



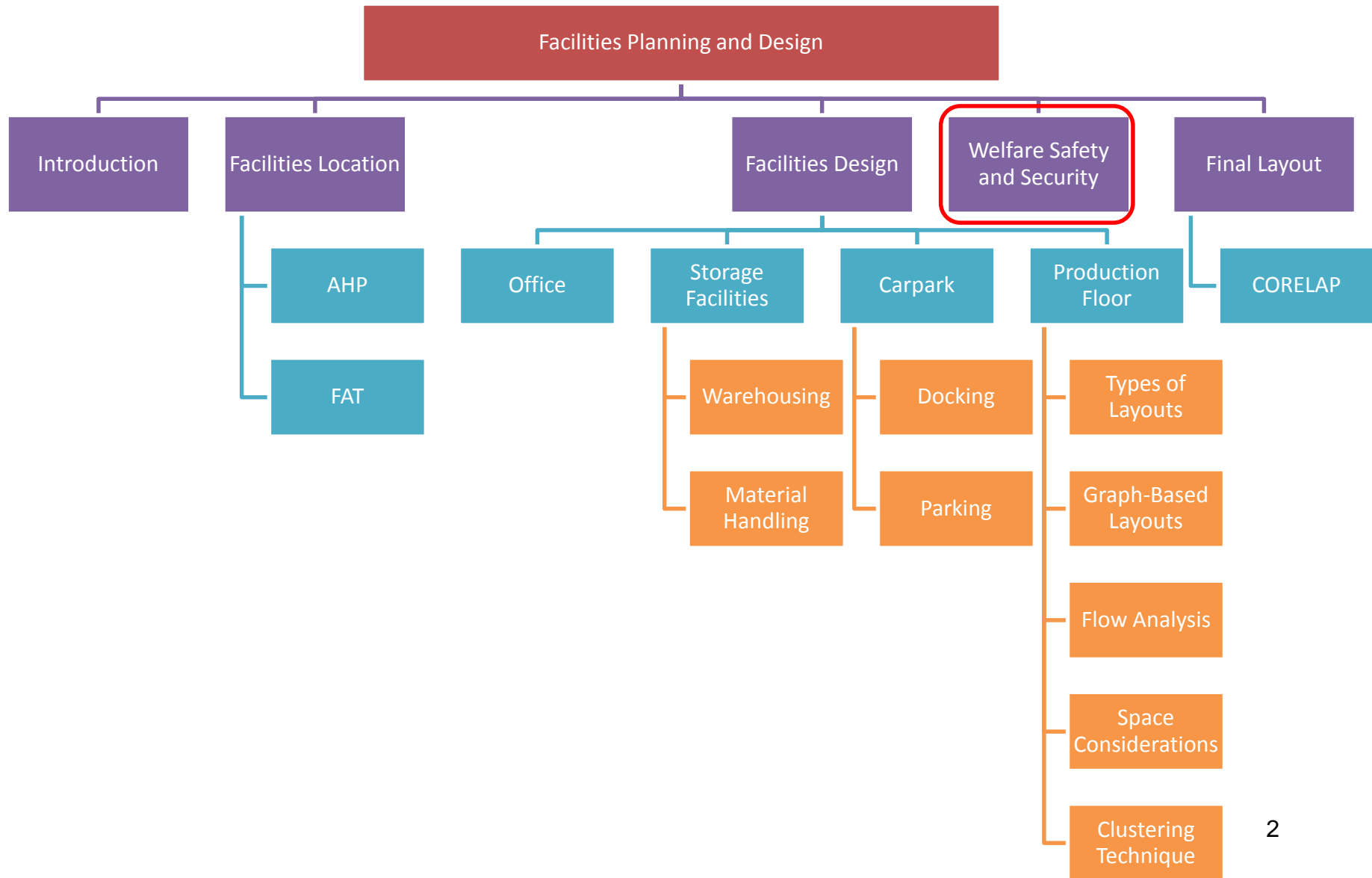
Problem 04

Safety and Welfare

E212 – Facilities Planning and Design

SCHOOL OF
ENGINEERING

E212 Facilities Planning & Design - Topic Tree



Facilities Planning for Personal Requirement

- Objectives:
 - Provide an interface between work and private time
 - Improve safety and health at workplace
 - Improve personnel productivity by improving personnel morale
- Examples of provisions: safety (first-aid, fire), food services, locker rooms, etc.
- Extent of provisions depends on government regulations and management's policy
- In Singapore, provisions pertaining to safety and health are controlled by legislations, e.g.:
 - Workplace Safety and Health Act
 - Fire Safety Act

Facilities Planning for Personal Requirement

Some key aspects to consider when planning for facilities:

- Locker rooms – proximity to staff entrances, allocation by gender, ventilation, traffic flow
- Restrooms – near work area, minimum number required, privacy, allocation by gender
- Food services – number of staffs, kitchen and dining area layout, ease of cleaning, aesthetic factors, location, ventilation
- Drinking fountains – quantity, location/distribution
- Health services – first aid room and first aid kits, location, evacuation routes
- Car parks – number of staffs, space utilization, traffic flow

