Part B – Health Facility Briefing & Design

64 Decontamination Unit

iHFG

International Health Facility Guidelines

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64 Decontamination Unit

1 Introduction

A Decontamination Unit (DCU) is a facility with the tools and equipment needed to clean people, clothing, and equipment of both hazardous and non-hazardous substances.

Decontamination may be necessary to stop people whose jobs expose them to toxins from unintentionally carrying such contaminants outside of the workplace and into contact with the general population. Decontamination may also be necessary to stop people from bringing contaminants into certain facilities, including healthcare facilities.

The minimum requirement of decon0tamination facilities attached to Emergency Units and Urgent Care Centres is included in the Emergency Unit FPU within these Guidelines.

This FPU covers more dedicated, larger and special-purpose Decontamination Units including:

- Stand-alone facilities
- Facilities attached to workplace
- Facilities attached to Hospitals

Further reading material is suggested at the end of this FPU but none are mandatory.

Users who wish to propose minor deviations from these guidelines should use the **Non-Compliance Report** (**Appendix 4 in Part A**) to briefly describe and record their reasoning based on models of care and unique circumstances.

The details of this FPU follow overleaf.

Decontamination is performed to prevent individuals whose work exposes them to contaminants from inadvertently bringing those contaminants outside the workplace and potentially spreading them into the wider environment.

Decontamination may also be necessary before contaminated people enter certain facility types, including but not necessarily limited to healthcare facilities.

Description

A Decontamination Unit can be either stand-alone, attached to a facility which poses the danger of contamination, or attached to the Emergency Unit or Urgent Care Centre at a Hospital. These are separately described below.

Stand-alone Decontamination Unit

In a facility such as a factory or workshop site, where exposure to contaminants is considered a risk, a stand-alone Decontamination Unit may be required. The facility's staff, who may be accidentally or periodically exposed to contaminants would be required to undergo de-contamination in the stand-alone Decontamination Unit, somewhere on the campus before returning to work or leaving the compound.

Such a facility will be self-contained with receiving areas, decontamination facilities and discharge areas. In such a facility, it is assumed that those exposed to contaminants are not otherwise injured, ill or in immediate danger.

In such situations, it is necessary to send those affected to the nearest hospital with decontamination facilities attached to the Emergency Unit. A Stand-alone Decontamination Unit may be a separate building on the campus. It may also be a mobile, temporary, or relocatable unit, depending on the circumstances and the facility's operational policies.

The use of a stand-alone or mobile unit can ensure that the unit is cleaned separately from the rest of the worksite and that it can always be kept at a reasonable distance from the potential source of contamination.

Decontamination Unit Attached to a Facility

A Decontamination Unit may be directly attached to a facility such as a factory, workshop, research laboratory or similar situations.

In such a situation, a decontamination unit may be integrated into the design of the facility. The operation of an attached Decontamination Unit would be similar to a Stand-alone Decontamination Unit. However, an attached Decontamination Unit may share certain components with the rest of the building such as staff amenities, common corridors etc.

Decontamination Units attached to Emergency Units or Urgent Care Centres

A minimum provision for decontamination facilities is required as part of the design of Emergency Units and Urgent Care Centres. Refer to the Emergency Unit FPU for the requirements of decontamination facilities.

If a patient is brought in with actual or suspected contamination such as in the case of industrial accidents, explosions, chemical spills and the like, it will be necessary to decontaminate before entering the Emergency Unit. Without such decontamination, other patients and staff may be exposed to the contamination and therefore spreading the risk.

For very large hospitals, such as those at Role Delineation Levels 5/6 or specialised hospitals dealing with high-risk patients exposed to contamination, it may be necessary to create a more dedicated Decontamination Unit, attached to (or very close to) and Emergency Unit or Urgent Care Centre.

This FPU sets out the requirements for such a dedicated unit without replicating the minimum requirements built into the Emergency Unit FPU.

2 Functional & Planning Considerations

Operational Models

Decontamination units are divided into several zones. The person being decontaminated must pass through these zones sequentially. This is intended to limit the quantity of contaminants that can be present in each area's environment and to prevent cross-contamination between clean and dirty sections. A three-zone system, consisting of an unclean room (undressing room), a shower room, and a clean room, is a typical decontamination unit structure.

