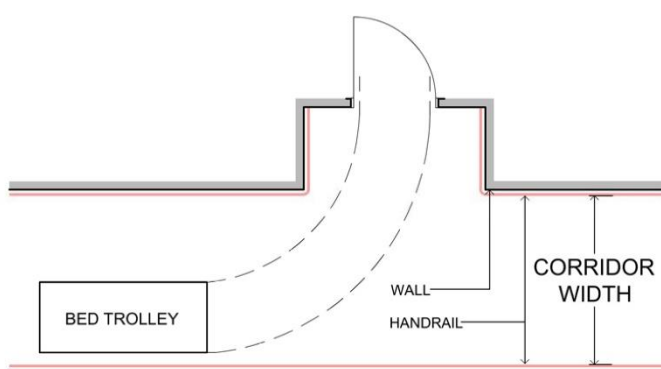


Figure 1.6: Corridor with recessed door entry to allow for turning

In the diagram shown above, where the corridor width is not sufficient to allow a bed trolley to turn into a room, a recessed entry door is provided.

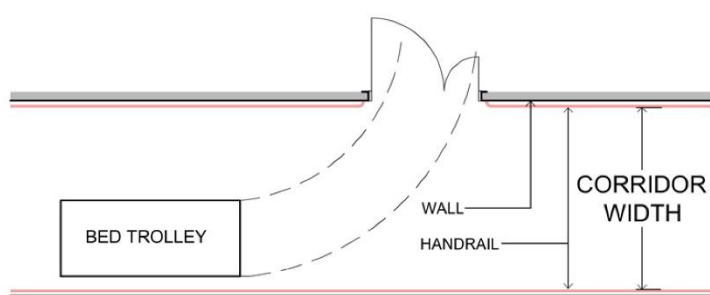


Figure 1.7: Corridor with double door room entry to permit turning

Alternatively, in the diagram shown above, where the corridor width is not sufficient to allow a bed trolley to turn into a room, a double door may be provided.

The minimum clear door widths for individual rooms are indicated within the Room Layout Sheets provided within these Guidelines. These are subject to the clear width being effective and useable according to one of the 2 scenarios shown above.

Disability Access

In all corridors, especially narrower corridors used either by ambulatory patients or staff, consideration must also be given to accessibility requirements, particularly access via a wheelchair. Effective access may require localised corridor widening or provision of double doors to allow disabled staff to pass or to access doors.

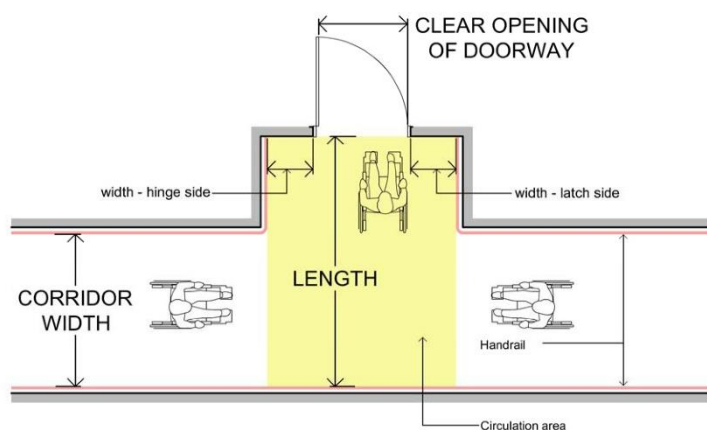


Figure 1.8: Corridor modified for disabled access

In the figure shown above, the corridor has been modified to give a person in a wheelchair the required circulation space to access and operate the door. The requirements of width on the latch side and hinge side, the clear opening of a doorway, the direction of door swing and the direction of approach to the doorway are inter-related and should be considered. The exact dimensional requirement for accessibility may be subject to specific accessibility codes and standards which should be followed.

