

Part C – Access, Mobility and OH&S



*i*HFG

International Health Facility Guidelines
2025

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1 Executive Summary

This Part C of the Guidelines covers the subjects of Access, Mobility, Occupational Health and Safety. These are subjects which are common to most areas of healthcare facilities. So, they are combined into one Part for ease of reference.

This part is divided into several sections including:

- Space Standards and Dimensions
- Human Engineering
- Ergonomics
- Signage
- Doors
- Grab Rails & Handrails
- Windows and Glazing

The above sections represent the common and default provisions, unless noted otherwise elsewhere in these Guidelines.

The more specific requirements for individual departments and rooms are covered separately in the FPU's, Room Data Sheets and Room Layout Sheets. So, a holistic approach and understanding of the requirements is recommended.

This section also mentions certain aspects of materials. There is some overlap with Part D Infection Control. Therefore, in relation to the impact of the materials on infection control this section needs to be read in conjunction with Part D.

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.

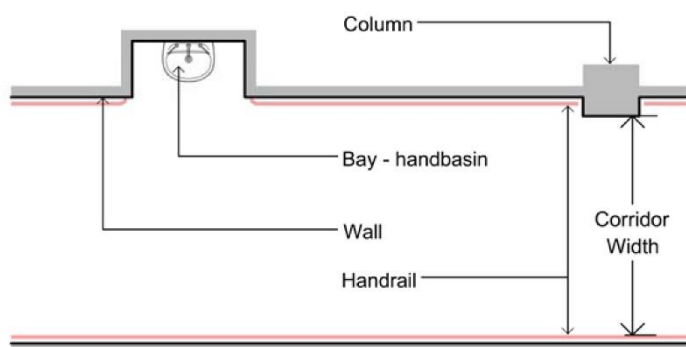


Figure 1.1: Corridor Plan – showing the width clear of handrails and obstructions

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.

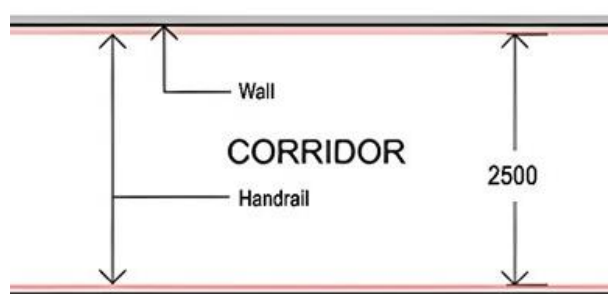


Figure 1.2: Corridor plan showing minimum clearance for patient corridors in FPUS

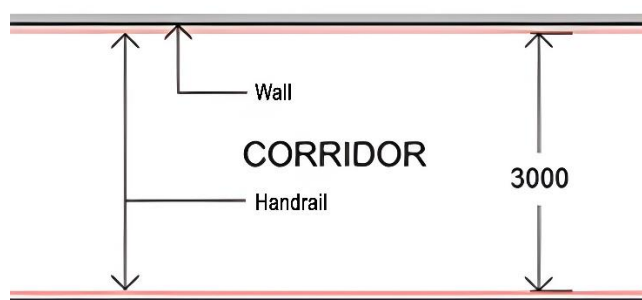


Figure 1.3: Corridor plan showing minimum clearance for travel corridors

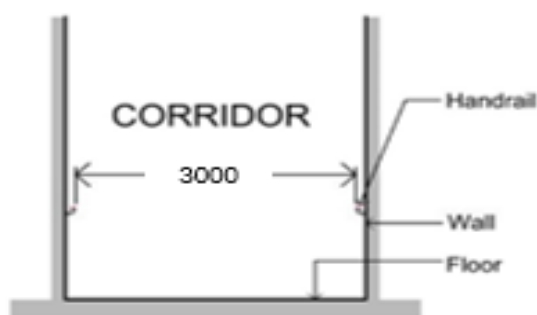


Figure 1.4: Corridor plan showing minimum clearance

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. .

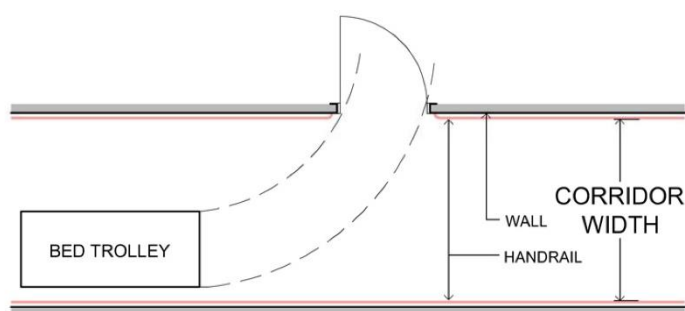


Figure 1.5: Corridor width permits turning into a room

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.

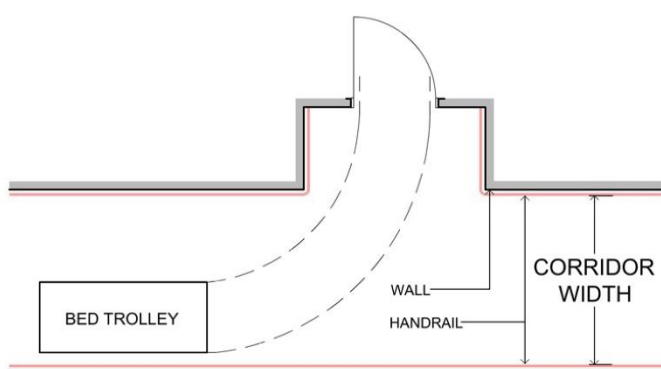


Figure 1.6: Corridor with recessed door entry to allow for turning

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.

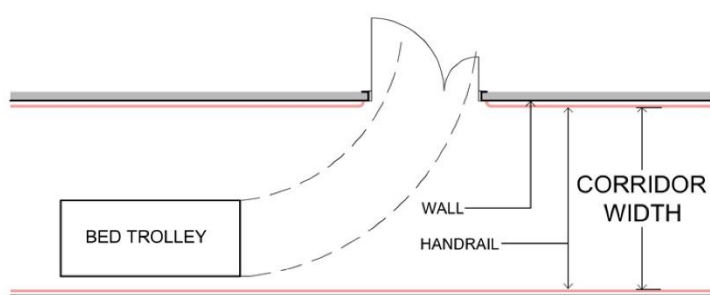


Figure 1.7: Corridor with double door room entry to permit turning

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.

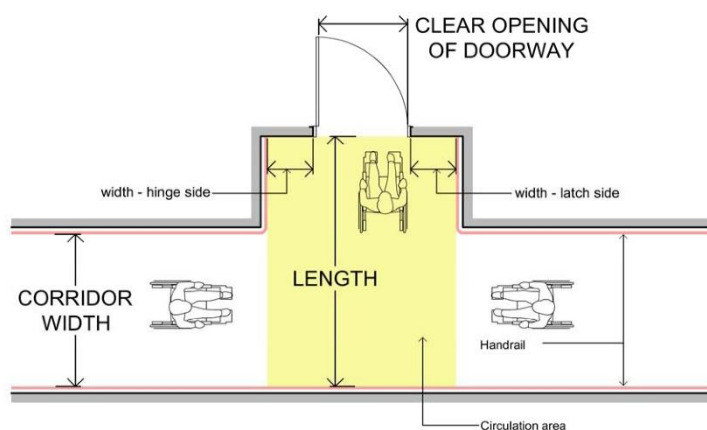


Figure 1.8: Corridor modified for disabled access

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.

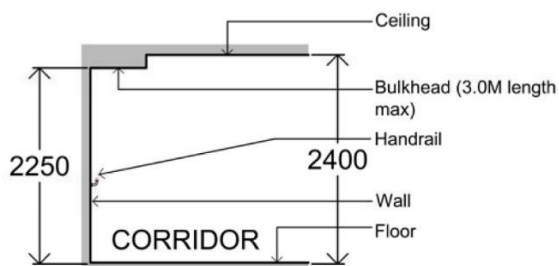


Figure 1:9: Corridor section showing minimum ceiling heights

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.

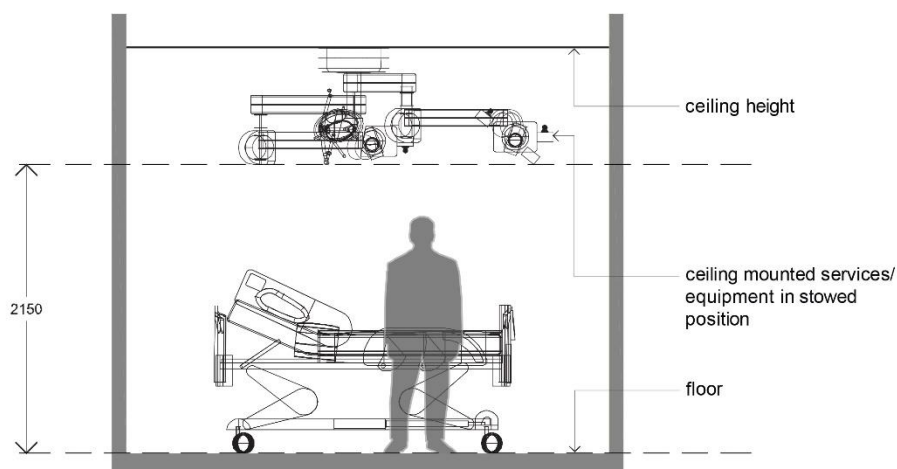


Figure 1.11: Ceiling mounted services stowed

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)

3 Human Engineering

3.1 General

The discipline of human engineering is concerned with the design of machines, work systems and environments to consider the safety, comfort and productivity of humans, both able bodied persons and persons with a disability. The subject of Human Engineering includes many aspects of Ergonomics. These Guidelines aim to provide designers with principles to guide their planning design in order to develop a space that is in line with the principles and aims of human engineering. Designers must also comply with local standards and codes applicable to people with disabilities, and Occupational Health and Safety (OH&S)

A key consideration in a health facility design is to provide an environment that promotes the independence of patients. Designers need to take into consideration:

- The needs of abled bodied persons including staff, visitors patients
- The needs of persons with a disability including mobility impaired, visually impaired and hearing-impaired persons
- The needs of people using short term mobility aids
- The possibility of staff with certain disabilities (as long as these do not compromise the performance of their responsibilities)
- Bariatric patients and visitors
- Parents with children and prams
- The needs of patients with mental illness or cognitive disorders

Planning

Initial planning should include provisions for people with special needs as noted above to avoid future building alterations that may be cost prohibitive and compromise good planning.

Fixtures & Fittings

Fixtures and fittings that will be used for support including grab rails, handrails, shower rails, towel rails, soap holders and footrests should be able to support the weight of a heavy person including the concentrated load of a falling person. For example, towel rails (if any) should be designed with the strength and detailing similar to handrails and grab rails.

Fittings and fixtures suitable for bariatric persons should accommodate weights of between 250kg and 500kg. This provision applies to fixtures such as hand wash basins, toilets, benches, desks and similar items used by bariatric patients. It also applies to all types of furniture expected to be used by bariatric patients.

Refer to Part B – Inpatient Unit – Bariatric for further information.

Handwashing Basins

Location and arrangement of fittings for handwashing should permit their proper use and operation. Particular care should be given to the clearances required for elbow action type handles. Non-thermal transmitting standard handles are preferred, with effective finger grips (except in Mental Health patient facilities). Heights are to suit the particular function, such as paediatric, disabled and standard. For adult hand wash basins (scrub sinks) refer to Part D of these guidelines which defines various types required for different clinical and non-clinical areas.