In all permutations including Stand-alone, Attached or part of the Emergency Unit, Decontamination Units must be designed to be easy to clean, sanitize and to prevent the spread of contaminants outside the unit.

Unit Planning Models

The planning models are very similar for the 3 different settings explained above. In each case there is a need for a sequence of spaces that take a person from the state of being contaminated, to a state where they are cleaned. This sequence will require a set of inter-connected rooms or zones for each patient independently at any given time. Multiple patients should not go through the same path at the same time due to privacy reasons and danger of additional contamination being shared.

Each path can be designed as a module. The number of modules will depend on the volume expected or the facility's service plan. The minimum will be one module.

The Modules are dedicated to the patient path of decontamination, whilst the balance of the areas including Staff Support areas can be shared.

Functional Zones

- **Arrival area**- a roofed area outside the Decontamination Unit where contaminated people (or patients) arrive by various means including private vehicles, emergency vehicles or ambulances etc. The Arrival area should be equipped with deluge showers built into the ceiling of the roofed arrival area. The deluge showers can be used, when required, to wash down large numbers of people at the same time, before entering the building. The arrival area will have a clinical hand wash basin type A and a PPE storage unit and waste bin.
- **Arrival/ Triage Lobby** – This is an area immediately inside the facility, under negative pressure. At this point staff will direct and assist the contaminated people to enter one of the decontamination modules available (if more than one). The triage lobby will be (N) Neutral pressure.
- **Airlock** – an airlock between the Triage Lobby and the Undressing room. The function of this airlock is to maintain negative pressure in the undressing room as well as providing privacy to the undressing room. The airlock itself will have (-) negative pressure.
- **Undressing Room -** a negative pressured room where the contaminated people can remove

their clothes. This may be assisted or un-assisted. The Undressing Room will have a clinical hand wash basin type A as well as PPE storage unit. Biohazard waste bin should also be provided in this room. The Undressing Room will have (- -) negative pressure.

- **Decontamination Shower –** a room equipped with decontamination shower hose (multi-jets), hand-held hose and hand wash basin type A. This area needs to be designed for assistance by staff. In the Decontamination Shower room the contaminated person is hosed down and cleaned as necessary. There must be provision for soap, shampoo, various mild and safe chemical solvents, and towels in this area. Therefore, water proof storage units for these items should be provided. The Decontamination Shower room will have (- - -) negative pressure.
- **Clean Room -** a neutral pressured room where people can put on new clothes, or in the case of a Decontamination Unit attached to an Emergency Unit, hospital gowns. Storage racks for a change of clothes or hospital gowns as well as toilets must be provided. This room will require supervision and final checking of the cleaning process by the staff. The Clean Room will have (-) negative pressure, which is positive compared with the Decontamination Shower but negative compared with the exit corridor outside the room. This is to maintain the progressive negative pressure towards the Decontamination shower.
- **Exit corridor –** This is the corridor outside the Clean Room where the cleaned people exit. In the case of stand-alone facilities or those at workplace, this may be connected to the outside or the inside of the building. Unless the people being cleaned are ill or incapacitated, they will be free to resume normal life. In the case of Decontamination Units attached to Hospitals (generally at the Emergency Unit), the patients can use the exit corridor for access to the appropriate area of the Emergency Unit or other parts of the Hospital for further treatment.
- **Staff Support –** adjacent areas for Decontamination Unit staff and support facilities including - Staff room
  - Staff toilets and showers (male/female)
  - Staff change rooms (male/female)
  - Store room
  - Dirty Utility room
  - Disposal room (clinical waste).

In facilities which are attached to an Emergency Unit, these support rooms may be shared with the Emergency Unit if they are located close to the Decontamination Room. If not, then separate facilities for the Decontamination Unit must be provided.

In facilities which are stand-alone or connected to workplace, the Staff Support areas must be provided as part of the Decontamination Unit and be dedicated to the Unit.

3 Functional Relationships

A Functional Relationship can be defined as the correlation between various areas of activity which work together closely to promote the delivery of services that are efficient in terms of management, cost and human resources. Correct Functional Relationships are identified below.

External Relationships

The external relationships of a Decontamination Unit will depend on the model of planning. These are described separately below.

