PRIVATE HOSPITAL GUIDELINES

GUIDELINES FOR THE CONSTRUCTION, ESTABLISHMENT AND MAINTENANCE OF PRIVATE HOSPITAL AND DAY PROCEDURE FACILITIES

3 RD EDITION 1998

ACKNOWLEDGMENTS

The initial preparation of these guidelines in 1992 would not have been possible without the effort of a large number of people from both the public and private sectors, all experts in their own field.

Valuable advice was received from individuals in the following areas:

Health Department of Western Australia (HDWA)
Private Hospitals Association W A Branch (PHA)
Local Government Association of W A (Inc.) (LGA)
Private and Public Health Sectors
Private and Public Sector Architectural and Engineering Firms

These revised guidelines (2nd edition 1996) are the result of many hours of work, advice and comment from individuals in both the public and private sector.

Appreciation is extended to all those individuals and their respective organisations that have made this 1996 review of the Private Hospital Guidelines possible.

FACILITIES & ASSETS BRANCH
HEALTH DEPARTMENT OF WA

FOREWORD

The *Hospitals and Health Services Act 1927* empowers the Commissioner of Health to licence private hospitals and issue guidelines with respect to their construction, establishment and maintenance.

The guidelines apply to both new and existing remodelled facilities. The attached chart, titled "Private Hospitals - Guide to the HDWA Process for Approval and Licensing", clarifies the licensing process. The chart addresses both the facility and operational streams. These guidelines only specify the facility standards to be observed and procedures associated with the hospital development process. In addition, all relevant rules, codes, regulations, instructions or other legislation, adopted by the guidelines, are identified.

The guidelines will be reviewed and updated as required and additional guideline documents may be issued to cover not only private hospitals but also kindred health care institutions.

This 2nd Edition 1996 follows the same format as the previous document. The scope and technical content have been reviewed to ensure the guidelines reflect current requirements.

The major areas of revision are:

- clarification and importance of statement of function;
- provision for natural disaster updated;
- corridor widths clarified;
- provisions for physically impaired included;
- energy management reviewed;
- environmental design reviewed and updated;
- facility engineering services completely reviewed;
- facility planning requirements updated;
- sterile goods supply reviewed and updated;
- day procedure units contained in a separate section;
- ambulance facilities included; and
- table of contents reviewed and index included.

Inquiries or questions on the guidelines may be addressed to the Commissioner of Health, attention Manager, Private Sector Licensing Unit, Health Department of WA. East Perth Government Offices, 189 Royal Street, East Perth, WA., 6004, telephone 9222 4222. Direct lines for the Private Sector Licensing Unit are 9222 4023 or
9222 4027.

Additional copies of this document may be obtained from the Manager, at the same address.

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PRIVATE HOSPITAL GUIDELINES

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A. INTRODUCTION

A1 GENERAL

The **Guidelines** are designed to provide guidance for the construction, establishment and maintenance of private hospitals and a variety of related health care facilities.

The **Guidelines** are presented in the form of minimum requirements and do not necessarily reflect ideal standards which may, in many instances, be above the acceptable minimum standard.

The **Guidelines** place emphasis on achieving facilities reflecting current health care procedures in a desirable environment for patient care at a reasonable facility cost.

The model standards suggested in the **Guidelines** are performance and service oriented, and where prescriptive measurements are given, these have been carefully considered relative to generally recognised standards which are self evident and do not require detailed specification. For example, experience has shown that it would be extremely difficult to design a patient bedroom smaller than the size suggested and still have space for the functions and procedures normally conducted within it.

In many instances it may be desirable to exceed minimum requirements to achieve optimum standards. For example, although a stated minimum patient bedroom door width will permit the passage of beds, greater widths may be desirable to minimise damage to beds and door frames where frequent traffic may occur.

The **Guidelines** are presented in a manner, which seeks to encourage design innovation, and there is provision for exemptions to be granted where it is demonstrated that the intent of the standard has been met.

Formatting of the Guidelines has been designed to assist the user. **Bold text identifies important or mandatory requirements.** Mandatory requirements are identified by the word **shall** (see also A12 Glossary of Terms).

A2 HOSPITALS AND HEALTH SERVICES ACT 1927

Section 26J of the Act empowers the Commissioner of Health to promulgate guidelines covering establishment, construction and maintenance of private hospitals.

A3 STATEMENT OF FUNCTION

Refer to D1 - Furniture and Equipment - General

Refer to G1 - Facility Planning Requirements - Whole Facility

Any application to the Commissioner for approval to develop a private hospital *shall* conform with the process as outlined in the "Private Hospitals - Guide to the HDWA Process for Approval and Licensing" Chart and *shall* include a Statement of Function with the application for Approval in Principle (Stage 3). The Statement of Function *shall* advise the following:

1. Describe the organisation, company or institution responsible for the establishment and management of the facility.

2. Describe how the unit will operate with patient and staff flow plans.

3. Describe medical procedures that will be carried out at the facility.

4. Advise examples being used as references for the planning and operation of the facility.

5. Provide a description of accommodation to be included in the facility.

6. Provide accommodation schedules that include room areas, room height, and relationship to adjacent accommodation.

7. Describe staging or future expansion potential.

8. Describe impact on existing services and facilities (if applicable).

The Statement of Function *shall* also include a description of those services necessary for the complete operation of the facility but which may be available elsewhere in the community, and therefore, need not be duplicated in this facility.

If applicable, the Statement of Function *shall* also address the potential for future expansion of essential services, such as Medical Imaging and Pathology laboratories, which may be needed in response to increased demand.

A4 COMPLIANCE

Compliance with these guidelines is a specific condition of being granted a licence by the Commissioner to operate premises as a private hospital. Failure to comply with the guidelines will result in a breach of condition of licence unless specific exemptions have been given by the Commissioner in writing.

Any applicant requesting a licence *shall* be required to submit for approval any site plans, plans, specifications, the "Statement of Function" and any other documentation which the Commissioner may, from time to time, determine necessary for evaluation of compliance with the guidelines. Approval *shall* be issued in writing and may be conditional.

It is emphasised that compliance with these guidelines forms only one element of the private hospital licensing process. Conformity with other service planning criteria and relevant regulations is essential. It is assumed that other facets of the overall service planning process have already been finalised or are proceeding concurrently. In particular, the need for any proposed facility will have already been established and agreed, as will the size and range of services to be provided.

Compliance with these guidelines alone cannot be construed as an approval for proceeding with any development. Formal notification from the Commissioner must be received prior to commencement.

A5 RIGHT OF APPEAL

An applicant has the right of appeal.

When the Commissioner refuses to license a facility due to an applicant's serious non-compliance with the Guidelines, as interpreted by the Commissioner, the applicant may, under the Act, lodge an appeal with the Minister for Health within 30 days of the refusal being formally notified, i.e. date of issue of letter.

Minor issues, which do not impact on licensing, can only be resolved by negotiation between the applicant and the Commissioner.

A6 MODERNISATION AND EXTENSION

Refer to B12 - Partial Modernisation Compliance.

Where existing facility modernisation or replacement work is proposed, all new work and/or additions ***shall*** comply, insofar as is practical, with these guidelines and any other codes, standards, or regulations empowered by them. Where it can be demonstrated that total compliance is impractical or impossible, exceptions may be considered. This cannot, however, be construed to mean that the granting of an exception is guaranteed, particularly where major improvements required for patient safety are in question.

Where it is proposed that existing building areas are to be substantially redeveloped, they ***shall,*** insofar as is practical within structural and spatial limitations, comply with these guidelines. In this context, "substantial" work is defined as costing in excess of 50% of the cost of replacement of that part of the existing facility with new work.

New additions to any private hospital facility should conform with these guidelines and should not, as for any modernisation or alteration, serve to diminish levels of safety which existed prior to the work.

All modernisation, alteration and extension projects ***shall*** be subject to the requirements stated in sections A3 & A4 above. Also refer to section B12 - Partial Modernisation Compliance, for further detail.

A7 EQUIVALENT ALTERNTIVES

The primary objective of the guidelines is to achieve a desired performance result or service. Prescriptive limitations, when given, such as exact minimum dimensions or quantities, describe a condition commonly recognised as a practical standard for normal operation. For example, the reference to minimum room area is easily understood as being needed for patient, equipment and staff activities. This avoids the requirement for complex descriptions of procedures for appropriate functional planning.

Where specific measurements, capacities or other standards are described, equivalent alternative solutions will be assessed and may be deemed acceptable if the Commissioner considers that the intent of the standards has been met.

It is important to note that nothing in these guidelines should be construed as designed to restrict innovation which might improve performance and/or outcomes.

A8 ACCREDITATION

Compliance with these guidelines does not imply that the facility will automatically qualify for accreditation by the Australian Council on Health Care Standards.

Accreditation is primarily concerned with hospital management and patient care practices, although the standard of facility is certainly a consideration. Contact the:

Australian Council on Health Care Standards
PO Box 95
Waterloo NSW 2017

Phone: (02) 9662 2311
Fax: (02) 9662 6370

for detailed information on accreditation requirements.

A9 OCCUPATIONAL SAFETY AND HEALTH

Manufacturers and Designers Responsibilities for Building and Equipment Design and Maintenance

It should be noted that, under the Occupational Safety and Health Amendment Act 1995, Section 23, a person who designs, manufactures,
imports or supplies any plant (includes machinery, equipment, appliance, implement, tool or accessory components) for use at a workplace, must have regard to testing, providing information and ensuring that persons who properly install, maintain or use the plant are not exposed to hazards.

A10 MAINTENANCE

Refer to Section E5 of the Building Code of Australia - Maintenance.

In designing and detailing a hospital or day surgery facility, the recurrent costs involved in maintaining the building stock should be an important consideration. Hospital proprietors should consider the establishment of an asset management program to ensure that building stock is maintained to an appropriate standard. The architect and engineers should minimise the impact of maintenance on the life cycle costs of the facility, with obvious due consideration to the proprietor's capital commitment. Selection of building material, finish, fitments, plant etc., and maintenance access are all important considerations.

The aim of the above is to prevent the building from deteriorating to the point where the Commissioner, under the Act, might need to consider the withdrawal of a licence if the building stock is deemed to be unsafe.

Also refer to:

(a) B7.3 - Maintenance of Fire Safety
(b) E2.18 - Maintenance of (Electrical) Installation.

A11 FURTHER INFORMATION AND ADVICE

In addition to these guidelines, the Health Department of WA maintains a library of standards and technical notes on most areas of hospital design. Included in the library is a system of service classification and level of nursing care with models of facility requirement.

For further information relating to any aspect of hospital design, contact the Facilities and Assets Branch, Health Department of WA.

A12 GLOSSARY OF TERMS

"the Act" - means the *Hospitals and Health Services Act 1927.*

"acceptable standard" - means a standard acceptable to the Commissioner.

"area, space" - means that the guideline requirement need not be fully enclosed but form part of a larger space e.g. trolley park alcove off a corridor.

"Building Code of Australia" - (Building Code of Australia (1990) and any subsequent amendments or updates.

"Commissioner" - means the Commissioner of Health of the Public Service of the State of WA.

"compliance" - means to act or provide in accordance with the requirements or recommendation of these guidelines or referenced standards or regulations.

"disabled" facilities - facilities that are designed for use by the disabled, to AS 1428 series.

"egress" - a safe means of escape in the event of an emergency (usually fire).

"ensuite" - means a room fitted out with a shower, a water closet and a basin/mirror combination. It does not necessarily open directly off a bedroom. Variations are "fully" and "semi-assisted" types. It is acknowledged that this is not the true dictionary definition.

"facility" - means the physical aspects of the development e.g. the buildings.

"fully assisted" facilities - facilities (toileting, showering, bathing etc.) that are designed to facilitate patient assistance by two staff members.

"Guidelines" - a collection of requirements and recommendations, some mandatory, some non-mandatory, which describes a minimum level of facility provision.

"interpretation" - means, in this instance, the meaning of something as understood by the Commissioner.

"minimum" - means the least level of provision which is considered necessary for a given function. Anything below is considered unsatisfactory.

"Nursing Unit" - the module by which a hospital is developed to ensure cost efficient nurse coverage for patient safety and service e.g. One (1) nursing unit = 30 to 35 acute patient bedrooms = One (1) ward.

"office, room" - means that the function be fully enclosed to create its own space e.g. Birth Room, Operating Room.

"optimum" - the preferred level of provision, not necessarily the best, but higher than the minimum level. It is acknowledged that this is not the true dictionary definition.

"partially assisted" facilities - facilities (toileting, showering, bathing etc.) that are designed to facilitate patient assistance by one staff member.

"Patient Care Area" - area as defined in the Building Code of Australia part of a health care building normally used for the treatment, care, accommodation, recreation, dining and holding of patients including a ward and treatment area".

"Private Hospital" - means a hospital that is not a public hospital, as defined in "the Act".

"Radiographer" (Medical Imaging Technologist) - a person eligible for membership with the Australian institute of Radiography and is permitted by the Radiological Council to operate major x-ray equipment under the direction and supervision of a licensed Radiologist.

"shall" - implies that the referenced requirement is **mandatory.** (see "should").

"should" - implies that the stated requirement is recommended, but is **not mandatory.** (see ***"shall"*****).**

"Standards" - means the Standards of the Standards Association of Australia.

'"Treatment Area" - area as defined in the Building Code of Australia - an area within a patient care area such as an operating Theatre and rooms used for recovery, minor procedures, resuscitation, intensive care and coronary care from which a patient may not be readily moved".

"X-Ray" Operator - a person who has received approval by the Radiological Council to perform a range of X-ray examinations, limited to chests and extremities, using low powered mobile x-ray equipment.

PRIVATE HOSPITAL GUIDELINES

B. CONSTRUCTION – STANDARDS & METHODS
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B. CONSTRUCTION - STANDARDS AND MEHTODS

B1 PROVISION FOR NATURAL DISASTER

B1.1 General

All hospital facilities should be capable of continued operation during and after a natural disaster, except in instances where a facility sustains primary impact. This means that special design consideration is needed for the protection of essential services such as emergency power generation, heating systems, water (if applicable), etc. Typical problems such as disruption to the Minister's water or sewer mains and energy supplies, may affect the operation of on-site services. However, the responsibility for maintaining these public utilities lies with others.

Appropriate construction detailing and structural provision ***shall*** be made to protect occupants and to ensure continuity of essential services where there is a history of earthquakes, cyclones, flooding, bushfires or other natural disasters.

B1.2 Earthquakes

Refer to E6 - Structural Engineering

Facilities *shall* be designed and constructed to withstand the force assumptions of AS1170 Part 4 - Minimum design loads on structures - Earthquake loads.

B1.3 Cyclones

Refer to E6 - Structural Engineering

Facilities *shall* be designed and constructed to withstand the force assumptions of AS1 170.

In cyclonic areas, special attention ***shall*** be given, not only to protection against the effects of the direct force of wind (structural detailing, special cladding fixings, cyclonic glazing etc.), but also against such things as wind generated projectiles (trees, cladding, fencing etc.) and localised flooding.

B1.4 Flooding

Consideration ***shall*** be given to possible flood effects when selecting and developing a site. Where possible, facilities ***shall*** **NOT** be located on designated flood plains. Where this is unavoidable, extra care is to be

taken when selecting structural and construction methodology, and protective measures against flooding are to be incorporated into the design.

B1.5 Bushfires

Facilities *shall* be designed and constructed in conformity with AS3959 - Construction of buildings in bushfire prone areas.

Protection against bushfires ***shall*** be addressed in site selection, creation of firebreaks, fire resistant construction, sufficient water supply and building sprinkler systems (external).

B1.6 Emergency Communications

Refer to E3

In all cases, effective long range communications systems, which do not rely on ground lines to function, are essential.

Consultation with the State Emergency Service is recommended to ensure arrangements are in place for emergency long range communications assistance in the event of emergency situations or a major disaster.

B2 CONSTRUCTION AND DESIGN STANDARDS

Refer to B14 - Security
E6 - Structural Engineering

Refer to Appendix 2 - Health Facility Fire Design Supplement 1993.

Construction and design standards in new and remodelling projects ***shall*** generally comply with the requirements of the Building Code of Australia. The "Health Facility Fire Design Supplement 1993 adds to and complements the contents of the Building Code of Australia.

Note that where there is a conflict between the Building Code of Australia and these guidelines, the guidelines ***shall*** apply.

Further to the requirements of the Building Code of Australia, the following ***shall*** be complied with:

B2.1 Materials Generally

All building material used in the construction of a Private Hospital *shall* be new and of a type suitable for use in the particular element

of construction. Installation *shall* be to the manufacturers' recommendations, or as dictated by codes etc. The exceptions to this rule are renovated or restored historical elements, e.g. door units, leadlight glazing etc., and elements suitable for re-use in a facility redevelopment, e.g. existing doors, windows etc.

Experimental materials or components are not acceptable for inclusion, although small sample areas for evaluation purposes are allowed. This does not exclude the use of new materials that comply with all the relevant codes and requirements of these guidelines, but which have not been used before in this State.

B2.2 Roof Form and Construction

B2.2.1 **As for B2.1, the roofing material used in the construction of a Private Hospital *shall* be new and of a type suitable to its particular application.**

B2.2.2 Where modifications are made to an existing tiled roof or where a new tiled roof abuts an existing tiled roof, existing tiles that are in good condition may be re-used. Metal roofing material cannot be reused except where it is carefully removed and refitted and complies with the fixing standards set by the manufacturer.

B2.2.3 Where low pitch metal decking is proposed, it is strongly recommended that pitches of 1-2° are not used. 3° is the absolute minimum recommended, 5 ° preferred. Hospital roofs generally have substantial service penetrations, and the need to be trafficable for regular service access to mechanical plant. Pitches of 1-2 ° are regularly found to have low spots, normally mid span, which hold water and eventually rust.

B2.2.4 Silicon sealing and pop riveting of flashing around penetrations in low pitch roofing is also regularly found to leak. It is recommended that flashing on the high side of the major roof penetrations (mechanical) extend back to the ridgeline. Flashing detailing, even at a pitch of 5°, is very important.

B2.2.5 In addition, box gutter design should be capable of handling the most extreme downpour. Overflow pops of substantial capacity are essential. Vortex breakers at the head of downpipes are also recommended. Box gutters should not pass over internal spaces, but where there is no option, special arrangements should be made for water leakage protection. Box gutters should never pass over areas such as main electrical switchboards, operating rooms, lift machine rooms and shafts, etc.

B2.2.6 Consideration should also be given to box gutter expansion joints, e.g. maximum spacing recommended are:

P.G.I./Zincalume	18 metres
S.S./Aluminium	12 metres
Copper/Zinc	7 metres

B2.2.7 Box gutters, where wide enough, should also be made trafficable.

B2.3 Corridors

Minimum corridor widths is a controversial topic, as there are many schools of thought on the underlying principles which should dictate them. The following requirements are a negotiated minimum taking into account the need to allow for the movement of trolleys, beds, wheelchairs and other mobile equipment, including the passing of such equipment.

The over-riding principle in setting the minimum is the need to allow for a workable width that, in the event of an emergency evacuation procedure, does not impede egress.

As such, corridor widths ***shall*** comply with the following:

B2.3.1 **In areas where regular trolley and stretcher movement is expected, e.g., nursing units, operating and birth suites, intensive care units etc., the minimum corridor width *shall* be 2100mm.**

The optimum corridor width is 2350mm.

Even at this dimension, special consideration must be given to the width of doorways into adjacent rooms and the widening of corridors at the entry to the affected rooms to accommodate turning trolleys and beds.

B2.3.2 Corridor widths in the above areas may be considered at lesser dimensions where an existing building is utilised, but special design and planning detail must be incorporated to overcome the problems of congestion and the potential risk to patients and staff in an emergency evacuation mode. **Written approval must be obtained from the Commissioner.**

B2.3.3 **Corridor widths in areas where irregular trolley or bed movement is expected, e.g., Radiology, can be reduced to 1800mm.**

Special consideration must be given to door widths to ensure the unrestricted movement of the trolley or bed from corridor to adjacent room.

B2.3.4 **Corridor widths in outpatient suites and in areas not used for patient transportation on trolleys or stretchers may be reduced to 1500mm.**

B2.3.5 **Corridor widths of 1200mm are acceptable where there is no patient transportation requirement and where corridor runs are no longer than 3 metres, e.g., corridor spur to a group of offices.**

B2.3.6 Corridor widths of lesser dimensions are unacceptable, except where forming part of an existing facility, **and where written approval has been obtained from the Commissioner for the lesser width.**

B2.3.7 **Widths of major arterial inter-department corridors and public corridors generally *shall* be as wide as is deemed necessary for the proposed traffic flow, but *shall not* be less that 21 00mm.**

B2.3.8 Widths of lobbies within corridors ***shall*** be as wide as deemed necessary for the proposed traffic flow, and ***shall*** comply with the "Building Code of Australia".

B2.3.9 In addition to the above, corridor widths ***shall*** comply with the requirements of A.S. 1428 series, "Design for Access and Mobility".

Refer to B.6 - Handicapped Access

B2.3.10 Corridor widths as noted above mean clear, unobstructed widths. Such items as handrails, drinking fountains, hand basins, telephone booths, vending machines and portable or mobile equipment of any type ***shall not*** reduce the minimum width or impede traffic flow.

B2.3.11 Consideration ***shall*** be given to the elimination of potentially dangerous 'blind spots'.

B2.4 Ceiling Heights

Minimum ceiling heights ***shall*** be as follows:

B2.4.1 **The minimum ceiling height in occupied areas *shall* be 2400mm,** but consideration should be given to the size (aesthetic consideration) and use of the room. 2700mm is considered a more appropriate ceiling height in work areas, e.g., therapy rooms, conference rooms, intensive care (open plan), kitchens etc. Ceiling heights in ensuites can be reduced to 2250mm where required, to accommodate building services, structure etc.

B2.4.2 **The minimum ceiling height in corridors, passages, recesses, etc. *shall* also be 2400mm.** In portions of remodelled existing facilities, the corridor ceiling height may be reduced to 2250mm, but only over limited areas, e.g., where a mechanical duct passes over a corridor, a reduced ceiling height for no greater corridor length than 3000mm is acceptable. **The extent of any such variation from the above recommendations must be approved in writing by the Commissioner.**

B2.4.3 **In areas where access is restricted, e.g., drinking fountain recess etc., a minimum ceiling height of 2250mm is acceptable.**

B2.4.4 Rooms with ceiling mounted equipment may require increased ceiling heights, e.g., X-ray rooms, operating rooms, etc. Heights should comply with equipment manufacturers' recommendations. The most common ceiling height in such areas is 3000mm.

B2.4.5 Minimum ceiling (sofit) heights of external areas such as entry porticoes, ambulance entries and delivery canopies should suit the requirements of the vehicles expected to use them. Special consideration is to be given to the impact of whip aerials fitted to ambulances etc.

B2.4.6 Ceiling heights in plant rooms are to suit equipment and safe access for service and maintenance. A minimum recommended height is 2400mm.

B2.5 Doors

B2.5.1 **The minimum dimensions of clear door openings to inpatient bedrooms in new areas *shall* be 1200mm wide and 2030mm high, to ensure clearance for the movement of beds.** Existing doors of lesser dimensions may

be considered acceptable where function is not adversely affected and replacement is impractical.

B2.5.2 **In general, clear door openings to rooms which may be accessed by stretchers (including wheeled bed stretchers), wheelchairs or handicapped persons (including employees), shall be a minimum of 900mm. (1000mm recommended for some situations, e.g. hoists, shower trolleys etc.).**

B2.5.3 **Clear door openings in corridors *shall* suit the requirements of traffic and equipment movement but *shall* not be less than 1200mm.**

B2.5.4 While these standards are intended to facilitate access by personnel and mobile equipment, consideration must be given to the size of furniture and special equipment that is to be delivered via these access ways.

B2.5.5 **All doors between corridors and rooms or spaces subject to constant patient or staff occupancy, except elevator doors, *shall* be of the single or double leaf swing type.** Openings to showers, baths, patient toilets, I.C.U. patient compartments, and other such areas, not subject to use as a fire exit, may be exempt from this standard. Note that if sliding doors are used they are more difficult to treat acoustically and when so treated, are very hard to open due to the friction caused by the seals and the additional door weight (solid core).

B2.5.6 **Doors, except those to spaces such as ducts (which are not subject to constant patient or staff occupancy), *shall not* swing into corridors in a manner that might obstruct traffic flow or reduce the required corridor width.**

B2.5.7 **All doors in corridors *shall* swing in the direction of egress.**

B2.5.8 **Glazed panels, installed in accordance with AS 1288 - "Glass in Buildings - Selection and Installation" shall be provided in doors where visual observation for reasons of safety, security or patient observation is required, but in fire doors the size must comply with AS 1905.1 "Components for the Protection of Openings in Fire Resistant Walls - Part 1 - Fire Resistant Door Sets".**

B2.5.9 Beam activated automatic sliding or swing doors are considered highly desirable in high traffic areas such as main entries and delivery points. They may also be used successfully in areas where "hands-off" access is necessary, e.g. entries to operating suites. Where installed, they are to satisfy the requirements of emergency egress and to close at a rate which provides sufficient time for disabled and frail patients and visitors to enter/exit. Automatic doors are not mandatory.

B2.5.10 **Hardware *shall* be provided to suit the requirements of privacy, safety, security and function, e.g. indicator sets to toilet cubicles.**

B2.5.11 Consideration should be given to the particular requirements and special fittings needed for areas in which the disabled (lever action), psychiatric (concealed or flush) and paediatric patients (low level) might be accommodated.

B2.5.12 Rooms identified for paediatric use may require multiple security, i.e. high and low level handles fitted to the same door.

B2.5.13 Special digital, magnetic card or key type locking systems should also be considered for use in psychiatric facilities.

B2.5.14 **Rooms which contain baths, showers and/or water closets *shall* be equipped with doors and hardware which will permit emergency access from the outside.** When such rooms have only one opening or are small, the doors ***shall*** be capable of opening outwards or in a manner which will negate the need to push against a patient who may have collapsed within the room.

B2.5.15 All hospital facilities should also have a rational master key system.

B2.5.16 Door closers should be considered for doors that should remain closed; e.g. toilet doors. External doors- doors into operating rooms and the operating suite generally, corridor doors etc. Note that closers on doors to disabled toilets can cause access problems. It is recommended that they not be fitted.

B2.5.17 Door hold-open/closers should also be considered for doors that should remain open, e.g. doors on main traffic routes, delivery doors (manual closing) etc.

B2.5.18 Delayed action hold-open/closers also require consideration; e.g. doors in corridors where regular trolley movement by single operators might cause door damage, doors into kitchens etc.

B2.6 Windows

B2.6.1 **All rooms occupied by patients or staff on a regular basis *shall* have 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 naturally ventilated and lit atriums and courtyards.

B2.6.2 **Each external window and/or external glazed door panel area *shall not* be less than 10% of the floor area of the room concerned. An opening component equal to not less than 5% of the floor area of that same room is considered highly desirable.** These requirements together will ensure natural light and ventilation in the event of an electrical or air handling system failure.

B2.6.3 It also facilitates energy management and conservation as artificial lighting and air conditioning systems may not be necessary at certain times of the day and year. Windows are also generally considered to be an important factor in the psychological well being of some patients. **Opening windows however also create security problems. This *shall* be addressed. Refer to B14 - Security.**

B2.6.4 The inclusion of an openable window component in multi level hospitals with ducted air-conditioning- systems, or in buildings in cyclone prone areas, is not always possible. In these circumstances, fixed windows are acceptable, although access for external window cleaning should be considered. **All openable external building perimeter windows and doors *shall* be lockable.**

B2.6.5 Hopper windows should not be used in multi-storey buildings because they can act as smoke/heat scoops from fires in storeys below.

B2.6.6 Window cleaning cradle/securing points ***shall*** be considered.

B2.6.7 **Doors, sidelights, borrowed lights and windows in which the glazing extends to within or below 450mm above the floor, and are subject to possible breakage, *shall* be glazed with safety glass that will not create dangerous cutting edges when broken. See A.S. 2208-1978 "Safety Glazing Materials for Use in Buildings (Human Impact Considerations)".**

B2.6.8 **Safety glass *shall* also be used for wall openings in activity areas such as recreation and exercise rooms and for shower screens, internal doors and full height windows, including those in Paediatric and Psychiatric areas.**

B2.7 Screens and Grilles

Generally, openable external windows, vents and doors *shall* be fitted with flyscreens. Doorways that are used on a regular basis (e.g. service or main entries) need not be flyscreened but *shall* be fitted with a self-closing device. Other exceptions to the above are windows, in multi-storey or fully air-conditioned buildings, that are used for service access (cleaning, maintenance), or pivot/swing/tilt for cleaning purposes, etc.

External doors that open directly into food preparation areas and are used for service deliveries or regular access *shall* be fitted with air curtains, flexible doors or an equal control system to restrict the ingress of insects. Flyscreen doors, (which can be propped open), and electronic insect traps within the kitchen, are not suitable as the only means of insect control. See section G7.2.13, Insect Control (Catering).

Security grilles, an appropriate impact resistant glass or electronic security system should be installed wherever high security areas have external windows, e.g. Pharmacy Stores and Workrooms, Medical Records Stores etc. Refer to B.14 -Security.

Security flyscreened doors, where installed, ***shall not*** compromise emergency egress.

B 2.8 Ramps

Where ramps are required for patient access, minimum gradients are to comply with the requirements of the Building Code of Australia.

Ramps in other areas, e.g., service roadways, ***shall*** comply with good design practice and be suitable for the task. Australian Standards, wherever applicable, ***shall*** be used.

Ramp gradients for ambulance - Refer to G9.5.

B2.9 Floor Joints

Threshold and expansion joint covers *shall* be made flush with the floor surface to facilitate the use of wheelchairs and trolleys and to be easily cleaned (infection control). Expansion and seismic joints in multi storey facilities *shall* be constructed to resist the passage of fire and smoke.

B2.10 Grip Rails- Design Detail

Grip rails, as referred to in the following sections, *shall* be detailed as described in AS 1428.1, "Design for Access and Mobility."

Grip rail fixing and support - Refer to B2.12.

B2.11 Plumbing Fittings Generally

Location and arrangement of fittings for handwashing *shall* 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. Heights are to suit the particular function e.g. paediatric, disabled, standard.

B2.12 Fixture Support

Grip rails, handrails, vertical adjustable shower supports, towel rails, soap holders, foot rests and any other fixture which may be used for support, *shall* have sufficient anchorage and strength to resist the sustained concentrated load of a falling heavy human.

Handwashing facilities *shall* be securely anchored to withstand an applied vertical load of not less than 115kg on the front of the fixture.

B2.13 Mirrors

Mirrors *shall* not be installed at handwashing fixtures in food preparation areas, nurseries, clean and sterile supply areas, scrub sinks or other areas where asepsis control would be lessened by hair combing.

B2.14 Soap Dispensing

Provision for "hands off" liquid soap dispensing should be included at all handwash facilities. All standard basins should be fitted with "handcleanser" liquid soap and all scrub-up basins (clinical handwashing) with "disinfectant" liquid soap.

B2.15 Hand Drying

Provision for hand drying *shall* be included at all handwash facilities, except operating suite scrub-up troughs. Hand drying facilities ***shall*** be single use, separate and individual linen/paper units enclosed in such a way as to provide protection against dust or soil and ensure single unit dispensing. Hot air dryers are permitted provided that installation precludes possible contamination by re-circulation of air, and location takes into account the acoustic isolation requirement given that they are noisy.