Handwashing facilities should be securely anchored to withstand an applied vertical load of not less than 115kg at any point on the basin. Additional provisions may be required for bariatric patients as mentioned above.

The basins provided for handwashing must be designed to minimise the risk of splashing. The water discharge point of the handwashing basin faucets should be a minimum of 255mm above the bottom of the basin and provided with regulated water pressure.

Handwashing basins used by medical and nursing staff and food handlers should have fittings that can be operated without using hands.

All fixtures and tapware within the mental health ensuite should be anti-ligature. Refer to the figure below for examples of acceptable tapware and shower fixtures.

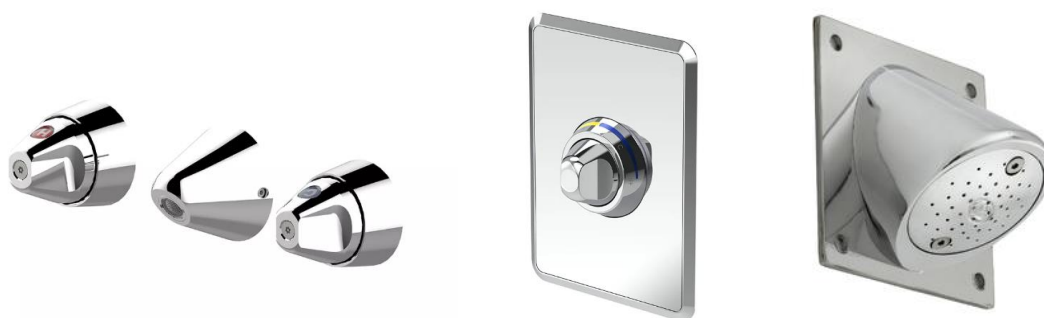


Figure 2.1 Tapware, mixers & shower heads suitable for acute mental health Units

Staircases

Staircase design should to comply with the requirements of the local Building Codes and standards.

Design of staircases must comply with the local Building Codes and standards. Consideration should be given to:

- Security to prevent objects being thrown or falling down the staircase
- Use of non-slip treads
- Provision of adequate lighting

Ramps

Ramps should be designed to suit their intended purpose and provide for the correct width and slope, particularly if used for mobile equipment such as beds, manual trolleys, motorised trolleys, pallet movers or vehicles.

Special consideration should be given to the surface covering of ramps to provide a non-slip finish and reduce the force required to move mobile equipment.

Internal Ramps

Internal ramps within a healthcare facility are not desirable. However, if they must be provided due to certain local circumstances, the following will apply:

Maximum gradient of internal ramps will be 1 in 20

Every 15m, there should be a flat landing area with a minimum 2m length

If there is a change of direction in the flight and the ramp is intended for the movement of beds, the landing should be a minimum of 2m length to allow for the turning of a bed or stretcher on a flat area.

If there is a change of direction in the flight but the ramp is not intended for the movement of beds, the landing should be the same minimum length as the ramp width.

Internal ramps should have the same type of grab rails or protection rails as the corridors to which they are connected.

If an internal ramp is not enclosed by walls, then balustrades should be provided in the same manner as stairs.

External Ramps

Maximum gradient of external ramps will be 1:12.

Every 9m, there should be a flat landing area with a minimum length equal to the width of the ramp.

If there is a change in the direction in the flight of the ramp, the landing should have the appropriate length to allow various objects to turn around 180 degrees without difficulty. The minimum landing will be the same as the width of ramp.

If any external ramp is used to carry patients on stretchers, the minimum landing length will be 2m.

If an internal ramp is not surrounded by sloping ground or matching stepped landscaping, then balustrades should be provided in the same manner as stairs.

4 Ergonomics

4.1 General

All health facilities should be designed and built in such a way that patients, staff, visitors and maintenance personnel are not exposed to avoidable risks of injury.

The design of common elements such as workstations and typical rooms will have a significant impact on the occupational health, safety and welfare of staff and patients. Many jurisdictions now place a legally enforceable duty of care on designers and manufacturers to ensure a safe work environment.

Ergonomics incorporates aspects of functional design - the practise of designing elements to consider the proper use and to suit the people expected to use them. There is a vast body of expert opinion available on ergonomic standards. While there are differences on some ergonomic aspects such as sitting posture or monitor angles there is general agreement on the majority of issues.

Ergonomic standards provide a baseline for design that will suit a majority of situations and people. It is not possible to arrive at a solution that is applicable to all due to individual differences. Ergonomic principles endorse the possible use of adjustable spaces and objects to allow for the special needs of staff, patients and visitors as far as possible. Such provisions are typically expensive, so their use must be balanced against the real benefits and the facility budget.

Designers typically design for their target populations based upon percentages of the population described as percentiles. It is common to design for all falling between the 5th percentile of females to the 95th percentile of males. The 5th to the 95th Percentile range accommodates 90% of the target population as represented in the diagram below.

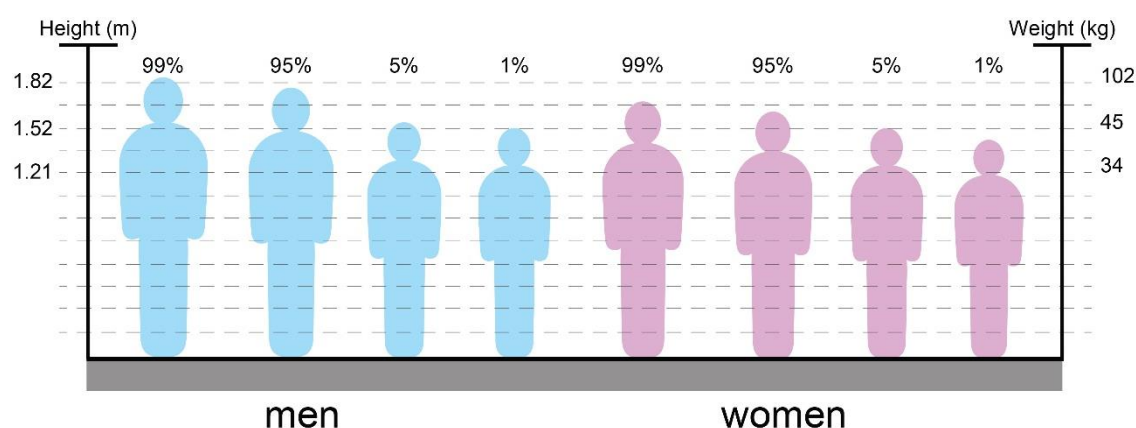


Figure 3.1: The relative sizes of different percentile adult humans (from All Steel Ergonomics and Design, A Reference Guide)

Nothing in these guidelines is intended to create a situation where the needs of all possible preferences or indeed the highest possible standards are implemented in all situations.

The ergonomics standards included in these guidelines are those commonly debated and considered in relation to Healthcare Facilities.

For additional information and relevant standards, please refer to the References and Further Reading list at the end of these Guidelines.

Where a facility is designed for staff or patients with special needs, some deviation from these Guidelines may be appropriate. In such circumstances, it is recommended that designers seek advice from specialist ergonomics experts or OH&S officers.

4.2 Accessibility Standards

Readers should refer to local mandatory Standards for Accessibility and Barrier Free design that cover the subject of access for people with disabilities.

Special consideration is given to the following:

- Access ways and circulation
- Corridors and pathways suitable for wheelchair users
- Facilities for people with ambulatory or sensory disabilities
- Avoidance of discrimination for people with disabilities

Parts of the facility may be specialised for use by patients (or staff) with particular disabilities. In such areas, the specialised needs will override the more common provisions for people with disabilities. In short, 'specialisation' is not seen by these Guidelines as non-compliance in relation to other Accessibility Standards.

It is the requirement of these Guidelines that a minimum number of rooms suitably sized and designed for use by people with disabilities are provided. This is separate to the expected number of patients with disabilities or patients in a wheelchair as a result of their illness. This is due to the fact that the attendance of a patient at a hospital with some form of disability may be unrelated to that disability. For example, a patient using a wheelchair may attend a hospital for a heart condition. These are identified in the relevant sections of the FPU in part B of these Guidelines.

4.3 Ergonomic Standards for Benches and Shelving

These ergonomic guidelines cover the average use of facilities by able bodied persons.

For simplicity, the Ergonomics standards are presented in a table form under several categories. All items should be regarded as recommendations unless noted as mandatory.

Item	Condition of Use	Depth mm	Height mm	Thickness mm	Mandatory	Remarks
Work bench	Utility	600	900	Max 35	No	Flat Monitor
Writing bench	Keyboard use	720-750	680-720	Max 35	No	Flat Monitor
Writing bench – height adjustable	Keyboard use	720-750	580-760	Max 35	No	Seated user
Writing bench – height adjustable	Keyboard use	720-750	660-1180	Max 35	No	Seated or standing user
High Counter (parcel shelf)	Over bench of 720 AFFL	250	1130-1150	20-35	No	600mm reach to the inside edge of counter
High Counter (parcel shelf)	Over bench of 900 to 1000 AFFL	250	1200-1250	20-35	No	600mm reach to the inside edge of counter
Shelving	Over 900mm high bench	350	1520-1810	20-25*	No	2 shelves
Shelving	Over 720mm high bench	350	1370-1710	20-25*	No	2 shelves
Shelving Unit	Full Height	350-400	1500-1810	20-25*	No	7 shelves adjustable

Table 2: Recommended ergonomic dimensions in work areas

*Shelf thickness is subject to span, intended load and method of support

The recommended heights and dimensions for work benches are demonstrated in the figures below.

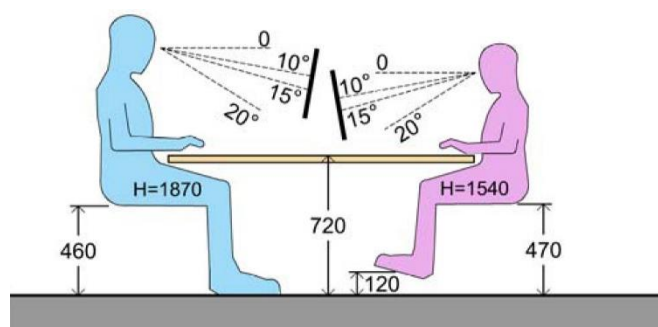


Figure 3.2: People of different heights sitting at a fixed height workstation

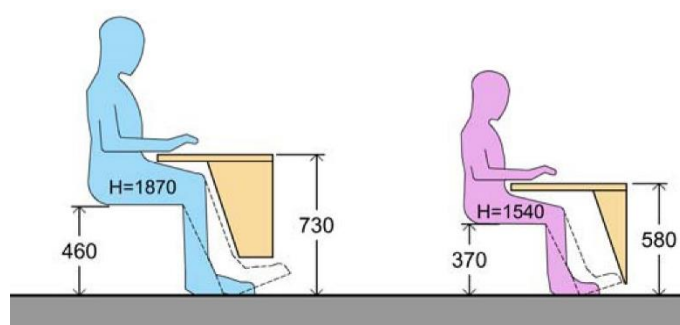


Figure 3.3: People of different heights sitting at an adjustable height workstation

4.4 Reception / Staff Stations

General

The functions undertaken at the Reception or Staff Station (or Nurse Station) may include:

- Reception of visitors and enquiries
- Staff work base and control station
- Reporting and recording patient records
- Dispensing to patients and relatives

The Reception/ Staff station will generally consist of a workbench or workstation and may include a high counter (parcel shelf or service counter).

Refer to Ergonomic Standards in section 4.3 for standards applicable to workbenches.