A stand-alone Decontamination Unit can be located as a separate building in a discrete section of a site, ideally away from un-related general public entrance and exit. Those accessing the facility shoud not mix with with those accessing other buildings on the site.

A Deconamination Unit attached to the workplace should be connected at a discrete section of the building away from the main entrance. In this model access to the unit may be provided from both outside the building and from inside the building. Both access points can converge at the same Traiage lobby. External access is for people who come from outside for the purpose of decontamination within the facility. For example from other buildings on the campus or from other sites. Internal access is for people who are working within the building and may be contaminated through the processes present in the building, for example in a factory. Before leaving the building, they are decontaminated.

A Decontamination Unit which is attached to an Emergency Unit or Urgent Care Centre should be connected close to the ambulance entrance, which in turn must be away from the Emergency Unit

main entrance. It should also be away from the main entrance to the hospital. Its driveways, leading to the ambulance entrance should be separated from the public trafic circulation as far as possible. The general public should not be admitted to the entrance that leads to the decontamination unit. The facility for the deluge shower, previously mentioned can be part of the general ambulance area and under the same roof.

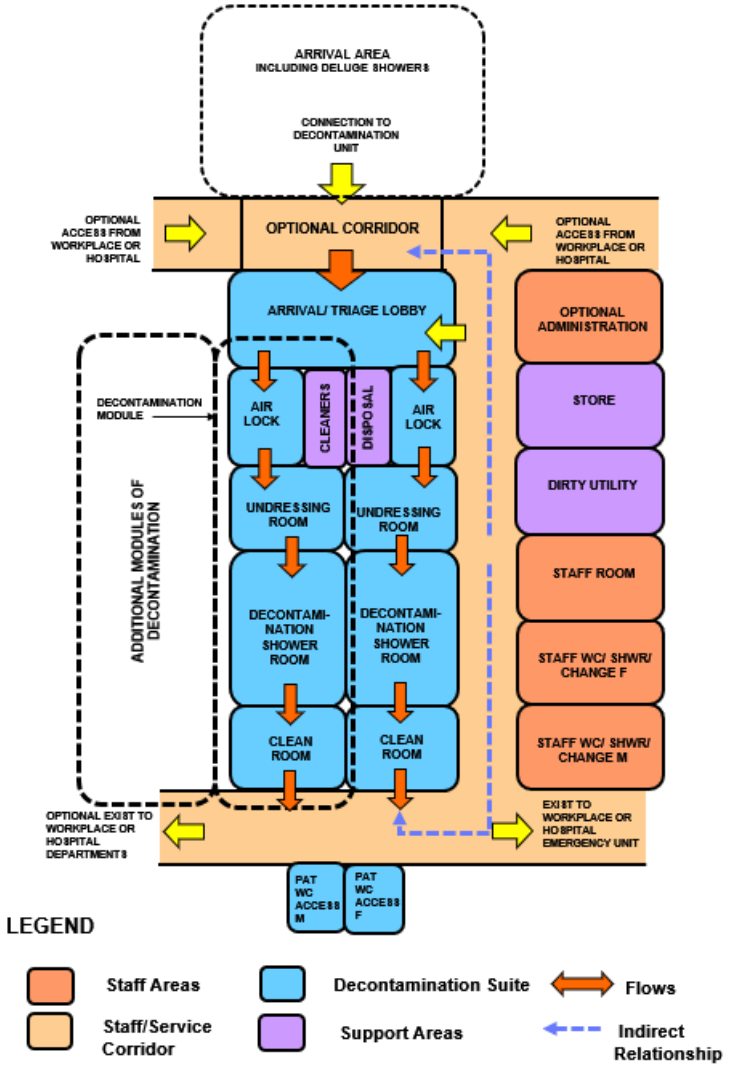
Also refer to separate FPU – Emergency Unit in these Guidelines.

Internal Relationships

Decontamination process should be in a one-way flow – contaminated personnel will enter through the undressing room and proceed to the shower area and exit through the clean room where they can get dressed. Access doors between these areas should be signposted to require one way traffic from contaminated to clean, to avoid the spread of contamination.

Functional Relationships Diagram

The functional relationships of a Decontamination Unit are demonstrated in the diagram below.