The Workplace Safety and Health Act (Singapore)

- Came in effect 1st March 2006 as an essential part of the new framework to cultivate good safety habits in all individuals so as to engender a strong safety culture in our workplace. Some amendment with effect from 10 Oct 2011.
- The Workplace Safety and Health Act (Singapore) can be found under from the Occupational Safety and Health Department (OSHD) of the Ministry of Manpower (MOM).
- Website link to **MOM Workplace Safety and Health Guidelines:**
<http://www.mom.gov.sg/legislation/occupational-safety-health/Pages/default.aspx>

General Guidelines To First Aid Provisions

- a) Provide first-aid boxes - type and number recommended according to number of staff in each work shift
- b) Provide sufficient number of first-aid boxes on each floor within the premises
- c) Provide a trained first-aider if staff employed exceeds 25
- d) Provide a first aid room if total staff employed exceeds 500
- e) If the workplace has exposure to toxic or corrosive substances, provide emergency showers for quick drenching, and eye wash for flushing the eyes for chemical/toxic substances handling industries

First-Aid Box Provisions



Every first-aid box provided in a workplace shall (According to WSH Act) —

- (a) be adequately equipped;
- (b) be properly maintained;
- (c) be checked frequently to ensure that it is adequately equipped and that all the items in it are usable;
- (d) be clearly identified as a first-aid box;
- (e) be placed in a location that is well-lit and accessible; and
- (f) be under the charge of a person appointed by the occupier of the workplace.

Ratio Of Employees To First-Aid Boxes (According to MOM Guidelines)

(Recommended Only – Note that the workplace owner still have to ensure actual adequacy of provisions on a case-by-case basis, as stipulated by the WSH Act.)

No. of employees	No. and type of first-aid boxes
Less than 25 employees	at least one Box A
every 50 employees	at least one Box B
every 100 employees	at least one Box C

Note: 2 First Aid Box A = 1 First Aid Box B
2 First Aid Box B = 1 First Aid Box C

First-Aider Provisions



Ratio Of First-Aiders To The Number Of Employees:

(1) Where more than 25 persons are employed in a workplace, there shall be appointed in the workplace as first-aiders who shall be readily available during working hours such number of persons as complies with the ratio of one first-aider for every 100 persons employed in the workplace or part thereof.

Type of workplace	No. of employees	No. of first-aiders
Quarries, construction sites, shipyards, petroleum refineries, woodworking factories	26 – 100	one
	More than 100	one for every 100 persons employed or less
All other factories and workplaces covered under the Regulations	26 – 150	one
	More than 150	one for every 150 persons employed or less

First-Aider Provisions



- (2) Every person appointed as a first-aider shall:
 - (a) have successfully completed a training course acceptable to the Commissioner; and
 - (b) undergo such subsequent re-training in first-aid treatment as the Commissioner may require.
- (3) Where there is a shift work schedule in a workplace, the ratio of the number of first-aiders available on each shift to the number of persons employed at work on that shift shall comply with the ratio specified in point (1).
- (4) Every first-aider shall maintain a record of all treatment rendered by him.
- (5) A notice shall be affixed in every workplace stating the names of the first-aiders appointed.

First-Aid Room Provisions



- A first-aid room is to be provided where there are more than 500 employees.

Some factors to consider for the first-aid room:

Design Considerations:

- A couch for waiting patients
- Moving space for people and equipment
- Well lit & ventilated
- Emergency lighting
- Clear signboard(s) to identify the room
- First Aid equipment
- Total floor space

Location Considerations:

- Near toilets
- Near lifts and main passageways
- Accessibility to work area
- Accessibility to car park

Fire Safety



Key aspects in implementing fire safety:

– Fire prevention

Clear all exit stairways; designate smoking zone; switch off electrical and gas appliances; remove combustible materials; do not overload power outlets; have adequate ventilation; enforce security measures to prevent sabotage; minimize combustible materials in public access areas, etc.

– Maintenance

Install, check and service all fire protection equipment/systems (e.g. **fire-extinguishers, fire-sprinkler systems, hose reels, fire hydrant, etc.**)

– Plan Ahead

Have an approved fire emergency plan; conduct fire evacuation drills; train staffs in using fire protection and fire-fighting equipment, etc.

Emergency Evacuation



Elements of an emergency evacuation plan:

- **Detection and Alarm Systems**

For danger warning and quick notification to staff

- **Escape passage**

Use single route, avoid risk/danger areas, utilize stairway instead of lift

- **Assembly area**

Safe distance outside facility, sufficient to hold all staff for headcount.
Easily recognizable location

- **Educating staff**

On policies, procedures, escape route

- **Emergency drills**

To familiarize staff on what to do

- **Map of facility**

By floor, showing the specific exit route, location of stairways, fire alarms, fire extinguishers, fire-hose, water-points, fire-sprinklers, etc.