High Counter

The Reception/ Staff Station may include a high counter (also known as a parcel shelf or service counter) to partially conceal objects, records and equipment from view and may also be used as a writing surface for filling forms or signing documents.

Design of high counters should address the following:

- If the counter is used for communication and contact between staff and visitors, care should be taken to avoid excessive reach across the workstation area and to avoid excessive height which can be a barrier to communication.
- The workstation surface width should be 600mm deep minimum.
- If a flat panel display is required, the workstation surface width should ideally be 750mm deep but 600 deep can also work in tight situations.
- If the high counter is used as a writing surface and to transfer items and documents, the workstation depth should be reduced to provide a 600mm maximum reach from the edge of the workstation surface to the high counter edge.
- The recommended height of the high counter used against a work surface height of up to 720mm above the floor is 1150mm above floor level. This height will allow a typical person to gain sufficient privacy for work whilst being able to look over the top to visitors, standing or

sitting.

- The recommended height to the top counter used against a work surface height of 900mm to 1000mm is between 1200mm and 1250mm above the floor level. The use of a sitting/ standing height adjustable table is not recommended for this application.

High-Low Design

Where children or visitors using wheelchairs are expected at the Reception or Staff Station counters, a design incorporating a high section (for staff privacy) as well as a low section is recommended.

The low section is typically at 720 to 870mm above the floor to allow users in wheelchairs to approach the counter front on. Adequate leg room beneath the work surface is required.



Figure 3.4: Examples of Staff Stations design integrating both high and low counters

Security Barriers

In some situations, it may be necessary to provide a security barrier at the counter. This may be of a high-quality plastic or in a variety of security glass including laminated glass, toughened glass, laminated & toughened glass and glass with a special security film.

In such situations, the barrier will include a slot that is sufficient to allow the passage of sound and small objects. A slot of 125 mm minimum is recommended. If a glazed security barrier is provided at a counter used for public interaction, then an intercom system may be provided to amplify the sound for persons with hearing impairments.



Figure 3.5: Staff Station with security glazing barrier used in a mental health facility

At counters such as Pharmacy Dispensing Counters, it may be necessary to pass larger objects from one side to the other. In such situations a two-way drawer or cupboard may be used. These should be lockable.

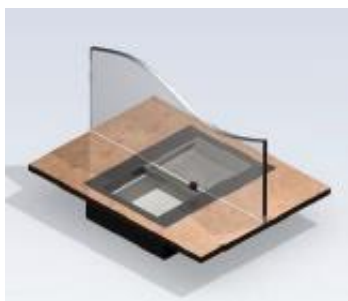


Figure 3.6: Counter with security barrier and pass through drawer

If the Reception/ Staff Station or counter is the only barrier between a department and areas outside the department (FPU), it may be necessary to provide after-hours security.

If a full height barrier such as security glazing has been provided as described, this may be sufficient. Alternatively, a lockable security grille or similar device should be provided.

The grill or similar device should be operable by the staff from the normal standing height. The operation of such a grille (or shutter) may operate in the vertical or horizontal direction.



Figure 3.7: Reception with vertical roller shutter for after-hours security

4.5 Workbenches

General

Workbenches may be designed for sitting or standing positions depending on the preference and work practises of the staff using them.

Both options are suitable for their intended purpose. However, the ergonomic standards for the two will vary as identified below.

Sitting Position Workbench

The height of a workbench used in the sitting position should be between 680mm to 720mm above the floor. The typical minimum depth is 600mm. Consideration should be given to clearance behind the rear of a chair especially when a fixed object or another workstation is placed back-to-back. The recommended minimum clear distance is 1200mm.

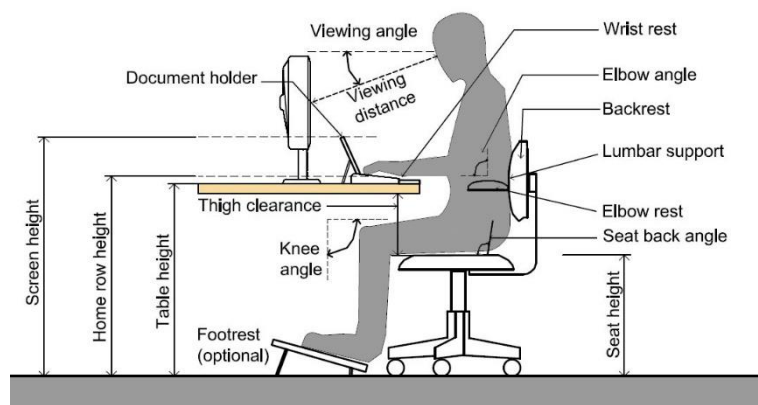


Figure 3.8: Ergonomic elements of the workbench used in the sitting position

Standing Position

The standing height workbench may also be used for seated activities. In this circumstance, ideally the work bench would be height adjustable.

The height of a workbench used primarily in the standing position, even with keyboard work should be 900-1000mm above the floor. Examples include Staff Stations, Reporting stations, Pharmacy Counters.

If the workbench is used for a majority of work in the standing position but seated for keyboard work then the recommended height is 900mm above the floor. This option is most frequently used in Utility Rooms, Laboratory benches and Kitchens. If seated activities are required at a standing position workbench, a high stool with a footrest should be provided.

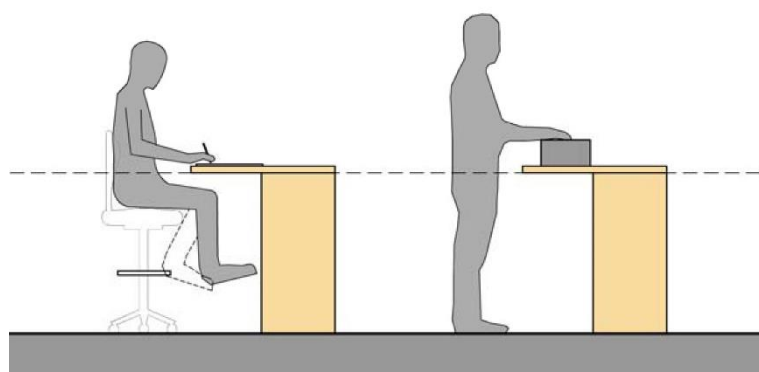


Figure 3.9: Standing height workbenches with seated position and standing positions

Foot Support

Shorter staff may use footrests in the sitting position to lift the feet to the optimum ergonomic position. Chairs used at work benches used in the standing position should have foot support rings and be height adjustable. Standing height work benches where high stools are used may be

constructed with built-in footrests. The footrest should be located 700mm below the height of the counter and recessed by about 150mm to prevent striking by shins.

Refer to Figure 3.9 for appropriate foot support while seated at a standing height workbench.

Bench Support

Many people tend to sit on the edge of the bench from time to time. It is important to support the bench with robust materials to avoid the collapse of the bench and becoming a danger to users. The support may be gained by using sufficiently thick and sturdy materials such as 32mm fibre board or thinner materials such as 25 mm fibre board supported by a steel frame.

Ideally, the maximum thickness of the bench including any support over the user's knee should be no more than 35mm. Supports should be designed to avoid contact with the user's knees.

Support for the bench may be by metal legs or joinery blades. The design should avoid conflicts and entanglement with the chair and the peoples knees as far as possible.



Figure 3.10: Workbench top of 32mm thickness with bench supports

Adjustable Keyboard Shelves

Where a fixed height workstation is selected, adjustable keyboard shelves can provide some flexibility in the provision of height adjustment. Adjustable keyboards were more popular in the decades past but are increasingly un-common as they reduce the flexibility of benchtop use. Another reason is the increasing use and familiarity with the use of laptop (notebook) computers with integral keyboards. Therefore, adjustable keyboard shelves are not considered mandatory. If, however they are preferred the following section can be considered.

The advantages can be summarised as follows:

- Lower keyboard location results in the hands and fingers being straight or leaning slightly forward. This typing posture is considered ergonomically preferred to hands and fingers leaning upward to reach the keyboard
- Lower keyboard can better accommodate shorter staff without changing the height of the entire work surface provided that other critical ergonomic adjustments are also made, e.g. the height of monitors

The keyboard shelf, if provided should be large enough to accommodate the keyboard and computer mouse pad with the mouse handheld in a natural position.

The disadvantages can be summarised as follows:

- Placement of the keyboard is restricted to one area
- The adjustment mechanism below may snag clothing and compromise knee space
- If the adjustable support is too small to accommodate both the mouse and the keyboard, it will result in the mouse being placed on the desk. Then the user will be forced into a poor posture with shoulders not level and spine curved

On balance, keyboard shelves are not recommended. If maximum flexibility is intended a better option is a height adjustable desktop.

4.6 Typical Workstations

Workstations include proprietary corner workstations, workstations without a side bench and desks which may include a side return.

A workstation intended for working, writing or keyboard use while in seated position should be within the range of 680mm and 720mm high (with 720mm being the default). The ideal width of the bench may be 750mm to 800mm. In very tight situations a 600mm bench can also be considered, especially for laptop computer use.

If the workstation includes a side return, the depth of the return may be between 450mm and 750mm with 600mm being the optimum recommendation. This will allow for under-bench storage such as pedestal units, filing or drawer units.

Workstations designed with an angled corner to accommodate a computer should provide a minimum dimension of 400mm across the corner to allow for a keyboard or laptop computer.

The workstation should be designed to allow for adequate knee space. The space must be large enough so that the action of turning to use under bench units does not result in hitting the knees against these units.

One end of the workstation may be shaped to form a meeting table. For this purpose, rounded edges are recommended. Such workstations may suit doctors consultation rooms.

Workstations should include a modesty panel if they face onto an open area or if visitors are expected to sit across the workstation.



Figure 3.11: Typical corner workstation with privacy screen/ pinboard/ modesty panel

Workstations should have provision for safe cable management. With the advances in workstation design and height adjustable desks, many alternatives for cable management are available. However, the better systems all have the commonality of easy access to outlets, both power and data.

It should not be possible to accidentally knock out cables or spill liquids into power outlets.

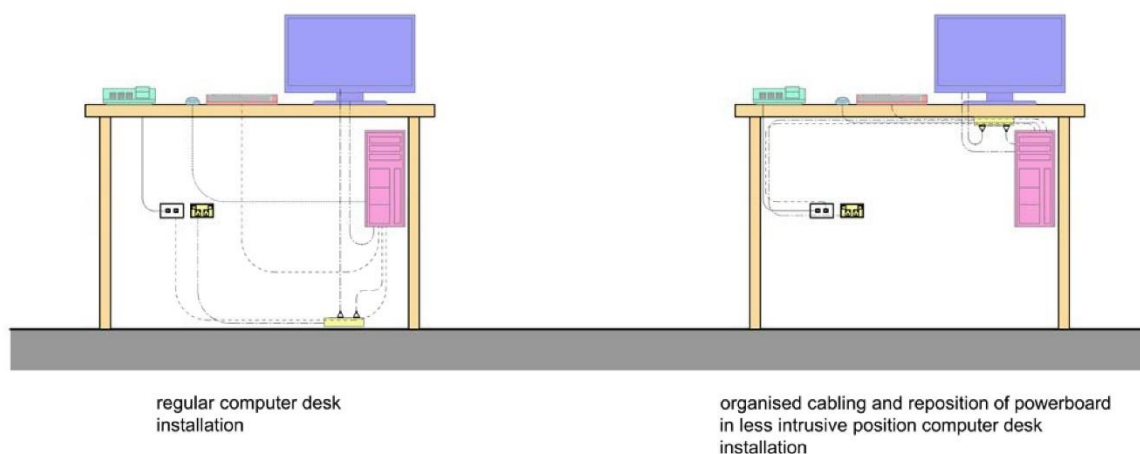


Figure 3.12: Cable management system before installation and after installation

4.7 Hot-desks / Mobility Centre

In the modern work environment staff tend to be highly mobile, hot-desking is a system of organisation allowing multiple staff to use a single shared work point at different time periods.