B3 FINISHES

Finishes in new and remodelled areas *shall* comply with the following:

B3.1 Walls Generally

Other than special treatments included as feature face work in public or staff relaxation areas, wall finishes *shall* be scrubbable, and in the immediate vicinity of plumbing fixtures, *shall* be smooth and water-resistant.

B3.2 Ceilings Generally

All exposed ceilings and ceiling structures in areas occupied by patients or staff, and in food preparation or food storage areas, *shall* be finished so as to be readily cleanable with equipment routinely used in daily housekeeping activities. In food preparation and other areas where dust fallout would present a potential problem, there *shall* be a finished ceiling that covers all conduits, piping, duct work and open construction systems. Ceilings in operating and delivery rooms, isolation rooms, nurseries, and sterile processing rooms *shall* be monolithic from wall to wall without fissures, open joints, or crevices that may retain or permit passage of dirt particles. Light fittings *shall* also be recessed and flush fitting and sealed to prevent dust ingress. Acoustic and/or lay-in ceilings *shall not* be used where particulate matter may interfere with asepsis control.

Ceiling construction in psychiatric patient and seclusion rooms *shall* minimise potential for injury.

B3.3 Suggested Wall and Ceiling Paint Finishes

A wall and ceiling paint finishes schedule is available as a guide, upon request from the Health Department of WA.

B3.4 Floors Generally

Floor materials *shall* be easily cleanable and have wear resistance appropriate for the location involved.

Floors in areas used for food preparation or food assembly *shall* be water resistant and greaseproof to comply with the Food Hygiene Regulations. Floor surfaces, including joints in tiles in such areas, *shall* be resistant to food acids (epoxy grout). In all areas subject to frequent wet cleaning methods, floor materials *shall not* be physically affected by germicidal cleaning solutions.

Floors subject to traffic whilst wet (such as showers and bath rooms, kitchens and similar work areas) *shall* be capable of maintaining a non-slip surface in accordance with Section 332 of the Occupational Health Safety and Welfare Regulations 1988.

Floors in areas and rooms in which flammable anaesthetic agents are stored or administered to patients *shall* comply with AS 1169-1982.

Conductive flooring may be omitted in anaesthetising areas where a written resolution is signed by the Hospital board or administration stating that flammable anaesthetic agents will not be used and appropriate notices are permanently and conspicuously affixed to the wall in such areas and rooms. Otherwise, appropriate conductive flooring ***shall*** be provided.

Wall bases in kitchens, operating and delivery rooms, clean and dirty utility rooms, C.S.S.D. areas and other areas subject to frequent wet cleaning methods *shall* be made integral with the floor, tightly sealed against the wall, and constructed without voids, i.e. covered skirting.

Finish, trim, floor and wall construction in dietary and food preparation areas *shall* be free of spaces that can harbour rodents and insects. Details to comply with the relevant Public Health regulations in force.

B3.5 Floor Finishes - Responsibility

The selection of floor finishes is very important. It has direct impact on safety (patients, staff and visitors) and has potential legal implications if not correctly addressed (e.g. Workers Compensation, Tort Law etc.). Fire safety compliance is also a special consideration. A "duty of care" exists where professionals are involved in the selection of products (e.g. architects, interior designers) and responsibility must be addressed when purchasing replacement products (e.g. purchasing officers, retailers/agents etc.). Floor finishes also have a direct impact on the whole of life costs of any building where cleaning and maintenance is concerned. This is especially true in a hospital. Low capital cost may result in high whole of life costs.

B3.6 Penetrations

Floor and wall penetrations by pipes, ducts and conduits *shall* be tightly sealed to minimise entry by rodents and insects. Joints of structural elements *shall* be similarly sealed.

B3.7 Soft Furnishings

Use of materials for items such as mattresses and upholstery, as well as certain plastics in quantities known to produce large amounts of toxic gases, *shall* be avoided as far as practical.

Cubicle screens, bed screens and curtains/window treatments *shall be* non-combustible or rendered flame retardant and *shall* comply with the Building code of Australia, Section C1.10.

B4 ENERGY CONSERVATION AND MANAGEMENT

B4.1 General

The cost of energy is a significant component in the operational costs of a hospital. These ongoing costs can be minimised by intelligent design and the adoption of effective operating and maintenance practices.

The following areas should be considered:

- Climatic Design
- Natural Ventilation
- Services Selection
- Energy Management

B4.2 Climatic Design

In order to minimise energy use and provide improved thermal comfort conditions, the building should be designed to reflect the climate of the site. The passive design issues which should be considered during the design process to ensure an optimum thermal design include:

- site layout and orientation
- planning
- sun control
- air movement and wind shelter
- thermal capacity of construction

B4.2.1 **Site Layout and Orientation**

Siting and orientation are important parts of every project's design as they affect the potential to capture or avoid natural energy. In general, building on an East/West axis provides a more energy efficient plan.

B4.2.2 **Planning**

The planning of rooms should also consider the influence of climate. Patient and habitable rooms should be located on North and South facades with service areas located on the East and West.

B4.2.3 **Sun Control**

Sun control is generally required on all windows facing North, East and West. In the Northern latitudes sun control is also required on the south. Sun screening devices should be designed to ensure that direct sun does not occur on the working plane.

B4.2.4 **Air Movement and Wind Shelter**

The direction and velocity of wind and air movement significantly affect the achieved thermal comfort and the overall energy use of a building. Consideration should be given in the design process to providing protection for cold winter and hot summer winds and utilising the cool prevailing breezes in summer.

B4.2.5 **Thermal Capacity of Construction**

Energy demands are affected by the building envelope or exterior enclosure including configuration, fenestrations, wall materials, colours, insulation, sealing, area of exposure of roof and walls, overhangs and mass. These issues should be considered in the process of selecting materials for the building envelope.

B4.2.6 **Condensation**

Condensation problems often occur in the north of Western Australia. Where the site location has a climate with a risk of condensation on building surfaces or ductwork, the design must prevent internal condensation. Building condensation has the potential to cause ongoing maintenance problems and damage. Condensation problems can be expected where the dew point in a month exceeds the minimum temperature, the internal temperature or the supply air (cold) duct temperature. The location of cold ductwork within the conditioned space is one method of reducing the risk.

B4.3 Natural Ventilation

In most areas throughout Western Australia the climate is such that buildings can be naturally ventilated for a substantial portion of the year. Consideration should be given to incorporating natural ventilation design to take advantage of possible energy savings.

Refer to section E1.2 for detailed ventilation requirements.

Notes: In the air conditioning of patient areas, consideration should be given to providing individual room control e.g. unitary systems. This system allows for greater use of natural ventilation resulting in significant energy savings.

This consideration is of course invalid in areas requiring guaranteed asepsis control etc.

In workshops and similar spaces a positive natural ventilation system based on stack ventilation is suggested.

In naturally ventilated buildings the thermal comfort limits can be extended by providing air movement. Ceiling fans are particularly suitable. Ceiling fans used to augment conditioned air should also be considered in the northern latitudes. Higher supply temperatures are possible, resulting in energy conservation and lower running costs.

B4.4 Services Selection

Design selection of heating, cooling and assisted ventilation systems, along with equipment and control types, can minimise energy use. This also applies to the lighting design, light fitting (luminaire) selection, method of heating water and steam generation, and the selection and energy source for any other major items of equipment in the facility. Refer also to the index of standard AS 3000 - Electrical Installation.

In other words, all aspects of Mechanical, Electrical and Plumbing services should be investigated thoroughly by the design consultant to minimise the on-going costs of energy consumption.

Refer to Section E for specific requirements for Engineering Services.

B4.5 Energy Management

It is recommended that all new projects should comply with the requirements of the WA Building Management Authority's Energy Manual: "Energy Management in the design of New Buildings".

The main points are: -

B4.5.1 Roof Ceiling Zone

The thermal transmittance of the roof ceiling zone should not exceed the 'U' value set out in Figure 10.5 (in the above manual).

B4.5.2 Exterior Walls

(a) The average Thermal Transmittance of the gross wall areas should not exceed the 'U' value set in Figure 10.4 (in the above manual).

(b) The building should have an Overall Thermal Transfer Value (OTTV) not exceeding the value set in Figure 10.7 (in the above manual).

Notes: Because of the mass of traditional cavity brick construction, its performance when used in association with normal glazing is deemed to comply with the requirement of item (a) above.

B5 ENVIRONMENTAL DESIGN

See also C.10 - Environmental Impact.

B5.1 General

The elements covered in an environmental design statement are:

- climatic design
- natural ventilation
- energy management
- acoustics daylighting
- mechanical

The first three are covered by Section B4, Energy Conservation and Management, considered important enough to highlight and treat independently.

This section will deal with the last three elements.

B5.2 Acoustics

The acoustic requirements are considered under the following major headings:

- planning
- neighbourhood annoyance
- background noise
- hydraulic noise
- acoustic isolation
- speech privacy
- reverberation
- hearing conservation
- room acoustics

Acoustic issues need to be addressed throughout the design process to ensure best value is achieved.

Refer also to B2.5 - Doors and E5 - Hydraulics.

B5.2.1 **Planning**

Planning is the key to achieving a good working environment within a building. Existing buildings generally have varying background noise levels. There is also a diverse range of technical requirements for the required spaces in new accommodation. By using knowledge of existing conditions and the requirements of each space it is usually possible to plan the new accommodation to avoid

expensive technical solutions in the achievement of acceptable acoustic conditions.

The acceptable acoustic conditions are detailed in this brief and are based on Legislative Requirements, Australian Standards, knowledge of previous building performance and functional requirements.

The Applicable standards fall into the following categories:

1. Legislative Requirements which would include the Local Government Act, Worksafe Western Australia and Environmental Protection Authority.

2. Australian Standards and Building Code of Australia.

3. Where issues are not covered by the above, the standards are determined by 'good practice' as achieved and identified in previous buildings.

B5.2.2 Neighbourhood Annoyance

The requirements of the Noise Abatement (Neighbourhood Annoyance) Regulations, 1979 *shall* be met in full.

Notes: These regulations set the maximum permissible sound level at the boundary of the site for various times of the day. The major design issues to be considered include:

- noise break-out from mechanical equipment and plant rooms;

- noise from external plant and equipment, including steam generators, cooling towers, chiller/condensers, wall mounted air conditioning units and compressors;
- noise from emergency generators in terms of both the engine and exhaust;
- location of service driveways - e.g. for ambulance and deliveries, in particular those used at night; and
- location and type of refuse storage.

B5.2.3 Background Noise

The background noise *level shall not* exceed the levels set in Australian Standard *AS 2107-1987* " Acoustics-

Recommended Design Sound levels and Reverberation Times for Building Interiors".

In existing buildings it may be possible to measure background noise levels prior to upgrading. To assist in appropriate planning, existing buildings should be acoustically surveyed where possible.

Notes: The "design sound levels" recommended in the Standard relate to the background noise level in a room as a result of noise from building services such as ventilation and air-conditioning systems, lifts, plumbing and lighting. It includes intrusive noise from normal activities in adjacent spaces and external noise sources such as mechanical plant, traffic and aircraft noise.

B5.2.4 Hydraulic Noise

Plumbing noise can be intrusive at low sound level because of its informational content and ease of propagation via structure-borne paths. For an acceptable acoustic environment it is essential that all plumbing noise sources are considered, both for the adjacent spaces and other floors.

Planning is the key to effective control of plumbing noise. By locating ensuites over/under existing ensuites or other non-occupancy spaces the effect of hydraulic noise is reduced.

Adequate acoustic design is to be carried out to ensure appropriate measures are provided to prevent unwanted noise intrusion.

B5.2.5 Acoustic Isolation

The acoustic isolation provided between various spaces *shall* be designed to ensure that the noise level in neighbouring spaces does not exceed the 'design sound levels' recommended in the Australian Standard AS 2107-1987.

In addition to the above requirement, certain rooms require specific acoustic isolation.

Dependent on the speech privacy requirements, the rooms *shall* be provided with walls/ceilings which

achieve the following minimum acoustic performance:

-

- **High**
  Walls: STC (Sound Transmission Class) 49
  Ceilings: Room to Room
  CAC (Ceiling Attenuation Class) 45
- **Medium**
  Walls: STC (Sound Transmission Class) 45
  Ceilings: Room to Room
  CAC (Ceiling Attenuation Class) 41

Careful detailing of walls, windows, doors, floors, ceilings and mechanical systems *shall* ensure that the performance of the construction is not downgraded due to flanking transmission.

Notes: The noise sources to be considered in terms of acoustic isolation include:

- internal noise sources from plant and equipment (as in plant rooms, lifts, workshops, laundry, kitchens, emergency generator, etc.) and activity noise (as in utility areas, day rooms, children's ward, etc.);

- external noise sources such as traffic, aircraft, industrial and externally located plant and service bays; and

- internal noise transmission to external spaces such as workshops and plant room noise to walkways and courtyards where the noise level should not exceed 50 dB(A).

B5.2.6 **Speech Privacy**

The requirements for speech privacy are to be considered and *shall* achieve the following performance as determined by the Australian Standard AS 2822-1985 "Acoustics - Methods of Assessing and Predicting Speech Privacy and Speech Intelligibility":

Confidential Speech Privacy- Articulation Index (A.I.) not exceeding 0.05 for the specified voice level.

Normal Speech Privacy - Articulation Index (A.I.) not exceeding 0.10 for the specified voice level.

Notes: Confidential privacy is provided where speech communication must be private. Normal privacy provides adequate acoustic isolation to ensure freedom from disturbing and intruding speech.

The Articulation Index takes into account the three factors affecting speech privacy in a room. These are:

- speech level;
- acoustic isolation between the source and the
- receiver; and
- background noise level at the receiver position.

In determining the acoustic isolation requirements, a realistic estimate of speech level should be used. In a Birth Suite *Normal* privacy at a *Shouting* voice level may be appropriate, whereas in the Director of Nursing Office *Confidential* privacy at a *Raised* voice level may be required.

When designing to achieve a specified level of speech privacy, all relevant sound transmission paths must be considered.

Background noise levels used for the calculation of speech privacy should be based on the 'satisfactory' levels specified in Australian Standard 2107 - 1987. Where background noise levels in existing buildings are available, these noise levels may be used.

In spaces where Speech Privacy is critical speech privacy should be assessed in octave bands in accordance with ANSI S3.5 - 1969, American National Standard, Methods for the Calculation of the Articulation Index.

B5.2.7 Reverberation

The control of reverberation in spaces is normally carried out either for noise reduction within a room or to create a specific acoustic environment. Reverberation Time (RT) within specified rooms ***shall*** not exceed those recommended in Australian Standard AS 2107 - 1987 "Acoustics - Recommended Design Sound Levels and Reverberation Times for Building Interiors".

Notes: As a guide to achieving the required reverberation times the ceiling should achieve the following acoustic performance in the listed typical areas.

- **Noise Reduction Coefficient (NRC) of 0.65 in:**
  circulation areas, entry foyers, waiting areas, day rooms and dining rooms

- **Noise Reduction Coefficient (NRC) of 0.85 in:**
  plant rooms and audiological test rooms

B5.2.8 **Hearing Conservation**

The requirements of the Occupational Health, Safety and Welfare Regulations 1988 *shall* be met in full. Regulation 302 - 314 inclusive, address Hearing Conservation aspects of work environment.

Notes: To comply with the intent of the regulations, the major design issues to be considered include:

- Workplaces should be designed to minimise noise exposure to occupants. Noisy machines and activities should be remote or isolated from other work areas.

- Noisy equipment should be acoustically enclosed where practicable.

- Noisy work areas such as workshops should have acoustically absorbent ceilings to reduce noise exposure of other staff working nearby.

- Noise levels of equipment should be an integral part of equipment selection/purchasing procedures. (Refer Section 23 of the OHS&W Act).

- Consideration should be given to the impact of ultrasonic noise generation. (Refer to AS 2243 - Part 5).

B5.2.9 Room Acoustics

Some spaces require specialist acoustic treatment in terms of Room Acoustic design. These rooms include:

- Speech Pathology areas (See note below)
- Audiological Test Booths (See note below)
- Chapels
- Conference/Seminar rooms
- Lecture Theatres

The acoustic design issues that *shall* be separately considered include speech intelligibility, acoustic isolation, reverberation, sound reflection patterns and background noise.

Note: A speech pathology service design guideline titled "Speech and Audiology Department -Acoustic Requirements" is available from the Facilities and Assets Branch, Health Department of WA.

B5.3 Daylighting

Refer also to B4.2.3 - Sun Control

The extent of daylight design can be determined by considering:

(a) the subjective preference of people for daylight and views to the outside, and
(b) the energy savings achievable by utilising daylight.

The four major design issues to be considered in a daylight design are:

- level of illumination
- spatial distribution of llumination
- discomfort glare
- radiant heat

B5.3.1 Level of Illumination

The level of illumination *shall* comply with the levels recommended in Australian Standards.

- **AS 1680 Part 1 (1990) Interior Lighting - General Principles and Recommendations**

- **AS 1680 Part 2 (1990) Interior Lighting Recommendations for Specific Tasks and Interiors**

B5.3.2 **Spatial Distribution of Illumination**

An even spatial distribution of light is difficult to achieve, particularly with a unilateral daylight design. Where skylight systems are used they should be designed to ensure that diversity of illumination does not exceed a ratio of 2:1.

B5.3.3 **Discomfort Glare**

The level of discomfort glare from any source *shall* be limited to the glare indices established in the I.E.S. Code "Interior Lighting".

Consideration should be given to incorporating an energy conservation lighting system in the building.
For glare control avoid direct sun penetration onto the working plane and glazed external doors and windows at the end of corridors.

Consider the specific visual environment requirements for Visual Display Units in offices and nurses stations.

Note: The areas most suited to daylighting include patient areas, foyer/waiting areas, corridors and workshops.

B5.3.4 **Radiant Heat**

Associated with daylighting systems utilising direct sun is the incidence of solar gain (radiant heat).

Consideration ***shall*** be made to ensure comfort conditions are not exceeded in spaces daylit with direct sun systems-

B5.4 Mechanical

B5.4.1 **Mechanical Acoustics**

The background noise level ***shall not*** exceed the levels set in Australian Standard AS 2107 - 1987 "Acoustics - Recommended Design Sound Levels and Reverberation Times for Building Interiors". This Standard details the allowances required for tonal noise sources.

Fan noise, breakout noise, regenerated noise, radiated noise and any other acoustic/vibration emissions need to be considered.

Supply and return air paths should be checked to ensure that sound isolation between spaces is not compromised. Where necessary appropriate silencers or other suitable methods of sound attention should be provided.

Smoke exhaust systems should meet the acoustic requirements as set out in AS 1668.1 - 1991. These systems should also meet the Neighbourhood Annoyance regulations if periodic testing or operation will be required.

B5.4.2 **Vibration**

Dynamic elements of building services *shall* be vibration isolated from the building to reduce transmitted vibration to below the "just perceptible" level as indicated on the Reiher-Meister scale of human perception of vibration. This will also ensure that background noise levels specified in B5.2.2 are not exceeded.

Note: The "just perceptible" level equates to 110 dB velocity at any discrete frequency in the range 3-60 Hz.

B6 ENVIRONMENTAL DESIGN

B6.1 General

There is increased public awareness of barriers that make reasonable utilisation of facilities difficult or impossible for the physically impaired.

A hospital facility will have a high proportion of occupants (patients and visitors) who are unable to function without some form of assistance. Some staff may also be impaired. To ensure minimum patient dependence on staff, consideration should be given to design provision for optimum patient independence.

Consideration must be given to the wide range of disabilities including:

Mobility impairment
Impaired or loss of sight
Impaired or loss of hearing

B6.2 References

Three information sources are recommended for reference. These are:

(a) Building Code of Australia.

(b) AS 1428 series of Australian Standards.

(c) Disability Services Commission publications.

Where there is a conflict of detail, the Building Code of Australia *shall* take precedence.

B6.3 Specific Considerations

B6.3.1 Access and Use

Refer to B2.3 - Corridor Widths

Refer to the document 'Who Needs Access - Accent on Access A Planning Guide" published by ACROD (WA Division) - Access and Mobility Sub Committee for further guidance.

Refer also to the series of brochures published by the Disability Services Commission for further information.

Problems of access and use by the physically impaired *shall* be minimised. In addition to design for patients, health care facilities must include provisions for access and use by physically impaired staff and visitors.

Emphasis should be given to accessibility and convenience with appropriate consideration of personal dignity and needs. There may be many solutions to the needs of the physically impaired. Innovation and alternatives are encouraged insofar as they meet the intent of the standards.

B6.3.2 Planning

To minimise overall costs and to avoid the need for expensive modification of finished work, initial designs *shall* include specific consideration of the needs of the physically impaired. The majority of requirements can be easily accommodated during the planning stage at little or no additional cost; modifications required at a later time may be prohibitively expensive or impractical.

B6.3.3 **Parking**

Refer to Section C7 of this document as well as the relevant local authority, for the parking requirements of the physically impaired.

B6.3.4 **Lifts**

Refer to Section E4 - Lifts

Lift arrival signals *shall* be both audible and visible, and indicate direction of car travel. Lift control buttons *shall* be accessible to and useable by wheelchair occupants. Audible signals may be muted when they are objectionable, as in patient sleeping areas. Raised or Braille letters or numerals or other means ***shall*** be used to identify each floor for the visually impaired.

B6.3.5 **Unsafe Design**

Special attention *shall* be given to elimination of unsafe design, i.e. shielding sharp projections, moving parts, and heated surfaces.

B6.3.6 **Conveniences for the Physically Impaired**

Refer to Section E5 - Hydraulics.

At least one drinking facility, toilet (unisex) and handwashing facility *shall* be available on each floor for use by physically impaired patients, staff and visitors.

Hot water to hand washing facilities *shall* be temperature controlled.

Refer to Section E3 - Communications.

A public telephone, for use by the physically impaired, *shall* be located in a convenient location within the building, preferably with the other public telephones installed at able persons' height.

Where a single telephone is installed, it *shall* be installed for use by the physically impaired.

Notes: The disabled unisex toilet and handwashing facility can also function as the general visitors' unisex toilet. A disabled toilet is not specifically for the exclusive use of physically impaired persons.

B6.3.7 **Exclusions**

Those sections of the facility from which the physically impaired are specifically excluded, such as boiler rooms, need not meet these requirements. Exclusion of the physically impaired from any area may require justification for approval.

B6.3.8 **Carpeting**

All carpeting in areas subject to use by mobile impaired individuals *shall* be very high density with a low cut or uncut pile that will provide minimal resistance for wheelchair use. Underlay is permissible, provided it is installed firm or hard and does not exceed 1 cm in depth. Carpet and underlay *shall* be stretched taut and securely anchored at all edges to the floor to minimise resistance to wheelchair travel and to avoid tripping hazards. Edging strips *shall* be bevelled and *shall* not project higher than 1 cm above the floor line.

B6.3.9 **Modernisation**

In modernisation of, and additions to existing facilities, only that portion of the facility affected by the project, including adjacent areas used for access, must comply with this section. However, it is hoped that the total facility will be made accessible to the physically impaired where practical.

B7 FIRE SAFETY

Refer to E5.3 - Hydraulics - Fire Service.

Refer to Appendix 2 - Health Facility Fire Design Supplement 1993.

B7.1 Design and Construction

Hospital buildings, services and equipment *shall* be designed and constructed in accordance with the requirements outlined in the Building Code of Australia.
The primary reference classification is Class 9a, Health Care Buildings, although other sections may also be appropriate.

In addition to the above reference, the Health Department of WA publication "Health Facility Fire Design Supplement - 1993", provides specific information unique to Western Australia.

The above documents cover such design elements as:

- compartmentation
- egress
- fire and smoke barriers/doors
- fire resistant construction
- fire detection and alarm systems
- fire suppression systems (automatic and manual)
- electrical protection
- emergency lighting
- brigade access
- building clearances
- other fire safety related design considerations

The specific requirements of the above documents will modify or exceed requirements of other relevant standards, codes and by-laws, but the requirements of the above documents *shall* be met unless a waiver is formally approved, in writing, by the Commissioner.

No provision of the above documents or their referenced standards precludes the construction of a hospital to a higher standard.

The Fire and Security Unit of the Health Department of WA, as the Commissioner's representative, is available for consultation

to clarify specific requirements of the above documents, and *shall* certify the compliance of the final design.

B7.2 Certificate of Fire Safety Compliance

At the completion of the construction phase, the Commissioner's nominated representatives *shall* carry out a site inspection and issue a "certificate of fire safety compliance". The building cannot be occupied until the "certificate of fire safety compliance" has been issued.

B7.3 Maintenance of Fire Safety

Refer also to E2.118 - Maintenance of Installation

It is a requirement of the licence issued by the Commissioner for a private hospital to operate that all of the facilities that go to make up the hospital be adequately maintained. This also includes the fire prevention and protection aspects of the building fabric.

All fire safety prevention and protection facilities ***shall*** be maintained in accordance with the relevant Australian Standards, where such exist. In their absence, manufacturers' recommendations ***shall*** set the standard.

Where fire suppression equipment is discharged, it/they *shall* be immediately serviced. Portable extinguishing equipment ***shall not*** be returned to its mountings in a discharged condition.

Means of egress required in the design of the building *shall not* be modified without the specific written approval of the Commissioner. In addition, egress ***shall not*** be compromised in any way by the placement of either fixed or mobile equipment and/or goods in access ways or exits.

Of particular importance, is the maintenance of the integrity of concealed fire and smoke barriers, i.e. in ducts, above ceilings, etc. Retrofit of services often results in major or minor penetrations through fire or smoke barriers which are not sealed in accordance with the barrier systems' manufacturers' recommendations. **All penetrations for retrofitted services <u>are</u> to be sealed, no matter how minor. The integrity of the barrier <u>must</u> be maintained.**

It is also important to note that no area within a hospital *shall* have a function change without a re-assessment of the modified fire risk and fire safety provisions by the Commissioner. A letter of approval *shall* be issued when the above mentioned requirements have been met.

B7.4 Operational Procedures

All private hospitals *shall* prepare and maintain an adequate "Fire Safety and Evacuation Manual" and initiate and maintain effective evacuation procedures in relation to the manual for staff and patient safety, all to the approval of the Commissioner.

B7.5 Fire Safety Inspections

Regular checks will be carried out by the Commissioner's fire and security representative to ensure compliance with the above.

B8 STATUTORY AUTHORITY APPROVAL

The approval by the Commissioner to create or continue to operate a private hospital, under the *Hospitals and Health Services Act 1927,* does not exempt the owner/builder of the necessity to comply with any statutory requirements established and controlled by other authorities.

Such authorities are:

- Federal Government (various Departments/Authorities/Commissions)
- Water Corporation
- Western Power Corporation
- Alinta Gas
- Environmental Protection Authority
- Worksafe Western Australia
- Department of Mines (explosives, flammable storage)
- Local Government
- Other bodies as authorised by jurisdiction

It is also recommended (not mandatory) that all State and Local Government planning approvals (see Section C1 - Site Planning Compliance), be obtained before submitting documents to the Commissioner for approval.

B9 STANDARDS AND CODES

B9.1 General

Codes, rules, Standards and specifications etc., of statutory organisations, or those specifically referred to in the text of this document, ***shall*** be deemed to be specific requirements of these Guidelines. The Standards of Standards Australia are included.

Exclusions and special conditions applied to said codes, rules, Standards and specifications by the Building Code of Australia, ***shall*** also apply to these Guidelines.

B9.2 Reference to Standards

Where a code or Standard is listed or referred to within these Guidelines and is not dated, the appropriate document ***shall*** be the latest edition of that code or Standard, and ***shall*** incorporate all revisions. Where the code or Standard listed or referred to within these Guidelines is dated, then reference to that dated issue is necessary, as later revisions may not be acceptable or relevant. Where the referenced code or Standard has been replaced by a completely different code or Standard, the Commissioner or his representative ***shall*** be consulted to ascertain its relevance and acceptability.

B9.3 Differences between the Guidelines and Codes and Standards

Where a difference occurs between the detailed references in the Guidelines and the relevant Codes and Standards, then the requirements of the Guidelines shall be construed as being the preferred requirement.

B9.4 Omitted Relevant Australian Standards

Where Standards Australia documents exist which are specifically applicable to the requirements of hospital construction, equipment, service and practice, but are not referred to in these guidelines, they should be adopted as being indicative of "good practice". The above are not mandatory unless directed by the Commissioner of Health.

B10 CONSTRUCTION AND DESIGN FLEXIBILITY

Demographic variables, epidemiological changes, technological change, changes in philosophy on methods of treatment, changes in service due to the economic viability of the need for that service, are all reasons for providing hospital facilities that are robust and imaginative enough to enable modification to support an unknown range of future activities and services. Form following function needs to be tempered with an element of consideration for strategic response to growth and change.

As such, consideration should be given to the way the hospital can change and grow to accommodate all of the above variables.

B11 CONSTRUCTION PHASING

Projects involving alterations and/or additions to existing buildings *shall* be programmed and phased to minimise disruption of retained existing functions.

Access, exits and fire protection *shall* be so maintained that the occupants' safety will not be jeopardised during construction.

B12 MODERNISATION COMPLIANCE

Refer to Section A6 - Modernisation and Extension.

Refer to Section B7 - Fire Safety.

Further to Section A6 - Modernisation and Extension, when it is not financially viable to modernise the entire existing facility in accordance with these guidelines, approval may be given by the Commissioner for renovation of elements only of the facility. The approval would be conditional upon the incorporation of appropriate measures or features that guarantee the safety of patients, access by the physically impaired and effective operation of the facility.

The Commissioner may also make it conditional that the outstanding items are to be resolved at a later date when the finances become available. A time frame might also be imposed.

When partially modernising a facility, those areas that do not comply with these guidelines, (in particular, Section B7 - Fire Safety) must be separated from sections to be modernised by fire barriers of not less than 2 hour fire resistant construction, extending through the full height of the building or compartment. Doors in these barriers *shall* also be 2 hour rated. Remodelling of one or two rooms within an existing area are exempt, but written approval must still be obtained from the Commissioner.

Requests for partial modernisation must be submitted, in writing, to the Commissioner for his consideration.

B13 SIGNPOSTING

Appropriate and comprehensive signposting *shall* be provided for all private hospitals. Signposting *shall* clearly identify staff, patient and visitor areas, and draw attention to restricted areas, etc.

The preferred lettering style is "Helvetica Medium" upper and lower case generally. Upper case only is preferred for the building Main Entry Sign. This is not mandatory.

Internationally recognised symbols (pictograms) in lieu of room titles are acceptable to the Commissioner.

Sizes of letters in relation to reading distances, mounting heights etc. *shall* comply with the relevant standards. Refer to the NSW Health "Hospital Signposting Manual" for assistance.

Further information, including Health Department of W.A. preferred sign vocabulary, is available upon request from the Manager, Private Sector Licensing Unit, Health Department of W.A.

Signposting ***shall*** comply with the following parameters:

B13.1 External directional - non-illuminated.

Colour - white reflective letters on a blue background (steel or aluminium construction preferred).

B13.2 Building Main Entry - feature sign.

Form, location and colour to be determined by designer.

B13.3 External Signs - illuminated.