Protection of Openings

Openings such as doorways and corridor junctions which are subject to the movement of objects such as beds and trolleys should ideally be protected by corner guards up to the height of minimum 900mm AFFL or ideally up to 1500 AFFL. Corner guards should be made of resilient material.

2.2 Ceilings

Ceiling Heights

For all types of healthcare facilities, the default ceiling height of 2700 is recommended. This ceiling height is recommended in patient accommodation and treatment areas (other than Operating rooms, Medical Imaging rooms, Procedure Rooms and Critical Care rooms). It is also suitable for offices, conference rooms, administrative areas and support areas.

The minimum acceptable ceiling height in occupied areas is recommended to be 2400mm, but consideration should be given to the size (sensory consideration) and use of the room.

Ceilings in patient bed areas including Bedrooms, Bed Bays and Recovery areas should be a minimum of 2700mm. Bedrooms for bariatric care may require an increase in ceiling height if ceiling mounted lifting equipment are to be used.

In critical care bed areas such as ICU, CCU, HDU, PICU, NICU and Emergency Resuscitation Rooms a ceiling height of 3000mm is recommended to provide sufficient height for ceiling mounted equipment and service pendants.

In Mental Health Units, Seclusion rooms must be designed and constructed to avoid features that a patient could use for injury or self-harm. For example, an impact resistant set ceiling made of cement board or similar. The recommended ceiling height is 3000mm.

The recommended ceiling height for Corridors, and lift lobbies is 2700mm with a minimum of 2400mm.

The recommended ceiling height for small Ensuites is 2400mm.

In existing facilities being renovated, ceiling heights in Corridors and Ensuites may be reduced to 2250mm, but only over limited areas such as where a mechanical duct passes over a corridor.

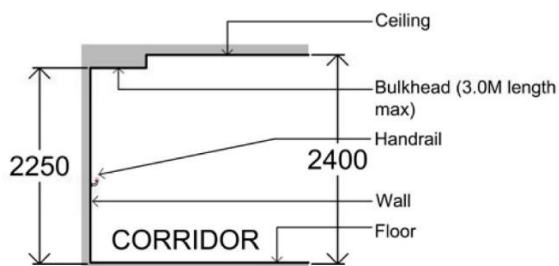


Figure 1:9: Corridor section showing minimum ceiling heights

In corridor bays or areas with restricted access such as a hand wash basins recess, a minimum ceiling height of 2250mm is acceptable.



Figure 1.10: Reduced height ceiling within a hand wash bay along a corridor

Rooms with ceiling mounted Medical Imaging and other equipment, such as X-ray Rooms and Operating Rooms require increased ceiling heights. The default minimum ceiling height in these areas should be 3000mm.

In addition, in such rooms the ceiling height should comply with the minimum equipment manufacturers' installation requirements.

Ceiling mounted equipment must be able to achieve the required clearance height of 2150mm when in the stowed position, especially within circulation areas. Refer to Figure 1.11 below.