Hot-desks can take many forms, from a full shared workstation to multiple smaller desks which may be occupied for limited periods of time. Collections of such may be referred to as Mobility Centres.

Hot desk stations should have easily accessible, typically above desk, power and data connection points. Desks should be ideally height adjustable to accommodate different personal dimensions and should be 750mm to 800mm deep to accommodate a laptop computer, a PC monitor and separate keyboard.

Where it is anticipated that Hot-Desk users would be using laptop computers it is recommended that the work point be established with monitors and keyboards ready for connection to the laptop to provide users with an ergonomically safer environment.

4.8 Sitting – Standing workstations

Research has suggested that sitting for extended periods of time may have some health risks. Accordingly, it is becoming more common for staff to demand work stations that accommodate both sitting and standing working options.

A Sit – Stand workstation should be electronically height adjustable between the heights of 660mm to 1180mm. Suitable arrangements for the provision of power and data connections must be made, typically either wall below the lowest desk height or preferably soft wired desk mounted outlets to remove the risks associated with trailing power and data cables as the desk is raised or lowered.

Sit – Stand work points are not suitable in all locations and it is recommended that work points for public interface should be either sit or stand to suit the application required.

4.9 Computers

General

People tend to use computers in a variety of ways. It is difficult to dictate a particular position to suit all people. The following guidelines represent the most typical preferences and standards.

Computer Monitors

The type of monitor will dictate the depth of the work surface. Older type CRT (Cathode Ray Tube) monitors which require greater workstation depth to permit a comfortable distance from the user's eyes are rarely used now. Flat screen monitors require less depth of surface and are easier to look at for longer periods as they are low glare and almost eliminate screen flicker. The lighter weight and support stand design of flat panel screens also provide greater flexibility to adjust monitor height to improve user posture.

Monitor Position

Ideally, the monitor position should be adjustable both vertically and horizontally to suit different users. The height of the User will influence the vertical position of the monitor. The best option is for an adjustable monitor arm. These are, however, expensive and are not recommended for all conditions as most flat panel monitors come with some height adjustability built into the monitor stand. For most users, a fixed monitor is acceptable.

The angle of view to the centre of the monitor should be within a range defined by a horizontal line taken from the user's eye down to 15 degrees depending on the user's preference. The recommended head tilt sustained over a long period is 15 degrees, excessive head tilt may result in fatigue. The most comfortable viewing zone is between 32 degrees and 45 degrees below the horizontal as represented in the diagram below.

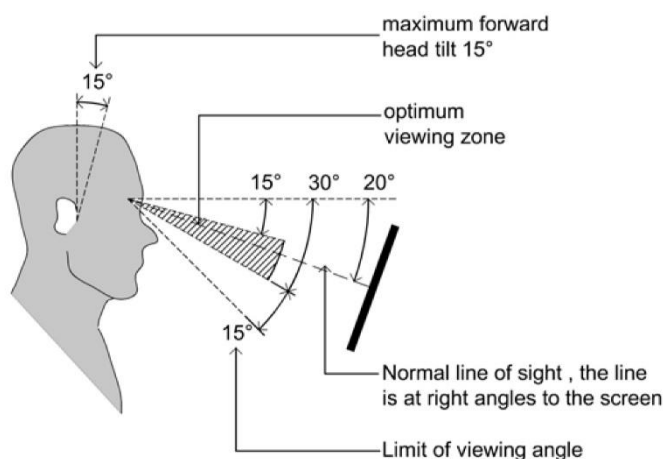


Figure 3.13: Recommended viewing angle (Source: AS 3590.2-1990 Screen based workstations Part 2 Workstation furniture)

The optimum areas for the location of key objects on the workstation or desk are demonstrated in the diagram below.

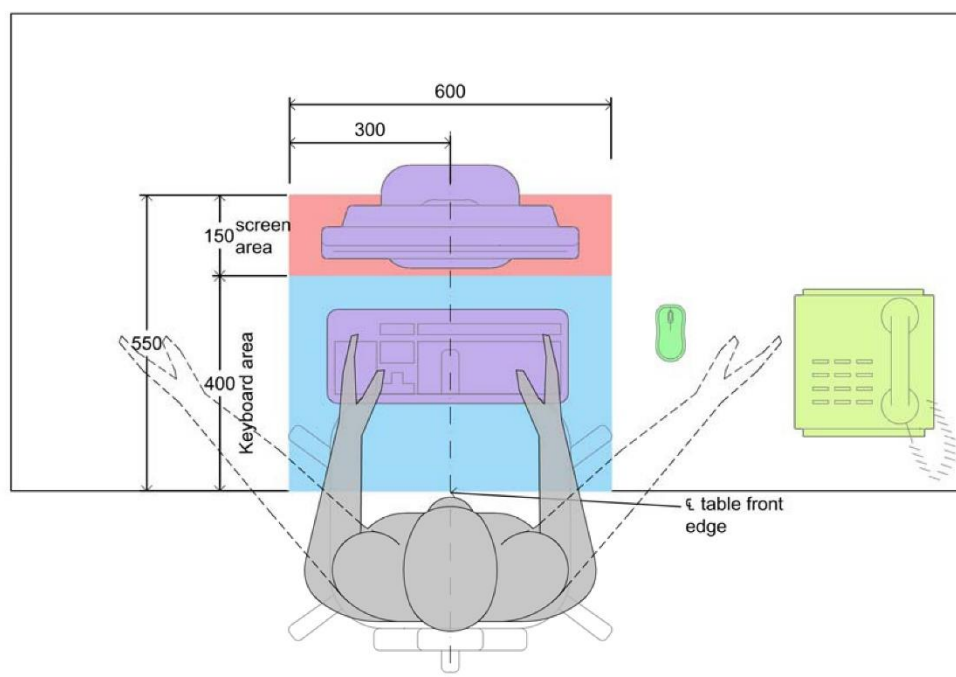


Figure 3.14: Optimum location of key elements on a workstation (Source: AS 3590.2-1990 Screen based workstations Part 2 Workstation furniture)

Laptops

The modern laptop is a powerful and portable device which is frequently used in place of desktop computers, particularly for mobile staff and staff using hot-desks. Laptops are designed for portability and that inherently creates a conflict with good ergonomic positioning of both screen and keyboard.

Where Laptop computers are used for periods of time in excess of one hour the laptop should be supplemented with a stand to allow its screen to be placed in an ergonomically correct position and a supplementary keyboard. Alternately a separate monitor, set up in an ergonomically correct position that can be connected to the laptop and supplementary keyboard is recommended.

Nothing in this section prevents the use of laptop computers as desktop replacements. This type of computer is acceptable for occasional typing and is recommended for maximum space saving and user flexibility.

4.10 Shelving

General

The design of shelving should address issues of depth, height, spacing and strength. Shelving covered by these guidelines include shelving units (proprietary or joinery), strip shelving, bookcases, metal shelving units and racking and shelves within cupboards.

Depth

Shelving depth recommendations are as follows:

- Shelves below a bench should be the same depth as the bench
- Shelves that are wall mounted including shelves over a bench or workstation should be 350mm deep, if cupboard doors are required the total depth should remain 350mm.
- Shelves for medical records should be 400mm deep to allow for files to be stored laterally.

Height and Spacing

For all types of wall shelving, height and spacing recommendations to optimise reach for persons are as follows:

- The lowest shelf should be not less than 150mm above the floor.
- The highest shelf should be up to 1810mm above the floor.
- Any shelf higher than 1810mm this will require a step ladder to access.
- Shelving above a 720mm high work surface should start at 1350mm to the underside. The underside of the shelf will be 630mm above the work surface.
- Shelving above a 900mm to 1000mm high work surface should start at 1500mm to the underside. The underside of the shelf will be 500mm to 600mm above the work surface.
- Shelving for medical records should be 2100mm high with 7 shelves starting at 150mm above the floor up to a maximum height of 1800mm.
- Shelving used for linen storage should be 450mm deep and a minimum of 400mm apart. For linen shelves located above a linen supply trolley the depth of the shelf should match the depth of the trolley.

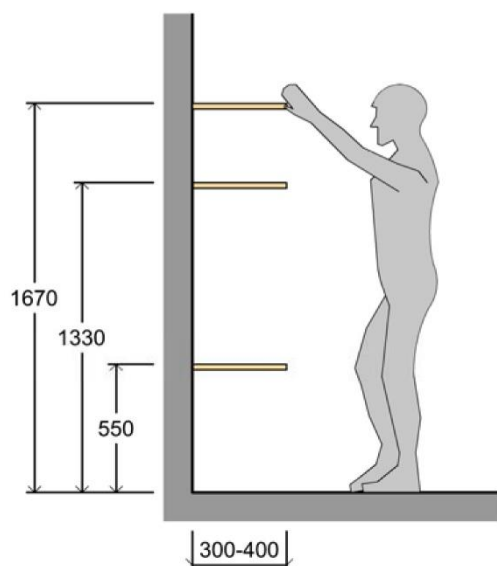


Figure 3.15: Reach of standing person to shelving over desk



Figure 3.16 Shelving installed

It is recommended that all shelving be adjustable as far as possible. Joinery units may include fixed shelves when items to be stored require additional support.

Note: In heavy use areas of health facility the conventional metal pins inserted into joinery walls often fail. In such situations, proprietary metal strips to hold shelf supports may be preferred.

Designers should refer to local infection control policies and Part D of these guidelines for suitability of proprietary shelving systems for clinical areas.

Strength

Design of shelving should suit the weight of items to be stored. Heavy items may require fixed shelving, additional shelving thickness, shorter shelving spans or use of stronger material such as metal.

Adjustable shelving does not have the strength of fixed shelving and is more suitable for light weight objects.

Disabled Access

Shelves designed for use by people with disabilities including patients, visitors or staff should comply with relevant accessibility standards.

Recommended reach heights to shelving and across a bench for persons in a wheelchair are demonstrated below:

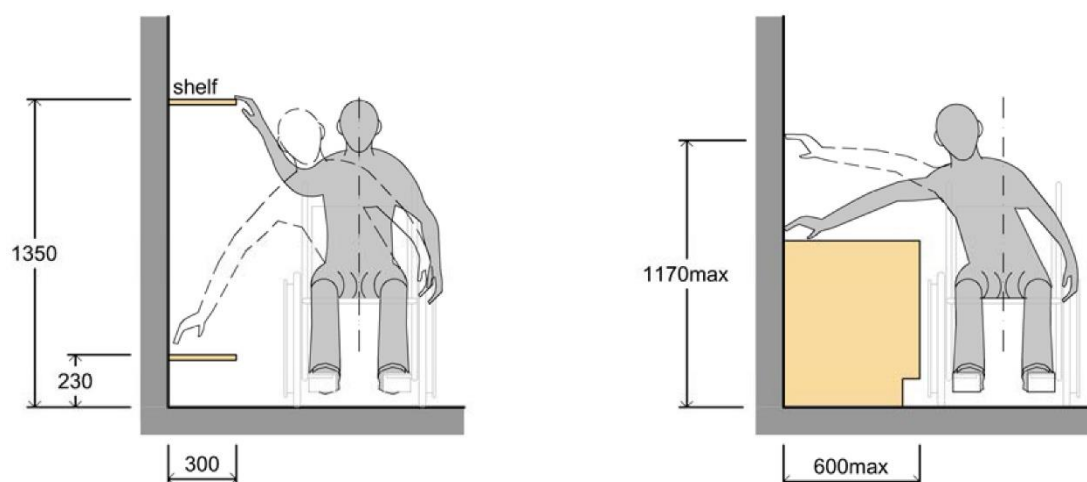


Figure 3.17: High and low side reach of a person in a wheelchair to shelving and to a bench.