- 'Emergency Department, (if applicable). Colour - white letters on a red background.
- 'Main Entry' and 'Night Entry' (if applicable). Colour - white letters on a blue background.

B13.4 Internal Signs - non-illuminated directional and area identification.

Ceiling or wall mounted.
Colours - no special requirements.

B13.5 Internal Door/Frame Numbering – maintenance reference, all door/frame combinations.

Colours - no special requirements.

B13.6 Internal and External Room Function Identification Signs - non-illuminated, located on doors.

Consider format to allow easy replacement of sign or sign inset when room function changes.

Patient rooms are to be identified on wall projected corridor signs for easy reference by visitors. Door signs are not required.

B13.7 Egress Signs

In accordance with relevant codes.

B13.8 Fire Services Signs

In accordance with the following:

Fire Extinguishers - AS 2444 - (1990) Portable Fire Extinguishers - Selection and Location"

Fire Hose Reel Cabinets - **Signposting on cabinet doors shall be 50mm high white letters on a contrasting background, to read "Fire Hose Reel", or if equipment is together in a single cabinet, "Fire Equipment"**

A pictogram (or pictograms) in accordance with international standards is also an appropriate alternative.

Hydrants - AS 2419 Part 1 (1988) "Fire Hydrant Installations, Systems Design, Installation and Commissioning", as interpreted by the WA Fire Brigade Board.

B13.9 Road Markings - parking bays, arrows, symbols, instructions etc.

Colour - white generally, blue for disabled, yellow for restricted zones.

B13.10 Miscellaneous Signs - illuminated and non-illuminated.

As required e.g. illuminated 'X-Ray Room in Use' signs. Colours to meet the requirements of the relevant code or regulating authority.

B13.11 Bed Numbering/Doctor Identification/Special Instruction Signs

Normally located at the bedhead, although location and format at the discretion of the client and designer.

B13.12 Street Directional Signs

In accordance with the requirements of the local Council and/or the appropriate section of the Main Roads Department.

Note that Accreditation Standards require that the facility has street directional signs sufficient to enable it to be easily located from the major access road in the area.

B14 SECURITY

Refer to E3.7 - Door Security.

Consideration ***shall*** be given to the additional facility requirements that result in a secure and safe environment for staff, patients and visitors.

The issue of security is raised throughout the guidelines e.g., door hardware, lighting (external) etc. Rather than resolve the issue at micro level only, consideration *shall* be given to the macro solution, i.e. good initial planning and detail design to overcome the principal problems of concealment of, and ease of access by, the undesirable element, and containment of certain categories of patients.

A private hospital, even without an Emergency Department, is a 24 hour operation with visitors and staff entering and leaving at all times, but most likely on an informal and unscheduled basis. At these times, the potential for unauthorised entry into the building exists and, especially at night, attacks on visitors and staff when walking to and from car parks, bus stops, etc. is potentially real.

Day Procedure Units, especially if stand alone buildings, which are limited to daytime operation, ***shall*** also be well secured against unauthorised entry.

Issues that require consideration are:

- areas of the building that are difficult to monitor after dark;
- service entries where traffic might not be controlled;
- external illumination generally, in particular around carparks and entry points;
- landscaping that might shield intruders;
- building features that allow easy ingress of intruders;
- the role of security systems (closed circuit TV etc.); fencing;
- drug storage - location and security;
- night staffing levels and protocol for receiving emergency or night visitors (after hours);
- restricted after hours vehicular access; and
- containment of difficult, disturbed or demented patients.

This list is not intended to cover all issues, but to stimulate the designer to consider security as an important part of the design process.

B15 QUALITY CONTROL .

Consider the following construction and design process issues:

- the drafting and signing of a variety of contracts;
- the installation of complex and technologically advanced electric; electronic, mechanical and hydraulic systems and equipment;
- the need to achieve high levels of construction and finish that result in easy-clean environments;
- to construct within tolerances that allow fitout to occur as documented;
- the construction of multi-storey, sometimes high rise, structures within tolerances that satisfy the installation of vertical transport systems and the fitting of factory made components;
- the need to achieve secure fire rated construction;
- the installation of mechanical systems which control pressure differentials to successfully create isolated or ultra-clean environments;
- controlled and guaranteed exhaust systems which create safe working laboratory environments;
- the installation of controlled liquid waste treatment systems;
- to construct on time and to budget;
- to construct in and around areas of existing hospitals that continue to operate, to a phasing plan; and
- the co-ordination of all of the above into a successful end product that ultimately satisfies the user, as well as the Health Department officers who are responsible for the enforcement of the standards.

It is strongly recommended that to combine all of the above, plus many other facets of hospital design, construction and commissioning, and to achieve the best result for all concerned, a system of quality control be implemented to oversee the total process, from inception to occupation.

Guidance can be obtained from AS 2990 - 1987, "Quality Systems for Engineering and Construction Projects."

Please note that the quality control process is not mandatory, but is an initiative of the construction industry regulatory authorities, amongst others, to introduce a method of self regulation, thereby reducing the need for the bureaucratic process.

Allied to the outcome of quality control, but further away from realisation, is the certification of private regulatory agents who may take over completely the responsibilities (and delays) of the same bureaucratic process. These agents

would be employed as consultants and assist the design/documentation team in addressing the appropriate regulatory requirements.

C. SITE - DEVELOPMENT AND IMPACT
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C. SITE - DEVELOPMENT AND IMPACT

C1 PLANNING

The location and development of the site *shall* be in accordance with the requirements of the Local Authority Town Planning Scheme, or in the absence of a scheme be approved by the Local Council or Authority and be to the satisfaction of the Commissioner.

C2 ACCESSIBILITY

The site *shall* be conveniently accessible to the community.

That same convenience of access ***shall*** be afforded service and emergency vehicles, including fire protection apparatus, keeping in mind the size and configuration of some of these vehicles.

C3 AREA

The area of the site *shall* be determined by:

- the nature and overall size of the facility;
- the requirements of the Local Town Council or Authority for the facility to comply with all of their codes in force at the time of design and construction.
- existing features etc. that might limit total site development consideration e.g. rocks, wetlands, heritage buildings etc.; and
- the building site coverage (section C4 following).

C4 SITE COVERAGE

The gross floor area of the facility at ground level ideally should not exceed 2/5 of the total area of the site, subject to the provision of adequate parking. However, inner city developments where land is at a premium, may require special consideration and variation from the $^{2}/_{5}$ rule will be at the discretion of the Commissioner.

The gross floor area includes all roofed buildings and walled compounds but excludes verandahs, entry porticoes, etc.

C5 SETBACKS

All private hospital buildings *shall* generally have clear minimum setbacks of 4500mm measured horizontally between any part of the building and the front, side and rear boundaries of the site, but must also comply with the requirements of the Town Planning Scheme. Exceptions to this requirement include small service outbuildings and setbacks where the nature of the site and adjacent structures require special consideration. Each case will be dealt with on merit. An approval for concession must be obtained in writing from the Commissioner and the Local Authority. Note that additional special features such as fire protection systems may be requested.

C6 ROADS AND PATHWAYS.

Refer also to G9.5 - Ambulance Facilities

Paved roads *shall* be provided within the boundaries of the site for access to all entrances; parking areas; service, delivery and maintenance points; emergency receival points (if applicable).

Access for fire fighting equipment and personnel is also to be guaranteed to all perimeter doorway entries of the building, all as determined by the WA Fire Brigades Board.

Hospitals having an organised Emergency service *shall* have the access route well marked to facilitate entry from the public roads or streets serving the site. Access to the Emergency entrance *shall not* conflict with other vehicular or pedestrian traffic, and *shall* be located so that it will be subject to minimal impact from flooding and other natural disasters.

Paved pathways *shall* be provided for external to building pedestrian traffic within the site. Allow for movement from bus stops to all accessible on-site locations. Council (where applicable) crossovers should be an important consideration when laying out site roadways as their impact on public roadways will affect the neighbourhood by impacting local traffic patterns and road design.

Note that roadways are only suitable for pedestrian traffic where they are crossed whilst moving from one pathway to another. This requires special consideration in car parks.

C7 PARKING

Refer to G9.5- Ambulance Facilities.

Refer to G.12 - Day Procedure Units - Parking/Ambulance pick up.

On site parking *shall* be provided. When calculating the number and location of on-site parking bays, the following points should be considered:

- facility type (maternity, surgical, etc.)
- facility location (city, suburban, country)
- available off-site parking
- public transportation
- local Council regulations
- staff
  - own transport
  - maximum number on duty
  - alternative modes of transport (walking, cycle)
  - car pooling
- visitors
  - own transport
  - open visiting hours
  - peak times (5-8 pm)
  - alternative modes of transport (walking, cycle)
- patients
  - day patients (outpatients)
  - inpatients (nature of patient e.g. maternity type often attract more visitors)

- deliveries and service - short term parking
- emergencies - short term parking (if applicable)
- ambulances - short and long term parking
- doctors and visiting specialists/consultants bays
- disabled - close to building entry, minimal roads to traverse, compliance with regulations and codes in force
- allocation of space for bicycles and motorcycles one common covered "set-down" area for patients, visitors and staff. - short term parking
- future expansion

A formal parking study is desirable, but in the absence of such a study, the following "rule of thumb" guideline can apply. Provide:

- **One parking space for each maternity bed plus one space per two beds for each other category of patient.**

- **Four Parking spaces for each Procedure Room in the Day Procedure Unit.**

- **One space for each employee normally present on the largest weekday shift.** This ratio may be reduced in an area convenient to public transport or public parking facilities, or where carpool or other arrangements to reduce traffic can be developed.

- **Consideration must be given to the number of staff with cars**

when providing sufficient "overflow" parking bays for staff shift changeovers. There is the potential for twice the number of staff-owned cars to be on site at this time.

- **Spaces dedicated** for use by **doctors** and **visiting specialists/consultants only,** the number determined by the maximum on site at one time.

- **A minimum of two spaces for disabled drivers for the first 30 beds plus 1 per 30 beds thereafter.** To be located close to an accessible building entry point (not service), preferably the main entrance. The actual total of disabled bays set aside, and their location, will vary considerably between facilities, and must be reviewed in realistic detail to ascertain the final number.

- **An area for bicycle and motorcycle parking** (variable, say 2 and 1 respectively for every 30 beds).

- **A covered "set-down" area for disabled passengers, patients and staff in front of an accessible building entry point** (not service), preferably the main entry.

- **Short term parking for Emergency, Delivery and Service vehicles,** actual provision dependent upon size of service.

- **Where outpatient and emergency services are proposed, parking spaces *shall* be provided to suit the expected throughput.** Availability of public transport can be factored in. Overflow impact on other types of hospital parking ***shall*** be avoided.

- **Expansion potential** (if applicable).

Number, sizes, layout and setback of bays *shall* comply with Local Council regulations or by-laws. Where the facility is located in a country area, consider larger bays to cope with the prevalence of four-wheel drive vehicles fitted with roo-bars and bull-bars.

Separation of parking areas into dedicated staff, visitors, doctors, outpatients, short term/emergency, delivery etc. zones ***shall*** be considered.

Construction of roadways ***shall*** also be considered in areas such as Delivery/Setdown where heavy vehicles are used and where heavy equipment is lowered from vehicles (surface damage).

C8 SITE GRADING AND SAFETY

The balance of a Hospital site not covered by buildings should be graded to

facilitate safe movement of the public and staff.
Where this is not possible, access should be restricted.

C9 LANDSCAPING

A suitable landscaping scheme *shall* be provided to ensure that the outdoor spaces become pleasant areas for patients to view from their beds and in which patients, visitors and staff may relax. The scheme should also ensure that the buildings blend into the surrounding environment, built or natural.

Water conservation should be a consideration when designing layouts and selecting plants. Bore water (if available) for reticulation is recommended. Mains water use for reticulation is restricted. The Water Corporation should be consulted for current regulations.

Local Council verges (where applicable) should be considered an extension of the Hospital site and are to be landscaped and maintained accordingly.

Site storm water drainage and bore water treatment spill ***shall*** also be considered when developing landscaping concepts.

C10 ENVIRONMENTAL IMPACT

Local Council regulations covering type and extent of landscaping (if they exist) *shall* be taken into consideration.

The aesthetics and form of a hospital facility *shall* be sympathetic with its immediate environment, either built or natural e.g. domestic scale and treatments where built in a residential area. The "streetscape" is to be enhanced.

Consideration should also be given to the siting of a hospital facility to ensure that it is accepted as an asset by the majority of the community, and not thought of as an imposition and inconvenience on the neighbourhood.

C11 PUBLIC TRANSPORTATION

A hospital facility *shall* be located to ensure reasonable access by patients, staff and visitors to public transportation, where it is available. When not available, representations should be made to the appropriate transport authority early in the planning stages for the provision of public transport.

C12 PUBLIC UTILITIES

The requirements and regulations of authorities regulating water, **electricity, gas, telephones, sewerage and any other responsible Statutory or Local Authority must be complied with in establishing a hospital facility on any site.**

Impact on existing local service networks will be substantial.

C13 STRUCTURAL CONSIDERATIONS

If the site is low lying or on the side of a hill, or partly consists of rock, then structural engineering advice should be sought at an early stage to minimise future drainage or settlement problems.

D. FURNITURE AND EQUIPMENT
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D. FURNITURE AND EQUIPMENT

D1 GENERAL

Refer to A3 - Statement of Function

Furniture and equipment, both fixed and mobile, *shall* be provided in sufficient quantity and quality to satisfy the requirements of the Statement of Function and to meet minimum Occupational Health, Safety and Welfare Regulations. All furniture and equipment is to be maintained in a clean, safe and serviceable condition.

D2 LEVEL OF PROVISION

It would not be considered feasible for these guidelines to specify all possible furniture and equipment requirements. However, the provision of an appropriate volume and quality of items is deemed to be of great importance and *shall* be given serious consideration. Completed schedules must demonstrate not only that essential items will be provided but also that they will be available at a level consistent with good patient care, as determined by the Commissioner or his representative.

D3 LAYOUTS AND SPATIAL REQUIREMENTS

The design of the facility *shall* take into account the spatial requirements of furniture and equipment, e.g. trolley bed impact on the design of corridors, doorways and room proportions; service area for sterilisers, etc.

Drawings submitted to the Commissioner for approval are to show the locations and spatial requirements of said furniture and equipment, to enable an accurate assessment of the modus operandii of the facility or facility component. The furniture and equipment is to be drawn to the manufacturers' dimensions, taking into account all overhangs and projections.

Where final selection has not been made on an item of furniture or equipment, the dimensions of the largest option is to be used. Special service connections (e.g. mechanical, electrical, plumbing) should be considered when placing the equipment.

D4 ELECTRO-MEDICAL EQUIPMENT SAFETY

Refer to E2 - Electrical Service

All electro-medical equipment *shall* conform to the requirements of AS 3200 - 1986. "Approval and test specification - Electro-medical equipment - General requirements", and any other appropriate Australian Standard; e.g. AS 3205-1985 "Approval and test specification - Dental and mobile diagnostic x-ray equipment", etc.

Particular attention *shall* also be given to the electrical safety of plugs and sockets for the electrical supply to free-standing equipment.

E. FACILITY ENGINEERING SERVICES

E1 MECHANICAL SERVICES

Mechanical services shall be designed and installed to provide throughout the life of the facilities:

- *The mechanical services required for the health care outcomes offered to the patients using the facilities;*
- *compliance with the technical standards required by statutory regulations and these Guidelines;*
- *compliance with the proprietors' duty of care directions on risk containment covering both normal and emergency operating conditions.*

Persons and organisations employed to plan, design, provide, install and commission the services shall be qualified and have a history of competence with the type of services provided.

Throughout the life of the facility there shall be written records available and providing all the information and instructions needed, by technically competent persons, to understand the basis of design and the intended safe operation of the services provided.

Services should provide the lowest practicable life cycle cost consistent with the risk management criteria set by statute and proprietors directions.

E1.1 General

The certification of the Mechanical Services installation shall be undertaken by a professional Engineer with Corporate Membership of the Institution of Engineers, Australia, relevant NPER - 3 Registration, and experience in hospital design. The professional Engineer shall certify all test data and that the design complies with all statutory requirements and these Guidelines.

The Consulting Engineer shall certify that the installation complies with the documentation and the mandatory requirements established or implied with the "Approval to Construct".

The Consulting Engineer shall ensure that facilities provided and their associated operation and maintenance can be conducted in a safe manner.

Special consideration should be given to the following items in mechanical services design:

- reliability of operation, eg required availability, need for dividing capacity into modules, need for stand by plant or capacity;

- balancing complexity with skills available for maintenance;

- balancing capital, operating and maintenance costs to give best practicable life cycle cost;

- effective system management;

- select equipment with noise and vibration characteristics that satisfy the requirements of Section B5;

- select equipment with stable operating points and below their maximum limits for capacity, speed, temperature and pressure all within bounds of the energy management policy detailed below: and

- safe operation, access and egress.

Cost effective energy conservation measures should be incorporated in the services, eg:

(a) cost effective design for lowest life cycle cost based on the planned life of the asset;

(b) economy cycles to be employed to reduce energy consumption when outdoor ambient permits; (Typically to plant 30kWR and above)

(c) ward air conditioning to be shut off when not occupied (either unitary fan coil units or VAV boxes);

(d) ensuite exhausts to be continuous in operation, filtered outside air to wards to be tempered and ducted into the room or supplied to the corridor only if it will thoroughly mix with room conditioned air before being exhausted through the ensuite;

(e) enclosures with similar air quality requirements and common hours of operation to be grouped on common systems where possible;

(f) cut off heating and cooling controls to areas requiring sepsis control out of normal operating hours (fans to continue running to maintain positive air flow from clean to dirty); and

(g) standby turn down modes of operation for Operating Rooms to conserve energy when the rooms are not in use. Consider systems that maintain pressure gradient at lower flow rates, however, have greater temperature throttling ranges.

E1.2 Heating/Cooling/Ventilation Generally

Heating, cooling and ventilation shall be provided as required under this section to ensure reasonable comfort in all patient service areas and appropriately manage the risks identified in Section E1.3 and E1.4. Heating, Cooling and Ventilation shall generally be to the requirements of HDWA Specification Note SN.SO1 attached as Appendix E1

The winter set point should generally be 20 degrees Celsius (°C)± 1 degrees Kelvin (°K). The summer set point should generally be 24°C ± 1°K. These may be adjusted to suit local preferences or medical needs. For instance, elderly patients and babies may require higher temperatures and controlled relative humidity conditions. Operating Rooms areas usually require lower temperatures and set point adjustment.

E1.2.1 Heating

Where internal temperatures fall below 19°C patient areas shall be provided with heating systems.

An adequate and safe heating system shall be provided for all other areas including bath and shower areas, in geographical locations where the average minimum temperature in any month falls below 10°C. Heating is recommended where inside temperatures will not remain within accepted comfort levels at all times.

Heating shall be provided in all cases where the average minimum temperature in any month falls below 10°C.

Gas heaters, if used, shall be installed where the equipment is visible, readily accessible and easily maintainable. Where gas heaters are not installed in such locations they shall be enclosed in a structure that shall not hinder maintenance and inspection but which shall provide a minimum fire resistance level of 60/60/60. The enclosure shall be protected by a smoke alarm connected to the FIB.

E1.2.2 Cooling

Patient areas shall be air-conditioned where the internal temperature can exceed 27°C.

Air conditioning, or evaporative cooling where suitable for the area, shall be installed for all facilities in locations where the process (ie laundry or kitchen) would produce room conditions in this range.

Where evaporative cooling is used the systems shall be readily and safely accessible for cleaning and arranged to have dry sumps when switched off to minimise Legionella risk. The sanitation procedure for bacterial control in accordance with AS3666 shall be detailed in the Maintenance Manual provided to the client.

Air conditioning is recommended for all occupied areas.

Economy cycles are recommended.

Where ceiling sweep fans are used they shall be in accordance with Section E2.16.

Provided the requirements of E1.2.3 and E.1.2.5 are satisfied, air conditioning may be provided by direct expansion plant or via chilled/heating water as appropriate for the facility.

Where the facility has a post disaster function or requires chilled water / cooling services for sustaining human life or critical service, this shall be achieved by providing sufficient electrical generation capacity to start and run all chillers, chilled water pumps, critical air conditioners, direct expansion plant, etc. necessary for the continued operation of all critical areas and services.

E1.2.3 **Ventilation Generally**

(a) Outdoor Air

Outdoor air intakes shall be located in accordance with AS1668.2 Clause 2.2 to ensure the supply is of adequate quality.

Except as otherwise required in Specification Note SN.S01 (attached as Appendix E1) **and in these Guidelines, outdoor air provisions shall be in accordance with the Building Code of Australia and AS1668 Part 2. Where class of occupancy is not specifically listed in Table A.1 under "Health Care", an equivalent class of occupancy from other areas of the Table shall be used.**

Enclosure occupancies and outdoor air requirements for systems serving a group of enclosures shall be in accordance with AS1668.2 Clause 2.3.

Where scheduled rates are not required for dilution of anaesthetic gases or other chemical or viral contaminants, or to achieve positive airflow from clean to dirty areas, outdoor air may be

reduced in accordance with AS1668.2 Clause 2.3.4 by providing higher efficiency filtration.

Where not required for positive air flow control, induced make up air may be considered equivalent to fresh air, provided the source is not contaminated and complies with the Building Code of Australia requirements for "borrowed" air.

Variable volume supply air systems shall incorporate control devices to ensure minimum outdoor air supply to all areas is maintained at all times.

Forced fresh air shall be provided in accordance with these guidelines to all occupied spaces regardless of whether the area is served via operable windows.

(b) Exhaust Air

Except as otherwise required in SN.S01 and SN.S02 of the Specification Notes (attached as Appendix E1), exhaust air provisions shall be in accordance with the Building Code of Australia and AS1668 Part 2, Table B1. Exhaust air discharges shall be in accordance with AS1668.2 Clause 3.7.

Clean areas shall not be ventilated by systems serving sanitary compartments, dirty utility rooms and similar spaces.

Other enclosures that are similar in nature may be served by common exhaust systems in accordance with AS1668.2 Clause 3.6.

Contaminated exhaust systems, including those serving toilets, and those necessary to attain positive air flow from clean to dirty areas shall be provided with dual motor fans and automatic change over from duty to standby in the event of a failure of the fan or motor. As an alternative, single motor fan systems, with differential pressure switches, to provide remote alarm or visual indication, in a continuously occupied area, of fan failure may be used.

Exception to the above provision shall apply to independent toilet exhaust systems serving single use toilet/shower or bath areas.

Acoustic isolation and transfer ducts shall be provided for make-up air supply for shared use ensuite toilets and where toilets have doors which open directly onto public areas or thoroughfares. Toilet enclosures including ventilation transmission paths shall provide acoustic isolation of at least Sound Transmission Class 35.

Kitchen areas shall be ventilated in accordance with Health (Food Hygiene) Regulations of the Health Act and AS1668.2.

The following areas shall have exhaust ventilation rates that are the greater of either those shown below or the requirements of AS1668 Part 2 Table B.1.

Ensuites (incorporating showers)

(a) Single Patient	10 l/s/m²
(b) Shared Patient	15 l/s/m²
Patient Bath Rooms	15 l/s/m²
Dirty Utility Rooms	10 l/s/m²
Cleaners' Rooms	10 l/s/m²

E1.2.4 **Air Handling Systems**

All air handling systems shall be designed and operated in accordance with AS1668 Part 1.

Where required by AS1668.1 provision shall be made for manually resetting, starting and stopping of all systems, apart from those serving operating suites, procedures and treatment rooms, delivery rooms and recovery areas, by Fire Brigade personnel in a location convenient to the fire control centre. These special systems shall continue to run until such time that smoke is detected in the supply air at which time all supply, return and exhaust fans serving the affected area shall shut down or operate in the smoke control mode.

Where systems fall outside the jurisdiction of AS1668.1, all supply air systems, with the exception of unitary (room mounted direct expansion) equipment shall automatically shut down on any fire alarm signal in the area served by that system. In general, exhaust air systems shall

continue to operate to aid in smoke removal and to maintain infection control.

Ductwork shall comply with the requirements of the Building Code of Australia, AS1668 Part 1 and AS4254.

Duct insulation in the form of fibreglass or mineral wool shall only be external to the duct to allow internal cleaning when required.

Flexible ductwork shall conform in all respects to clause 2.8 of AS4254.

Duct acoustic treatment and equipment such as fan coil units, conditioners, VAV boxes etc. incorporating fibreglass and mineral wool products shall not have fibres exposed to the airstream. Perforated facings shall have impervious linings.

E1.2.5 **Sepsis Control**

Design principles throughout the patient care areas shall, in addition to comfort requirements, provide good odour and sepsis control. Airflows shall be from clean to dirty areas at adequate rates to control the spread of contamination from the dirty areas. This will frequently require air quantities in excess of the minimum scheduled in the Australian Standard AS1668 Part 2, and these Guidelines.

Positive flow at adequate rates is preferred to the defining of pressure differentials between areas. In some circumstances, flow may be required only on opening of doors and the system shall have adequate flexibility to accommodate this requirement.

Provision shall be made to ensure constant air supply with varying filter resistances in areas requiring sepsis control. (Typically Operation Rooms/Setup Rooms, Isolation Rooms and sterile areas).

Should individual room recirculation (unitary) units be used in areas requiring sepsis control, special filters and cleaning procedures approved by the hospital's infection control committee will be required. Additional air handling equipment will be required in these circumstances to achieve the necessary clean to dirty airflow patterns. (Note: Individual room units incorporating high level filtration preferred, eg, electrostatic filters).

Such areas include:

- Delivery Rooms
- Nurseries
- Isolation Wards
- Special Care Wards
- Treatment Rooms
- Casualty Areas

Systems incorporating central air supply and remote filter stations are recommended for these areas. **Unitary equipment without H.E.P.A. (absolute) filtration shall not be installed in areas utilised for invasive procedures.**

Fans in systems serving areas requiring sepsis control shall be operated 24 hours per day to maintain airflow patterns from clean to dirty areas.

E1.2.6 **Legionella and Microbial Control: Air Handling Systems**

Air conditioning systems shall be designed, operated and maintained to prevent Legionella and other microbes from developing in the systems.

The recommendations and requirements of the following Australian Standards shall be complied with:

AS 3666.1: 1995
AS 3666.2: 1995
AS 3666.3 (Int): 1998

The responsible Hospital Facilities Engineer shall create and oversee a program of regular maintenance for the prevention of hazardous levels of Legionella and other Microbial growth within the facility's air handling systems (Refer to Section F).

E1.2.7 **Air Filtration**

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Four main levels of air filtration are generally required in hospital systems. These exclude those that have special requirements such as for the removal of grease from kitchen hoods, hoods in spray booths and other special purpose applications for which filters shall be selected for that particular function.

When outside air provisions are reduced from that tabulated in AS1668.2 table A1 filters shall, in

addition to complying with these guidelines, satisfy AS1668.2 Appendix D.

Filters shall be located in accessible non-occupied areas wherever possible for ease of maintenance and should be of the disposable (not washable) type to maintain filter effectiveness.

The four main air filtration levels are:

a) Basic Level

The basic level of filtration is that applicable to unitary equipment for recirculation of air in a single room.

Filters shall be Dry Panel filters of minimum 60% efficiency to No. 4 Dust as specified in AS1132.

Such systems are generally installed in non-health service areas (See Section E.1.2.5 - Sepsis Control).

b) Standard Filters

Standard filters shall be fitted in ducted systems to general hospital, service and administration areas.

The minimum quality filters shall be Dry Panel or extended surface of minimum 70% efficiency to No. 4 Dust as specified in AS1132.

c) Special Treatment Area Filters

Except where unitary equipment is used with provisions as required in Clause E1.2.5, special treatment area filters shall be installed in systems supplying treatment areas of the hospital and areas requiring good control of airborne contamination.

These areas include:

Minor Procedure Rooms
Minor Dental Procedure Rooms
Treatment Rooms
Delivery Rooms
Recovery Area
X-Ray Rooms

C.S.S.D. Preparation and Clean Areas not attached to Operating Rooms or Set up Rooms
T.S.S.U. Preparation and Clean Areas not attached to Operating Rooms or Set up Rooms

Filters shall be extended surface filters of minimum 80% arrestance efficiency to No. 4 Dust and 95% to No. 2 Dust as specified in AS1132.

Adequate pre filters and pressure differential indicators are recommended for this level of filtration.

Areas utilised for invasive procedures shall be provided with H.E.P.A (absolute) filtration as below.

d) Operating Rooms/Set-Up Rooms/Attached Sterile Supply Store Rooms Areas/Absolute Containment Isolation Suites

H.E.P.A. filter installations shall be adequately pre filtered with a minimum of Special Treatment Area Filters (Level 'c' above).
Filtration shall be H.E.P.A. Filters of 99% minimum Hot DOP arrestance efficiency. Filters shall be tested as installed and subject to certification by the Cold DOP test to AS1132.9.
H.E.P.A. filter installations shall also be subject to cold D.O.P. certification after initial installation, service or replacement.

Fan systems incorporating H.E.P.A. filters shall include differential pressure indication across the H.E.P.A. filters for pressure indication. Differential pressure indication shall be provided over a constant pressure loss unit such as a heating coil or a velocity probe. Both indications shall be displayed in the area supplied with the acceptable operating range clearly marked on the gauges. A fault indication light shall be activated within the area supplied on loss of acceptable airflow or excessive H.E.P.A. filter differential pressure and a signal sent to the Building Management System. The system shall incorporate automatic pressure adjustment to compensate for the increase in filter pressure drop.

E1.3 Heating / Cooling / Ventilation Requirements for Specific Functional Areas

E1.3.1 Operating Rooms

Supply air to Operating Rooms shall be supplied at high level in a manner that minimises recirculation of potentially contaminated room air and provides the cleanest practical air supply over the operating table area. A uniform downward airflow shall be achieved over the operating table.

Total circulated air quantity shall be not less than 20 air changes per hour of which a minimum of 30% shall be fresh air to minimise the build up of anaesthetic gas contamination. However, there may still be occasions where this minimum still may not be sufficient.

Due to the necessity for individual temperature, sepsis and odour control, **each Operating Room shall be served by a dedicated air conditioning unit which may also serve that Operating Room's adjacent sterile support rooms. Dedicated units may not be necessary for Systems using full outside air**

Operating Rooms for special procedures such as orthopaedic surgery will require special mechanical systems to suit their intended use. **Orthopaedic operating rooms shall have a minimum of 55 air changes per hour of the total room volume supplied uniformly over the work/surgical area of minimum 2400mm x 2400mm and achieve a minimum of 0.1m/s and a maximum of 0.25 m/s across the table. A minimum of 6 air changes per hour shall be fresh air.**

Low level exhaust and other provisions in accordance with AS1169 shall generally be provided. Where full provision is not made in accordance with AS1169, Operating Rooms shall have a notice, affixed as required, indicating that flammable agents must not be used. Further, N_2O shall not be utilised where low level exhaust is not provided and the range of surgical procedures undertaken in the Operating Room restricted accordingly. Low level exhaust shall be extracted at 200mm above floor level. Refer also to Section 1.3.4. for further information on N_2O extraction.

Air not required for exhaust or maintenance of outward airflow for sepsis control may be recycled as return air.