4 Design Considerations

Refer to Part C for Ergonomic issues, Part D for Infection Control, and Part E for Engineering requirements.

Doors

Door openings shall have a minimum of 1200mm clear opening to allow for easy movement of stretcher and equipment.

Safety and Security

Entry to the Decontamination Unit should be secured and monitored. Doors between rooms should ensure one-way traffic flow is encouraged and maintained.

Units should be assessed and must meet security provision checklists as seen in **Part C - Access, Mobility, OH&S** of these Guidelines.

Finishes

Finishes including building fabric, floor, wall and ceiling finishes, should be relaxing and non-institutional as far as possible. The following additional factors should be considered in the selection of finishes:

- durability
- ease of cleaning
- infection control
- fire safety
- moisture and heat resistance
- movement of equipment

Floor and walls should be anti-static, heat resistant, anti-bacterial, anti-fungal and chemical resistant. All joints in flooring must be sealed and coved at the edges (against walls or fixed joinery) where possible. Water and chemical resistant are also important characteristics of selected flooring. Walls shall be painted with lead free paint.

Refer to **Part C - Access, Mobility and OH&S** of these Guidelines for more information on wall protection, floor finishes and ceiling finishes.

Building Services Requirements

This section identifies unit specific services briefing requirements only and must be read in conjunction with Part E - Engineering Services for the detailed parameters and standards applicable.

Heating Ventilation and Air-conditioning (HVAC)

Efficient ventilation should be provided to Decontamination Shower Room.

The air temperature in the other areas should be capable of being maintained along with relative humidity, both should be adjustable.

All HVAC units and systems are to comply with services identified in Standard Components and **Part E – Engineering Services**.

Medical Gases

Concealed and recessed cabinet with medical gases could be provided in the Decontamination Shower. Refer to the relevant Standard Component in these Guidelines.

Hydraulics

Warm water supplied to drench hose (in decontamination shower) should be ideally at 38 degrees Celsius and must not exceeds 43 degrees Celsius.

Separate drainage system should be provided to detain the water from the Decontamination Shower room. It cannot be mixed with the regular drainage system due to contaminants.

5 Standard Components of the Unit

Standard Components

Standard Components are typical rooms within a health facility, each represented by a Room Data Sheet (RDS) and a Room Layout Sheet (RLS).

The Room Data Sheets are written descriptions representing the minimum briefing requirements of each room type, described under various categories:

- Room Primary Information; includes Briefed Area, Occupancy, Room Description and relationships, and special room requirements).

- Building Fabric and Finishes; identifies the fabric and finish required for the room ceiling, floor, walls, doors, and glazing requirements.
- Furniture and Fittings; lists all the fittings and furniture typically located in the room; Furniture and Fittings are identified with a group number indicating who is responsible for providing the item according to a widely accepted description as follows:

Group	Description
1	Provided and installed by the builder
2	Provided by the Client and installed by the builder
3	Provided and installed by the Client

- Fixtures and Equipment; includes all the serviced equipment typically located in the room along with the services required such as power, data and hydraulics; Fixtures and Equipment are also identified with a group number as above indicating who is responsible for provision.
- Building Services; indicates the requirement for communications, power, Heating, Ventilation and Air conditioning (HVAC), medical gases, nurse/ emergency call and lighting along with quantities and types where appropriate. Provision of all services items listed is mandatory.

The Room Layout Sheets (RLS's) are indicative plan layouts and elevations illustrating an example of good design. The RLS indicated are deemed to satisfy these Guidelines. Alternative layouts and innovative planning shall be deemed to comply with these Guidelines provided that the following criteria are met:

- Compliance with the text of these Guidelines.
- Minimum floor areas as shown in the schedule of accommodation.
- Clearances and accessibility around various objects shown or implied.
- Inclusion of all mandatory items identified in the RDS.

Non-Standard Components

Non-standard rooms are rooms are those which have not yet been standardised within these Guidelines. As such there are very few Non-standard Rooms. These are identified in the Schedules of Accommodation as NS.