5 Signage

Signage and wayfinding are important in a health facility precinct to direct patients staff and visitors to areas and to prevent access to restricted areas. Signage and wayfinding systems should comply with local authority Guidelines where they are provided and applicable.

The following guidelines are provided to cover common elements within the healthcare setting.

5.1 General

The font style chosen for signs should be a simple open style and easy to read. The preferred lettering style is 'Helvetica Medium' or Arial as an alternative, upper and lower case generally. Upper case only is recommended for the building Main Entry Sign. This is not mandatory.



Figure 4.1: Example of Helvetica medium font style

The size of lettering is related to the height of the sign and the reading distances and should comply with relevant local standards.

There should be a luminance contrast of 30% minimum between the lettering and the background of all signs.

Internationally recognised symbols (pictograms) in lieu of room titles are recommended as these are universally understood.



Figure 4.2: Internationally recognised pictograms used in Signage

Braille and Tactile signage are recommended for all signs within reach range.



Figure 4.3: Room Sign with braille

It is recommended that the facility have an exterior or interior sign indicating the type and level of care and the hours of operations, particularly if the facility is not open 24 hours per day, seven days per week. For example, Day Surgery Centre, Opening Hours 8am - 6pm, Sunday- Thursday.

If Emergency care is not provided, it is recommended to have an external sign indicating the address of the nearest 24 hours Emergency facility for redirection of urgent cases arriving after hours at the wrong facility.

5.2 External Signs

External Directional Signs

Entry points to the facility should be clearly identified from all major transport/ circulation modes (e.g., roadways, bus stops, vehicular parking). The exterior signage should be clearly visible from a distance and understandable with icons, universal symbols and/or cues for orientation.

Boundaries between public and private areas should be well marked or implied and clearly distinguished. Signage should be flexible, expandable, adaptable and easy to maintain. Signage should be consistent with other patient communications and supporting print, web, and electronic media.

It is recommended that external directional signs have large letters on a contrasting background colour. External signs should be constructed of steel or aluminium if possible and be weatherproof.



Figure 4.4: Example of external building signs

External Illuminated Signs

It is recommended that external illuminated signs such as those used for the Building, Main Entry, Night Entry or an Emergency Unit should have white letters on a contrasting background. Signs for Emergency are commonly white lettering on a red background.

The Emergency Unit (as referred to in part B of these Guidelines) should have only “Emergency” and “وحدة الطوارئ” on the external sign for simplicity. The sign may include a symbol as required and should be clearly visible from the entry to the site.

Road Markings

Road markings such as parking bays, arrows, symbols and instructions should be white generally, blue for dedicated accessible zones and yellow for restricted zones, unless otherwise directed by local authority, guidelines or standards.

Street Signs

Street signs shall be in accordance with the requirements of the local Municipality and/or the appropriate section of the regional roads and traffic authority.

It is recommended and usually required by accreditation standards, that the facility has adequate street directional signs that allow the site to be easily located from the major approaches in the area, including by road, rail or by foot.

5.3 Internal Signs

Directional Signage

Directional signs are normally ceiling or wall mounted and not illuminated. It is recommended that directional signs apply the following principles:

- Directional signs be provided to direct patients, staff and visitors from the entry to all major destinations, including the room required
- Exit directions be included where necessary
- Text be dark lettering on a light background for clarity and ease of reading
- Directional signs on ceilings should not obscure any other ceiling services, light fittings, emergency lighting or fire exit signs.

Directional signs in the Main Entry area, Foyers, Lift Lobbies and public amenities areas may include braille lettering for the visually impaired. If provided, it is recommended that signs with braille should be located immediately above the hand rail.



Figure 4.5: Corridor directional sign, ceiling mounted entry

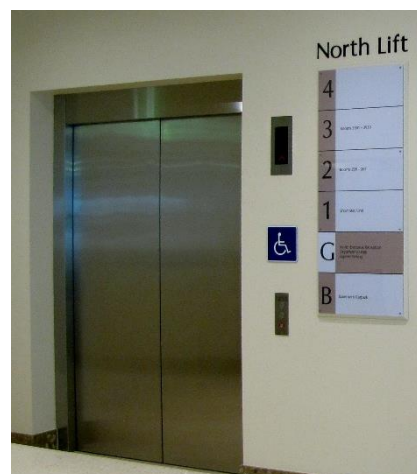


Figure 4.6: Directory sign beside lift

Signage is recommended for destinations for patients and visitors. Signage for staff-only rooms are optional.

Room/ Door Signs

Non-illuminated, internal and external room function identification signs that are located on doors require the following considerations:

- If the room function is likely to change, the sign system used should allow easy replacement for removable signs and consideration needs to be given to the following:
 - Vinyl-cut lettering is a practical and inexpensive option, capable of easy changing, however removal may cause damage to some surfaces
 - Some signs using removable slats can be easily stolen unless a locking cap is used
- Not all rooms will require a sign, signage may not be provided to staff only rooms
- Signs may be provided to indicate rooms with restricted access, e.g. Staff Only
- Room signage should comply with the facility standards
- Room/ Door signs in general are not mandatory



Figure 4.7: Viny-cut lettering sign with locking cap



Figure 4.8: Removable slat type signs, with a locking cap

Bed Numbers

Bed numbers assist staff and visitors to find patients or bed locations as necessary. Each bed should be provided with a separate number. Bed numbers should be located outside the patient bed room, clearly visible in the corridor and not obscured by equipment parked beside rooms.

For multi-bed rooms, a range of numbers may be shown outside the bedroom.



Figure 4.9: Room signs for bed numbers

Multi-bed rooms and open bed bays should also display the bed number in each bed space, which is visible with the privacy screen curtains closed.



Figure 4.10: Room/ Door Signs and bed number signs outside the entry to the bed space

Patient Information

Signage requirements in patient areas and Bed rooms need to carefully consider patient confidentiality issues.

For patient privacy and confidentiality of patient records it is not recommended to display patient information on signs within the patient bed rooms such as patient details, doctor or special instructions.

Door Number Signs

In some facilities a room/ door number sign will be required on the door frame for maintenance purposes. Where provided these signs should be unobtrusive. If room/ door numbering is required to a whole facility it is recommended that numbering is consistent throughout and sequential. Door numbering is not mandatory.

5.4 Miscellaneous Signs

The healthcare precinct will include various other signs that may be illuminated or non-illuminated such as:

- Illuminated 'X-ray Room in Use' or 'Laser in Use' signs
- Radiation warning signs and symbols
- Security surveillance warnings
- Safety warning signs

The colours and wording used should meet the requirements of the relevant code or regulating authority.

Fire Services & Egress Signs

Fire services and egress/ exit signs will be installed in accordance with the local fire services codes and standards. As fire service equipment signs are required to be identified from any direction, consideration should be given to use of cantilevered wall signs in these locations.

6 Doors

6.1 Door Swing

Doors subject to constant patient or staff usage should not swing into corridors in a manner that might obstruct traffic flow or reduce the required corridor width. Where doors need to swing out into corridor they should be set in a recess. The recess should extend a minimum of 100mm beyond the extend of the door swing.

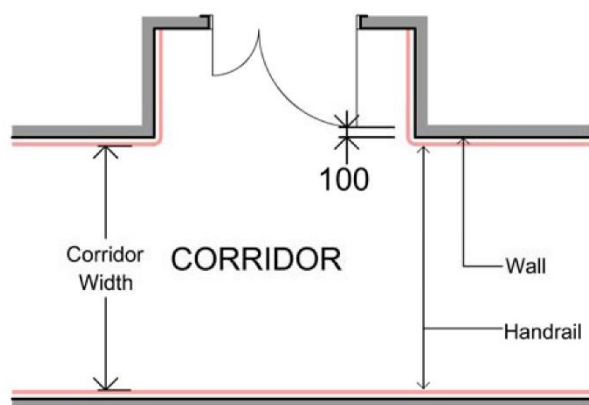


Figure 5.1: Doors swinging into a corridor should be recessed

Doors for Fire Egress

All doors used for fire egress should comply with the requirements of local Building Regulations. If such doors also form part of a fire or smoke compartment, they should maintain those properties in the closed position.

Sliding doors may be used for exit doors opening directly to the outside if an approved failsafe system is provided to open the door in case of fire.

Doors in Patient accessed areas

Doors to rooms that are likely to be used by patients without staff assistance should be single or double swing type.

Swing doors should generally open into rooms from corridors and circulation areas. The exceptions may include:

- Doors to small patient Ensuities, Toilets and Showers should generally open out
- Doors to accessible Toilets and Showers should open out
- Doors to small Change Cubicles should open out
- Doors subject to the requirements of "Emergency Access" should open out or open in both directions
- Doors to mental health patient rooms should open outward or have a break-out type door
- Doors to isolation rooms should depend on the type of pressurisation (refer to *Part D - Infection Control* of these guidelines)

6.2 Door Openings

Clear door opening widths between two sections of a corridor or from one corridor to another should be as specified by the relevant building codes and standards for doors in the path of fire egress. In effect, for the purpose of these Guidelines all corridors are on the path of egress.

The recommended minimum clear door opening width to Patient Bedrooms in new areas is 1400mm wide and 2140mm high. This is to ensure sufficient clearance for the movement of beds.

In existing areas being renovated and doors with reduced dimensions may be approved in situations where it is not possible or economical to replace the doors, as long as the function is not adversely

affected. In any case, doors to patient bed rooms should not be less than 1200mm wide and 2040 high.

Rooms that require access for stretchers, wheelchairs, people with a disability or using mobility aids should have a minimum clear door opening of 900mm. Where access is required for hoists and shower trolleys such as Ensuites, Bathrooms, Patient Showers, a minimum clear opening of 1000mm is recommended.

Door openings must take into consideration requirements for special equipment that may be moved into patient accessed rooms, such as bariatric equipment and lifting apparatus.

6.3 Emergency Access

Certain rooms that are used by patients should be equipped with doors and hardware that will permit emergency access from the outside. These rooms can be defined broadly as follows:

- Rooms that are used independently by patients, have only one door and are less than 6m²
- Rooms where there is less than 2.5 metres of clear space behind the single door
- Patient Bedrooms, Bathrooms and Ensuites in Mental Health facilities or Mental Health components of other health facilities
- Secure rooms in mental health facilities

When such rooms have only one opening the door should be capable of opening outwards or in a manner that will negate the need to push against a patient who may have collapsed within the room. In other words, if the door normally opens inwards, in case of emergency, the staff must be able to open the door outwards without any need to use a key, Allen key or special device, whilst managing security in normal use.

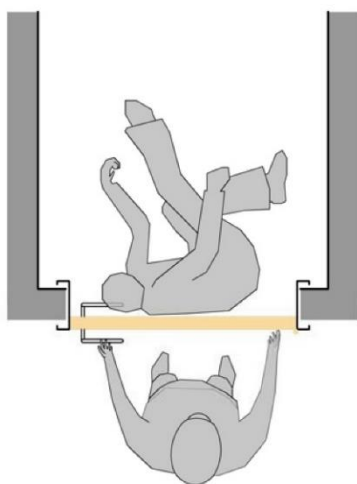
These Guidelines recommend the use of retractable door stops within flat metal door frames together with coin operated door snibs. The snib can be opened with a coin while the door can be opened outward by simply pushing the door stop into the frame.