Extraction of relief air and, if incorporated, recycle/return air is recommended to be located at low to mid level. It is recommended that, as a minimum requirement, supply air diffusers be located directly above the operating table. Exhaust/relief air should, as a minimum, be extracted at a point as close as possible to the anaesthetic delivery trolley to remove leakages and anaesthetic gases from the work area whilst ensuring good airflow through the room.

Diffusers mounted above the operating table shall be of a non-aspirating type and the ductwork and air outlets configured to provide a uniform downward airflow over the operating table.

Return air shall ensure good dilution ventilation throughout the room and enhance the downward uni-directional flow of air across the operating table. The provision of an all fresh air purge cycle is recommended in operating rooms. Fresh air purge shall be incorporated where procedures may be septic or where obnoxious odours may be produced.

The Operating Room temperature shall be adjustable to suit the requirements of the procedure in progress. It is recommended that the temperature adjustment range be 16ºC to 24ºC. The proposed function of the room will determine what degree of adjustment is provided.

Room relative humidity shall be maintained within the range of 40% to 70% except when flammable agents are used when the requirement of AS1169 is to maintain relative humidity above 55%. Where humidifiers are used they shall be of the steam or ultrasonic type. Except where flammable agents are used, limiting humidity range by equipment design is acceptable unless there is a specific surgical requirement.

E1.3.2 Orthodontic Operating Rooms

For Orthodontic Operating Rooms the engineering requirements for air supply shall be the same as for Operation Rooms.

E1.3.3 Sterile Supply Service Facilities

These areas shall be air conditioned with a minimum of 10 total air changes per hour. Air

movement and ventilation shall achieve a positive airflow from clean to contaminated work areas. When the zone is not occupied, ventilation shall be maintained sufficient to ensure cleanliness levels are maintained.

E1.3.4 **Procedure, Recovery, Delivery, Dental Procedure and X-Ray Rooms**

These rooms, which may have requirements for either the administration or aspiration of gaseous anaesthetics or analgesics, shall have adequate ventilation with suitably located grilles to ensure that the level of gaseous contamination does not rise above a maximum acceptable level. Low level exhaust (200mm above floor level) shall be installed for anaesthetic gas scavenging where N_2O is used.

Extraction of return air shall be at low to mid level, per Clause E1.2.7.

Note: Extraction of return air at ceiling level has been demonstrated in some hospitals to result in poor dilution ventilation of the work area, ie. Airflow across the ceiling and consequent reduced flow through the work area.

Local Extraction of patient exhaled anaesthetic gas at source is strongly recommended. **This becomes a mandatory requirement and shall be provided where measured levels of anaesthetic gas within the area are considered excessive by the Hospital's Occupational Health and Safety Committee.** Proprietary brand extraction arms as produced for example, by Nederman, B.O.C. Gases or Jason Industries are worthy of consideration.

Total air circulation shall be not less than 10 air changes per hour of which the minimum outside air supply shall be the greater of 20 l/s per person or 2 air changes per hour. Alternatively, localised exhaust shall be provided at each bed achieving a minimum of 50 l/s exhaust per bed.

Cupboards containing anaesthetic machines shall be ventilated to remove the build-up of N_2O within the cabinet.

E1.3.5 **Isolation Rooms**

a) Absolute Containment Isolation Room (With A*irlock* Lobby)

These are high containment isolation rooms normally associated with Intensive Care Units. Access to these units is through an airlock that contains scrub-up facilities.

As a minimum, the following shall be provided

- **a dedicated supply and dedicated ducted exhaust system;**

- **absolute filters of 99% minimum HOT DOP arrestance efficiency on the supply air system. Depending on room utilisation, absolute filters may be required on the exhaust system;**

- **supply air of the greater of 12 air changes or 9 l/s/m^2 of floor area and a minimum of 2 changes per hour of fresh air;**

- **no air shall be returned from the Isolation Room or Lobby.**

Provision shall be made for the protection of the isolation patient, staff and other patients by reversing airflow from and to the Isolation Room so that the Isolation Room becomes positive or negative in air pressure with respect to the adjacent rooms.

The positive airflow, from clean to dirty areas shall be achieved by the clean area air supply quantity exceeding the dirty area supply by at least 10%. The negative airflow shall be achieved by increasing the exhaust air quantity to at least 10% above the supply air quantity. In addition, the airflow shall be at sufficiently adequate rates across openings to control the spread of contamination.

This alternating airflow is normally achieved by variable speed drives with electronic controls.

Positive indication of the mode of operation shall be provided. Alternating airflow mode shall only be initiated by a key switch, ideally located at the Nurses Station responsible for the Isolation Room.

It is recommended that an arrangement be provided to vary the room temperature up and down from the set point by $\pm$ 3°K.

Special filter cleaning and clinical sepsis control procedures *shall* be approved by the Hospital Infection Control Committee.

Staff *shall* be protected by universal precautions (gowns, gloves, masks etc.).

b) Standard Containment Isolation Room (without Lobby)

This is a standard isolation room normally associated with ward areas. These rooms are normally centrally located in the ward and are located adjacent to a corridor clinical hand basin. **While occupied by an infectious patient, there shall be no return air from these rooms and the exhaust quantity shall exceed the supply air quantity by at least 10%. Clear indication shall be provided at the Isolation Room door to identify when the containment mode is in operation. As a minimum requirement, exhaust shall be via a dirty (eg, toilet exhaust) system. The air change rate shall be the greater of 9 air changes per hour or 7 litres per second of supply air per square metre of floor area. The minimum supply air filtration shall be via extended surface (eg 4 peak) filters as per standard ward air conditioning provision, to give filtration efficiencies of 80% on Number 4 and 95% on Number 2 Dust as specific in AS1132.**

This arrangement only protects other patients in the Nursing Unit from infection. Staff protection is achieved by universal precautions (gowns, gloves and masks).

E1.3.6 **Autopsy and Body Holding Areas**

Systems serving these areas shall be independent of other systems. Exhaust ventilation rates shall be greater than 12 l/s/m².

Exhaust from this area shall be designed to protect personnel undertaking procedures and be discharged in a manner that will not contaminate any adjacent area or system.

E1.3.7 **Laboratory Areas**

Specific areas of laboratories have the potential to contaminate air supply systems and these facilities

shall be examined for the requirements of controlled air flow and areas from which air should not be recirculated, or require a high level of filtration before recirculation.

If a high level of filtration and air scrubbing is not provided, full fresh air systems shall be provided with minimum supply air quantities of 7.5 l/s/m².

Fume cupboards shall comply with AS2243.8 and systems and equipment shall comply with the relevant Australian Standards on laboratory safety.

Exhausts from this area shall be discharged in a manner that will not contaminate any adjacent area or system.

Special temperature and humidity requirements shall be met where required for the equipment or materials being prepared.

Laboratories shall be held at negative pressure with respect to adjacent areas so as to contain odours etc. in the case of spills.

Laboratories used for genetic manipulation shall be accredited by the National Health and Medical research Council.

E1.3.8 X-Ray Dark Rooms/Processing or Viewing Areas

Special ventilation requirements shall be met, dependent upon the type of film processor (automatic or manual) to be installed.

Adequate ventilation is required to contain the uncontrolled spread of fumes from potentially harmful chemicals into occupied spaces. The fumes (or potentially contaminated air) shall be exhausted to outside air, and not recirculated.

Through - the - wall processors require local exhaust ventilation to each side of the wall. Slot extraction shall be provided immediately above the processor. The air velocity through the slots shall be at minimum 3.5 m/s, and designed for effective capture of the contaminants. Most processors also require indirect connection (soft coupling) of the drier fan discharge to an exhaust system, in addition to general room exhaust for fumes emitted from stored chemicals and the machine cleaning process. Additional direct extraction from the

processor cabinet is recommended to provide a minimum 0.5 m/s capture velocity over all openings in the cabinet to contain chemical emissions. Low level exhaust shall also be provided for X-Ray Dark Rooms and Processing Areas.

Air spill shall not occur from the Dark Room to adjacent spaces. Dark Room exhaust shall balance or exceed supply and shall be at least 25 air changes up to 12m^2 of room or 15 air changes for greater areas.

Daylight processing equipment shall be provided with adequate local exhaust ventilation to prevent the uncontrolled escape of chemical emissions.

If remote chemical mixing and reticulated chemical supply is used, the chemical mixing tank shall be contained in a ducted enclosure, connected to an exhaust system as described above.

Local exhaust ventilation shall be provided above sink units used in connection with the regular cleaning of X-ray processor equipment components.

If silver reclaiming is also undertaken, the silver reclaimer shall be located within either of the above mentioned exhausted environments. It is recommended that exhaust from this ducted enclosure be the method of achieving low-level extraction.

Work areas and enclosures used in connection with the manual processing of x-rays, where utilised. eg. in dental clinics, *shall* be provided with dilution ventilation and temperature controls to prevent the build up of fumes.

Vapour emissions from the tundishes into which the liquid waste discharges shall also be controlled.

E1.3.9 **Linen Processing Areas**

Excessive exposure to lint dust, generated in the folding/handling of linen, can cause irritation of the upper respiratory system.

If linen is processed within the facility the filtration, mechanical ventilation and air conditioning systems servicing this area shall be designed to ensure appropriate lint dust control viz. high level

laminar supply combined with low level exhaust with lint filters.

The mechanical services systems shall also be designed to deal with the heat generated by the laundry drying process, eg exhaust registers over the dryers and/or dryers ducted direct to outside air with lint collection provision on all exhaust discharges.

Provision shall be made for regular maintenance to prevent the excessive build up of lint dust which can be the source of a fire hazard.

Spot cooling with air-conditioned or evaporatively cooled supply air should be considered to provide adequate operator comfort in laundries.

Ventilation shall be provided in accordance with AS1668 Part 2 and where air conditioning is installed, a minimum of 25 air changes/hour is recommended. For evaporative cooling a minimum of 35 air changes/hour is recommended. Airflow shall be from clean to dirty areas.

To avoid cross infection, soiled linen rooms shall be exhausted through a dedicated system.

Exhaust fans shall be fitted with fan failure indication located in a continuously occupied area or dual motor fans shall be provided.

The Clean Linen Store shall be air conditioned and supplied with air from a clean zone external to the Laundry. Air pressure shall be positive in respect to the rest of the Laundry.

Air conditioning is required to reduce the moisture content of linen.

E1.3.10 **Endoscopy Units**

The use of chemical disinfectants such as glutaraldehyde for the disinfection of fibre optic scopes requires special fume containment and air movement considerations. Ventilation in workrooms where scopes are cleaned shall achieve a minimum of 15 air changes per hour.

Ducted local exhaust ventilation shall be used in preference to recirculating filtered air systems.

Instrument soaking areas should be located in a fixed position (the use of mobile trolleys should be avoided) allowing for plumbed disposal of waste glutaraldehyde through dedicated waste lines.

Where manual scope disinfection in glutaraldehyde trays occurs, the scopes and disinfection trays shall be contained by a system of local exhaust ventilation capable of providing adequate capture of contaminants, ie face velocity greater than 0.5 m/s. A fume cupboard type hood with a sliding sash shall be provided.

This hood should incorporate a perforated supply air plenum at the top and down draft slots and plenum exhaust at the sinks.

Where the hood occurs in an operating suite between the Clean Up and Set Up Rooms, it shall be of pass through design with interlocked sliding sashes. The relative positive pressurisation of the Suite shall not be adversely affected when either door is open.

Alternatively, complete manual disinfection of scopes may be carried out in a dedicated scope disinfection room equipped with a down draft trough with perimeter exhaust slots exhausting at a rate sufficient to contain fumes.

Where automatic or semi-automatic disinfectors are used, a localised exhaust system shall be provided to achieve appropriate capture and removal of contaminated air. Fumes shall be drawn away from the operator's work position. Machine mounted filters are not always sufficient and require monitoring.

The cupboards in which fibre optic scopes are stored shall be ventilated and pressurised with filtered supply air to level b filtration as a minimum requirement to ensure thorough drying of the stored scopes.

E.1.3.11 Podiatry Laboratories

Podiatrists involved in the production of orthotic devices may be exposed to a number of potential hazards due to the materials being handled and the techniques employed. Grinding, buffing and polishing can potentially generate high dust concentrations. The mixing and moulding of partially cured polymers, the heating of thermoplastic materials and the brush

application of glues, and coatings, can also give rise to vapours and fumes. Podiatry laboratories are often small and, in many cases, lack sufficient ventilation to cope with these contaminants. These laboratories also have the potential to contaminate other air supply systems and facilities.

Full fresh air conditioning and ventilation systems shall be provided with a minimum supply air quantity of 20 litres per second per square meter of facility floor space.

Extraction shall be localised as close as practicable to the sources of contamination identified above. Exhausts from this area shall be suitably filtered and discharged in a manner that will not contaminate any adjacent area or system.

Capture velocities at the point of localised extraction shall be sufficient to collect and remove contaminants, eg. as a guide the capture velocity should exceed 2 meters per second. Proprietary brand systems such as the Nederman extraction arms with filter boxes or the units produced by Jason Industries have considerable merit. Due consideration should also be given to acoustics to prevent noise nuisance.

E1.3.12 **Dental and Orthodontics Laboratories**

Dental workers are exposed to potential hazards similar to Podiatrists, with chemicals, acids, grinding, buffing, polishing etc.

Similar ventilation outcomes as those defined in E1.3.11 shall be provided as follow:

- **Full fresh air conditioning and ventilation systems shall be provided with ventilation at 20 l/s/m^2.**
- **Localised extraction shall be provided complete with captive hoods where applicable. Note proprietary brand located systems shall be considered for polishing and grinding machines.**

Fume cupboards shall be provided where chemical mixing is carried out.

Fume cupboards shall comply with AS2243.8.

E1.3.13 Waste Management Areas

Waste storage areas should be designed to allow ready access, provide security for the material, reduce organic decomposition, contain odours and allow hygienic cleaning of the storage area and carts.

Airflows shall be to waste storage areas from adjacent treatment facilities and public areas to achieve appropriate sepsis and odour control. Discharge air from waste storage areas shall be exhausted through a dedicated ductwork system to a point remote to air intakes. Temperature control to reduce organic decomposition of stored waste may be required dependent on frequency of disposal and ambient temperature at the site.

Reticulated steam, pressure cleaning systems and air blow drying facilities ***may*** be appropriate to facilitate cart cleaning in central waste collection areas. Larger institutions may benefit from the installation of a mechanised bin washing facility that will require specialised services according to washer design. Liquid waste emanating from disinfection procedures ***will*** require stabilisation before disposal in sewerage systems. **Handwash facilities shall be provided adjacent to all waste handling areas. Showers shall be provided within dedicated waste collection areas.**

E1.3.14 Laser Surgery

Laser surgery can, depending on the type of laser and surgical procedure undertaken, produce a surgical plume. This plume can create a smoke hazard, can be a noxious odour, and/or more critically, create an infection control risk to either the patient or health service personnel. These surgical plumes can contain blood-borne pathogens, air-borne contaminants, and bacterial and viral particulates.

Where these risks can occur these potential hazards of the surgical plume shall be managed by the introduction of localised mechanical extraction.

Dedicated exhaust systems providing capture at plume source is the strongly favoured means of containing and removing contaminants generated by the surgical plume during the procedure. Such systems can achieve appropriate capture velocities and effective containment and removal of contaminants.

Recycling filter units can satisfy the requirements provided the health service is able and committed to ongoing monitoring and maintenance of the unit. **In order to remove the bacterial and viral particulates and other contaminants, capture velocity must be maintained and the internal filter unit must be capable of satisfying AS4260 Grade 2 requirements namely; 'Absolute' (H.E.P.A.) filters with 99.99% filter efficiency for 0.3 micrometre particulates. Filters shall be subject to certification by a Cold D.O.P. test to AS1132.9 at each change of filter.** It is noted that due to short filter life maintenance costs to these requirements can be high and should be carefully assessed.

E1.3.15 **General Other**

The ventilation requirements of ethylene oxide sterilisers shall be considered when they are installed within a hospital and shall adhere to the National Code of Practice for the Safe Use of Ethylene Oxide in Sterilisation/Fumigation Processes [(NOHSC:2008 (1992)].

Also consider the ventilation requirements of:

- laser equipment where used, eg. in Endoscope Rooms;
- cytotoxic drug preparation;
- hospital workshops, eg. spray painting areas; and
- storage of medical gases.

E1.4 Hot Water

An adequate supply of clean hot water shall be reticulated to all patient treatment, staff work and patient and staff ablution facilities, as detailed in the Statement of Function (A3).

Provision shall be made to limit the supply temperature of hot water to all patient use fittings to eliminate the risk of scalding. Maximum temperature at outlets shall not exceed 46°C for adult patients except that where warm water circuits are used, control of circuit temperature to 50°C maximum is acceptable. For nursery areas the maximum temperature at the outlet shall not exceed 42°C.

Where patients are expected to have difficulty in adequately adjusting a comfortable showering or bathing temperature, local thermostatic control is recommended. Such controls are to be installed at high level to eliminate the chance of accidental resetting of the water temperature.

E1.4.1 Legionella and Microbial Control

Hot Water Systems shall satisfy the requirements of AS 3666. Systems shall be designed to minimise excessive deadlegs and enable the quick and easy maintenance of the system for Legionella and microbial control. Systems serving areas where there are patients with immunodeficiency shall be regularly tested for Legionella concentration and concentration levels maintained below levels set by the Health Services risk containment policy.

Health Services shall have in place a regular program of maintenance to prevent Legionella and other microbial growth in the potable water supply.

Operation of the system at a temperature above 70°C for one hour each month and through each outlet for a minimum of five (5) minutes is one method of protecting warm water systems from the risk of microbial growth. In addition to this, aerators, shower roses and other such fittings should also be cleaned and sanitised at regular intervals. This is provided the associated hospital operational and sanitising requirements are complied with. Dual temperature thermostats are suggested for this purpose. Suitable warning signs shall be displayed at all impacted outlets during this temperature raising process.

Proprietary systems such as that provided by Edwards Hot Water could be considered. Alternatively, warm water systems may incorporate an approved chemical disinfection system. A proprietary system such as Rheem Warm Water and Treatment System could be considered.

E1.4.2 Hot Water Service: Food Handling Areas

Domestic hot water provision for the washing of crockery, glassware and cutlery shall be as described in the Food and Hygiene Regulations.

The requirements are summarised as follows:

1) Rinse water shall be at a temperature of not less than 50°C and contain not less than 50 mg/kg of sodium hypochlorite; or

2) **Rinse water temperature shall not be less than 75°C.**

Where hot water is reticulated at low temperature (below 55°C), as in warm water circuits discussed above, provision shall be made for suitable sanitising of the system and circuit pipework to prevent the growth of Legionella Bacterium. Aerators, shower roses and other such fittings shall be cleaned and sanitised at regular intervals.

E1.5 Medical Gases and Suction

Operating rooms, recovery, procedures rooms, intensive care, birth rooms, screening rooms and other treatment areas as dictated by the Statement of Function (A3), shall be provided with a reticulated medical gas and suction service. These services shall be in accordance with the Australian Standard AS2896 - "Medical Gas Systems - Installation and Testing of Non Flammable Medical Gas Pipeline Systems".

Patient rooms shall have oxygen and suction services provided by a fully reticulated system. The minimum provision shall be an oxygen and suction point provided to each single bedroom and shared oxygen and suction points between two beds within multiple bedrooms.

Reticulation systems shall be fully designed including piping and equipment sizing.

An adequate supply of terminal equipment shall be provided, held at the point of service in a suitable manner for immediate use as required.

Where anaesthetic gases are administered, a system shall be provided for active aspirated gas scavenging. This requirement need not apply to analgesic areas where adequate ventilation is provided.

Gas and suction warning systems shall be installed in appropriate locations in wards and all critical care areas, including operating rooms, birth suites, recovery areas, intensive care and casualty areas, all as defined in AS2896.

Warning system power supplies shall be from the vital one second supply or backed-up with a dedicated battery supply.

Suitable emergency *gas* supplies shall also be available for use in these areas.

Installation shall be undertaken by approved, experienced and competent installers as required by AS2896. Calibrations and testing of gauges shall be undertaken to the requirements of AS1349. The work shall be undertaken by specialist subcontracting organisations. These organisations shall be certified to ASNZS ISO 9002 by a third party certifying body that is JAS-ANZ approved. They shall also have appropriate installation staff training, equipment, quality processes, relevant insurances and installation expertise.

Commissioning of gas and suction services shall be in strict accordance with the procedures outlined in the Australian Standard AS2896. Tests shall be witnessed by the NPER-3 Certifying Engineer and a representative of the Hospital. Procedures shall also be established for regular reliable ongoing replenishment and service of all systems and equipment.

Dental Wet Suction Systems shall be designed and installed to AS2686 Part 1 or 2 as applicable.

E1.6 Earthquake Loads

All equipment, duct work, cable trays etc covered in this section shall be installed in such a way that it satisfies the requirements of AS1170-4 Section 5 (Requirements for Non-structural Components). All such fixings shall be designed by an Engineer satisfying the requirements of Section E6.1 of these Guidelines.

E2 ELECTRICAL SERVICE

Electrical services shall provide throughout the life of the facilities:

- *the electrical services required for the health care outcomes offered to the patients using the facilities;*
- *compliance with the technical standards required by statutory regulations and these Guidelines;*
- *compliance with the proprietor's duty of care directions on risk containment covering both normal and emergency operating conditions.*

Persons and organisations employed to plan, design, provide and operate the services shall be qualified and have a history of competence with the type of services provided.

Throughout the life of the facility there shall be written records available and providing all the information and instructions needed, by technically competent persons, to understand the basis of design and the intended safe operation of the services provided.

Services should provide the lowest practicable life cycle cost consistent with the risk management criteria set by statute and proprietors directions.

E2.1 General

Electrical installations shall comply with the requirements of AS3000, the Supply Authority, the Building Code of Australia Health (Public Buildings) Regulations, these Guidelines and other relevant Australian Standards.

The design, witnessing of all relevant tests and certification of the hospital's electrical installation shall be undertaken by an appropriately qualified professional Engineer with Corporate Membership of the Institution of Engineers, Australia and/or relevant NPER-3 Registration and experience in hospital design. The professional Engineer shall certify all tests and that the design complies with all statutory requirements and with these Guidelines.

The electrical contractor or consulting engineer shall certify that the installation complies with the documentation and the mandatory requirements established or implied with the "Approval to Construct".

In addition to the requirements of Section E2.8, where the facility has a post disaster function (see section B1.1 of this

document) and the need for critical to human life systems to remain operational:

- **there shall be a high quality emergency electricity supply sufficient to provide capacity to start and run equipment in accordance with the standby requirements of AS3009;**

- **including capacity to supply heating and cooling systems in critical areas.**

The emergency service shall be rated and supplied with fuel for a minimum of twelve hours operation at full load.

All components of the supply: fuel system, generation, control, protection, distribution, maintenance and integrity monitoring shall be compatible and consistent with guaranteeing a reliable service during failure of normal electrical services.

Consideration to be given to the physical separation of incoming site sub-mains, and the minimisation of single points of supply failure from the Supply Authority

Particular emphasis shall be placed on the safety and reliability of the installed service.

E2.2 High Voltage Sub-Station - Transformer Installations

Where a private hospital is required to have a high voltage sub-station and/or transformer installation on site, it shall either be in buildings or structures remote from the patient areas or be fire isolated as part of the main building. Fire safety provisions, as outlined in Section B7 of this document, are to be complied with.

The sub-station installation shall comply with the requirements of the Building Code of Australia and the WA Electrical Requirements for fire separation and/or isolation from buildings.

E2.3 Consumer Mains and Sub-Mains

Mains that supply emergency equipment shall be fire rated as required by the Building Code of Australia. Where required by Australian Standards, sub mains shall be suitably fire rated and protected.

Where not mandatory, consideration should be given to fire protection of all mains and sub-mains to minimise the disruption of other fire isolated areas from a remote fire.

E2.4 Switchboards

The site main switchboard and the building main distribution board shall be at least Form 3B in accordance with AS3439.1, with additional separation such that the external conductor terminals of each incoming unit are segregated from those of the outgoing units. The site main switchboard and the building main distribution board shall be fully enclosed in an enclosure to achieve a FRL of 120/120/120 (or isolated from the building) which, in conjunction with mains and sub-mains protection recommended under E2.3, shall minimise disruption to the facility in the case of a fire.

Switchboards distributing electricity within a hospital installation shall:

a) be located in readily accessible, well-illuminated areas with the duct door designed so that they cannot obstruct the means of emergency egress;

b) be mounted in a secure location, be accessible only to authorised hospital personnel and comply with the requirements of AS3003 for protective devices and Clause E.2.5 of these guidelines;

c) be constructed to adequately withstand, without damage, the prospective short circuit currents at the installed location;

d) be provided on the basis of at least one distribution board per required fire compartment. Fire or smoke isolated areas within major fire compartments are exempt from this requirement;

e) have main switch or switches controlling the incoming supply;

f) be enclosed by non-combustible construction or a fire protective covering with doorways or openings suitably sealed against smoke spreading from the enclosure. Refer to BCA D2.7 and Specifications C1.1.2.5 (e). Fire protective covering has the same meaning as described in BCA A1.1.

g) have all equipment on the switchboard mounted in a manner and appropriately labelled so as to permit ready comprehension for identification and control. All combination fuse units shall be labelled nominating the maximum fuse rating permissible that will adequately protect the circuit originating from the unit;

h) have 3 spare fuse carriers with fuse elements intact, kept at all times at each switchboard for each rating or

type of fuse installed on that board. They shall be retained in special clips or racks for ready identification and use; and

i) be suitably protected against unauthorised access, vandalism and vehicular damage.

j) be supplied with a single line diagram and a schedule of circuits identifying the items of emergency equipment supplied from the electrical switchboard. The schedule of circuits is to separately schedule and highlight the emergency equipment supplied from the electrical switchboard and be laminated or mounted behind glass within the switchboard.

Consideration should be given for the use of centre trip position circuit breakers for ease of identification of tripped circuits.

E2.5 Discrimination

The protection equipment on all switchboards shall be so coordinated that in the event of any condition of over-current or short circuit occurring at the load side terminals of any sub-main or final sub-circuit protective device:

a) sub-mains protection effectively discriminates;

b) all lighting circuits continue to operate apart from any lighting which is supplied by the faulty circuit; and

c) power outlets in patient treatment areas continue to operate apart from any faulty circuits in those areas.

Discrimination may be dispensed with where patient treatment areas are not involved and where a standby lighting and power system which complies with AS3009 is installed together with emergency lighting in accordance with AS2293.1.

Note: The use of separately fused light fittings will in most cases isolate the fault to a single fitting which speeds fault location considerably. However, this is optional, with cost needing to be assessed relative to the consequences of an occurrence.

E2.6 Cabling (General)

All cabling in a private hospital electrical installation shall comply with the requirements of AS3000, AS3008.1, AS3009 and the requirements of the Health Department of WA document "Health Facility Fire Design Supplement - 1993" (Appendix 2). Consideration should be given to running of

cabling with a 25 percent spare capacity over the calculated maximum demand.

Substation and sub-mains cabling shall be located so as not to interfere with medical equipment sensitive to magnetic fields. Consideration should be given to avoid running of cabling adjacent intensive care areas, Operating Rooms and the like where electrocardiographs, monitoring equipment is to be operated regularly.

Special consideration should be given to the placement cabling whose impedance may affect equipment performance eg. x-ray equipment.

It is recommended that a cable tray system be provided in corridors and the like for the reticulation of sub-mains, general light and power cabling and communications and data cabling.

E2.7 Lighting

E2.7.1 Generally

All areas shall be adequately illuminated by natural light or artificial means to afford safe movement commensurate with the purposes of each area. Artificial lighting shall be by means of electricity.

The level of general lighting provided throughout *shall* be not less than the recommended service illuminance levels listed in AS1680.

Where working positions are fixed, advantage may be taken of the AS1680 task lighting provisions.

Lighting in operating suites and their associated service areas shall comply with AS1680. The general lighting within the operating theatres shall be switched to allow adjustment of the illumination levels between 700 and 1200 lux in at least 3 approximately equal steps. General procedure rooms shall have general maintenance lighting levels of not less than 320 lux and shall comply with the requirements of AS1680. Endoscope procedure rooms and procedure rooms where anaesthesia or intravenous isolation is required shall have a general maintenance lighting level of not less than 400 lux.

A general maintenance lighting level of 240 lux shall be provided throughout ward areas in compliance with AS 1680 including those areas beyond the foot of the bed.

Consideration shall also be given to the task to be undertaken by clinical and other staff within wards and an adequate maintenance lighting level shall be provided to comply with AS 1680 and the Occupational Safety and Health Regulations, 1996.

A patient reading light shall be provided at the head of each individual bed capable of producing a maintenance lighting level of 240 lux to the page, with a switch located in a position so as to allow convenience of operation by the patient occupying the bed, eg switching incorporated in the nurse-call handset or bedside cabinet. Note that the patient reading lights and examination light functions can, in some instances, be served by the one fixture.

Artificial lighting suitable for clinical observation complying with AS1680 shall also be provided to the areas where clinical observation is required in the Statement of Function. Design drawings shall indicate the areas covered by the code by means of cross-hatching or other similar means.

E2.7.2 **External Lighting**

All external paths of travel including the pathway from each entrance or exit, including emergency exists, to a public thoroughfare shall be (for the whole of the "after dark" patient visiting times) illuminated to a level not less than that detailed in AS1158 - "Public Lighting Code" for Category C.

As stated in Section B14, external lighting design shall take into account the need to minimise the undesirable element. Entry points, carpark and unattended areas must get special attention. Impact on patient areas shall be minimised.

Note requirements for multiple circuits detailed under paragraph "C") "Lighting Electrical Installation".

E2.7.3 **Lighting Electrical Installation**

Where automatic control of lighting is provided a separate manual ON switch shall be provided to override all of the automatic control. Consideration shall be given to the location of the override with regard to accessibility. External lighting shall be connected to circuits separate from those supplying the lighting in foyers, entry porches, emergency escape passageways and similar areas providing means of entry or egress.

Where two or more lights are required to illuminate external or internal stairs or exit paths, luminaires shall be connected over at least two circuits and arranged so that all sections remain illuminated if one circuit fails. Required internal exit paths and internal and external fire stairs and ramps shall have emergency lighting.

Luminaries installed less than 2400mm from a floor or ground or similar surface on which persons may normally stand shall be suitably constructed or protected by guards against accidental damage and so that bare lamps are not directly exposed. Luminaires complete with protective wire guards may be utilised in plant rooms and other similar areas below 2400mm.

Mixed power and lighting circuits are not permitted other than single phase extraction fans in single toilet, shower, bathroom or other approved areas, which may be connected and switched with the light fitting.

E2.8 Stand-by Lighting and Power (Essential Supplies)

Stand-by lighting and power in accordance with AS3009 shall be provided. Engine driven generator sets shall have a diesel engine prime mover, with 5 attempt repeat starts or the equivalent of 60 second cranking whichever is the greater facility and automatic normal/stand-by/normal supply transfer, all as defined in AS3009.

Generator and battery maintenance logs shall be provided. Also consider the remote indication of generator low fuel level. This is of particular importance to small hospitals without on-site maintenance staff. A procedure shall be put in place for the recycling of diesel fuel to prevent contamination.

Note that limitations are imposed on the bulk storage of diesel. Consideration shall also be given to the length of time diesel or other fuels are held in storage before use.

