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.