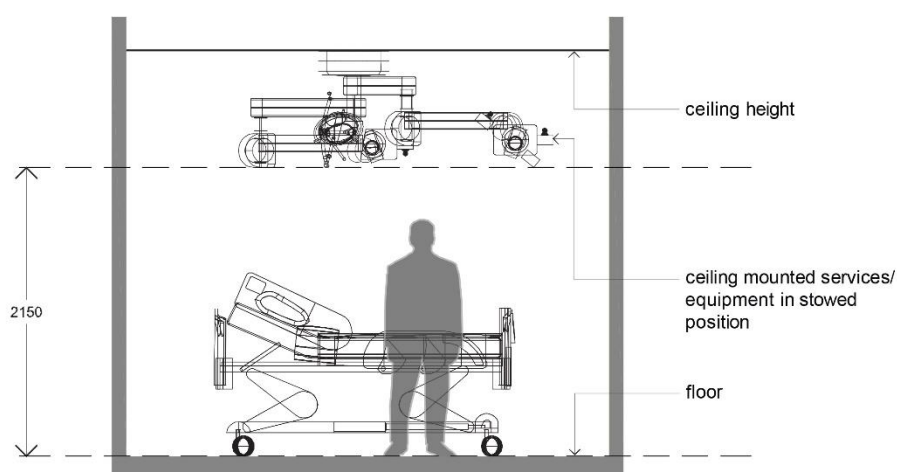


Figure 1.11: Ceiling mounted services stowed

Minimum ceiling (soffit) heights of external areas such as canopies over main entries, ambulance entries and loading docks should suit the requirements of the anticipated vehicle traffic. Special consideration should be given to emergency vehicles with aerials fitted. The recommended minimum ceiling (soffit) height is 3200mm.

Plant Room ceiling heights should suit the equipment installed and allow safe access for service and maintenance. The minimum recommended ceiling height is 2400mm in all trafficable areas. There is no requirement for a false ceiling in Plant Room areas.

Variations from recommended ceiling heights should be approved by the relevant health authority in writing.

2.3 Department Sizes

Department sizes (FPU sizes) will largely depend upon the project brief based on the Service Plan. The Service Plan provides the Key Planning Units (KPU's) and the brief, in the form of Schedule of Accommodation (SOA) takes the KPU's adds all the supporting rooms required as the basis for design.

KPU's are defined as rooms or services which represent patient activity. The KPU's used as the basis for generating a Schedule of Accommodation are:

- Inpatient Beds
- Same day Beds
- Critical Care Beds (ICU, CCU, HDU, PICU, NICU)
- Outpatient Consulting Rooms
- Operating Theatres
- Medical Imaging Modalities

The SOA will have a full listing of all the rooms required plus the departmental circulation allowance.

The KPU's are not mandatory and depend on the circumstances of each project whilst the supporting rooms need to be provided in accordance with the requirements of these Guidelines. Typical SOA for the FPU's under one or more Role Delineation Levels have been provided within these Guidelines but must be customized and adjusted to the exact KPU's required for the individual facility.

The recommended circulation as a percentage of the simple sum of all rooms is provided within this Part C of the guidelines as well as the individual FPU's provided.

Department (FPU) sizes are also affected by the ability to share or combine functions as long as the planning provides for appropriate safety standards and optimal patient care. The opportunities for certain facilities to be shared between two FPU's have been suggested within the text of the FPU's and as comments within the SOA included in the FPU's.

For further discussion on departmental areas including Functional Areas, Gross Departmental Areas, Travel, Engineering and how to measure floor areas refer to Part B Health Facility Briefing and Design, in particular the section on Planning in these Guidelines.

Departmental sizes also are contingent on design efficiency covered below.

In short, there are no guidelines on how large or how small a facility must be. However, once the KPU's are decided and declared, the rest of the requirements will follow, dictating the size of the facility.

2.4 Efficiency Guidelines

General

The concept of efficiency refers to the proportion of Net area vs Gross area in a brief or a plan. The difference between the overall building Net area and Gross area is the combination of inter-connecting corridors and engineering space allowance.

Under these Guidelines:

- Circulation is defined as the inter-connecting corridors within one Department (Functional Planning Unit).

- Travel is defined as the large arterial corridors which link the departments together. Travel also includes areas such as lift (elevator) lobbies and all types of stairs.
- Engineering refers to the total area of technical rooms, plant rooms, service risers and service cupboards but not open-air shafts.

Circulation

During briefing and the preparation of the SOA, Circulation corridor allowance is expressed as a percentage of the Net Departmental Areas, being the simple sum of all habitable rooms. Once the Circulation is added to the Net Departmental Area, it is referred to as the Gross Departmental Area.

Simplistic guidelines on efficiency tend to be misleading and should not be applied to vastly different functional briefs. It is more appropriate to allocate different circulation percentages according to each specific Department (FPU). Such a guide has been provided under the Schedule of Circulation Percentages in this section. The same is also shown under each FPU in the section titled Schedule of Accommodation (SOA).