E2.9 Emergency Lighting and Power

E2.9.1 <u>Emergency Power Supplies</u>

Fixed surgical luminaries in Operating Rooms shall be connected to an Uninterruptable Power Supply (UPS) System. A central UPS system is recommended for ease of maintenance. Battery capacity shall be in accordance with AS3009. Where a

UPS system has back up supply from an automatic diesel generator in accordance with AS3009, battery capacity may be reduced to a period of not less than 2 hours. Consideration should be given to the use of an AC Uninterruptable Power Supply for operating room lights.

Examination lights in Procedure Rooms, Birth Rooms and the like shall be connected to "Vital (1 sec)" central battery systems. Other "Vital (1 sec)" lighting circuits may be connected to the central battery power system or may consist of self-contained single point systems.
All battery supported equipment such as PABX, radio paging and fire alarm systems, together with medical gas warning, nurse call and similar systems shall be connected to "Vital (1 sec)" circuits. (Max. delay 1 sec).

In any room or enclosure containing stationary batteries with a stored capacity exceeding 1 kWh or a floating voltage which exceeds 115 volts that installation shall comply with the installation requirements of AS2676 "Installation and Maintenance of Batteries in Buildings" and AS3011 "Secondary Batteries installed in Buildings". Note that vented batteries require specific emergency washdown and washing facilities to be provided.

Fire rating of the enclosure shall comply with the requirements of the Building Code of Australia.

E2.1.2 **Emergency Lighting and Illuminated Exit Signs**

In addition to the stand-by lighting and power requirements, emergency lighting and illuminated exit signs shall be provided in accordance with the minimum requirements of AS2293 Part 1, "Emergency Evacuation Lighting in Buildings - Part 1 - Design and Installations", and as follows:

a) Illuminated Exit Signs

Exit signs shall be provided above or adjacent to each exit providing preferred public access to a road or open space. Additional directional signs shall be provided in corridors and lobbies as necessary to indicate the location of these exits, where they are not clearly visible. Consideration shall be given to the use of dual lamp exit signs.

b) Emergency Lighting

Emergency lighting shall be provided in corridors, stairways, toilets, ensuites, utility rooms, patient treatment areas and other critical use areas for the safe management of patient care.

E2.10 Night Lighting

Night lighting shall be provided to all wards, ward corridors and associated exit passages within the hospital where the normal lighting may be extinguished during the night. They shall be suitably spaced to illuminate each area including ramps and stair treads. It is recommended that night lighting to Wards be switched from the room entrance external to the room.

The night lighting shall provide a reasonably even level of diffused and low level lighting so as not to disturb sleeping patients.

E2.11 Surgical Luminaires and Examination Lights

Surgical and examination luminaires shall comply with AS3100, As 3137, AS3200 and BS EN 60598-2-25 (IEC 598-2-25).

The spectral output of the luminaires used for surgical and examination purposes shall comply with the requirements of AS 1680-2-5 for Clinical Observation.

Surgical and examination luminaires shall be mounted in accordance with the manufacturer's recommendations and standard details. A Structural Engineer shall design mounting for surgical luminaires.

E2.12 General Purpose Power Outlets

An adequate number of general-purpose power outlets shall be provided for all anticipated uses. At least two general-purpose outlets shall be provided for each bed position. Outlets shall be located to reduce the possible use of extension cords. Outlets shall be spaced to accommodate low voltage transformers plugged into both outlets.

One outlet shall be provided for every appliance in use at any one time, or if appliances are left plugged in, one outlet for each appliance. Piggyback plugs, double adaptors and power boards shall not be utilised.

It is recommended that cleaners outlets be provided at 10m centres, staggered along each lengths of the corridor.

Where non-standard voltages or frequencies are reticulated, the sockets or connections shall not be interchangeable with the standard voltage connectors and the operating voltage shall be clearly and indelibly indicated on or adjacent to each socket.

Outlets connected to an UPS or automatic diesel generator shall have either toggles or plates colour coded. Engraving of outlets will be acceptable in lieu of coloured flush plates or rockers.

Outlets in Nursery and Clinical Patient Rooms shall be RCD protected and shall be fitted with safety shutters.

Power outlets supplying equipment that is connected by a flexible cord and is not physically fixed in place shall be RCD protected as required by the WA Workplace Safety and Health Regulations.

It is recommended that RCD protection be provided to the following areas:-

- Wards
- Ensuites, toilets and bathrooms
- Operating and Procedures Rooms (to AS 3003)
- Clean and dirty utilities
- Cleansers outlets
- Workshops
- Laboratories
- Kitchens, tea preparation and laundries.

RCD protection devices shall be mounted in distribution boards or be integral within outlets.

E2.13 Outlets and Switch Locations and Types

Outlet and light switches shall be of robust construction with heavy-duty mechanisms.

Outlets and switches in disabled aged or assisted patient use activity spaces shall be:-

a). Between 900mm and 1100mm above the floor (recommended 1050mm).
b). Located at least 500mm from any corner.
c). Of the large rocker switch type with contrasting colours similar to Clipsal "Champagne" Series.

It is recommended that in other than disabled or assisted patient use activity spaces switches should be mounted at 1350mm above floor level and outlets mounted as follows:

Low Level Outlets	450mm above floor
Medium Level Outlets	1350mm above floor
Above Work Bench	150mm above bench
Above Desk	150mm above desk

It is recommended that cleaning outlets not be located behind doors and the outlets for refrigerators, washing machines, etc. not be located behind equipment but be accessible when the equipment is in place.

It is recommended that outlet and switch plates be installed horizontal.

E2.14 Labelling and identification of outlets and switches

All outlets and protective devices associated with electromedically protected areas shall be labelled in accordance with AS 3003 ie:

Outlets shall be labelled "RCD Protected" and shall be identified in a manner which facilities the recognition of the appropriate protective or monitoring devices

Each RCD or LIM shall be identified in a permanent manner so as to allow identification of outlets protected or monitored by the devices

All outlets and switches shall have "ON" indication.

Where switches are mounted externally to stores, cleaner's rooms and the like, it is recommended that the "ON" identification be a neon indicator.

All RCD protected outlets shall be labelled "RCD Protected". All special outlets and switches shall be labelled. Circuits and phase number shall be suitably identified at each light and outlet switch position.

It is recommended that labelling be in red and be minimum 3mm high and 0.4mm thick.

E2.15 Electric Room Heaters

The installation of electric room heaters shall comply with the requirements of AS3000 and the Health (Public Buildings) Regulations.

Where radiant type heaters are provided they shall be located in fixed positions and installed so that any part of a heating

element is at least 2150 mm above the floor and positioned in accordance with the protection of combustible materials to AS3000. Consideration should be given to fitting strip heaters with time delay switches to ensure that they are not accidentally left on, resulting in wasted energy and unnecessary operating cost.

Oil filled, fan type and similar low surface temperature heaters may be installed either as portable or fixed appliances, provided they are fitted with over temperature protection. **Fan type heaters shall not be used where excessive airborne lint, powder, or dust is expected.**

Consideration should be given to the installation of neon indicators to switch positions for all electric room heaters.

E2.16 Wall and Ceiling Fans

The installation of electric wall and ceiling fans shall comply with the requirements of AS3000 and the Health (Public Buildings) Regulations.

Where wall mounted fans are provided they shall be installed in permanent positions with the blades at least 2100mm above the floor and adequately protected by guards of robust construction.

Ceiling mounted fans shall be installed with the blades at least 2400mm above the floor, unless adequately protected from accidental physical contact.

The potential for strobing where fans are installed in rooms with fluorescent lighting shall also be a design consideration.

Consideration should be given to the matching of electronic fan controllers to the fans to reduce electrical "hum".

Consideration should be given to the limitation of the number of fans controlled by one controller to ensure matching of individual fan speeds.

E2.17 Hazardous Anaesthetising Locations

Where flammable anaesthetics are utilised, the electrical fit out shall be in accordance with AS1169, AS2120 and AS2430.3 on flammable medical agents.

E2.18 Medical Treatment Areas

In patient treatment areas where electro-medical equipment may be used for procedures classified as either body-type or cardiac-type, as defined in AS3003, the electrical installation shall comply with AS3003.

On completion of each body and cardiac protected area, the installation shall be tested and a report compiled in accordance with AS3003 Appendix "K".

E2.19 Alarm Systems

Alarm systems for Fire, Medical Gas and Suction Failure, Alert and Evacuation, and others required to suit the hospital functions, shall be connected to "Vital" (1 sec) circuits with an appropriate standby (Essential Supply) power system and installed for maximum reliability.

Details of system requirements are covered under their respective sections.

E2.20 Laboratories

Electrical installations within laboratories shall comply with the requirements of

AS2243 noting especially the following parts:
AS2243.7 Safety in Laboratories: Electrical Installations
AS2243.8 Safety in Laboratories: Fume Cupboards

E2.21 Earthquake Loads

All equipment, switchboards, cable trays etc. covered in this section shall be installed in such a way that it satisfies the requirements of AS1170-4 Section 5 (Requirements for Non-structural Components). An Engineer satisfying the requirements of Section E6.1 of these Guidelines shall design all such fixings.

E3 COMMUNICATIONS

Communications services shall provide throughout the life of the facilities:

- *the communication services required for the health care outcomes offered to the patients using the facilities;*
- *compliance with the technical standards required by statutory regulations and these Guidelines;*
- *compliance with the proprietor's duty of care directions on risk containment covering both normal and emergency operating conditions.*

Persons and organisations employed to plan, design, provide and operate the services shall be qualified and have a history of competence with the type of services provided.

Throughout the life of the facility there shall be written records available and providing all the information and instructions needed, by technically competent persons, to understand the basis of design and the intended safe operation of the services provided.

Services should provide the lowest practicable life cycle cost consistent with the risk management criteria set by statute and proprietors directions.

Planning for communications systems shall give particularly careful attention to risk control under normal and emergency operation. The range and reliability of the systems required and the ability of people to respond appropriately shall be considered.

E3.1 General

The design, witnessing of all relevant tests and certification of the hospital's communication installation shall be undertaken by an appropriately qualified professional Engineer with Corporate Membership of the Institution of Engineers, Australia and/or relevant NPER-3 Registration and experience in hospital design. The professional Engineer shall certify all tests and that the design complies with all statutory requirements and with these Guidelines.

The electrical contractor or consulting engineer shall certify that the installation complies with the documentation and the mandatory requirements established or implied with the "Approval to Construct".

Particular emphasis shall be placed on the safety and reliability of the installed service.

The Communications installation shall comply with the requirements of these guidelines and other relevant Australian Standards. Refer to E2.1.

E3.2 Telephone System

An efficient internal and external telephonic communication system shall be provided to administration, patient service, ward, treatment and other areas as identified in the Statement of Function.

Facilities shall be available for the reception of calls 24 hours per day. Night switching to alternative staffed areas after normal administrative hours is considered acceptable. Day procedure facilities shall be available for the reception of calls during the entire period of occupation. Automatic diversion of calls is recommended for after hours periods.

Primary external communication (typically telephone system) **shall be maintained in the event of a major power failure in accordance with AS3009.**

Provision shall be made for patients to make external calls, at any time, in an area convenient to the facility, either through a hospital handset or a suitable pay telephone. Such provisions shall be accessible to disabled patients.

It is recommended that the telephone facility incorporate a suitable Telephone Information Management System (TIMS) for administrative management and call cost reporting.

E3.3 Paging System

A paging system may be used to supplement the hospital telephone system for contact with key staff members. This facility is recommended for both large and small sites and may include arrangements for assistance call and other emergency signals.

Where a paging system is installed, automatic interface with the fire alarm system is recommended.

Paging may be of the public address or self-contained radio frequency type which produces full alpha/numeric message information.

Paging facilities shall be maintained in the event of a major power failure in accordance with AS3009.

Consideration should be given to effects of electromagnetic interference from equipment.

E3.4 Public Address System

A public address system may be installed in the hospital facility and may incorporate evacuation warning (tones or messages), area paging, intercommunication facilities, background music and other communications services as considered appropriate.
Where installed, such systems should not be unduly intrusive to patients in ward areas.

When functioning as a part of the facilities emergency evacuation system it shall continue to operate during periods of major power failure.

An Emergency Warning Intercom System (EWIS) shall be provided where required by the Building Code of Australia. The installation of an EWIS in other cases is highly recommended.

E3.5 Nurse Call System

A suitable Nurse Call System shall be provided to allow patients to call for assistance at each bed position, in-patient toilets, bathrooms, showers, appropriate treatment areas and other areas as identified in the Statement of Function.

Call buttons shall be appropriately positioned for use in the designated location or incorporate a pendant control (cord and button) for remote activation. Pendants may incorporate other facilities (in a multi-function handset) such as patient radio, television controls, reading light switching etc. **Pendant controls shall be designed to be inherently safe electrically and operate on extra low voltage. Pendants shall be provided at all patient bed positions, and shall include a 'Parking' facility and appropriate cable clip. Pendants shall be provided with 'pull out' alarms.**

Activation of a call point shall initiate audible and visual signals in suitable location or locations (eg. ceiling or wall mounted) and incorporate adequate means of identifying origin and priority of the call from either the nurse station, ward corridor, or nominated staff work areas. 'Follow me' systems are acceptable as an adequate identification of origin and priority of call.

Annunicator type system shall be capable of being read from any point within the ward corridors.

Ward signals shall produce momentary only audible and continuous visual indication, but calls from ablution and other high priority areas shall have continuous audible and visual indication until cancelled. Calls shall be cancelled at the point of origin only.

Each call point shall incorporate a reassurance light to be illuminated when the call is lodged and facilities, either electrically or mechanically, for cancelling the call at the point of origin only. Call points in wet areas shall be splash proof and the mounting plates sealed with a non-hardening anti fungal silicone sealant to prevent the ingress of moisture.

Call buttons shall be of suitable design for easy activation by disabled patients. Bed head services shall be equipped to accept air operated pendants.

The operation of the system shall not be affected by electrical mains power failure.

It is recommended that nurse call buttons be red mushroom head type engraved "Nurse call".

E3.6 Staff Assistance Call

A suitable call system shall be provided to allow calls for staff assistance by staff in such areas as operating suites, recovery areas, intensive and coronary care areas, birth rooms, X-ray rooms, physiotherapy rooms, nurseries and other major treatment or intensive nursing areas as identified in the Statement of Function.

Staff assistance call is also recommended in other areas where staffing levels may be inadequate to handle emergency situations, should they occur.

The system may utilise local or remote audible and visual alarm indication and may be interfaced to a radio frequency paging facility. **Alarm indications shall clearly identify the location of the emergency for which assistance is required. Signals for this system shall be distinctive and not confused with other installed call and alarm systems.**

Call buttons shall be appropriately positioned and of suitable design for easy use in an emergency situation.

Each call point shall incorporate a reassurance light to be illuminated when the call is lodged and facilities, either electrically or mechanically, for cancelling the call at the point of origin only. Call points in wet areas shall be splash proof and the mounting plates sealed with a non-hardening anti fungal silicone sealant to prevent the ingress of moisture.

Staff assistance call and Nurse call facilities may be provided from a single integrated system. Functions for staff assistance call and Nurse call to be clearly identified and distinctive**. Staff assist call**

facilities shall not be interlocked with "Nurse Present" facilities.

The use of "Nurse Present" indication is not recommended.

The operation of the system shall not be affected by electrical mains power failure.

It is recommended that staff assist button be unlabelled blue mushroom head buttons.

E3.7 Patient Entertainment

Provision shall be made for suitable and appropriate patient entertainment facilities at patient bed locations, patient recreation areas and Public / Patient Waiting Areas (eg. television, video, radio, music etc.). It is recommended that where television is provided, it should be permanently mounted in manner and location (wall or ceiling) which does not interfere with patient nursing or disturb adjacent patients.

Trolley mounted television sets are not recommended due to the Occupational Health and Safety implications of obstruction, collision and tripping.

E3.8 Door Security

It is recommended that an effective system of door communication and/or monitoring be provided to allow after hours visitors to be remotely assessed from ward level, or other appropriate area, prior to personal contact. This precaution provides staff security reassurance. Consideration should be given to integration of the door communication system with the radio paging system.

The need for this facility will be determined by the anticipated after hours activity and method of hospital management, as outlined in the **Statement of Function**.

E3.9 Other Systems

Other communications systems as considered necessary and outlined in the **Statement of Function** may include:

- facsimile
- computers (telephone link and networked)
- close circuit television (CCTV) for patient and security
- intercom (press button and hands-free)
- two-way radio (hospital/ambulance, orderly, security)
- satellite communication (education, training)
- high quality audio/visual systems (Speech Therapy, Staff Training etc.)
- duress alarms
- others as appropriate

All are to be installed to manufacturers' recommendations and comply with any regulations, codes, by-laws or statutory requirements.

E3.10 Cabling

Cabling for all voice and data related communications systems shall be installed in a Structured Wiring Format providing cabling infrastructure equal to minimum of Category 5 Unshielded Twisted Pair (UTP) cable. Final cabling installation shall be certified from a suitably qualified authority and shall conform to the manufacturers performance specifications and AS3080 - 1996. In addition the cabling installation shall conform to Australian Standards relating to Electro Magnetic Compatibility (EMC) covering both Emission and Immunity.

E4 LIFTS

When required by building configuration lift services shall provide throughout the life of the facilities:

- *the lift services required for the health care outcomes offered to the patients using the facilities;*
- *compliance with the technical standards required by statutory regulations and these Guidelines;*
- *compliance with the proprietor's duty of care directions on risk containment covering both normal and emergency operating conditions.*

Persons and organisations employed to plan, design, provide and operate the services shall be qualified and have a history of competence with the type of services provided.

Throughout the life of the facility there shall be written records available and providing all the information and instructions needed, by technically competent persons, to understand the basis of design and the intended safe operation of the services provided.

Services should provide the lowest practicable life cycle cost consistent with the risk management criteria set by statute and proprietors directions.

Lifts shall be installed and shall provide safe vertical transport for all conditions of patient and all goods required on each level of the buildings served.

Careful attention shall be given to contingencies of lift break down and mains power failure when assessing the number of lifts and the capacity of emergency power supplies needed for appropriate risk containment.

E4.1 General Requirements

All hospitals with patient facilities (such as bedrooms, dining rooms, recreation rooms, treatment rooms, etc.) or critical services (such as operating, delivery, diagnostic, therapy etc.) located on other than the ground level entrance floor (single level with direct flat or ramp access to open external spaces), shall have one (or more) electric traction or electro-hydraulic lifts. A minimum of two (2) lifts is recommended (but is not mandatory) to ensure continued inter level access in the event of the failure of one lift and/or during regular maintenance requirements when a lift is out of service.

E4.2 Number of Lifts

The total number of lifts to be provided shall be determined by a professional analysis of the anticipated usage. The minimum provision shall be as follows:

E4.2.1 1-60 Patient Beds

At least one (1) hospital type lift shall be installed when 1-60 patient's beds are located on any floor other than the main ground level entrance floor.

E4.2.2 61-200 Patient Beds

At least two (2) hospital type lifts shall be installed when 61-200 patient beds are located on floors other than the main ground level entrance floor, or where the major in-patient services are located on a floor other than those containing patient beds. The lift service may be reduced for those floors that provide only partial in-patient services.

E4.2.3 201-350 Patient Beds

At least three (3) hospital type lifts shall be installed where 201-350 patient beds are located on floors other than the main ground level entrance floor, or where the major in-patient services are located on a floor other than those containing patient beds. The lift service may be reduced for those floors that provide only partial in-patient services.

E4.2.4 Over 350 Patient Beds

For hospitals with more than 350 beds, the number of lifts shall be determined from a professional traffic study of the hospital planning and the expected vertical transportation requirements.

E4.3 Specific Requirements

E4.3.1 General

- **All lift installations shall comply in all respects with the appropriate parts of AS1735: SAA Lift Code and the requirements of the Building Code of Australia.**
- **All lifts shall have the facility to "home" to a nominated exit level.**

- **All lifts shall operate under fire service control in accordance with Clause 29.6 of AS1735 Part 2.**

- **Lift shafts and landing doors shall be fire rated in accordance with the requirements of the Building Code of Australia.**

- **Lift shafts shall have separation in accordance with the requirements of the Building Code of Australia.**

- **Lift lobbies shall have fire and smoke protection in accordance with the requirements of the Building Code of Australia.**

- **Lift call buttons and controls shall be of the type that will not be activated by heat or smoke.**

- **Permanent floor numbers shall be installed on the sight guard and to the rear of each set of landing doors.**

- **Precautions shall be taken to ensure that sound and vibration from hoisting motors, pumps, hydraulic systems and direct drive systems are not transferred into the structure or lift cars.**

- **600mm wide x 6mm thick rubber matting shall be installed to the access side of each controller and lift circuit breaker panel.**

- **As installed wiring diagrams in laminated plastic shall be installed in each lift machine room.**

- **All general-purpose power outlets (GPO's) associated with a lift installation shall be 30 mA residual current device protected. Common lighting and power circuits shall not be used on a lift installation**.

E4.3.2 **Emergency Lifts**

All lifts shall operate under emergency power conditions on the essential supply system during conditions of normal power failure as follows:

- **Each lift shall sequentially start and "home" to the Ground Floor at rated speed open its doors to allow any passengers to alight, and shut down with doors open. The preceding lift must shut down before the next lift starts. All lifts shall illuminate a 'Returning to Ground Floor' indicator on the car operating panel until the lift has arrived and the doors opened. Car lighting and ventilation fan within each lift shall remain operative while on emergency power operation.**

- **During the period the lifts are waiting to operate on emergency power, indication on the car operating panel "Emergency power Starting-Wait" shall illuminate.**

- **Where there is more than one (1) lift installed means shall be provided so that, in the event of any lift failing its assignment, the lift shall be prevented from further attempts to start and the sequence pass on to the next lift.**

- **On completion of the homing assignment:**

- **a minimum of one (1) lift shall continue to run and answer calls on a two button collective system and on fire service control as applicable; and**

- **the other lifts shall be prevented from starting until normal mains power is restored or additional signals are received for a lift to start.**

- **Should an assigned lift fail to start, or having started, break down, means shall be provided to shut down the lift, prevent any further attempt to start and transfer the running assignment to the next lift available. This shall occur on any failure of an assigned or next assigned lift to ensure that one (1) lift is always running on emergency power.**

It is recommended that at least two (2) lifts be capable of this emergency duty (designated

"emergency" lifts) but a minimum of one shall be provided.

Where there is more than one lift in the installation provision shall be incorporated in the lift controls and a signal system installed for additional lifts to be brought onto the emergency power system if additional capacity is available at that time.

Emergency power shall be supplied via the normal mains supply to the lift machine room circuit breaker panel, the sequential starting and emergency power operation of all lifts shall be within the lift control system. An emergency lift shall serve all occupied floors of a building.

E4.3.3 Doors

Lift car doors shall be of the horizontal opening power-operated type.

Door operators shall be adjustable speed and torque type to provide positive, efficient, quiet and smooth door closing.

Each lift car door shall be provided with a passenger protection device of the solid state modulated multi-beam infra red type with extended convergence zone protection into the hallway for greater passenger protection and to reduce the doors being damaged by trolleys and hospital beds.

E4.3.4 Lighting

Lighting in lift cars providing patient transfer where clinical observation is required shall comply with AS1680.2.5.

Two (2) self-contained battery/invertor emergency lights shall be installed in each lift car and one (1) on top of each lift car.

E4.3.5 Traction Lifts

All power and drive systems shall:

- **be of the direct drive solid state type with efficient filtering and electrically isolated from the main supply system.**
- **comply with the Australian EMC framework for radio frequency applications.**

- **comply with AS1044, AS1053 and AS2279.**

It is recommended that the drive systems are variable voltage, variable frequency A/C. type.

E4.3.6 **Special Facilities**

The requirements for persons with disabilities of "AS1735 part 12: Facilities for persons with disabilities" and the Building Code of Australia shall be incorporated in each lift installation.

Speech announcement systems in each lift car for car direction, floor served and emergency messages is recommended.

Two way levelling to ± 6mm is required.

A hands free two way emergency voice communication system shall be provided from each lift car to an emergency 24 hour answering service.

A digital car position indicator shall be installed in each lift car operating panel.

On lifts over two (2) stops direction of travel lanterns shall be installed at each landing.

E4.4 Lift Car Size

Generally, lift car sizes shall be determined by a traffic study which will result in a recommendation for the number, type, speed and occupancy requirements of the lift(s) in the facility, thereby determining the dimensional requirements.

In addition to the above the lift(s) required for transporting patients on beds and **"emergency lift" car(s) shall be capable of accepting the largest hospital bed with emergency equipment attachments and attendants. The minimum clear internal dimensions, measured clear of all obstructions including handrails etc. shall be:**

2280mm long
1600mm wide
2300mm high

and the minimum door clear opening size shall be:

1300mm wide
2100mm high

All hospital lifts, not just the emergency type, are recommended to be equal to, or greater than these minimum sizes. It allows total flexibility of facility use by patients on beds or trolleys.

The maximum clearance between car sill and landing sill shall be no greater than 25mm.

E4.5 Inspections and Tests

Prior to handover each lift shall be inspected and certified by an independent competent person as defined by the regulations which shall not be an employee or associated with the lift manufacturer or installation company.

Regular inspections and tests shall be carried out to ensure the continuous safe operation of the lift(s).

All inspections and tests required by AS1735 Part 10, Worksafe (WA) and the Occupation Health and Safety Regulations shall be carried out.

E5 HYDRAULICS

Hydraulic services shall provide throughout the life of the facilities:

- *the hydraulic services required for the health care outcomes offered to the patients using the facilities;*
- *compliance with the technical standards required by statutory regulations and these Guidelines;*
- *compliance with the proprietor's duty of care directions on risk containment covering both normal and emergency operating conditions.*

Persons and organisations employed to plan, design, provide and operate the services shall be qualified and have a history of competence with the type of services provided.

Throughout the life of the facility there shall be written records available and providing all the information and instructions needed, by technically competent persons, to understand the basis of design and the intended safe operation of the services provided.

Services should provide the lowest practicable life cycle cost consistent with the risk management criteria set by statute and proprietors directions.

Hydraulic services shall provide the water supply, drainage and fuel gas needs of the facility.

E5.1 General

The certification of the Hydraulic Services installation shall be undertaken by a professional Hydraulic services consultant experienced in hospital design and with membership of The Association of Hydraulic Services Consultants Australia Inc. The consultant shall certify all test data and that the design complies with all statutory requirements and these guidelines.

The Hydraulic designer or licensed contractor shall certify that the installation complies with the documentation and the mandatory requirements established or implied with the "Approval to Construct".

The following general provisions shall be satisfied:

- **All hydraulic services shall comply to AS3500 as a minimum standard requirement.**
- **All materials shall be suitable for their intended service.**

- **All brass shall be de-zincification resistant (DR) grade.**

- **Where dew point can be reached, insulation shall be provided to pipework to prevent condensation. Insulation shall have a continuous vapour barrier.**

- **Pipe materials shall be compatible with the nature and temperature of discharge.**

- **All hydraulic services shall be provided with permanent identification to AS1345 in both colour and letter form.**

- **All isolation valves for hydraulic services shall have permanently fixed plastic or brass identification discs. Discs shall be clearly permanently engraved to identify purpose and extent of control.**

- **All polluted water discharges shall be connected to sewer and not stormwater (eg treated heating and cooling water drains in plant rooms.)**

Special Consideration should be given to the following items in the hydraulic services design:

- Reliability of operation

- Ease of maintenance and selection of systems requiring minimum maintenance.

- Prevention of noise transference from hydraulic systems.

- The use of balancing valves on the hot & cold tapware to minimise water and energy use.

- Connection of pump pit controls, water treatment plant and main backflow prevention devices to BMCS (refer to electrical section for Control Panel requirements).

E5.2 Cold Water Supply

The hospital shall be provided with an adequate and safe cold water supply suitable for consumption, ablution and engineering purposes.

Water supply shall be a Grade 1 supply as defined in AS2118 (ie. Dual source of supply) where facilities have a post disaster function. Alternatively, provision shall be made for an emergency water supply. Consideration should be given to installing.

(i) a holding tank with a minimum 100,000 litres. The tank should normally be dry, but will be complete with couplings for filling via a water tanker;

(ii) or a direct water tanker coupling connection. **Both the tank and direct coupling outlets shall have a connection to a booster pump arrangement connected to emergency power supplies.**

Where the reliability of the town water supply is known to be poor, consideration shall be given to providing adequate on-site water storage for domestic and fire fighting purposes. It will also ensure access to a water supply during a natural disaster. See Section B1 and below.

Where the quality of water is known to be poor, consideration shall be given to providing a water treatment/filtration plant to maintain the integrity of hot water equipment, tapware, specialist health equipment, air conditioning plant and pipework.

The water supply system shall be installed in accordance with the requirements of the Water Corporation or Relevant Statutory Authority.

Provision shall be made for the isolation of fixtures, tapware and equipment in logical groupings for service purposes. Records shall be kept of locations of all isolation valves. (See section F Building and Engineering Manuals) **All isolating valves shall be tagged.** Resilient seated ball valves are recommended.

The cold water supply system design shall reflect a capacity statement from the supply authority giving minimum (200kPA) and maximum (650kPa) available pressures at probable simultaneous flow of bathroom and other fixtures, plus full flow of continual operating equipment.

Excessive dead legs (non re circulatory) normally longer than 6 metres shall have flushing points.

Boundary connections shall be fitted with flow and pressure test sampling points.

E5.3 Hot Water Supply

See Section E1.3 Hot Water (Mechanical) and Section E5.4 Backflow prevention.

E5.4 Backflow Prevention For Potable Water Supplies

Backflow prevention of Hot & Cold Water Supplies shall be provided to both existing systems and new installations wherever there is a risk of backflow contamination occurring within the facilities potable water supply.

Backflow prevention shall be provided in accordance with AS3500 Part 1:2 1998, AS 2845 and to the requirements of the relevant statutory authority.

Appendix E2 provides the hazard ratings of the majority of fixtures used within a facility. High and medium level hazard fixtures shall be addressed as the minimum requirement.

Mechanical Backflow Devices: Annual Testing

Where mechanical backflow prevention devices are used they shall be tested every 12 months by a technician with certification recognised by the Water Corporation of WA.

Each individual mechanical device shall be fitted with a tag identifying the due test date.

The responsible engineer for the health care facility shall maintain the test certification certificates for later reference.

E5.5 Identification and Signage: Non Potable Water

All pipework and outlets with non-potable water shall be identified to comply with the relevant Australian Standards.

The non-potable water pipework (hot and cold) shall be clearly identifiable in both exposed and concealed positions. Identification shall comply to Australian Standard AS1345 in both colour and letter form.

Signage on non-potable water supply outlets shall be provided in a visible position over or adjacent to non-potable water supply outlets.

E5.6 Fire Service

The fire service shall be as detailed in the "Building Code of Australia" and the "Health Facility Fire Design Supplement 1993". (Appendix 2) and to the requirements of the Fire & Rescue Services.

Fire hydrants and/or hose reel cabinets shall be bunded and it is recommended that enclosed cabinets incorporate a minimum 50mm diameter floor drain.