Refer to figure 5.2 below.

Important note: This requirement cannot be satisfied by any of the following alternatives:

- Cavity sliding doors
- Sliding doors on the inside of the room

door access blocked



door access unblocked

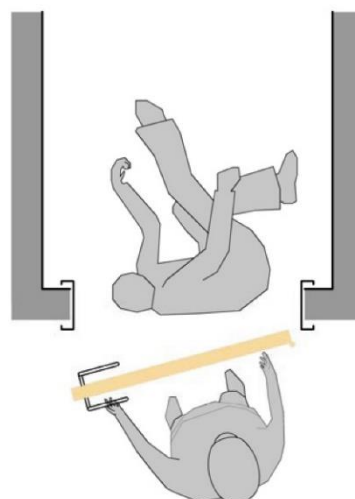


Figure 5.2: Inward opening door access blocked

Outward opening door access unblocked

In all areas except mental health secure rooms, surface sliding doors installed on the outside of the room may satisfy the requirements of this section. This can be achieved if:

- The door can be easily and safely removed off the track
- Door removal is not prevented by the door locking mechanism

Mental Health Seclusion Rooms

In mental health seclusion rooms, the following configuration is recommended:

- Two standard doors, opening outwards, doors should be separated
- Alternatively, one standard door opening outwards and one adjacent door minimum 450mm wide, opening out
- Both doors with external locks and fully recessed internal handles or special mental health standard anti-ligature door handles
- Over the door sensor that alerts staff to self-harm attempts

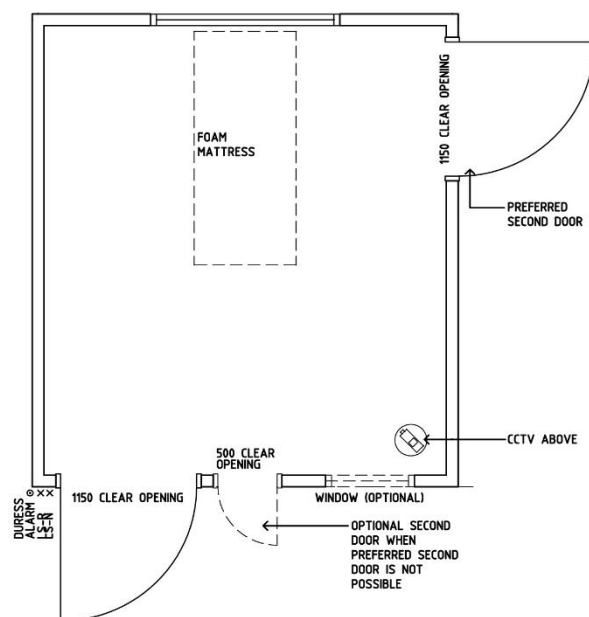


Figure 5.3.1: Recommended door openings for Seclusion Room



Figure 5.3.2: Over the door sensor

For additional information on doors in Mental Health Units refer to relevant FPU's in Part B of these Guidelines, i.e.. Mental Health Unit - Adult, Mental Health Unit - Child & Adolescent and Mental Health Unit - Older Persons.

6.4 Door Hardware

Handles

In all doors within a health campus, consideration should be given to the shape of the door handle so that it is not caught by pockets in clothing of staff, patients or visitors. Handles with a full return are recommended.



Figure 5.4: Recommended door handles with a full return

The door handle/ hardware should allow the door to be unlocked and opened with one hand. The handle should be such that the hand of a person who cannot grip will not slip from the handle during the operation of the latch.

Push / Pull Plates

For doors where a door lock or latch is not required, a push plate with pull handle may be installed. Examples include Dirty Utility or scrub rooms where staff may be carrying objects or have wet hands.

In Paediatric Units, doors that require a push/ pull plate only may have a second push/pull plate installed at paediatric height, if used by paediatric patients.



Figure 5.5: Push Plate and Pull handle

Mental Health Areas

Door handles and door hinges in Mental Health areas must not provide ligature points that may be used for self-harm. This can usually be achieved by using recessed, concealed or flush hardware. Alternatively, specially formed knobs are available which do not allow 'hanging'. Acceptable handles and hinges are demonstrated below.





Figure 5.6.1: Door hardware suitable for acute mental health Units



Figure 5.6.2: Door hinges suitable for mental health units

Shared Ensuites

Ensuites that are shared by two patients should incorporate hardware to automatically lock one door and indicate 'room occupied' if the other door is operated. Both doors should be unlocked once one of the doors is opened from inside.

Note: The Use of Shared Ensuites is NOT recommended in these Guidelines.

Locks

Door locking may include keyed locks, electronic locking systems, snibs, push buttons and privacy latches with indicators.

Door locking should be suitable to the function of the room and the security requirements of the Users. Door locking should always allow escape from inside a room accidentally locked.

Fire exit doors should be openable from the inside with a single action. It is recommended that door hardware and locking be flexible as far as possible to allow for future change of use.

Certain rooms in a healthcare facility should not be lockable by the patient and these include:

- Standard Inpatient bedrooms (not Mental Health*)
- ICU/ HDU/ CCU/ NICU/ PICU patient rooms
- Isolation rooms (except bed access doors from the corridor when dual access to the patient room is provided)

* In Mental Health, patient can lock the door but staff must be able to open from outside of the room. Staff will have key and the latch must be retractable.

Hold Open Devices

Doors that need to remain open may require hold open devices, to prevent them closing, particularly in main travel and circulation pathways. Hold open devices should be installed according to relevant fire regulations, building codes and standards.

Designers should consider the following if hold open devices are required:

- The devices should be activated in easy reach without bending down
- Hold open devices should not be installed on doors that are required to stay closed such as pressurized rooms
- Devices should not be installed on doors where disturbed patients may lock themselves in a room
- Hold open devices should not be installed in Mental Health Unit patient areas where they may create a ligature point and be used for self harm
- Electronic hold open devices linked to a fire/ smoke alarm system are acceptable and must have a manual release button as part of the device. Doors fitted with electronic hold open devices must also be fitted with self-closers and if double doors, a door selector device. Any Fire Door fitted with an electronic hold open device must be provided with a clear warning sign "Automatic Fire Door – Keep Clear".



Figure 5.7: Electronic operated door hold open device

In travel pathways used frequently by staff pushing trolleys or carrying items through doors that need to remain closed it is recommended that delayed action self-closing devices are installed.



Figure 5.8: Delayed action door closers

Self-Closing Devices

Self-closing devices are fitted to doors that are required to stay closed that may include:

- Pressurised rooms such as Isolation rooms.
- Entry doors to Units that have restricted access such as:
 - Operating Unit
 - Paediatric Unit/s
 - Sterile Supply Unit
 - Catering Unit
 - Mental Health Unit/s
 - Air locks, with or without air pressurization
 - Birthing Rooms
 - Clean and Dirty Utility Rooms
 - Disposal Rooms

Self-closing devices are discouraged to the following rooms:

- Offices
- Patient Bedrooms
- Bathrooms, Ensuites, Toilets, Showers
- Rooms used independently by people with disabilities
- Meeting Rooms and Interview Rooms

If self-closing devices are fitted to Patient Bedroom doors, they should be mounted on the public side of the door rather than the patient side.

Self-closing devices should be designed and installed to allow the door to open a full 90 degrees. The nib space required for the self-closer arm should be considered.

Self-closers used in double doors should be accompanied by suitable sequencer hardware to allow the doors to be closed in the correct sequence. Self-closers that duplicate the functionality of a hold open device may also be considered.

Self-closing devices required to fire and smoke doors should be installed according to local Building Codes and Standards.

6.5 Metal Doors

These guidelines neither require or recommend the usage of metal door leaves. Metal doors may hold static electrical charge and need to be grounded in all Cardiac Protected Areas if used. Metal door leaves may be used in plant rooms, electrical rooms, waste management rooms and similar services areas. However, metal door frames are acceptable and recommended for its durability and sturdiness.

6.6 Door Grilles and Undercuts

Door grilles or undercuts may be required to facilitate air-conditioning systems, to allow for return air or for balancing of air pressurisation between rooms.

An alternative to door grilles may be the use of a door undercut. Care needs to be taken however to avoid the use of large undercuts close to shower areas which result in water leakage into adjacent rooms.

Door grilles or undercuts should be used where mandated pressure differentials are required to adjacent spaces in accordance with relevant building codes and standards.

Door grilles or undercuts are not recommended in the following rooms or areas:

- Pressurised isolation rooms, negative or positive
- Rooms with radiation shielding
- Rooms requiring acoustic privacy
- Fire or smoke doors
- Doors used by people in wheelchairs, due to potential damage
- Window a mental health unit, to avoid potential for self-harm
- Ensuites, Bathrooms, Toilets or Showers

An Inward sloping door slot may be considered instead of an undercut. The slope is from outside down to the inside in order to ensure any water droplets remain on the ensuite side of the door rather than the bedroom side. A door slot should be ideally located around 200mm above the floor with an opening of maximum 15mm.



Figure 5.9: Door with grille

Door with undercut

Door with slot

6.7 Observation Glass

Glazed panels may be provided in doors where visual observation for reasons of safety, security or patient observation is required. Obscured or frosted glazing of varying degrees may be provided to doors where it is necessary to observe a person standing behind the door while maintaining room security and privacy. Observation panels in fire doors must comply with the relevant Building Codes and Standards.

Observation glass is recommended in the following rooms/ areas:

- Operating and Procedure Rooms
- Scrub Rooms

- Air-locks
- Clean and Dirty Utilities. Partially frosted glazing may be applicable in these rooms where a level of privacy and security is required
- Interview rooms including those used in mental health units
- Rooms requiring an observation window but with no physical possibility of providing a window
- Kitchens and Pantries
- Corridor access doors

Observation glass is not recommended to the following doors:

- Patient Bedrooms, unless staff observation is required for clinical purposes, such as in Mental Health Units. Vision panel cover to the observation glass or integral blinds should be operable from outside the room in this case
- Rooms requiring acoustic isolation, unless glazing can achieve the required room acoustic privacy
- Rooms requiring a high level of patient or staff privacy such as Consult Rooms

Observation glass should have a cover to fully obscure the vision panel in the following areas:

- Operating and Procedure Rooms where laser may be in use or for additional privacy
- X-ray or imaging rooms with radiation shielding
- Rooms with electromagnetic shielding
- The vision panel cover should be operable from inside the room

6.8 Automatic Doors

Beam activated automatic sliding or swing doors are considered highly desirable in areas where there may be a large volume of movement such as Main Entrances and delivery points. Automatic doors may also be used in areas where rapid, hands free access is preferred, such as entries to the Emergency Unit or the Operating Unit.

Automatic doors, particularly if required for emergency egress should be installed according to local Building Codes and Standards. Where installed, attention should be given to allowing sufficient time for doors to open and close for disabled, frail and paediatric patients and visitors.

Automatic doors are not mandatory.

6.9 Sliding Doors

Surface sliding doors may be used and installed in accordance with local Building Codes and Standards, providing that fire and other emergency exiting requirements are not compromised.

Sliding doors should be used with caution due to difficulties with cleaning, maintenance issues and acoustic issues.

If installed, sliding doors should be of solid core or metal frame construction to resist warping and therefore locking. Sliding doors should have tracks on top and guides to the bottom of the door for efficient operation. Floor tracks should not be installed as they tend to collect dust and dirt and are difficult to clean. A small floor guide attached to the frame is acceptable and recommended for providing efficient operation.