It is important to provide an adequate circulation allowance in briefing documents such as SOA. Insufficient allowance for circulation is not recommended as this may force designers to reduce the size of functional spaces resulting in a sub-optimal plan. It must also be noted that the circulation percentages are a target for planning and should be used as a guide only. They apply to specific Functional Planning Units (FPUs) included in these Guidelines.

Larger and more complex FPU's such as Operating Unit, Intensive Care Unit or Emergency Unit require a larger circulation percentage. Simpler FPU's and those incorporating large open plan areas such as Administration Unit or Supply Unit will require a smaller circulation percentage.

Schedule of Circulation Percentages

Recommended Circulation Percentages for typical Functional Planning Unit (FPU) are as follows:

FPU No.	Department or Functional Planning Unit (FPU)	Minimum Circulation %
10	Administration Unit	20
50	Allied Health Unit	25
40	Catering Unit	25
45	Clinical Information Unit	15
55	Coronary Care Unit	35
60	Day Surgery/ Procedure Unit	40
65	Dental Unit	32
70	Education & Training Unit	30
75	Emergency Unit	40
80	Endoscopy Unit	20
85	Engineering & Maintenance Unit	15
95	Housekeeping Unit	10
110	Inpatient Accommodation Units	35
130	Intensive Care Units	40
150	Laundry/ Linen Handling Unit	10
160	Medical Imaging Units	35
180	Mental Health Units	32
215	Mortuary Unit	20
175	Nuclear Medicine Unit	35
117	Inpatient Unit - Maternity	35
235	Operating Unit	40
245	Outpatient Units	32
120	Paediatric / Adolescent Unit	35
255	Pharmacy Unit	25
260	Public and Staff Amenities Unit	20
230	Radiation Oncology Unit	35

FPU No.	Department or Functional Planning Unit (FPU)	Minimum Circulation %
265	Rehabilitation Unit	25
270	Renal Dialysis Unit	32
280	Sterile Supply Unit	25
285	Supply Unit	10
290	Waste Management Unit	20

Table 1: Recommended Circulation Percentages

Travel Corridors and Stairs

The allowance for Travel including both Stairs and Corridors applies to all internal, habitable parts of the facility. The recommended allowance for Travel depends on the configuration of the building components. Stairs are counted at each level of the building as part of Travel.

Low-rise buildings tend to be spread out with many corridors connecting the Departments (FPU's) together.

High-rise buildings tend to be more compact and replace long corridors with additional lift (elevator) lobbies.

In most situations, within a height range of 1 to 15 storeys, a high-rise building is expected to have a lower Travel area than Low-rise. Beyond a certain number of floors, the lift cores will become so large that push the departments out, increasing the Travel areas again.

During the briefing and preparation of the SOA, Travel is calculated as a percentage of the Gross Departmental Area. Gross Departmental Area is the simple sum of the room areas plus the Departmental Circulation.

The minimum and recommended Travel percentages are shown in the table below.

Engineering

In this context Engineering refers to the Technical Rooms, Plant Rooms, Service Cupboards and Service Risers but not open-air shafts. It is assumed that all technical and plant rooms are enclosed with the exception of heat rejection components, which may be open to the air. Open air components will not count as Engineering in this context.

During briefing the space required for Engineering is calculated as a percentage of the Gross Departmental Area (mentioned above).

The percentage allowance for Engineering is usually very similar or identical to the Travel allowance. The combination of Travel and Engineering allowance is referred to as T&E.

Travel and Engineering (T&E) allowance

As a rough guide, the following range of Travel and Engineering percentages may be used for planning purposes but must be confirmed after design. The percentages recommended apply to the total Gross Departmental Area.

Sr. No.	Building Levels *	Travel Minimum %	Engineering Minimum %	T&E % Minimum	T&E % Recommended
1	1	19	19	38	38
2	2	18	18	36	36
3	3	17	17	34	36
4	4	16	16	32	34
5	6	15	15	30	34
6	12	15	15	30	32

* Habitable levels including the ground level and any habitable basement levels (not carparking)