E5.7 Sewerage and Sanitary Plumbing

E5.7.1 General

All hospitals shall be provided with an adequate sewerage and sanitary plumbing system, either connected to the town sewerage and drainage scheme, or where specific approval is given, a system conforming to the regulations for Bacteriolytic Treatment of Sewerage, and the Disposal of Effluent and Liquid Waste under the Health Act.

All sewerage and sanitary plumbing systems shall be designed to comply with the requirements of AS3500 and these guidelines.

All polluted water discharges shall be connected to sewer and not stormwater (eg. Treated heating water; cooling water in plant room). Access shall be provided at all changes of direction and junctions for easy maintenance.

Inspection and cleaning facilities shall be positioned external to the building fabric wherever possible. Where this is not possible, inspection and cleaning facilities shall be positioned in ducts or within the wet areas it serves where ever possible.

All plant rooms containing water vessels/substance shall be bunded and sufficient drainage provided to accommodate an uncontrolled leak within the plant room. Tundishes shall be provided adjacent to air conditioning condensate discharge lines (ie. No condensate drains shall run across the top of the plant room floors.

Access pits with appropriate covers to suit loadings are recommended in industrial areas in lieu of cleanouts, with locations adjacent to vehicular access for cleaning/pumping out.

Inspection and cleaning facilities generally shall not be positioned in ceiling spaces.

E5.7.2 Drains and Gullies

Adequate overflow relief gullies shall be provided to minimise back flow into buildings. Floor waste gullies, shower wastes and the like should connect to overflow relief gullies or disconnector gullies, wherever possible.

Drains shall be provided with adequate manholes and clean out points at ground level for efficient and quick maintenance.

Floor waste gully grates and surrounds, industrial floor waste grates and surrounds and cleanouts and surrounds should be brass with heavy-duty chrome plating or stainless steel.

Baths shall have adequate floor drains adjacent to the edge of the bath.

Wastes and drainage cleanouts in vinyl floor areas shall have clamp rings fitted.

Puddle flanges shall be installed to all above ground level pipework penetrations of wet areas. Puddle flanges shall have 3mm diameter drain holes.

E5.7.3 **Sewerage Pumping**

Where pump systems are required for the disposal of sewerage or effluent they shall be installed in duplicate and shall be connected to the hospital emergency power supply or the systems shall incorporate adequate storage to cover any potential disruption in normal power supply (minimum four (4) hour storage). Also refer to clause E5.1.

E5.7.4 **Industrial Waste Discharges**

The treatment of industrial wastes shall be in accordance with the requirements of Water Corporation and other relevant statutory authorities.

Industrial traps built insitu shall be suitable for their purpose and structurally sound.

Where with the mixing of chemicals wastes may result in fume emission, the mixing shall occur within the vented drainage system, not at a common tundish.

Selection of industrial floor wastes, bucket traps, floor grating (kitchens) etc. should take into account occupational health and safety requirements (non-slip).

E5.7.5 **Photographic X-Ray: Silver Discharge Requirements**

All X-Ray process discharges to sewers shall meet with the satisfaction of the Water Corporation of WA. Refer to "Discharge of Photographic Wastes to Sewer – IWPUB27" produced by the Industrial Waste Section of the Water Corporation for further information beyond the information provided below.

For processing where the total quantity of silver in the effluent from a site averages less than two (2) grams per day averaged over a full seven day week, the silver bearing chemical wastes may be discharged directly and without treatment to sewer.

For film processing where the silver content of the effluent from a site averages two (2) or more grams per day, silver recovery shall be undertaken or wastes collected for transport by a permitted waste transporter.

The silver recovery system shall reduce the silver concentration in the effluent to a maximum of fifty milligrams of silver per litre of effluent (50mg/L), at the entry to the main sewer. If a steel wool iron exchange system is incorporated into the system, then an iron removal system shall also be used so that iron concentration does not increase above the levels existing in the untreated effluent by more than 25mg/L of iron.

For new installations, manufacturers and/or distributors of silver recovery systems shall provide a warranty that the effluent quantity out of the system meets the limit of 50mg/L of silver and must specify the operating conditions under which the warranty will apply.

The maximum silver discharge from a single site into the sewer main shall be limited to one hundred and forty grams per day (140g/day).

Consideration shall be given to the risks associated with the effects of corrosion on copper drainage piping due to silver and other waste discharges.

Water Wash Requirements

A wash water limiter or control system shall be used on any water wash processor, so that water is only used when film is being processed, and also,

so that water usage is reduced to the minimum levels sufficient for adequate washing.

Testing Requirements

For all sites where the total silver discharge exceeds the two (2) grams per day a testing program shall be initiated.

All silver recovery systems shall be tested every 3 months by collecting and submitting a discharge effluent sample to a NATA registered laboratory for analysis of silver. The sample shall be collected from the outlet pipe immediately after the silver recovery system and the sample shall be analysed for silver according to specified sewerage authority procedures. Any system that is discharging more than 50mg/L of silver shall be upgraded or replaced.

Results shall be kept on-site for examination by sewerage authorities when requested.

Each fixer bath is to be tested with approved test strips for pH and silver content at least once per week to identify cases of over-replenishment. Chemical supply companies will provide a list of recommended silver content for comparison.

E5.8 Storm Water

The stormwater drainage systems shall be designed generally in accordance with AS3500 part 3, and chapter 2 of the Institute of Engineers Australia publication "Australian Rainfall and Runoff" 1987 ed.

Stormwater from buildings and paved areas shall be disposed of in a manner acceptable to the Local Government Authority.

Roof Drainage systems shall be designed to handle a 1:100 year intensity based on available Bureau of Meteorology statistics and incorporate separate overflow relief discharge to minimise roof gutter overflow and consequent building damage and service interruptions. Consideration **shall** also be given to ways of preventing leaf build up in gutters, which in turn has the potential for building damage and service interruption, again due to gutter overflow.

Consideration **shall** be given to the use of hail guards and the method of connection of rain water pipe (RWP) connections to gutters to allow for expansion/contraction.

Paving areas shall be designed to the intensities nominated in AS3500.

Rainwater pipes shall incorporate relief grates at connection between RWP and storm water drain. All RWPs to have cleaning access at base. Consideration **shall** be given to storm water and soak well drainage systems also incorporating relief grates, for air and stormwater relief.

Storm water drainage grates shall be cross-webbed in car parks and paths and not be located in wheel chair access areas or trolley areas.

Channel grates for road or footpath cross over drains shall be of lateral or longitudinal bar design.

Consideration **shall** be given for pollutant traps to be installed prior to connection to the authority drainage system.

All storm water drainage systems should be gravity systems and pumping used only where gravity connection cannot be obtained.

Pumps, if required, shall be as previously specified for sewer pumps.

E5.9 Natural Gas/LPG Gas

The gas service shall be designed in accordance with the Gas Installation Code A6601/1992 and relevant statutory authority requirements.

Gas services shall be designed to operate from delivery point to gas outlet at the "prescribed pressure".

Where over prescribed pressure is required to operate equipment, approval shall be obtained from the statutory authority and the Health Department of WA and regulators installed to suit the installation.

Where the facility has a post-disaster function or requires gas/heating services for sustaining human life, provision shall be made for the continuity of gas supply. This can be achieved by duplication of the gas supply provided it is a totally independent supply or dual fuel firing of critical plant.

Where the possibility of Natural Gas being available at a future date, LPG gas lines should be sized for Natural Gas installation.

Kitchens shall be provided with gas isolation valve(s) appropriately labelled at the main entry point for isolation on exit in event of fire.

E5.10 Fixtures and Tapware

Fixtures and tapware shall be suitable for their purpose and generally in accordance with the Health Department of WA Specification Notes.

E5.11 Earthquake Loads

All equipment, pipework, tanks, etc covered in this section shall be installed in such a way that it satisfies the requirements of AS1170-4 Section 5 - Requirements for Non-Structural Components. An Engineer satisfying the requirements of Section E6.1 shall design all such fixings.

E6 STRUCTURAL ENGINEERING

Structures shall provide throughout the life of the facilities:

- *compliance with the technical standards required by statutory regulations and these Guidelines;*
- *compliance with the proprietor's duty of care directions on risk containment covering both normal and emergency operating conditions.*

Persons and organisations employed to plan, design, provide and operate the services shall be qualified and have a history of competence with the type of services provided.

Throughout the life of the facility there shall be written records available and providing all the information and instructions needed, by technically competent persons, to understand the basis of design and the intended safe operation of the services provided.

E6.1 General

The certification of the structural engineering installation shall be undertaken by a professional Engineer with Corporate Membership of the Institution of Engineers, Australia, relevant NPER - 3 Registration, and experience in hospital design. The professional Engineer shall certify all test data and that the design complies with all statutory requirements and these guidelines.

The Commissioner may require an independent check of the structural design if deemed necessary. The structural check will be coordinated by the Health Department of WA as part of the "Approval to Construct" process.

Design calculations etc. may be requested by the commissioned independent consultant to verify the structural adequacy, **and shall be made available as required. Photostat copies of calculations are acceptable provided they are legible. Standards, where relevant, shall form the basis of any structural design for a Health Care building.**

E6.1.1 <u>Structural Drawings</u>

The structural drawings shall clearly and completely define the structural components of the installation, these should preferably be produced on CADD format compatible with HDWA 'CAD Drafting Guidelines'.

Included on the drawings shall be a set of general notes laying out:

- the design codes used in the design;
- the design live loading including service loads;
- the design wind loading (ultimate) and terrain category;
- any imposed construction/erection loadings, eg. earth moving equipment;
- foundation design parameters;
- required concrete strength and cover to reinforcement and slump;
- welding categories; and
- corrosion protection treatment.

Provided in the specification shall be any other details necessary to define the action and performance of the structure and its interaction with the environment.

It is not required to duplicate design/performance parameters on the drawings and in the specification. Where design/construction loadings, and/or concrete parameters, and/or welding categories, and/or corrosion protection treatments are different for different parts of the work - state the required values on the drawings of the different parts rather than in the general notes.

E6.1.2 As Constructed Structural Documents

At the completion of construction, the builder shall provide:

a) One full set of as-constructed drawings, preferably negatives and CAD disk completely defining the structure as built, incorporating all changes and amendments to the original drawings.

b) Certified calculations by a qualified practising Structural Engineer, as defined in E6.1 General, of any changes or amendments to the original design.

E6.2 Design Loads

E6.2.1 Wind Loads - Loads in Cyclonic Areas

Facilities shall be designed and constructed to withstand the wind loads required by the force assumptions of AS1170.2. Wind loads shall be

based on basic wind gust velocities as defined in Section 3.2 of AS1170.2 and a structural importance multiplier Mi=1.1.

Buildings in regions C or D shall comply with the following:

A minimum health facility building design in Region "C" or "D" shall assume not greater than a terrain category of 2½ with velocity multipliers equal to the average of those given in Table 3.2.5.2 for terrain categories 2 and 3.

Note: This is used because the terrain roughness covered in category 3 may be subject to deterioration in high winds.

- In determining internal pressures, all window openings glazed or unglazed are regarded as potential dominant openings unless suitable protection against debris penetration is provided.

- External doors are assumed potential dominant openings unless doors and door fixings are shown adequate to resist the wind loading.

- An opening can be assumed to have adequate protection if shown capable of resisting a 4kg mass with a 100 x 50mm cross section striking at any angle with a velocity of 15 m/s.

The parts of the health facility building accommodating patients, accident and emergency and operating theatres shall be strengthened areas (ie. strengthening an area to increase its potential to provide debris protection) for use during cyclonic conditions.

They shall comply with the following minimum construction criteria:

- Reinforced 200 masonry block walls and core filled in every core; or timber or steel framed walls clad internally and externally with 18mm thick structural ply, screw fixed at 150 centres to studs, plates and noggings.

- Ceiling battens effectively strapped to truss bottom chords or ceiling joists, and 18mm thick structural ply, screw fixed to ceiling battens at 150 centres.

- All doors serving the strengthened area shall be internal, solid core, inward opening with effective fixings fitted top and bottom.

- All windows shall be protected with debris screens.

E6.2.2 **Earthquake Forces**

Facilities shall be designed and constructed to withstand the force assumptions of AS1170.4. All structures shall be designed as Type III using an Importance Factor of 1.25. Particular attention shall be given to the design of non-structural elements where loads are likely to be imposed in accordance with Section 5 (Requirements for Non-structural Components). The relevant services consultant shall be responsible for specifying or obtaining compliance with these provisions by engaging the services of a competent structural engineer as described in E6.1. In order to prevent collapse and to achieve the lateral and vertical deflections required in the equipment manufacturer's specifications. The elements carrying the dynamic load in both directions shall be braced or tied down.

In multi-storey buildings that are sub-divided into separate units by seismic joints, each unit shall be provided with an exit stairway to permit evacuation without crossing the seismic joints. Construction of all seismic joints shall be designed to minimise the passage of fire and/or smoke horizontally or vertically.

E6.2.3 **Live Loads**

All structural loads shall be evaluated in accordance with AS1170.1 and 'Private Hospitals Guidelines'.

The structure shall be designed to be capable of sustaining the design loads listed in the Loading Code AS1170 unless higher loads are required in the table below. Actual loads shall be determined by the Design Engineer but shall not be less than those nominated.

Allowance shall be made for additional loads imposed by walls, other special equipment, furniture, etc. The minimum allowance is 0.5 kPa for floors and 0.1 kPa for roofs.

Further allowance shall be made for access ways, aisles or spaces where heavy equipment loads may be moved or located during construction, installation or commissioning.

LIVE LOADS TABLE		
Area	**Element**	**Minimum Loading Condition**
Minimum floor load.	Floor.	3.0 kPa UDL
All Plant Rooms, Loading Dock, Waste Holding areas, Bulk Stores, Film Store.	Floor.	7.5 kPa UDL
Loading Area, Medical Records.	Floor.	10.0 kPa UDL
All other stores, Kitchen, Scullery, Catering, Dirty Utility, CSSU.	Floor.	5.0 kPa UDL
Dairy and Bulk Food Cool Rooms.	Floor	15.0 kPa
Medical Imaging, Ultrasound Unit, Operating Theatres.	Floor.	5.0 kPa
Medical Imaging, Ultrasound Unit.	Underside of slab over/ceiling structure.	One moving load of 10kN anywhere on the ceiling structure.
Operating Theatres.	Underside of slab over/ceiling structure.	Minimum of 8 loads of 5kN each located anywhere in the ceiling.

Areas designed for compactus loadings shall be clearly identified on the drawings. Final locations of these areas shall be determined during the planning of the building.

E6.2.4 **Dead Loads and Other Loads (eg. temperature)**

These loads shall be assessed in accordance with AS1170.1.

E6.3 Footings

E6.3.1 Extent of Element

The sub structure includes the building footings and any basement areas of the building.

E6.3.2 Geotechnical

A geotechnical site investigation shall be performed to assess sub surface conditions at the site unless there is adequate site specific data available from previous investigations or local authorities. The investigation shall provide sufficient information to provide recommendations on:

- site classification in accordance with AS2870.2 "Residential Slabs and Footings";
- suitable footing types, geotechnical design parameters and estimated settlement characteristics. The consequences of any expansive clay soils must also be evaluated;
- excavation characteristics, particularly with regard to occurrence of any strong rock and need for dewatering;
- site preparation requirements, including any procedures for proof rolling, ground water control, and excavation of unsuitable soil;
- suitability of on-site materials for use as fill and minimum compaction requirements;
- site preparation requirements and CBR design values for car parking areas and roads;
- design requirements for temporary and permanent excavations and earth pressures behind retaining walls; and
- earthquake site factor in accordance with AS1170.4, including basis of selection.

The type and scope of field investigation techniques used shall take account of the area and nature of the development, anticipated conditions at the site and general practices in the area.

Any fieldwork shall include determination of ground water level if it is within a depth which will influence the design or construction.

The fieldwork shall be supervised by a suitably experienced geotechnical engineer or engineering geologist and the work shall be performed in accordance with AS1726, "Site Investigation Code". If clays are encountered then laboratory testing is required to determine their expansive characteristics in accordance with AS2870. Depending on the nature of development, laboratory testing may also be required to evaluate the strength and compressibility of clayey soils.

A report shall be prepared which summarises the results of the field and laboratory studies and presents the recommendations on the geotechnical aspects of the development.

E6.3.3 **Environmental Requirements**

(i) Acoustic

Where appropriate and in conjunction with the specialist environmental consultant, the building sub-structure shall be designed to ensure that potential noise and vibration which is outside acceptable standards (refer 'Private Hospitals Guidelines Section C10 - Environmental Impact') is not transmitted to the structure.

(ii) Moisture

In conjunction with the Architect, the building sub-structure shall be designed to ensure that no moisture enters any parts of the building, unless it is part of the design solution and is acceptable to the Health Department of WA.

E6.3.4 **Structural Resistance and Durability**

The sub-structure shall be designed to transmit the building loads to soil/rock of a suitable bearing capacity, in accordance with the requirements of:

- AS1170 SAA Loading Code(s)
- AS3600 SAA Concrete Code
- AS1289 Methods of Testing Soils for Engineering Purposes
- AS2159 Piling Code

The structure shall be designed to tolerate movements in the foundations caused by moisture variations settlements etc. and comply with the relative differential movement limits as in AS2870.2.

The sub-structure shall be designed to provide a projected building life at least equal to that of the building structure.

E6.3.5 **Maintenance**

The sub-structure shall permit the necessary access for the performance of routine maintenance of sub-soil drainage systems and any other services located within this zone. The sub-structure system itself shall require no maintenance.

E6.4 Super Structure

E6.4.1 **Structural Frame - Extent of Element**

The structural frame shall include but not be limited to; columns, upper floors, roof structures, support beams and staircases.

The structure includes the total structural form of the building, the structural core and all other components which contribute to the function of sustaining and transferring to the foundations all forces and moments arising from all vertical and horizontal loadings on the building.

E6.4.2 **Environmental Requirements - Acoustic**

Acoustic Airborne Sound Transmission: the structural system *shall* be designed in conjunction with the Specialist Environmental Consultant so as not to impair the required acoustic isolation between rooms in the building, refer Section C10, Environmental Input, of Guidelines.

E6.4.3 **Structural Resistance and Durability**

The structure shall be designed in accordance with the requirements of:

- AS1170 SAA Loading Codes (all parts)
- AS3600 SAA Concrete Codes
- AS4100 Steel Structures
- AS1720 Timber Code
- AS3700 Masonry Code

and the codes referenced therein.

It is recommended that the structure be designed to provide a projected building life equivalent to either the anticipated useful economic life of the facility, or 50 years, whichever is the greater

E6.4.4 **Deflections**

The structure shall be designed to avoid excessive deflections, vibrations or resonance that may affect the serviceability of the structure, services, Operating and Procedure Room light fittings, applied finishes or any secondary construction such as partition walls.

Notwithstanding compliance with the following table, the structure shall ensure that deflections are visually acceptable and can accommodate equipment/services installed within required tolerances.

The following specific criteria shall be complied with (Deflections below horizontal, or straight line between supports in case of sloping member).

DEFLECTION TABLE	
Structural Element	Maximum Deflection
Supporting Face Brick Walls	span/1000*
Supporting Rendered Brick Walls	span/1200*
Floors not supporting brittle elements	limit to provide adequate serviceability of the brittle element
Stud walls under lateral loading	span/500
Roof members under: a) Dead Load (G) + b) Live Load (4 sQ) + c) Wind Load (Ws) +	 span/360 span/240 span/150
Roof members at eaves	less than the smaller of floor to eaves height/250 and frame spacing/200

* Maximum deflections after construction of walls.

\+ Load combinations for serviceability limit states shall be as set out in AS1170.1.

E6.4.5 **Health and Safety**

Fire safety: The structural system shall be designed in such a way as to contribute to the fire safety of the building and its occupants. The structure shall be designed to have the necessary fire resistance levels as required by the Building Code of Australia.

Access for maintenance purposes: The Structural Engineer shall liaise with the Architect and Specialist Services Consultants to ensure that adequate provision is made to facilitate safe access for maintenance purposes in accordance with current Occupational Health and Safety legislation.

Buildability: The structural documentation shall reflect the requirements of the Occupational Safety and Health Regulations.

E6.4.6 **Planning Considerations**

Location of structural elements: the columns, structural walls and braced frames of the structural system, shall preferably not intrude into the floor space and shall bear a regular geometric relationship to the planning grid. If the structural components are required at the core, they shall preferably be located within the body of the core and, if visible, have a regular geometric relationship to the planning grid.

If the structural components are required within typical building spaces they shall preferably be located with their centre lines at the centre of a planning module or in a position bearing a regular geometric relationship to the planning grid. Columns and structural bays within building space shall preferably be located in such a manner as to optimise structural sizes and not impede planning and flexibility of the building space.

The structural system shall preferably require no changes or alterations when any other elements are relocated. Load bearing partitions shall not be allowed except where permitted by the Health Department of WA.

The structural system adopted shall provide adequate space for services.

E6.4.7 **Joints in Structural and Masonry Walls**

Control joints shall be constructed to minimise the effects of linear shrinkage of concrete and masonry, temperature effects and movement of the founding soils. Control joints shall be to the geometry of the slabs.

E6.5 Modifications and Alterations To Existing Structures

The existing structure shall be reviewed and a report provided to the Health Department of WA on its current condition and compliance with the requirements of these Guidelines.

The structure in the Alterations and Additions area shall be upgraded to comply with these requirements unless approval is granted for partial modification in accordance with Clause A6 and B12 of these Guidelines.

PRIVATE HOSPITAL GUIDELINES

F BUILDING AND ENGINEERING FACILITIES MANAGEMENT
20 JULY 1999

F. BUILDING AND ENGINEERING FACILITIES MANAGEMENT

F1 GENERAL

Facilities shall be managed, operated, maintained and developed to:

- **achieve outcomes compliant with the design and performance standards set by these Guidelines**
- **contain risks within parameters complying with duty of care requirements .**

The proprietor shall develop a risk containment policy for the health service based on:

- **expert advice;**
- **the Statement of Function as defined in Section A3;**
- **a health delivery risk assessment;**
- **critical to human life requirements;**
- **public liability risk assessment; and**
- **a facility risk assessment.**

The policy shall:

- **be defined in writing;**
- **be supplied to all parties with a part in its implementation;**
- **be reviewed and adjusted when ever facilities are altered or functional application is changed;**
- **cover normal and emergency operation and conditions which may arise during maintenance and testing;**
- **be incorporated in work instructions;**
- **consider employees, contractors, suppliers, patients, the public, goods, equipment and fixed assets.**

Parties with a part in risk containment and mitigation shall:

- **be trained and rehearsed for their roles;**
- **be consulted over policy development.**

There shall be a person or organisation appointed to manage the facilities to achieve above criteria. That person or organisation shall:

- **have defined delegation of authority and responsibility;**
- **have written direction on the facilities risk containment measures required by the proprietor;**
- **be competent to assess the technical performance of the facilities;**
- **be required to report, in writing to the proprietor, any deficiencies that are beyond the facilities manager's competence or authority to keep within compliance standards.**

Persons or organisations employed to operate, maintain or develop facilities shall:

- **have a history of competence to do the work assigned;**
- **have access to the facility records;**
- **have direction to supply any information needed to keep the records updated to record any changes arising from the work done;**
- **be given written directions defining risk containment measures needed for compliance with the proprietor's risk containment policy.**

Definitions:

Facilities management: anything to do with managing the facilities to deliver the health care outcomes intended.

Facilities operation: anything to do with the routine and or emergency operation of the buildings, their services and equipment, including but not limited to: health and safety of users, economy of operation, control of access to starting and stopping and adjustment of control settings.

Facilities maintenance: everything to do with maintaining facilities to provide safe reliable performance and required standards of presentation.

Facilities development: everything required to extend or alter the facilities to keep compliance with statutory standards for the current use of the facility.

Proprietor's risk containment policy: the policy set by the proprietor for containing risks within defined requirements to meet the proprietor's assessment of duty of care responsibilities. Refer above

Health delivery risk: A risk to the successful outcome of intended patient service and care.

Facility risk: A risk to the safety of person(s) or proper performance from property arising from failing to provide, operate, maintain or develop physical facilities with appropriate duty of care.

F2 RECORDS

A current and accurate set of records in the form of drawings and manuals shall be created and maintained, and shall contain all information required for the effective operation, maintenance and upgrade of the facility throughout its lifetime.

The records shall be held in an accessible location at the hospital for reference by maintenance personnel, fire authorities and other parties having need to reference this information.

Manuals and drawings shall together provide the complete record of information required.

A copy of the records shall be maintained at a separate location as a precaution against the working record being destroyed.

The records shall be made available to the Commissioner of Health, as required, to enable an accurate assessment of any proposed work, in particular, remodelling or additions, as part of the licensing process. All borrowed documents will be returned.

The records described shall be available at the time of seeking "Approval to Occupy" from the Commissioner of Health, all as defined in the "Approval to Occupy Checklist".

Records shall include the history of access to and maintenance of each facility element with a bearing on containing risks or providing an environment needed for the health care objectives of the health service.

It is recommended, for ease of copying and maintenance, that records be established in electronic format.

F3 AS CONSTRUCTED DRAWINGS

The drawings shall include but not be limited:

- **architectural plans, elevations and sections sufficient to show: locations, identification and use of all rooms, materials of construction of the building, locations and ratings of fire and smoke compartments;**
- **communications system plans and circuit details for: telephone, data, security and call systems;**
- **electrical plans, details and circuit diagrams sufficient to show: main and sub main cable routes and capacities; switchboard locations and circuit details and ratings; earthing systems; cardiac protected circuit details; light and power layouts;**
    - **electrical schedules, copies of which shall be mounted at each switchboard, identifying the source of supply of the**

switchboard and the rating and purpose of each circuit;

- **fire plans and circuit diagrams sufficient to show: locations of fire detectors, fire sprinklers (if fitted), fire hydrants, hose reels, fire extinguishers: locations and circuits of fire communication systems; circuits of fire control panels;**

- **hydraulic plans, details and circuit diagrams sufficient to show: the location of all equipment; the route and capacity parameters of each service** (eg, cold water, hot water, sanitary drainage, treated water, storm water)**; the location of controls, and isolating valves;**

- **mechanical plans, details and circuit diagrams sufficient to show: the location of all equipment** (eg, autoclaves, kitchen equipment, pan sanitisers, laundry equipment)**; the route and capacity parameters of each service** (eg, air conditioning, exhaust ventilation, heating, steam, medical gas)**; the air balance of ventilation systems; the location of controls, isolating valves and fire dampers;**

- **structural plans, sections, details and schedules recording details of structural construction and the basis of the structural design.**

  The position of all buried and concealed services shall be included, with particular reference to isolating valves and cleaning and service points.

  The drawings and schedules shall be accurately maintained throughout the life of the facility. All changes shall be incorporated.

F4 EQUIPMENT AND SYSTEMS MANUALS

Manuals shall provide all information needed for the correct installation, operation and maintenance of installed services and equipment and shall:

- **record performance parameters of each service and equipment items;**

- **record commissioning and testing data;**

- **record all control set points;**

- **list sources of supply of components;**

- **include parts lists;**

- **include or cross reference risk containment requirements.**

F5 MAINTENANCE OF INSTALLATION

Facilities shall be regularly inspected and maintained to ensure that they shall at all times operate reliably, safely and with required risk containment.

Wherever Australian Standards cover the maintenance of facilities elements, maintenance shall be in accordance with those standards. Particular attention should be given to:

AS1670	**"Automatic Fire Alarm Installations"; and**
AS2293 Part 2	**"Emergency Evacuation Lighting in Buildings, Inspection and Maintenance".**
AS2676	**"Installation and Maintenance of Batteries in Buildings".**
AS3666 Part 2	**"Air Handling and Water Systems of Buildings, Microbial Control, Operation and Maintenance".**

There shall be arrangements in place for a maintenance response to facilities breakdowns, which meets the requirements of the proprietors risk containment policy.

G. FACILITY PLANNING REQUIREMENTS

G1 WHOLE FACILITY

Refer to A3 - <u>Statement of Function</u>

The following sections detail the specific spatial, room and function requirements of the various types of Nursing Units, specialist Departments and support areas. When using this section of the Guidelines the role of the whole facility **(refer Statement of Function)** is to be constantly referred to so that duplication or unnecessary provision of spaces and functions does not occur.

The following sections are not to be read in isolation as they contain only part of the total package of information. They are to be read in conjunction with the other appropriate parts of this document, ie. Construction - Standards and Methods; Equipment; Facility Engineering Services and the relevant sections of Facility Planning Requirements.

G1.1 General

The construction standards, finishes, minimum corridor widths, ceiling heights, door sizes, hardware requirements and window details etc. are provided in Sections B2 and B3 - "Construction and Design Standards" and "Finishes" respectively.

Functional room areas are affected by the location of doors and the dimensions of rooms, therefore, minimum recommended floor areas, where given, are notional and must be used as a starting point. Where neither areas nor dimensions are given, common sense and good designer skills are to be used to convert the following functional requirements into floor areas.

Where minimum dimensions of rooms are considered essential, they have been included.

G1.2 Swing Beds

For flexibility and added options for utilisation it may be desirable to include provisions for "swing beds" which might be a single bed, a group of beds or an entire unit that may be quickly converted from one category of use to another. An example might be long-stay beds which may be converted to acute beds. When this concept is included, care ***shall*** be taken to include facility requirements for all categories that are intended. Facility design for swing beds will often require additional corridor doors and provision for switching nurses call operation from one nurses' station to another. Security is also an issue, eg General/Medical to Paediatric.

G1.3 Department Sizes

Department sizes will depend upon the perceived facility role **(Statement of Function)** and organisation of services within the hospital. Some functions may be combined or shared provided that the layout does not compromise safety standards and medical and nursing practices.

G1.4 Infection Control

All areas of the facility *shall* be designed, constructed, furnished and equipped in keeping with the principles of infection control.

Infection control involves the prevention of possible spread of infection by the minimisation of transfer of micro-organisms from person to person.

A number of strategies contribute to the control of infection, such as hand washing, careful aseptic technique and the observance of "universal precautions". The "Guidelines for Infection Control in Non-Teaching Health Care Establishments" published by the Health Department of W.A. Disease Control Branch is applicable to all private health care facilities, and should be consulted for more detail on infection control specifics.

By far the most important of the infection control strategies is effective hand washing. Hand washing facilities *shall* be installed in all patient care areas, and also in all areas where careful attention to hygiene is essential, such as kitchens, laundries, pharmacies, laboratories, etc, and staff amenities areas, such as bathrooms, toilets and change rooms. Hand basins for staff use *shall* be equipped with lever action taps to allow hands free operation, soap dispensers and hand drying. Refer to B2.14 - Soap Dispensing, B2.15 Hand Drying, G - Facility Planning (staff, patient and clinical hand washing).

Other facets of construction and fit-out which contribute to effective infection control are covered in various sections of these Guidelines. They include ventilation, floor coverings, waste management, provision for ease of cleaning, provision for sterilisation and disinfection of equipment and instruments, and provision for the isolation of infectious patients as required.

G2 INPATIENT CARE

G2.1 Acute Nursing Unit

(General, Surgical, Maternity, Paediatric)

G2.1.1 **General (Acute Nursing Unit) - Size**

The number of beds in an acute nursing unit should not exceed 35, although the preferred maximum is 30.

Note that Maternity and Paediatric are more likely to be 20-25 bed nursing units.