How to Evaluate Safety and Welfare Provisions

- To understand whether the welfare provisions are sufficient:
 - a) Interview the workers, conduct employee satisfaction surveys, etc. to understand what are the areas the company can improve on to increase the employees' morale.
 - b) Benchmark against other companies of similar nature/scope/size to understand where they are lacking in terms of welfare provisions, so that they can improve and become more competitive.
- To understand whether the safety provisions are sufficient:
 - a) First, refer to the **Workplace Safety and Health Act** and the **Fire-Safety Act** to be clear on the local (Singapore) legislative requirements.
 - b) We can check on the company's accident/incident reports to understand their current safety standing.
 - c) We can conduct audits to check on the company's current policies, SOPs (Standard Operating Procedures), and site inspections to make sure that they are aligned with the stipulated requirements.

Problem 04

Suggested Solution

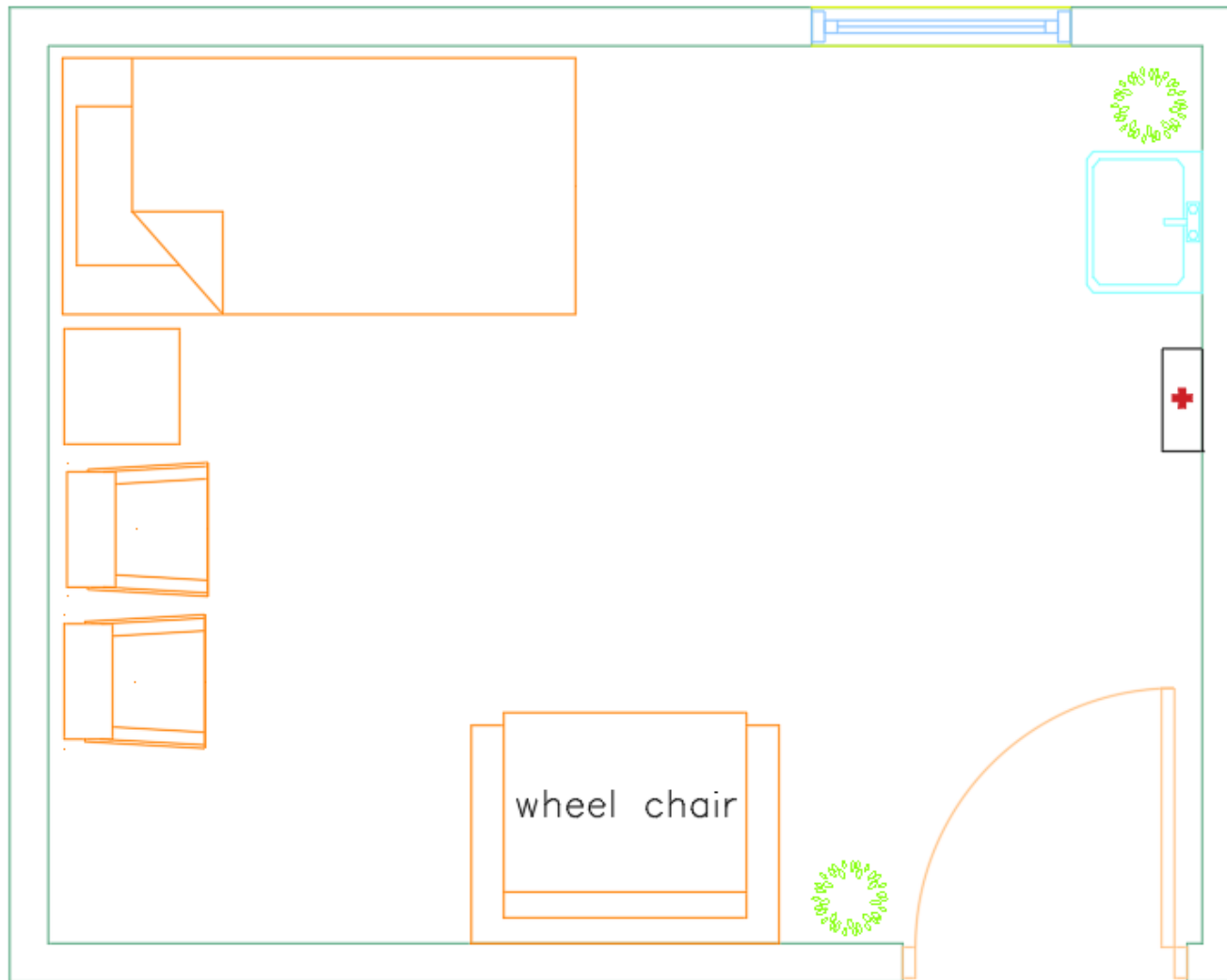


First Aid Provisions



- What Eren can propose for First Aid Provisions:
 - a) To meet existing need, Eren will need to recommend 5 Type C (or 9 Type B, or 18 Type A) First Aid boxes for the company.
 - b) When the number of workers increased to 550, Eren will need to make sure that there is at least 5 Type C and 1 Type B First Aid box (or other combinations of Box A, B or C) in the new facility. .
 - c) Create a First-Aid Room near entrance to the factory floor and office.

First Aid Room Proposal



Overview of E212 Facilities Planning and Design