The use of surface sliding doors rather than swing doors is recommended for airborne infection isolation rooms (negative pressure), protective environment rooms, and any other spaces which have been identified as an infection control risk.

Research indicates that swinging door motion creates more air turbulence and therefore possibilities for contamination than sliding door motion which may significantly affect infection control measures.

Surface sliding doors are permitted to Patient Toilets provided that the door cannot be locked from the inside and does not conflict with other requirements, such as access for the disabled.

Cavity sliding doors (also known as pocket doors) may not be used in the following areas due to the difficulty in cleaning and decontaminating the door and the cavity:

- Patient care and treatment areas including Bedrooms, Lounge areas, Treatment rooms, Procedure rooms, Operating rooms
- Patient Toilets, Ensuites, Bathrooms or showers where a patient may fall against the door and prevent it from opening
- Sterile Supply unit or rooms used for sterile stores
- Laboratory Unit
- Patient diagnostic areas including medical imaging, investigative and testing scanning areas
- Catering unit
- Mental Health areas



Figure 5.10: Surface mounted automatic sliding doors to Anaesthetic and Operating Rooms

6.10 Access Control Activation Devices

Access control may be required within a healthcare facility for a variety of reasons including:

- General security
- Prevention of access by unrelated and un-authorised staff
- Prevention of access by staff who have not changed (e.g. entry to operating theatres)
- Prevention of public access to staff-only areas
- Prevention of patient escape (e.g. in Mental Health units)
- Access to technical areas (e.g. access to plant rooms, electrical rooms etc)
- Access to dangerous areas (e.g. direct access to MRI zone 4)

Within clinical and sterile environments Access Control must prioritize touchless operation to minimize contamination risks and improve infection control. Where feasible, any device requiring direct physical contact should be avoided.

Touchless Access Control for secure as well as non-secure access may include:

- Wave Pads (where strict security is not the prime concern such as Operating Rooms)
- Retinal Scans
- Facial Recognition (subject to privacy protection)
- Proximity Cards

- NFC access via Mobile Phones

As an alternative to touchless sensors, in clinical areas where security is not the prime concern, the following devices may be used for opening doors or exiting from certain areas:

- Foot operated pads or buttons
- Knee operated pads or buttons

Elbow operated pads or buttons

7 Grab Rails & Hand Rails

7.1 General

In corridors accessed by patients, a grab rail/ handrail is required on both sides of the corridor.

To be effective, handrails suitable for patients and people with disabilities must be within the design criteria set out as follows:

- Clearance of the top arc of 270° is to be achieved throughout the full length of the handrail
- Rail ends should return to the wall or floor
- Handrails should have eased edges and corners
- Handrails are to be 30 – 50mm in diameter spaced 50mm from the support wall or balustrade. Where an elliptical handrail is used the horizontal dimension must be the larger
- Ends of handrails at the bottom of stairs and ramps extend beyond the last riser for the depth of one tread and ends of the ramp or top riser and then horizontally for at least 300mm (Refer to Figure 6.5 below).

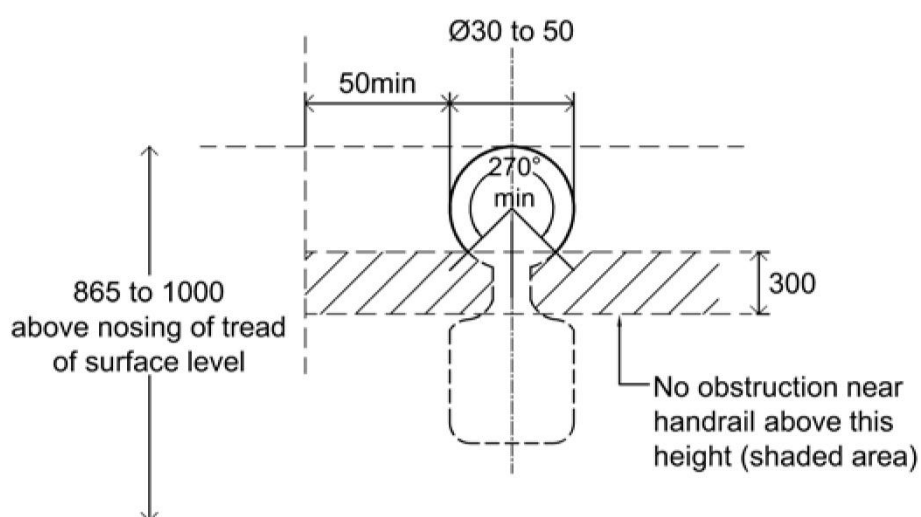


Figure 6.1: Section through handrail showing clearances

- Compliant handrail installations and mounting brackets are demonstrated in the figure below.



Figure 6.2: Compliant handrail examples

Non compliant hand rails examples are demonstrated in the figures below showing inadequate clearances, inappropriate width and profile and rails that do not return to the wall.

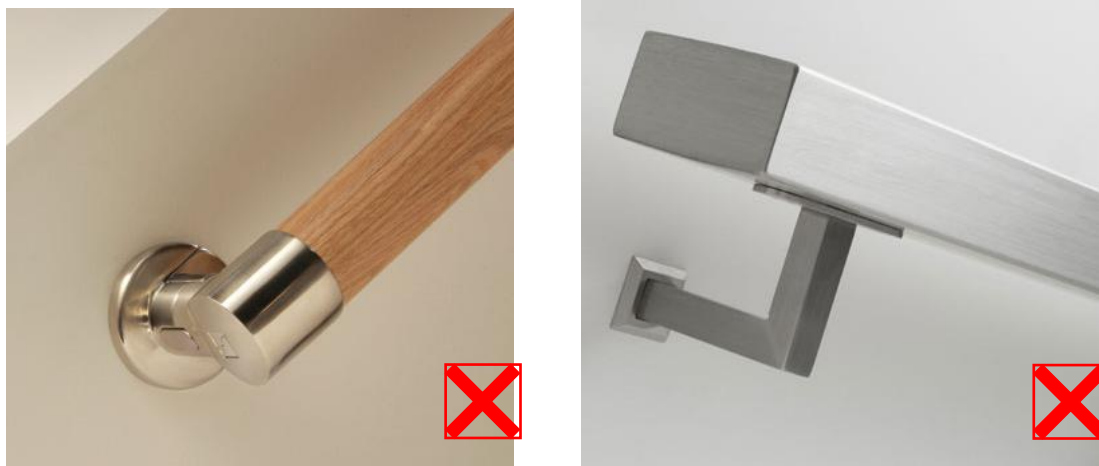


Figure 6.3 Non-compliant handrail examples

The following hand rail examples are compliant but not recommended. The downward projection of the mounting bracket could be a hazard to unstable users.



Figure 6.4: Compliant but not recommended hand rail mounting brackets

The ends of hand rails are terminated by returning to a side wall as demonstrated in the figure below. Alternatively, rails may return downwards onto a post or return back 180° on themselves.



Figure 6.5: Stair hand rail with return to the wall



Figure 6.6: Rail extends beyond the stair.

Prevention of Self Harm

In certain areas such as Mental Health Units, grab rails may present the possibility of self-harm by providing points of ligature.

Depending on the Operational Policy, corridor handrails in Mental Health Units should be designed in such a way that the space between the base of the handrail profile and the wall is blocked.

This arrangement does not eliminate the ligature point, but it makes it impossible to tie an object around the rail.

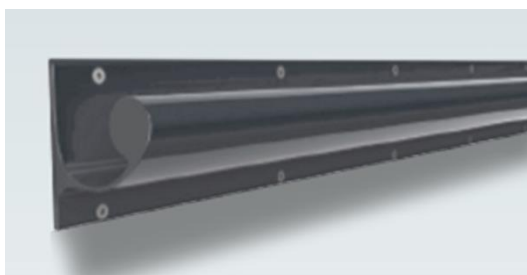


Figure 6.7: Anti-ligature corridor handrails

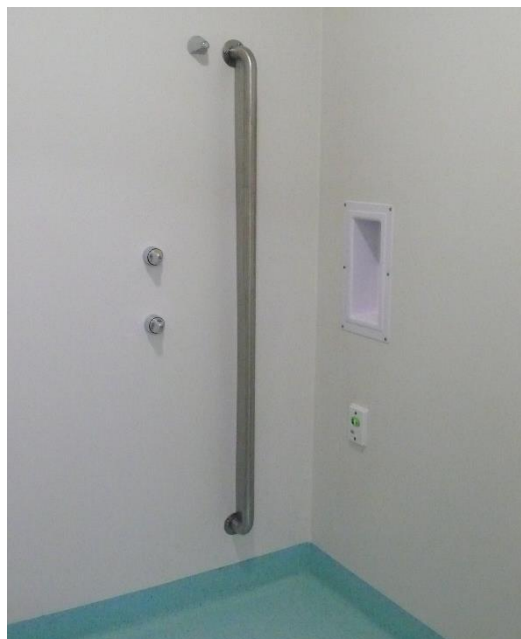


Figure 6.8: Anti-ligature shower grabrail

Outside Corners

Handrails meeting outside wall corners should be either continuous around the corner or set back from the corners by approximately 100mm. This is to minimise the chance of the rail grabbing onto clothing, especially large pockets. Any handrails continuing around 90 degree corners should be rounded to avoid a dangerous sharp edge.

8 Windows and Glazing

8.1 General

All rooms occupied by patients or staff on a regular basis require glazed windows or doors to achieve external views and/or make use of direct or borrowed natural light, where practical.

All Patient Bedrooms shall have external windows overlooking external areas. An external area is defined as the perimeter space around a building as well as lit atriums and courtyards.

An internal atrium with artificial ventilation will be acceptable if the area is more than 220 m² with a minimum dimension of 14 metres and includes suitable permanent landscaping. The width to height ratio of the atrium must not be 1:1.5 as indicated in Figure 7.1.

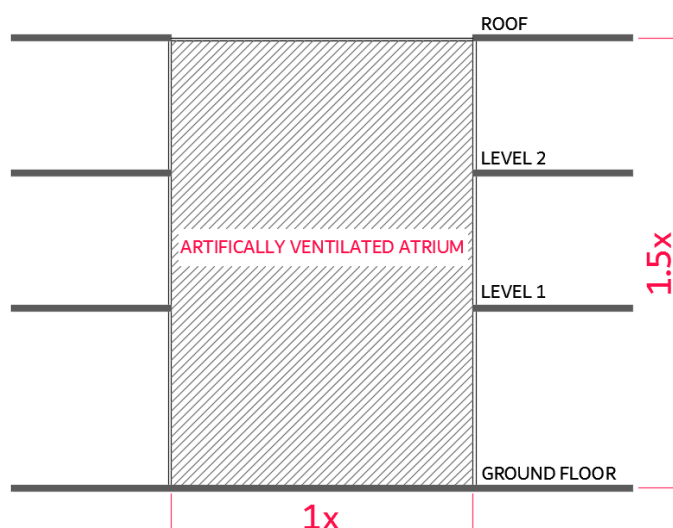


Figure 7.1: Width to Height Ratio in Artificially Ventilated Atrium

This requirement does not apply to patient bed areas in the Operating Unit, Emergency Unit, ICU and similar areas.

Window size and treatments can have a significant impact on the energy performance of a building.

Careful consideration must be given to the energy performance of the building balanced against patient comfort such as natural light, vision out to the surrounding landscape and thermal comfort.

8.2 Window Types

Fixed windows

Fixed windows are typically installed in high rise buildings with air-conditioning systems or buildings in areas susceptible to cyclones. Fixed windows will require consideration of external window cleaning systems.