At least 25 percent of the total bed complement *shall* be located in single bed rooms, each with a private ensuite.

Multiples and part multiples of this requirement go to make up a general hospital facility, eg. 2 x 30 bed nursing units make up a 60 bed hospital. Support facilities are to be duplicated for each nursing unit except where it is functionally feasible to combine the total area requirements to provide common rooms and spaces.

G2.1.2 **Patient Rooms/Ensuites**

(a) **Maximum Room Capacity**

Maximum room capacity *shall* be 4 patients.

(b) **Dimensions**

Minimum dimensions exclusive of ensuites, built-in robes, alcoves, entrance lobbies, floor mounted mechanical equipment etc *shall* be:

- **Single Bed rooms - 3450mm wide x 3600mm long.**
- **Two Bed rooms - 3450mm wide x 5600mm long**
- **Four Bed rooms - 6100mm wide x 5600mm long**

The above figures are based on overall bed dimensions (buffer to buffer) of 2250mm long x 1050 wide (Joyce Centenary).

Minor encroachments including columns and hand basins (as required) THAT DO NOT INTERFERE WITH FUNCTIONS may be ignored when determining space requirements.

(c) **Bed Spacing/Clearances**

- **In multi-bed rooms, the minimum distance between bed centre lines *shall* be 2400mm.**

- **For occupational health reasons, the minimum spacing between beds *shall* be 1200mm.**

- **In multi-bed rooms, a clearance of 1200mm *shall* be available at the foot of each bed to permit the passage of equipment and beds.**

Bed dimensions become a critical consideration in ascertaining final room sizes. The dimensions noted herein are intended as recognised minimums and do not prohibit use of larger rooms where required for needs and functions.

Paediatric bed rooms which are set up with cots may have reduced bed centres, eg. 2100mm, but consideration must be given to the spatial needs of attendant relatives. The 2400mm centre line is still recommended. It also allows flexibility of use of the room eg. "swing bed" use for adult acute service. Additional floor area should also be considered for the children to play within the room.

(d) **Functions**

The room will provide for the following functions:

- medical and nursing care
- therapeutic and clinical attention
- patient to read, write, relax and eat meals
- nurse call
- patient to view TV (optional)
- patient to use radio/music system optional)

- patient to use telephone (optional)
- storage of clothing and personal effects
- receiving of visitors
- patient privacy (bed screens)
- waste disposal

(e) **Observation Room**

Acute patient rooms set up as Observation Rooms, usually adjacent to Nurses Stations, *shall* be increased in width by 300mm. This provides for additional space for monitoring and other special equipment and additional staff support as required. These rooms generally occur in smaller hospitals where an Intensive Care or Isolation Unit may not be warranted.

The observation room ***shall*** be provided with a viewing panel from the Nurses Station. The panel will be provided with visual privacy control (blinds or curtains) to both the room and nurses station sides.

The room *shall* have direct access to an ensuite.

(f) **Maternity/Isolation**

In lieu of the provision of a dedicated isolated nursery, at least one acute patient room in the maternity nursing unit *shall* be set up as a Maternity/Isolation Room. In most instances it will function as a normal acute patient bedroom. **The room *shall* be increased in size to allow for the additional floor area required to provide a baby washing/changing facility within the room.** Details and location of the washing/changing unit will determine the dimension changes.

The room *shall* have direct access to a dedicated ensuite.

(g) **Windows**

Each acute patient room *shall* have a window in accordance with Section B2.6.

(h) **Nurse Call**

A nurse call system *shall* be provided in accordance with Section E3.4.

(i) **Patient Handwashing**

Patient handwashing facilities *shall* be provided in each patient room. Where the bedroom has direct access to an ensuite, the handwashing facility in the patient room may be omitted.

(j) **Ensuite/Toilet and Shower**

Refer to the "Glossary of Terms" (A11) for the definition of "Ensuite" as applicable to these guidelines.

Each patient *shall* have access to an ensuite room or separate toilet and shower room. The rooms will provide shower, water closet, handwash and grooming facilities. It is preferable, but not mandatory, that the ensuites are accessible directly from the patient rooms and not via the general corridor area.

Refer to B2.10 - Grip Rails - Design Detail.

One toilet room or ensuite *shall* serve no more than 4 beds. Grip bars *shall* be provided in the shower and water closet areas in accordance with AS 1428.1. The minimum dimensions of an ensuite are variable, but should equate to the useable floor area of an 1800mm x 1900mm room with a disabled shower dimension of 1000 x 1000 (corner location, no fixed panels, access to two sides), basin on the 1800 wall, disabled W.C. on the 1900 wall, and an outward opening door. Where, for instance, the shower is enclosed on 3 sides, consideration should be given to increasing the width of the shower recess. In addition, consideration must also be given to the provision of reasonable approach space to basins and water closets by patients experiencing various levels of difficulty.

Note that this section calls for a "disabled W.C." This means that the height of the pan ***shall*** be 460 mm (for ease of dismount) as for AS 1428.1, but given that these Ensuites are not specifically set up for use by wheelchair dependant patients (see k.), then the rear wall to front lip dimension can be reduced to 650mm. Consideration must be given though to dimensions and configuration (cistern impact) to ensure commode access to pan.

Location of plumbing fittings, door position and swing, room truncation and configuration, etc. are all critical to the room's performance.

Where paediatric patients are catered for, the heights of fittings and fixtures *shall* be reduced accordingly to suit the average anthropometric requirements of children.

(k) **Disabled Ensuite**

Refer to B6- Handicapped Access

A minimum of one ensuite for each 30/35 bed nursing unit *shall* be designed in accordance with the requirements of AS 1428.1, "Design for Access and Mobility". Consideration should be given to locating this ensuite in a position where multiple users can access it, ie. entry from a corridor. It is conceded that in a private hospital, all or most ensuites are generally accessed directly from the patient bedrooms, and this arrangement in relation to the disabled ensuite is also considered acceptable.

Height of W.C. pan is described in G2.1.2(j).

Note: The argument that the disabled can use the fully assisted showers, toilets and bathrooms is not valid as the aim, in this enlightened day and age, is not to alienate or treat differently those who have to contend with additional physical disabilities. Of course, the fully assisted facilities are still available for use by the disabled as required.

(l) **Patients' Belongings Store**

Each patient *shall* have within his/her room a dedicated wardrobe and bedside locker. The wardrobe must be suitable for hanging full length garments. The bedside locker is used for storing smaller personal effects, displaying of flowers, locating the telephone, shelf for water jug etc.
The bedside locker *shall* be fitted with a lockable drawer for patient use. The wardrobe and locker may be combined, and be fixed or mobile.

(m) **Visual Privacy**

In multiple bed rooms, visual privacy *shall* be provided for each patient. Movable curtains are recommended. The design for privacy ***shall not*** restrict patient access to the entrance, ensuite, toilet, handwashing functions (if included).

(n) **Partial Blackout**

Each room *shall* be provided with partial blackout facilities (blinds or lined curtains) for daytime sleeping.

G2.1.3 **Service Areas**

Provision for the services noted below *shall* be located in or be readily available to each Nursing Unit. The size and location of each service area will depend upon the numbers and types of beds served.

Identifiable spaces are required for each of the indicated functions. Each service may be arranged and located to serve more than one Nursing Unit, but unless otherwise noted, at least one such service area *shall* be provided on each nursing floor. Where the words "room" or "office" are used, a separate, enclosed space for the one named function is intended; otherwise, the described area may be a specific space in another room or common area.

(a) **Nurses Station or Administrative Centre**

Centrally located within the Nursing Unit.

This area will provide for:

- bench level activities;
- reception of visitors;
- receiving flowers and gifts;
- storage of files and stationery;
- use of various communications systems;
- use of computer terminal (optional);
- displaying of notices;
- storage of current medical records;
- writing of notes, charting;
- storage of resuscitation equipment and other mobile equipment (not necessarily within but certainly near);
- viewing of X-rays (optional); and
- paper waste disposal.

Note that nursing staff may consider a separate (shared) office for the Nurse Manager and Clinical Nurse Specialist (if one appointed) is necessary. The facility needs of the ward clerk (if one intended) ***shall*** also be determined.

(b) **General Purpose Office**

A General Purpose Office *shall* be provided for clerical support, staff handovers, doctors' write up and interview, staff conferences, education etc, preferably located near the Nurses Station.

(c) **Dangerous Drugs Store**

Facilities for dangerous drugs storage (Schedule 8) *shall* be provided, located within or under direct supervision of the Nurses Station (senior nursing personnel).

(d) **Clinical Handwashing**

Clinical handwashing (hands off) facilities *shall* be provided, conveniently located within the corridor space to serve all rooms. Minimum provision of 1 per 10 beds.

The handwashing facilities ***shall not*** impact on minimum clear corridor widths. At least one is to be conveniently accessible to the Nurses Station.

(e) **Storage Alcoves**

Storage space for stretchers and wheelchairs *shall* be provided, located out of normal traffic routes.

(f) **Clean Linen Store**

A room, trolley alcove or corridor imprest cupboard *shall* be provided for Nursing Unit level storage and distribution of clean linen.

(g) **Clean Utility Room**

A Clean Utility Room *shall* be provided located adjacent to the Nurses Station. The room will accommodate the following functions:

- bench level activities;
- writing;
- receiving and checking medicines and medical supplies, C.S.S.D. stocks and medical consumables;
- preparing and checking injections and medicines which are to be administered to patients;
- storage of medicines and medical supplies (Schedule 4);
- storage of C.S.S.D. stocks;
- storage of medical consumables;
- refrigerated storage of some drugs;
- equipping trays and trolleys for use in clinical procedures;
- equipping and storage of trolleys for holding and conveying medicines to the patients;
- displaying and writing information;
- staff handwashing (near door); and
- waste disposal (general, dry).

(h) **Dirty Utility Room**

A Dirty Utility Room located centrally within the Nursing Unit *shall* be provided.

This room will accommodate the following functions:

- bench level activities;
- setting up specimens of urine etc for examination, testing and/or laboratory investigation;
- washing of equipment, trays and trolley etc.;
- preparing pans, bottles and bowls for distribution to patients;
- storage of trays, cleaning agents, utensils etc and holding of items pending transfer to C.S.S.D. or laboratory (if applicable);
- urinalysis of specimens and recording of results;
- liquid waste disposal (slop hopper);
- receptacle sanitising (pan flusher sanitiser);
- storage of sanitised receptacles;
- waste disposal (linen and general waste); and
- staff handwashing.

Note: Under Waste Disposal, general waste equates to Ordinary and Pathological waste, including "sharps". **Suitable space *shall* be provided if a "separation at source" policy is to be utilised. See Section G.8.4. Waste Disposal.**

(i) **Staff Toilet(s)**

If the whole facility is sufficiently compact or appropriately designed, the central staff change/toileting provision may be adequate. If not, then separate facilities *shall* be provided at Nursing Unit level.

(j) **Drinks Preparation**

An area *shall* be provided for the preparation and serving of hot and cold beverages; including space for storage of raw materials, utensils, crockery etc and a wash up facility. Waste disposal (paper cups etc) is to be catered for. May be part of the Day Room.

(k) **Equipment Store Room(s)**

Adequate storage space *shall* be provided for equipment such as I.V. stands, inhalators, air mattresses, cots, walking frames, "sitz" baths, commodes, crutches etc. The size of the store will be determined by the equipment needs of the particular Nursing Unit. **Corridor storage, unless provided as a dedicated alcove, is not acceptable.**

(l) **Day Room(s)**

A space suitable for the day activities of acute inpatients *shall* be provided. These activities may include reading and relaxing, conversing with visitors or other patients, and watching T.V. **Nurse call as described in section 6.3 *shall* be provided.**

If the Nursing Unit caters for paediatric patients, then a Day Room will also be required to cater for games and activities suitable for children. Storage space will be necessary for play equipment.

In a small hospital, the Paediatric Day Room can be part of the paediatric patient room.

The size of the acute Day Room for adult patients *shall* be determined by multiplying the number of beds by 0.8m^2.

This takes into account the:

- shortening stay
- non-ambulant
- preference for privacy
- preference for outdoors of some patients

Day space is better provided as two small rooms rather than one large space, as not everyone wants to watch T.V., and some require a place to have a cigarette. Where this is not practicable, one room is acceptable. Common sense will dictate the smallest acceptable room size, but 16m^2 is recommended.

Mechanical and electrical design, along with room isolation, *shall* be considered for Day Rooms accommodating smokers. Impact on non-smokers *shall* be minimised.

Direct access to an external space is also highly desirable. This ensures that both indoor and outdoor patient preferences are catered for.

(m) **Flower Preparation**

A space *shall* be provided for the breaking down of floral gifts, placement in vases, storage, waste disposal, water source, wash-up and handwashing (over sink).

(n) **Laundry**

Facilities should be provided for the washing and drying of patients' personal clothing. Storage for cleaning agents should also be provided. Consider acoustic privacy.

(o) **Cleaners' Room**

A room or rooms *shall* be provided for the:

- storage of cleaning agents and materials;
- storage of cleaning equipment and trolley;
- liquid waste disposal (cleaners' sink);
- washing of mops, buckets etc.;
- decanting of detergents;
- storage of mops, brooms etc.;
- staff handwashing; and
- waste disposal.

(p) **Fully Assisted W.C.**

A room *shall* be provided for the fully assisted toileting of semi and nonambulant patients. Handwashing, hanging of clothes, nurse call (refer section E3) and grooming activities are to be catered for.

Special attention ***shall*** be given to the size of the room given its "fully assisted" functions.
Adequate grip rails *shall* be installed and *shall* comply with AS 1428 Part 1 - "Design for Access and Mobility".

One fully assisted W.C. per 30 bed Nursing Unit is required.

If multiple nursing unit configuration allows, the Commissioner may approve one Fully Assisted W.C. per 60 beds. To be negotiated and confirmed in writing.

(q) **Fully Assisted Shower/W.C.**

A room *shall* be provided for the fully assisted showering and toileting (some patients require toileting prior or during the showering exercise) of semi and non-ambulant patients. Handwashing, nurse call (see section E3), undressing, dressing, grooming and dirty linen disposal *shall* be catered for.

Special attention *shall* be given to the size of the room given its "fully assisted" functions.

Grip rails which comply with AS 1428.1 *shall* be provided. Provision *shall* also be made to limit the splashing of assisting staff. Privacy while showering is to be guaranteed (shower curtains around door). One Assisted Shower/W.C. per 30 bed Nursing Unit is required. Note the reference to trolley shower requirements in item (r) Bathroom.

If multiple nursing unit configuration allows, the Commissioner may approve one Fully Assisted Shower/W.C. per 60 beds. To be negotiated and confirmed in writing.

(r) **Bathroom**

A bathroom need only be provided if the pre-determined function of the facility includes paediatric patients or those requiring special immersion treatments, eg. dermatology patients.

Mobile "sitz" chairs in Ensuites will cater for most of the Maternity and other similar needs.

In the absence of a Bathroom, it is strongly recommended that a trolley shower provision be made in the Assisted W.C. Shower Room, ie. increase the room size to cater for the movement and operating space, and storage, of a shower trolley.

If a Bathroom is provided, it ***shall*** allow for the following functions:

- patient bathing with staff assistance as required;
- patient undressing, dressing and grooming;
- patient handwashing;
- use of nurse call (see section E3);
- disposal of dirty towels;
- patient privacy (curtain around door); and
- use of staff assistance call (see section E3).

The Bath ***shall*** be a peninsula type, ie the tap end only abutting a wall, to ensure occupational health and safety issues have been addressed, ie sufficient space for multiple staff assistance.

Hoisting apparatus, either mobile or fixed, might also be necessary.

The installation design should accommodate the disabled user ie grip rails on the end wall, recessed grip (tile detail) around the lip of the bath, and toe space for assisting staff.

Hydraulic lift baths are considered a good occupational health investment if the proposed facility use warrants it.

The size of the room will be determined by the space required for both fixed and mobile fittings and equipment and free floor areas which ensure adequate circulation space for semi and non-ambulant patients.

If a paediatric bathroom is provided, the height, scale and type of fittings and fixtures ***shall*** be included to suit the average anthropometric requirements of children.

The grip bars, ***shall*** comply with AS 1428 Part 1.

(s) **Visitors Toilet**

A visitors' toilet *shall* be provided on each floor and *shall* be designed in accordance with AS 1428.1.

This facility can also be used by the disabled patients, if required.

(t) **Nursery**

A room is to be provided for the medical and nursing care of newborn infants where a dedicated maternity or multi-function Nursing Unit is to be established. The following functions are to be allowed for:

- resuscitation (oxygen);
- ultra violet treatment;
- sleeping of babies;
- bathing of babies (controlled temperature water);
- changing, cleaning and drying of babies;
- storage (nappies, towels, creams, powders etc.);
- weighing of babies;
- waste disposal (refuse and dirty linen);
- handwashing (separate basin);
- bottle feeding of baby (a chair);
- use of nurse call (see section E3);
- use of telephone (see section E3); and
- use of staff assistance call (see section E3).

The room *shall* be located near to the Nurses Station to enable regular observation by duty staff. A corridor observation window *shall* be provided. Partial blackout for day-time sleeping *shall* also be provided.

The size and number of the Nursery(s) will be determined by the maximum number of beds in the Nursing Unit(s) to be set aside for maternity use.

If the nursing unit is dedicated maternity, with say 30 beds, and a "rooming-in" policy exists, then space for a minimum of 10 basinets *shall* be provided.

This must be seen as a "rule of thumb".

Allow 2.3m² of floor area per basinet for a general nursery.

Where a dedicated isolation nursery is provided, a minimum of 5 basinets per 30 beds is

recommended, with a floor area of 3.0m² per basinet. Space, in both models, accommodates baby washing sinks, basins, storage etc.

Dependant upon the size and nature of the facility, and as determined by the **Statement of Function**, a separate nursery might also be provided for isolation purposes. As already mentioned at G2.1.2 (f), Maternity/Isolation, where a separate isolation nursery is not provided, at least one patient room per Maternity Nursing Unit will be set up as an isolation facility.

(u) **Formula Preparation Room**

A room is to be provided for preparation and bottling of formula for bottle feeding of infants. The following functions are to be allowed for:

- bench level activities involving chemical sterilisation of bottles and teats, preparation of milk formulas, demonstrations to mothers on formula preparation and washing of equipment;
- storage of sanitised bottles and teats, dry goods and cutlery;
- water boiling;
- refrigerated storage of prepared milk acute formula, service areas; and
- staff handwashing.

The room should be near the Nursery, although where large scale production is necessary, a centralised Formula Preparation Room is acceptable. The Formula Preparation Room cannot form part of the Nursery.

The size of the room *shall* be determined by the size and number of Nurseries.

(v) **Corridors**

All corridors in the Acute Nursing Unit *shall* conform with Clause B2.3 Corridors.

Handrails *shall* be provided to all corridors serving patients in a Patient care area and *shall* conform to Clause B2.12 - Fixture Support.

G2.1.4 **Isolation Rooms**

Details and ratios in this section apply to those areas of the facility covered by new work, including replacement and/or major renovation. Existing nursing units and beds not affected by works and which have approved isolation facilities may be acceptable without changes or additions. Existing beds which are retained without change (including Psychiatric beds) need not be counted in the ratios required below.

(a) **Ratios**

One isolation room, designed to minimise infection hazards to or from the patient, *shall* be provided for each 30 acute care beds or fraction thereof (except as noted above).

Note that as universal precautions become the norm, this ratio may reduce.

These may be located within individual nursing units and used for normal acute care when not required for isolation cases or grouped as a separate isolation unit. **Each isolation room *shall* contain only one bed and *shall* comply with the acute care patient room section of this document as well as the requirements of the following sections.**

(b) **Entry Control**

Dependant upon the level of staff training and control; the type of patient to be isolated; the sophistication and the location of the isolation room within the nursing unit, the entry point may be direct from a general corridor.

The only stipulation is that the entry point be visually controlled from the Nurses Station and be near to the entries to both clean and dirty utility rooms and to a clinical handwashing facility.

Where the type of patient to be accommodated and the sophistication of the facility dictates, entry into the room *shall* be through a work area that provides for aseptic control including facilities separate from patient areas for clinical handwashing,

gowning and storage for clean and soiled materials. The work area may be a separate enclosed ante-room or a vestibule that is open to the room. The use of vestibule work space open to the room may provide flexibility for other use when not needed for isolation.

However, where the **Statement of Function** requires strict isolation, at least one isolation room may need to be designed for entry only through an enclosed ante-room.

One separate ante-room may serve several isolation rooms.

(c) **Viewing Panels**

Separate enclosed ante-room(s) for isolation rooms are not required as a minimum but, if used, viewing panel(s) *shall* be provided for observation of each patient from the ante-room.

(d) **Ensuite**

Each isolation room *shall* be provided with a dedicated ensuite (as detailed in this document), directly accessible from the bed area without entering or passing through the work area of the vestibule or ante-room.

(e) **Environmental Isolation**

In facilities where special procedures will take place, such as those for organ transplants, burn patients, and patients receiving immunosuppressive treatments, special design provisions, including special ventilation, will be necessary to meet the needs of the **Statement of Function**.

G2.2 Long Term Care Nursing Unit

G2.2.1 General

This section covers long term care facilities where they are part of a general hospital. ie. nursing home type beds occupied for longer than 35 days by patients who do not require acute care. Such beds are not licensed by the Commonwealth Government.

A separate set of guidelines cover the requirements of stand alone nursing home facilities.

Standards listed may also be suitable for other extended care facilities, eg. assessment centres. However, each of these other facility types may have additional and unique functional needs. Judgement must be used to ensure that all functional needs are met without unnecessary restrictions.

The following issues should be addressed:

(a) **Ancillary Services**

Where the long term care nursing unit is part of another facility, services such as catering, storage, pharmacy, laundry etc., may be shared. Where feasible all ancillary service requirements may be met by the principal facility and the only modifications necessary will be within the nursing unit.

(b) **Swing Beds**

See Section G1.2.

Security for patients with dementia (wanderers) *shall* be considered.

(c) **Special Needs**

While there are similarities in the spatial arrangement of acute and long term care nursing facilities, the service requirements of the latter will require unique and additional design considerations. When a section of an acute care facility is converted, it may be necessary to reduce the number of beds to provide space for long term care services. **DESIGN *SHALL* FACILITATE PATIENT MOBILITY AND INDEPENDENCE AND MINIMISE THE NEGATIVE ASPECTS OF INSTITUTIONALISATION.**

(d) **Provision for the Handicapped.**

See section B6, Handicapped Access. In addition to the complement of grip bars and rails in toileting areas etc., handrails *shall* be

provided in corridors as required in G2.1.3 (v).

(e) **Parking**

Refer to section C7.

(f) **Services**

Each long term care facility ***shall***, as a minimum, contain the elements described herein except that when the project includes the concept of sharing or "purchase" of services, appropriate modifications and deletions in space requirements can be made.

G2.2.2 **Number of Beds**

The number of beds in a long term care nursing unit *shall not* exceed 35, although the preferred maximum is 30.

At least 35 percent of the total bed complement *shall* be located in single-bed rooms, each with access to semi assisted ensuite facilities. Direct access to ensuites is preferable but not mandatory.

G2.2.3 **Patient Rooms/Ensuites**

Requirements are generally as for Acute Patient Rooms/Ensuites, section G2.1.2, although the following ADJUSTMENTS are required.

(a) **Dimensions**

Minimum dimensions exclusive of ensuites, built in robes, alcoves, entrances, lobbies, floor mounted mechanical equipment etc., *shall* be:

- **Single Bed Room - 3600mm wide x 3600mm long**
- **Two Bed Rooms - 3600mm wide x 5600mm long**
- **Four Bed Rooms - 6400mm wide x 5600mm long**

Minor encroachments including columns and hand basins (as required) THAT DO NOT

INTERFERE WITH ROOM FUNCTIONS may be ignored when determining space requirements.

Please note that single and two bed patient rooms are preferred for long stay patients. Four bed patient rooms tend to be too impersonal, noisy and not conducive to creating a "homelike" environment.

(b) **Display**

Facility *shall* be provided for the displaying of photographs, cards, flowers, etc. A shelf is adequate, but if a sideboard is used, floor area ***shall*** be increased accordingly.

(c) **Personal Items**

Patients rooms may be designed in such a way as to accommodate some patients' personal items, for example a favourite chair, a television, a glass fronted display cabinet etc. Again, floor area will have to be increased accordingly.

(d) **Wardrobes**

Wardrobe provision is to be increased to provide additional space for clothing for a long term stay.

(e) **Ensuite (assisted)**

Further to item (j) in section G2.1.2, the ensuite should include extra floor area for ease of movement by patients with walking assistance (frame, wheelchair, commode etc.). Semi-assisted toileting facilities *shall* be provided.

The shower provision within the ensuite does not need to be of "assisted" standard. Grip rails for disabled showering only are required.

The distance to be travelled by the patient from bedroom door to ensuite door *shall* be no greater than 10 metres.

The minimum dimensions of an assisted ensuite are variable, but should equate to the useable floor area in a 2000mm x 2000mm room with a disabled shower dimension of 1000 x 1000

(corner location, no fixed panels, access to two sides), basin and partially assisted W.C. on the adjacent walls, and an outward opening door. Where, for instance, the shower is enclosed on 3 sides, consideration should be given to increasing the width of the shower recess. In addition, consideration must also be given to the provision of reasonable approach space to basins and assisted water closets for the less independent patient.

Location of plumbing fittings, door position and swing, room truncation and configuration etc, are all critical to the room's performance.

G2.2.4 **Service Areas**

Requirements are as for Acute Service Areas, section G2.1.3, although the following ADJUSTMENTS are required.

(a) **Nursery and Paediatrics**

Special Nursery and Paediatric provisions are not required.

(b) **Examination and Treatment**

A room for examination and treatment of patients is to be provided. This may be omitted if all patient rooms are single-bed rooms, or if there are available outpatient consult/treatment spaces for shared inpatient use.

The room, if provided, ***shall*** comply with the requirements outlined in "The Design of Doctors' Surgeries", a design handbook prepared on behalf of the Royal Australian College of General Practitioners.

Examination and treatment room(s) may be in a central location to serve more than one floor and/or nursing unit.

(c) **Day/Dining Room**

A Day/Dining Room *shall* be provided at a minimum rate of:

- **2.8 sq.m. per bed for Day/Dining functions if in one room. The minimum floor area *shall* be 30 sq.m.**
- **1.9 sq.m. per bed for Dining only functions. The minimum floor area *shall* be 16 sq.m.**
- **0.9 sq.m. per bed for Day Room functions. The minimum floor area *shall* be 16 sq.m.**

Note: Consideration of larger room sizes than the minimum areas shown above is recommended.

Additional space *shall* be provided, at the same rate, for outpatient day hospital functions. As determined by the Statement of Function.

(d) **Therapies**

Physical and occupational therapy services *shall* be provided for rehabilitation of long term care patients. Areas and equipment *shall* be as necessary to meet the intent of the Statement of Function. Where the long term care facility is part of a general hospital or other facility for patients, services may be shared as appropriate.

See section G5, Allied Health, for details of facility provision.

(e) **Hair Care**

Facilities and equipment for patient hair care and grooming *shall* be provided outside the patient rooms. In accordance with the Health Act, a separate room *shall* be provided. Waiting space *shall* also be considered. A central location is recommended so that it can serve more than one floor and/or nursing unit.

(f) **Podiatry**

Facilities and equipment for patient feet care (Podiatry) *shall* be provided outside the patient rooms.

A Podiatry service may be in a central location to serve more than one floor and/or nursing unit.

(g) **Office/Interview**

A dedicated Office/Interview Room *shall* be provided, if not available as part of shared outpatient or administrative facilities in a general hospital.

(h) **Quiet Room/Chapel**

Access to a Quiet Room/Chapel is highly desirable.

(i) **Storage**

Extra space is required for the storage of long term care patients' suitcases and extra clothing. The additional floor area should be calculated at 0.5 sq.m per long term care bed.

(j) **Remodelling**

In remodelling projects only where it is not possible to provide rooms of adequate size to fit out as fully assisted showers or toilets, partially assisted facilities will be considered. Automatic acceptance of this alternative must not be assumed.

(k) **Bathrooms**

Bathrooms in long term care nursing units are to be designed to allow for the location and use of a patient hoisting apparatus, in addition to the fitout necessary as part of an acute nursing unit service. Hydraulic lift baths are considered a good occupational health investment.

G2.3 Intensive Care Unit (I.C.U.)

G2.3.1 General

Intensive Care Units (I.C.U.s), also known as Intensive Therapy Units (I.T.U.s), come in a variety of forms. The main types are as follows:

Medical/Surgical
Coronary Care (CCU)
Paediatric and Neonatal
Burns and Specialties

The nature and extent of intensive care type facilities may vary greatly from hospital to hospital, and will depend upon what is determined by the **Statement of Function**. In many instances, no intensive care facility will be provided at all.

In small hospitals, more intensive care may be provided in the form of "intensive nursing care" or "high-dependency nursing care" beds, within or attached to general nursing units. In these cases, few of the following requirements will be applicable. The exact level of provision will be established by the **Statement of Function**.

Please note also that the Commonwealth Department of Human Services and Health sets special conditions for intensive care units if health insurance benefits for such treatment is sought. Refer to Health Insurance Section of the DHSH for further information, telephone (06) 289 7908 or Fax (06) 289 8393.

The Health Department of WA maintains a system of classification and service level categorisation and can provide explanatory information upon request. This information provides clarification of the levels of service and facility outcome for the various classifications of Intensive Care.

The following requirements are for a Classification 4 I.C.U. and are MINIMUM levels of provision only. The statement of function may necessitate additional requirements.

G2.3.2 **Patient Areas**

The following *shall* apply to all intensive care units unless otherwise noted. Refer to sections G2.3.4, medical/surgical Intensive Care, G2.3.5, Coronary Intensive Care and G2.3.6, Paediatric and Neonatal Intensive Care for specific specialist ICU requirements.

(a) **Access**

The location of the ICU *shall* be conveniently accessible to and from:

Casualty
Operating Suite
Pathology (service eg. blood gas analysis)
Radiology (service eg. mobile x-ray).

(b) **Through Traffic**

The location *shall* be arranged to eliminate the need for through traffic.

(c) **Bed Numbers**

The recommended minimum bed provision for an ICU is 5. The recommended maximum is 15. The optimum is 10.

(d) **Medical Isolation**

At least one medical isolation patient room per ICU *shall* be provided. Entry *shall* be through an airlock. Direction of air flow *shall* be controllable.

Clinical handwashing, gown and mask storage and waste disposal *shall* be provided within the airlock. A partially assisted ensuite, directly accessible from the isolation room, *shall* also be provided.

(e) **Nurses Station**

A nurses station *shall* be provided. The nurses station, with space for charting and central monitoring, *shall* be located so that nurses will be in visual contact with each patient.

In larger units, more than one nurses station may be needed to provide for direct observation of all patients. The nurses station as a raised dais is recommended.

(f) **Monitoring**

Each unit *shall* contain an approved patient monitoring system, with visual display for each patient at a central monitoring point, generally the Nurses Station, see G2.3.2(e). Monitors with high/low alarm and the capability

to provide hard copy of displays are recommended.

(g) **Observation Windows**

To assist staff observation of patients in cubicles or single patient rooms, observation windows, conveniently placed to ensure unobstructed vision from the nurses station, *shall* be provided.