Room Name

[Description of room]

Requirements include:

- [List of FF&FE items]

6 Schedule of Accommodation

The Schedule of Accommodation (SOA) provided in the Appendices of this FPU represents generic requirements for this Unit. It identifies the rooms required along with the room quantities and the recommended room areas. The sum of the room areas is shown as the Sub Total as the Net Area. The total area comprises of the sub-total areas of these rooms plus an additional percentage of the sub-total applied as the circulation (corridors within the Unit). Circulation is represented as a percentage is the minimum recommended target area. Any external areas and optional rooms/ spaces are not included in the total areas in the SOA.

Within the SOA, room sizes indicated for typical units and are organised into functional zones. Not all rooms identified are mandatory, therefore, some rooms are found as optional in the corresponding Remarks. These Guidelines do not dictate the size of the facilities and the SOA provided represents a limited sample based on assumed unit sizes. The actual size of the facilities is determined by the Service Planning or Feasibility Studies. Quantities of rooms need to be proportionally adjusted to suit the desired unit size and service needs.

Any proposed deviations from the mandatory requirements, justified by innovative and alternative operational models may be proposed within the departure forms included in Part A of these guidelines for consideration by the health authority for approval.

Decontamination Unit

ROOM/ SPACE	Standard Component Room Codes	RDL2 to 6 Qty x m2									RDL2 to 6 Qty x m2			Remarks
Unit Size		**1 module**			**2 modules**			**3 modules**			**4 modules**			
Decontamination Module(s)		**Qty x m2**			**Qty x m2**			**Qty x m2**			**Qty x m2**			
Arrival/ Triage Lobby		1	x	10	1	x	15	1	x	20	1	x	25	Minimum 10m2. Add 5m2 per additional Decontamination Module
Airlock	airl-6-i	1	x	6	2	x	6	3	x	6	4	x	6	This is the airlock to the Undressing Room
Undressing Room	chpt-i similar	1	x	8	2	x	8	3	x	8	4	x	8	
Decontamination Shower Room	shdc-i similar	1	x	10	2	x	10	3	x	10	4	x	10	
Clean Room (Dressing Room)	chpt-i similar	1	x	6	2	x	6	3	x	6	4	x	6	
Toilet- Accessible	wcac-i	2	x	5	2	x	5	2	x	5	2	x	5	1 x Male, 1 x Female for up to 4 Decontamination Modules
Staff/ Support		**Qty x m2**			**Qty x m2**			**Qty x m2**			**Qty x m2**			
Cleaners Room	Clrm-6-i	1	x	6	1	x	6	1	x	6	1	x	6	
Disposal Room	disp-8-i	1	x	8	1	x	8	1	x	8	1	x	8	
Dirty Utility Room	dtur-14-i	1	x	14	1	x	14	1	x	14	1	x	14	Sub-dirty utility also acceptable for 1 to 2 modules
Staff Room	srm-15-i similar	1	x	10	1	x	10	1	x	12	1	x	12	
Staff WC/ Shower/ Change	chst-12-i similar	1	x	12	1	x	12	1	x	12	1	x	12	
Store	steq-10-i	1	x	5	1	x	10	1	x	15	1	x	20	Size 5m2 per decontamination module
Administration Office	off-2p-i or off-3p-i similar	1	x	12	1	x	12	1	x	16	1	x	16	Optional- may also be shared with other facilities and departments
Sub Total		**117.0**			**157.0**			**203.0**			**243.0**			
Circulation %		17.5			23.5			30.5			36.6			
Total Areas		**134.6**			**180.5**			**233.5**			**279.5**			

Please note the following:

- Areas noted in Schedules of Accommodation take precedence over all other areas noted in the FPU
- Exact requirements for room quantities and sizes will reflect Key Planning Units (KPU) identified in the Clinical Service Plan and the Operational Policies of the Unit
- All the areas shown in the SOA follow the No-Gap system described elsewhere in these Guidelines

7 Further Reading

In addition to Sections referenced in this FPU, i.e. Part C- Access, Mobility, OH&S, Part D - Infection Control, and Part E - Engineering Services, readers may find the following helpful:

- Guidelines for Design and Construction of Health Care Facilities; The Facility Guidelines Institute, 2014 Edition; refer to website www.fgiguidelines.org
- International Health Facility Guideline (iHFG), refer to website: www.healthdesign.com.au/ihfg