Openable windows

Openable windows may be provided for ventilation including to patient areas. The inclusion of openable windows may also aid in energy conservation as air-conditioning systems may not be required during the whole day or particular seasons of the year.

If it is preferred that patients not be allowed to open windows to avoid problems with air-conditioning, then the opening section of the window should be locked and operated by staff only.

Openable windows should have provision to restrict the degree of opening with either stop/ limit/ restrictor hardware or an open guard/ screen to prevent passage of objects of a similar size to a 100mm diameter sphere through the opening. Locks should be heavy duty, affixed to both sides of awning windows and fixed securely through the frame with tamper proof fixings.

Opening sections of the window may be provided with an insect screen as permitted by local Building Codes and Standards.

Awning Windows

Awning windows are also known as 'hopper' windows. These refer to windows hinged from the top. Awning windows should not be used in multi-storey buildings because they can act as smoke/ heat scoops from fires in storeys below.



Figure 7.2: Fixed windows in corridor



Figure 7.3: Awning window

8.3 Size

Each required external window and/ or external glazed door should have a net glazed area of not less than 8 per cent of the floor area of the room concerned.

An opening component not less than five per cent of the floor area of that same room is considered highly desirable but not mandatory. These requirements combined will ensure natural light and ventilation in the event of an electrical or air handling system failure.

8.4 Cleaning

Window cleaning requirements consistent with local Building Guidelines and standards should be considered.

The following options are provided for information:

- Inward opening and pivoting windows allow the outside surface of the window to be cleaned safely while standing inside the building
- With alternate fixed windows and outside opening windows it is possible to open one window to reach and clean the next window. However, this type of window will require secure harness anchor points for the cleaner
- A ledge or balcony may be provided only for window cleaning with no patient access. If no handrail is provided, a continuous harness system should be provided with a harness cable or rail that must reach a safe access point.
- A window cleaning cradle that typically descends from the roof may be used. Cradles must be accessible from a safe position on the roof and comply with all safety legislation
- Extension arms may be used to clean windows that are one level above the ground or able to be reached from a terrace
- Health facility may enter into a window cleaning contract with a contractor who uses a mobile scissor lift or similar lifting device

Note: For safety reasons cleaning windows using a ladder is not recommended.

9 Floors

9.1 Floor Finishes

General

This section of the Guidelines addresses issues related to floors that are concerned with Occupational Health and Safety. Refer to Part D for Infection Control related.

The selection of floor finishes is very important. It has direct impact on the safety of patients, staff and visitors. Floor finishes also contribute to the recurrent costs of a facility related to cleaning and maintenance. A low initial cost of a particular finish floor may result in a high ongoing cost impact.

Fire Safety

Floor finishes must comply with local Building Regulations and Standards particularly related to fire safety. This is applicable to new installations and renovations requiring replacement of floor coverings.

Balance of Considerations

A number of issues should be considered and balanced when making the choice of floor finish. Designers are encouraged to investigate alternative materials and if necessary organise for realistic onsite tests before making major decisions. The following are general guides to making this decision.

Design considerations include:

- Floor finish characteristics such as wear resistance and cleanability. Floor finishes should be impermeable, sealed, easy to clean, scrubbable, able to withstand chemical cleaning have an integral base
- Management policy and maintenance practices (frequency, type and effectiveness of cleaning equipment)
- All floor surfaces in clinical areas should be constructed of materials that allow the easy movement of mobile equipment
- Floor finishes should be selected to conform for imaging equipment technical requirements (e.g., electrostatic dissipation), infection control requirements, and service limitations (e.g., no powered floor cleaners are to be used in MRI scanner rooms)
- The amount and type of expected traffic (vehicles, trolleys, people hurrying, elderly, disabled people with or without walking aids and children)
- Consequences of exposure to contaminants including environmental design factors (visibility issues and contamination minimisation)
- Compliance with Occupational Health & Safety requirements
- Special provision of textured or studded flooring for areas with high potential for slip hazards
- Alternative information sources and relevant standards (use of contrasting colours, tactile indicators and warning signs)

Manoeuvrability

The floor finishes chosen should make the movement of objects such as trolleys, bed trolleys and wheelchairs sufficiently easy to minimise the potential for injury to staff.

The following should be considered when selecting floor finishes:

- Standard vinyl and similar products are the easiest materials for the movement of trolleys and wheelchairs
- Carpet, if used should be direct stick, commercial density with short piles, preferably loop piles a 90/10 or 80/20 wool/nylon mix with rubber backing is recommended
- Flocked carpet should be considered where the 'look and feel' of carpet is desired with the ease of movement over vinyl
- Many health facility staff consider that it is harder to move objects over cushioned vinyl. However, cushioned vinyl may still be preferred to standard vinyl for its sound absorption

qualities.

Acoustic Properties

Certain materials and finishes have a positive impact on the acoustic performance of rooms and corridors. The actual requirements are set out in the Acoustic Guidelines Part G.

The final choice must also take into account the fire rating and smoke generation properties of the materials chosen

Carpet floor finishes not only minimise noise generation, but they also dampen the noise generated by other sources. Carpet is particularly effective in corridor areas where a great deal of noise can be generated. This quality, however, should be balanced against the concerns for infection control, ease of movement by trolleys, beds and wheelchairs. Deep pile carpets make such movements and especially the turning of such objects more difficult.

Cushioned vinyl is also effective in minimising noise generation, but it does not dampen other noises as effectively as carpet.

Hard surfaces such as ceramic tiles, terrazzo, laminates, or similar finishes generate noise from walking staff and visitors as well as impact noise such as dropped items. They also reflect noise from other sources.

The use of Carpet is allowed in certain areas which are mentioned in the relevant Standard Components Room Data Sheets.

Conventional carpet types may be used in areas which are not directly within clinical areas such as:

- Offices
- Educational areas
- Meeting rooms
- Waiting areas

Certain Carpet types may be used in limited clinical areas including:

- Inpatient Unit corridors
- Inpatient bedrooms
- VIP bedrooms
- VVIP bedrooms
- Rehabilitation Lounge Areas
- Mental Health Lounge Areas
- Visitors waiting rooms in Inpatient areas
- Corridors and Waiting areas in Outpatient areas
- Other areas by specific permission from the MOH

In such areas the carpet should have the following properties:

- Direct stick
- Short twisted pile
- High density
- Anti-bacterial or Healthcare grade (according to the manufacturers' description)
- 100% wool or a high proportion of Wool/Nylon such as 80/20
- Broadloom installed over self-levelled, sealed concrete or Carpet tiles with rubber backing

As a better alternative to carpet, various types of vinyl flooring resembling the texture of carpet may be used. These are sometimes referred to as Flocked Vinyl.

In summary, the acoustic properties of the floor finish must balance against the preferences for infection control whilst complying with the relevant fire regulations.

Standard Domestic type carpet with separate backing are not regarded as suitable for healthcare environments.

OH&S Issues

In areas where staff must stand for long periods of time, finishes should be chosen that do not contribute to staff fatigue. Carpets and vinyls, cushioned and standard are widely considered to be acceptable for lengthy standing.

Hard surfaces such as tiles, terrazzo or finished concrete are considered to be too hard for lengthy standing over several hours and alternatives are recommended in staff work areas.

Hard resilient surfaces may be used in public areas or other areas such as cafeterias, foyers, atriums and courtyards.

Cleaning

Floor finishes selected should be resilient to wear particularly in high traffic areas, and be easy to maintain and clean in order to minimise operating costs.

9.2 Anti-static/ Conductive Flooring

A distinction must be made between antistatic and conductive flooring. Antistatic flooring reduces the risk of static occurring while conductive flooring absorbs the electrical charge. However, if rubber soled shoes are worn on conductive flooring the effect is negated.

In the past, anti-static flooring was required in Operating Rooms because of the use of flammable anaesthetic agents. These types of anaesthetics are no longer in use, so the requirement for this type of specialised flooring no longer applies in Operating Rooms or Anaesthetic Rooms.

In addition, anti-static flooring is expensive, both to install and maintain. Most public and staff areas do not pose a problem with respect to generation of an electrical charge. Where there is any possibility of such an event, for example a computer technician working with live computer components or a worker in a specialised micro-electronics laboratory, anti-static mats may be used which more than adequately provide the necessary barrier.

In summary, provision of anti-static or conductive flooring is not mandatory in any part of the health facility. Any special requirement may be noted specifically on the Project Brief.

9.3 Slip Resistance

Slip resistance is governed by the nature of the anticipated activity. Safety considerations of floor finishes must address all the relevant variables. Slip potential is a function of footwear, activities, gait, contamination, environment and other factors.

Selection of floor finishes should consider the slip resistance suitable for the specific location the floor finish will be used.

Appropriate floor finish applications include the following:

- Standard slip resistant vinyl may be used in areas where the floor is dry and those using the floor will be wearing shoes.
- Standard textured vinyl is similar to standard slip resistant vinyl but provides greater dry condition slip resistance and may be used where floors may be intermittently splashed with water.
- Studded vinyl flooring provides a higher level of slip resistance, is rated non-slip, is easy to clean and suitable for wet areas with bare feet applications such as patient showers. Non-slip finishes in Ensuites and Bathrooms need to consider the use of fine powder such as talcum powder.
- Safety vinyl flooring rated non-slip is suitable in wet areas where trolley movement is also expected, such as SSU Decontamination Areas and Dirty Utilities. This type of safety floor may be composed of vinyl with metal fragments and is not suitable for bare feet applications.
- Ceramic tiles with an appropriate slip resistance may be used for Ensuites and Bathrooms, but not clinical areas requiring seamless finishes. Smaller ceramic tiles generally provide greater slip resistance. The best combination of slip resistance and easy cleaning is commonly referred to as textured which has an 'orange peel' finish.
- Stone and terrazzo may not be slip resistant and if used in areas such as foyers and lobbies

may be treated with non-slip chemicals to improve the slip resistance.

Slip resistance is also an important consideration for ramps and stairways.

9.4 Floor Joints

Thresholds and expansion joint covers should be flush with the floor surface to facilitate the use of wheelchairs and trolleys. Expansion and seismic joints must be constructed to resist passage of smoke in accordance with local Building regulations and Standards.

10 Glossary

Abbreviations used in this volume include:

Abbreviation	Meaning
CCU	Coronary Care Unit
CRT	Cathode ray tube monitors
HDU	High Dependency Unit
ICU	Intensive Care Unit
FPU	Functional Planning Unit
Kg	Kilogram
M	Metres
Mm	Millimetres
m ²	Square metres
MRI	Magnetic Resonance imaging
OH&S	Occupational Health and Safety, also referred to as OSH, Occupational Safety and health in some jurisdictions
SSU	Sterile Supply Unit

11 References and Further Reading

- ANU, Building Requirements Manual 2010, Section 15 Disability Access and Facilities, refer to website <http://facilities.anu.edu.au/documents/building-requirements-manual/15-disability-access-and-facilities.pdf>
- Australian/New Zealand Standards AS 1428: 2009, Design for Access and Mobility, refer to website www.saiglobal.com
- Australian/New Zealand Standards AS/NZS 4442: 1997, Office Desks, refer to website www.saiglobal.com
- Australian/ New Zealand Standards AS/NZS 4443: 1997, Office panel systems – Workstations, refer to website www.saiglobal.com
- American Institute of Architects and The Facility Guidelines Institute, Guidelines for Design and Construction of Health Care Facilities; 2014 Edition; refer to website www.fgiguilines.org
- British Standards BS 8300:2009 Design of buildings and their approaches to meet the needs of disabled people. Code of practice. Refer to website <http://shop.bsigroup.com/ProductDetail/?pid=000000000030139436>
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