(h) **Area Provision (Dimensions)**

Where an open plan arrangement is provided, bed spaces *shall* be arranged so that there is a clearance of at least 1200mm from the side of the bed to the nearest fixed obstruction (including bed screens) or wall. At the head of the bed, at least 900mm clearance *shall* be allowed between the bed and any fixed obstruction or wall.

To facilitate resuscitation procedures without restricting movement of staff, beds, and equipment, the available minimum clear distance between the head of the bed and any fixed obstruction or wall and between the foot of the bed and the bed screen *shall* be 900mm.

When an open plan arrangement is provided, a circulation space of 2200mm minimum clear width *shall* be provided beyond dedicated cubicle space.

Separate cubicles (CCU) and single patient rooms including isolation rooms, *shall* have minimum dimensions of 3900mm X 3900mm.

All entry points, doors or openings, *shall* be a minimum of 1200mm wide, unobstructed. Larger openings may be required for special equipment, as determined by the **Statement of Function.**

(i) **Patient Privacy**

Each patient bed area *shall* have provision for visual privacy from casual observation

by other patients and visitors. Bed screens are recommended for the open plan ICU. Blinds or curtains are recommended for cubicle areas or dedicated patient rooms.

(j) **Natural Daylight**

Each bed *shall* have visual access, other than skylights, to the outside environment with not less than one outside window in each suite. Distance from the patient bed to the outside window *shall not* exceed 15 metres. When partitioned cubicles are used, patients views to the outside *shall* be through no more than two separate glazed panels.

(k) **Bedside Storage/Writing**

Each bed location *shall* include storage and writing provision for staff use.

(l) **Patients' Property Store**

Each bed location *shall* include storage facilities for patients' clothing and toiletries. A mobile unit is recommended to facilitate transfer with the patient.

(m) **Nurse Call**

A patient activated nurse call facility *shall* be provided at each bed for summoning assistance. See the relevant clause in the Electrical section E2 of this document.

(n) **Staff Assistance**

A staff assistance call facility *shall* be provided at each bed for summoning staff assistance. See the relevant clause in the Electrical section E2 of this document.

(o) **Bedhead Services**

A flexible bedhead services (Electrical and Mechanical) facility *shall* be provided. Refer

to the services sections E1 and E2 of this document.

(p) **Lighting**

Appropriate lighting, both general and task, is to be provided. Refer to the Electrical section E2 of this document for specific requirements.

(q) **Services Generally**

Refer to sections E1 and E2 of this document for the specific requirements for Mechanical and Electrical provision.

(r) **Clinical Handwashing**

Clinical handwashing facilities, convenient to nurses station and patient bed areas, *shall* be provided. The ratio of provision *shall* be one (1) facility for every three (3) patient beds in open plan areas and one (1) in each patient room or cubicle.

(s) **Equipment Alcoves**

Mobile equipment, used and located within the ICU, *shall* have parking areas out of traffic paths but convenient for access eg. cardiopulmonary resuscitation carts, mobile x-ray etc. Consideration should be given to the ever increasing amount of equipment used.

(t) **Fully Assisted W.C.**

One (1) fully assisted unisex W.C. for every 6 patient beds in the open plan arrangement *shall* be provided.

(u) **Partially Assisted Ensuite**

One (1) partially assisted ensuite, as defined in section G2.1.2 (j), *shall* be provided per 15 bed ICU (or part thereof) for use by the patients in the open plan arrangement.

The room size *shall* take into account the need for attached monitors, drip stands etc.

In addition, as requested in item G2.3.2(d) "Medical Isolation", a partially assisted ensuite is to be provided for, and directly accessible from, each separate patient isolation room.

(v) **Clock(s)**

An analogue clock (or clocks) with seconds sweep hand(s) *shall* be provided and conveniently located for easy reference from all bed positions and the nurses station.

(w) **Communications**

A comprehensive telephonic and intercom (combined or separate) communications system is to be provided. Refer to the Communications section E3.

(X) **Interior Design/Colours**

In all areas where patient observation is critical, colours ***shall*** be chosen which do not alter the observer's perception of skin colour.

The Health Department of WA can provide information to assist with suitable colour selection.

G2.3.3 **Service Areas/Functions**

The following additional service areas *shall* be immediately available within each Intensive Care Suite. These may be shared by more than one intensive care nursing unit (of up to 15 beds each) provided that direct access to the service area is available from each unit.

(a) **Clean Utility/Medical Supplies**

An area for the storage and preparation of medical consumables, readily accessible to staff working in the patient area, and so designed to ensure speedy preparation of medications, *shall* be provided. It must be located within close proximity of the nurses station. Refer to the Acute Nursing Unit Clean Utility, item G2.1.3 (g), for level of provision.

(b) **Medical Supplies Store**

A separate medical supplies store may also be provided if bulk medical stores are to be kept in the area. This area should be readily accessible from the Clean Utility area.

(c) **Dirty Utility Room**

A dirty utility room *shall* be provided. It must be an enclosed area for contamination control. Refer to the Acute Nursing Unit Dirty Utility, item G2.1.3 (h), for level of provision.

(d) **Cleaner's Room**

A dedicated cleaner's room *shall* be provided. Refer to the Acute Nursing Unit Cleaner's Room, item G2.1.3 (o), for level of provision.

(e) **Bathroom/Mobile Bath**

The need to provide a bathroom or a mobile bath should be considered in relation to the policy adopted for the care of burns or other special cases at the particular hospital. Fitout and room size to suit specific needs as identified in the Statement of Function and item G2.1.3 (r). Acute Nursing Unit - Bathroom.

(f) **Visitors' Gowning Area**

An area off the main traffic route may be provided for visitors to gown up prior to accessing the Intensive Care area. Storage provision for gowns, hanging space and disposal facilities are required.

The inclusion of the gowning area is dependent upon hospital policy regarding the need for visitors to gown up.

(g) **Staff Change/Ensuite/Toilets**

If the ICU is large enough and if it is hospital policy to change prior to entering the unit, then separate male and female change rooms with ensuite facilities *shall* be provided.

Staff Toilets *shall* be provided within the unit, in all cases.

(h) **Staff Lounge**

A staff lounge *shall* be provided within the unit for staff relaxation and beverage preparation. Inclusion of a window to the outside is desirable.

Where an "intensive nursing" facility only is provided, the hospital staff dining room will suffice.

(i) **Drinks Preparation**

Facilities *shall* be provided for the preparation and storage of patients' drinks. Shared use with the staff lounge area is acceptable.

(j) **Equipment Storage**

In addition to equipment storage alcoves and medical supply stores, and dependent upon the size of the ICU, an equipment store *shall* be provided for the less frequently used equipment and bulky disposal items. Storage provision should be generous. Planning consideration must also be given to the storage requirements of the oxygen and air cylinders which are necessary emergency back ups to the piped gases.

(k) **Offices/Secretarial Service**

An office or number of offices *shall* be provided, dependent upon the size of the ICU and hospital policy.

Provision of facilities for a secretarial service should also be considered, the need dependent upon the size of the ICU.

(l) **Interview/Distressed Relatives' Room**

A small room should be provided for private interviews with relatives and to temporarily accommodate those who are distressed. Access should be discrete from waiting areas to ensure privacy. In a small ICU, the office could provide this function. Direct access to a W.C. is recommended. A telephone ***shall*** be provided.

(m) **Reception/Waiting/Public Toilets**

As determined by the size of the ICU and hospital operating policy, a reception and visitors'/relatives' waiting area *shall* be provided immediately outside the entry to the ICU, but away from patient and staff traffic areas. A toilet facility for visitor use ***shall*** also be provided near the waiting area. These may be shared public toilets with the remainder of the general hospital.

Disabled toilet facilities *shall* be provided. Access to public telephones is essential. If a dedicated reception facility is not provided, restricted entry to the general public ***shall*** be ensured, eg. intercom and signposting with electronic door activation.

(n) **Tutorial Room**

Provision of a tutorial room for staff training is to be considered. In smaller ICUs the staff lounge may be used for this function.

(o) **Relatives' Overnight Accommodation**

Depending upon the availability of nearby commercial accommodation, consideration should be given to the provision of overnight accommodation for relatives, preferably near the unit. This will be dependent upon the size and intended function of the ICU. A motel type bed-sitter level of provision is recommended.

(p) **Staff Overnight Accommodation**

A room *shall* be provided for the overnight accommodation of medical personnel on 24 hour call for emergency cases.

(q) **Equipment Maintenance Service**

Dependent upon the size and intended use of the ICU, a dedicated electronic and pneumatic equipment maintenance service may have to be accommodated within the hospital or a 24 hour on-call emergency service made available.

This same service would cover the operating suite, casualty and radiology.

If a dedicated workshop is provided, its location should be in an area that is equally accessible to all of the above mentioned departments. The facility should have a degree of sound-proofing and be accessible from a non-sterile area.

G2.3.4 **Medical/Surgical Intensive Care**

In addition to the above standards, the following applies to medical/surgical intensive care units.

(a) **Open Plan/Rooms/Cubicles**

May be set up as an open plan nursing unit, with beds separated by curtains (ensuring compliance with privacy needs), or as separate enclosed rooms/cubicles only, or a combination of both.

(b) **Separate Patient Areas**

If the open plan is used, there *shall* be at least one (1) enclosed private patient room or fixed cubicle for every six (6) patient beds to enable isolation for psychological needs.

This is in addition to the Medical Isolation requirement outlined in section G2.3.2(d).

Small ICUs (5 bed) can combine the medical and/or psychological isolation requirement into one dedicated room. Larger units must have two separate areas (rooms or room and cubicle).

G2.3.5 **Coronary Intensive Care**

Cardiac patients have special needs. They are often fully aware of their surroundings but still need immediate and critical emergency care. In addition to the standards for ICUs above, the

following *shall* apply to the Coronary Care Unit (CCU).

(a) **Bed Provision**

Bed numbers in the CCU *shall* be as for the general ICU. Open plan bed layouts are not acceptable. It is preferable that each cardiac patient have a separate room or cubicle for acoustic and controlled visual privacy, although two (2) bed patient rooms are permitted.

A minimum of 50% of C.C.U. patients *shall* be accommodated in single bed patient rooms.

Where a small 5 bed combined ICU/CCU is provided, at least two (2) beds *shall* be in rooms, or room and cubicle. This provides flexible ICU/CCU accommodation, including medical/psychological isolation.

Where a large 15 bed combined ICU/CCU is provided, it is advisable to arrange the beds in 2 (or more) adjacent but physically separated groups of coronary and non coronary patients. Ancillary services should be shared between the bed areas.

(b) **Toileting**

Each cardiac patient *shall* have access to a shared partially assisted W.C. The ratio of patient to W.C. *shall* be no greater than 4:1. Distance travelled *shall* be no greater than 15 metres from bed to facility.

(c) **Multiple Equipment Display**

Equipment for monitoring cardiac patients *shall* have provision for visual display at both the bed location and the nurses station. Additional space requirements to be considered.

G2.3.6 **Paediatric and Neonatal Intensive Care**

Critically ill paediatric patients, from neonates to adolescents, have unique physical and psychological needs. Not every hospital can or should attempt to

have a separate paediatric intensive care unit. Many hospitals will be able to safely transfer their patients to other facilities with appropriate services. If a facility has a specific paediatric intensive care unit, the **Statement of Function** must include consideration for staffing, control and the safe transportation of critically ill paediatric patients with life support and environmental systems from other areas.

In addition to the standards listed for ICUs, each Paediatric ICU *shall* include:

(a) **Bed Ratios**

The Paediatric ICU may be open plan or may have all private patient rooms or a mix of both. **Where open plan is provided, at least 1 in 5 beds must be located in a private room or cubicle for psychological needs (in addition to the medical isolation requirement).**

(b) **Bedside Space**

Additional space at the bedside *shall* be provided for visiting parents.

(c) **Sleeping Space**

Sleeping space *shall* be provided for parents who may require to spend long hours with the patient. This space may be within the patient room or separate from the patient area (open plan) but must be directly accessible to the ICU staff.

(d) **Formula Preparation**

An area *shall* be provided for the preparation and/or storage of infant formula. This may be outside the Paediatric ICU suite but must be available for use at all times.

(e) **Consultation/Demonstration Room**

A consultation/demonstration room *shall* be provided within, or convenient to, the Paediatric ICU suite for private discussions with parents.

(f) **Toys Store**

Separate storage cabinets or closets *shall* be provided for toys and games that may be utilised by the paediatric patients.

(g) **Additional Storage**

Additional storage space *shall* be provided for cots, bed linen and other items needed for overnight accommodation of parents.

(h) **Area Provision (Dimensions)**

Basinets, incubators and warmers used for neonatal infants will need the same clearances as for adult beds.

In addition, because of the variations in paediatric bed and crib sizes and the potential for change, space allowances for each *shall* also be the same as that required for adult beds.

Refer to the document "Standards and Recommendations for Hospital Care of Newborn Infants", published by the Committee on the Foetus and Newborn American Academy of Paediatrics, for further guidance.

(i) **Examination/Treatment Room**

An examination and treatment room *shall* be provided separate from the paediatric bed area.

G2.3.7 **Other Specialty ICUs**

Because of the unique requirements of specialty ICUs no attempt is made here to suggest standards for the variety of specialty units that may be found in the larger medical facility. As far as applicable, the preceding standards ***shall*** be used. Adaptations, adjustments, and additions ***shall*** be made as needed for the functional needs of staff and patients with special consideration for access and inclusion of necessary auxiliary services.

G2.4 Psychiatric Nursing Unit

G2.4.1 **General**

This section deals with:

- a stand alone nursing unit or group of nursing units;
- a dedicated nursing unit within a general hospital; and
- a number of dedicated patient rooms as an annexe to an acute nursing unit.

Where a psychiatric facility is to be provided, the inpatient environment *shall* be as non institutional as possible. Colour, colour coding and graphics play an important part in defining areas, assisting to create a sense of well being and facilitating the therapeutic process. Above all, a safe environment for both patients and staff *shall* be provided.

The Statement of Function *shall* determine the size and function of the psychiatric facility.

A psychiatric nursing unit *shall* comply with the requirements outlined for an Acute Nursing Unit, (section G2.1), but with the following modifications or additions.

G2.4.2 **Security, Safety and Patient Rights**

Consider the following when determining the level of security provision in a psychiatric facility:

- safety of patients and staff;
- patients' legal rights; and
- the status of the hospital or part thereof under the Mental Health Act, or act in force at the time of development.

It is noted that, in general, voluntary patients cannot be secluded, restrained, or held in security against their will, unless they are detained in a hospital or facility "approved" for that purpose under the Mental Health Act.

However, in an emergency, where a person by reason of suffering from a mental illness, threatens their own safety or the safety of others, Common Law would support the restraint of such a person pending "referral" under the Mental Health Act, and until they can be admitted to an "approved" facility. The need for security in such an emergency should be considered.

A psychiatric nursing unit providing services not covered by the Mental Health Act, or equivalent, *shall* have general security provision as for an Acute Nursing Unit, although at least one Seclusion Room (section G2.4.6) per nursing unit *shall* be provided for emergency situations.

Where the psychiatric nursing unit is providing services covered by the Mental Health Act, or equivalent, the facility *shall* be capable of secure lockable isolation, area by area within and as a complete nursing unit. This is to ensure containment of potentially dangerous situations expected with some patients, ie. danger to staff and other patients (aggression) and patients themselves (suicide).

The 'secure' nursing unit or part nursing unit, depending upon the level of provision, must have integral impact resistant barriers (floor, walls, ceiling and penetrations - doors and windows) to ensure the above mentioned containment. In addition, construction and fittings ***shall*** provide protection from self injury and property damage eg. flush fitting door handles, vandal proof lights, etc. Door hardware selection must provide guaranteed patient security with
ease of use by staff, particularly in emergency situations, eg. digital push buttons in emergency locations in lieu of key activated systems.

Earth leakage protection of electrical circuits and tamper proof outlets *shall* also be provided in secure psychiatric facilities.

Consideration ***shall*** be given to the process of activation of any staff assistance call/duress alarm system. Activation would be from suitably concealed call points or transportable personal transmitters.

When the psychiatric facility is located within a multi storey building, access to external spaces above ground level, (eg. balconies, roof, etc.) is to be prevented.

G2.4.3 **Number of Beds**

The maximum number of beds in a psychiatric nursing unit *shall* be 30. At least 50% of psychiatric beds *shall* be located in single bed rooms, each with access to ensuite facilities.

Direct access to ensuites is preferable, but not mandatory.

G2.4.4 **Patient Rooms/Ensuites**

Patient rooms *shall* comply with the following:

(a) **Room Sizes**

Minimum room size, exclusive of ensuites, built in robes, desks, cupboards, alcoves, floor mounted mechanical equipment etc. ***shall*** be:

- single bed room - 10.5sq.m;
- two bed room - 17.5sq.m; and
- four bed room - 30.0 sq.m.

Variation of minimum room sizes may be considered by the Commissioner dependent upon:

- **Statement of Function;** and
- type of admissions to occupy the rooms.

(b) **Acoustic Privacy**

Refer to B5.2

Acoustic Privacy *shall* be considered and accommodated.

(c) **Security**

Security as above *shall* be provided.

(d) **Glazing**

All windows and observation panels *shall* be glazed with safety glass or a suitable alternative material, eg. polycarbonate etc.

(e) **Windows**

Where windows are openable, effective security features such as narrow windows that will not allow patient escape, *shall* be provided. Locks, under the control of staff, *shall* be fitted. The prison aesthetic is to be eliminated wherever possible.

(f) **Nurse Call**

A nurse call system is not required.

(g) **Ensuite**

As for the Acute Nursing Unit, (section G2.1.2 j) each patient *shall* have access to an ensuite room, or separate toilet and shower room. Fitout will afford protection from self injury and property damage.

It is preferable, but not mandatory, that the ensuites be accessible directly from the patients' rooms and not via the general corridor areas.

In a psychiatric facility whose role is covered by the Mental Health Act or equivalent, ensuite doors are to be fitted with locks, activated from without, that are solely under the control of staff.

(h) **Mirrors**

Mirrors *shall* be of safety glass or other appropriate impact resistant and shatter proof construction.

G2.4.5 **Service Areas**

The requirements listed in the Acute Nursing Unit Service Areas, section G2.1.3, *shall* also apply to service areas for psychiatric nursing units with the following modifications and additions:

(a) **Nurses Station**

The nurses station *shall* be located so that staff engaged in routine activities can

observe patients casually. This is to prevent the patients from feeling as though they are "constantly being watched".

In addition, the charting area *shall* be provided with provision for acoustical and visual privacy. An observation window over patient areas may be used if the arrangement is such that patient files cannot be read from outside the charting space.

(b) **Social Spaces (Day Rooms)**

At least two separate social spaces *shall* be provided, one for quiet activities and one appropriate for noisy activities.

The combined area *shall* be 3.75 sq.m per patient with at least 12 sq.m per room. This space may be used for dining activities, if the unit policy dictates. **Add 1.5 sq.m per patient for dining floor area provision. If dining activities are allowed for, a small pantry adjacent to the dining area *shall* also be provided.** The pantry fitout and size will depend upon the type of catering service available to the facility.

(c) **Group Therapy**

Space for group therapy *shall* be provided. This may be combined with the quiet space noted above, provided that an additional 0.7 sq.m per patient is added and a minimum room area of 21 sq.m, enclosed for privacy, is available for therapy activities.

(d) **Corridors**

Corridor widths and heights are to be as prescribed in B2.3. Variation of minimum corridor widths may be considered by the Commissioner dependent upon:

- **Statement of Function;** and
- type of admissions to use the facility.

(e) **Drugs**

The drug distribution station *shall* include extra provision for security against unauthorised access.

(f) **Equipment Storage**

Storage space for trolleys, wheelchairs etc. may be outside the psychiatric unit provided that provision is made for convenient access to equipment as needed.

(g) **Examination and Treatment**

A minimum of one (1) examination and treatment room *shall* be provided for each 30 bed psychiatric nursing unit, or part thereof. Size and layout to comply with requirements detailed in "The Design of Doctors' Surgeries", a design handbook prepared on behalf of the Royal Australian College of General Practitioners. The room can be a shared facility with other nursing units. Location within the psychiatric unit is not essential, but it is to be readily accessible to the unit.

(h) **Consultation Room**

A minimum of one (1) consultation room *shall* be provided for each 30 bed psychiatric nursing unit, or part thereof. Size ***shall*** also comply with "The Design of Doctors' Surgeries", as noted above.

The room *shall* be designed for acoustical and visual privacy. Construction to achieve a noise reduction of at least 45 dB.

The room can be a shared facility with other nursing units.

Location within the psychiatric unit is not essential, but it ***shall*** be readily accessible to the unit.

(i) **Occupational Therapy**

Each psychiatric unit *shall* contain 1.5 sq.m of separate space per patient for

occupational therapy with a minimum total area of 20.0 sq.m.

The space *shall* include provisions for:

- handwashing;
- work tops;
- storage; and
- displays.

Occupational therapy areas may serve more than one nursing unit.

When the psychiatric nursing unit contains less than 16 beds, the occupational therapy functions may be performed within the noisy activities area. In this instance, an additional 1 sq.m per patient is added to the total room area.

(j) **Medical Isolation**

Medical isolation rooms are not required (section G2.1.3). Psychiatric beds are not to be included in the bed count ratio when establishing the number of beds required for medical isolation.

G2.4.6 **Seclusion Room(s)**

Within the psychiatric nursing unit there *shall* be a seclusion room or rooms for patients requiring security and protection. The room(s) *shall* be located to enable direct nursing staff supervision. Each room *shall* be for only one patient. The room may be set up as a day room or as a single patient room. Construction and planning to prevent patient hiding, escape, injury or suicide, eg. full length curtains on windows to be avoided etc.

If a facility has more than one psychiatric nursing unit, the number of seclusion rooms *shall* be a function of the total number of psychiatric beds in the facility. Seclusion rooms may be grouped together. The seclusion room is intended for short-term occupancy by a patient who has become violent or suicidal. Finishes, fittings and construction are to comply with the 'secure' nursing unit provision under section G2.4.2, Security, Safety and Patient Rights. Doors ***shall*** open out and ***shall*** permit staff

observation of the patient while maintaining provision for patient privacy.

G2.4.7 **Day Hospital**

Where an outpatient day hospital service is proposed, increase the overall provision in proportion to the increase in patients. In particular, consider the areas set aside for:

- social activities, dining;
- group therapy;
- occupational therapy;
- patient rooms (resting, etc.);
- seclusion rooms (if considered necessary);
- toilets, showers;
- storage; and
- waiting areas.

The dining provision will be determined by the unit policy on the type of day care patient accepted and length of stay for treatment/observation. **Refer to the Statement of Function.**

G3 OUTPATIENT CARE

G3.1 Emergency

It is not mandatory for a private hospital to provide a dedicated emergency service, although a "first aid" service for staff, employees and visitors should be provided.

Emergency services are already provided by the major regional and district government run facilities, and unnecessary duplication of an expensive emergency trauma service requiring adequate equipment and 24 hour skilled staffing is not recommended.

It is recommended that hospitals which do not provide an Emergency Service display a prominent exterior sign at the main entrance stating this and giving the location of the nearest hospital with an Emergency Service.

In the event that an individual (who is unaware of or unable to immediately reach trauma services in other facilities) requires emergency treatment, duty of care dictates that assistance be given but that an ambulance service be called immediately for transfer of the individual to the closest trauma service. Special facilities for this type of trauma assistance are not required.

If the **Statement of Function** for a new or remodelled facility should include an emergency service, then details of requirement can be obtained from the Facilities and Assets Branch - Health Department of WA.

G3.1.1 **Emergency First Aid**

At a minimum, each hospital should provide an emergency first aid treatment room.

The room, if provided, *shall* comply with the requirements outlined in "The Design of Doctors' Surgeries", a design handbook prepared on behalf of the Royal Australian College of General Practitioners.

The treatment room may be in a central location to serve other functions than just emergency first aid - eg. long term care treatment room.

G3.2 Outpatient Consultation

It is not mandatory for a private hospital to provide a dedicated outpatient consultation service.

If it is to be provided, as listed in the **Statement of Function**, then the following ***shall*** apply.

G3.2.1 General

The type and size of this service is so variable, dependent upon the level of specialisation, that it would be impractical to list all of the requirements for all types. Therefore, it is suggested that the spaces outlined in the reference "The Design of Doctors' Surgeries", a design handbook prepared on behalf of the Royal Australian College of General Practitioners, be considered the minimum level of provision.

In summary, the following are listed

(a) **Entrance and Reception**

This may be a shared facility with the hospital or other specialty departments.

(b) **Waiting**

May also be shared.

(c) **Consulting/Examination room(s)**

(d) **Treatment room(s)**

(e) **Nurses Office**

The need for this space is dependent upon the size of the outpatient service.

(f) **Medical Laboratory/Utility Room**

The size and type of this facility will be determined by the size of the outpatient service and whether or not shared facilities are available within the hospital proper.

(g) **Disposal Room (Dirty Utility)**

(h) **Staff Room**

May be shared with the hospital.

(i) **Toilets and Change rooms**

May be shared with the hospital.

(j) **Storage**

As required - See Section G7.1.

(k) **Cleaners' Room**

May be shared with the hospital.

(l) **Environmental Requirements**

Special attention is to be given to the visual and acoustic privacy of patients when being interviewed and also to the quality of light when being examined. The latter requires adequate

(m) **Miscellaneous**

Construction, finishes, design for disabled access, parking, signposting etc., ***shall*** be in accordance with the other relevant sections of these guidelines.

G4 CLINICAL SUPPORT

G4.1 Medical Imaging (Organ Imaging) Suite

Refer to Appendix 3

G4.1.1 **General**

Equipment and space *shall* be as necessary to accommodate the Statement of Function. Specialised procedures such as electron beam therapy, radiation treatment, magnetic resonance imaging, computed tomography, scan units, angiocardiography, etc., are not common to most facilities, and so are not covered in this document.

When these and other procedures are part of the facility, then function, design and construction considerations

shall be given to the specific needs for effective operation, accessibility, safety and patient dignity.

Sonography and ultrasound are now present in most medical imaging departments and are therefore covered in these guidelines.

G4.1.2 Statutory Requirements

Any radiological service in Western Australia *shall* comply with the requirements of:-

- **The Radiation Safety Act 1975-1981**
- **The Radiation Safety (General) Regulations 1983**

as administered by the Radiological Council of Western Australia. Telephone: (08) 9346 2260
18 Verdun Street, Nedlands, WA.

The Act and Regulations contain guides on how facilities and equipment are to be used, the required radiation protection, who uses it, etc.

The Radiation Health Section of the Environmental Health Branch of the Health Department of WA. *shall* be consulted to ensure that all steps have been taken to provide facility radiation protection. This consultation should commence during the very early stages of planning.

Once authorisation has been obtained from the Radiation Health Section, and the requirements of the Radiological Council have been satisfied, a registration for the premises and equipment will be issued by the Council.

G4.1.3 Basic Service - General X-Ray

A hospital *shall* provide, as a minimum, on-site facilities for diagnostic x-ray as a service to the operating suite, inpatients and outpatients, and as required by the activities outlined in the Statement of Function. Procedures normally carried out would be to chests and extremities.

The mobile x-ray unit would generally be a condenser discharge type and require a parking area. X-ray

procedures would be carried out within patient rooms, operating rooms, nurseries and other designated areas.

Appropriate ancillary equipment in line with the services provided will need to be catered for.

In addition, a Dark Room/Store for the processing and storage of film *shall* be provided. The size and nature of this facility will depend upon the type of automatic processing utilised and the quantity of film to be stored. Attention is to be given to the special lighting and ventilation requirements. Refer to the relevant Service Sections of these Guidelines (Section E) for further detail. It is recommended that, from a planning viewpoint, the x-ray unit parking area and dark room/store be located centrally within the facility and/or adjacent to the operating suite.

G4.1.4 Room Dimensions and Access

Rooms *shall* be sized to suit the design requirements of the equipment used, to provide a safe working environment and to allow the effective movement of staff and patients.

Ceiling heights *shall* suit equipment, but be generally no less than 3000mm for ceiling tube mount installations.

Special consideration should also be given to the width and height of doorways to ensure delivery and removal of equipment is not impeded or prevented, and that patient trolley and bed movement is not hampered.

G4.1.5 Sonography/Ultrasound

A consult/examination room as detailed in G3.2., Outpatient Consultation, *shall* be provided where Sonography/ultrasound is carried out.

Facilities *shall* be provided for:

- sonography/ultrasound equipment (mobile?);
- patient examination/procedure;
- patient privacy;
- clerical activity (desk and chair);
- staff handwashing;
- waste disposal (rubbish bins); and
- storage (cupboards).

Services *shall* be as detailed in the other sections of the guidelines. Refer to Section E.

G4.1.6 **Off-Site Services**

Smaller hospitals cannot justify a full Radiological Service, therefore, access to off-site services is an important consideration in the planning phase, in particular, the selection of the site.

A planned or existing local or neighbourhood Radiological Service within close proximity to the hospital is essential to ensure minimum trauma when transferring a patient from the hospital to the off-site facility and back again.

A Radiological Suite on an adjacent site, or even as a tenant of the same building, would be ideal, enabling easy wheelchair transfer.

G4.1.7 **Radiology Suites - Size Categories**

Refer to the Health Department of WA. for information on a four (4) stage categorisation of radiological facilities.

A detailed check list of spaces has not been provided in the Guidelines. Contact the Facilities and Assets Branch, Health Department of WA. for further information.

G4.1.8 **Location**

The location of the Radiological facility, if provided, is variable. Consideration must be given to its proximity to Accident and Emergency, if provided, and to the Operating Suite, where dedicated in-theatre X-ray is not provided. Its role in Day Surgery and its function as an outpatient X-ray service, which in a private hospital is possibly its major role, will also dictate where in the facility it is located. In most instances, a compromise between travelling distance for inpatients (minor role) and convenience for outpatients (major role) will be made.

G4.1.9 **Staff Amenities**

Dependent upon the size of the Radiological facility, the following staff amenities, either dedicated or shared with the remainder of the hospital, ***shall*** be provided:

- dining
- change room
- toilet

G4.1.10 **Public Amenities**

Public amenities such as the following *shall* be provided:

- waiting area
- change cubicles (one for disabled use)
- public telephones
- public toilets (accessible to the disabled)
- clean potable drinking water

As for G4.1.9, they can be shared or dedicated.

G4.1.11 **Special Attention**

In addition, special attention is to be given to the following:

- structural support for equipment;
- level floor for equipment positioning and safe patient movement;
- large diameter electrical cable support tray impact on room space (in-floor and surface mounted);
- equipment ventilation;
- lead shielding;
- procedure timing (clocks);
- task lighting/dimming; and
- room blackout.

G4.2 Pathology Suite

G4.2.1 **General**

As a basic requirement, hospitals providing surgical and/or obstetric services *shall* have access to an approved 24 hour on-call contracted pathology service for the performance of tests in:

- haematology;
- clinical chemistry;
- urinalysis;
- microbiology;
- anatomy pathology;
- cytology; and
- blood banking.

The principal procedures to be carried out by the contract service include:

- blood counts;
- blood glucose;
- electrolytes;
- blood urea and nitrogen;
- coagulation; and
- transfusions (type and cross match capability).

Provision *shall* also be made for the collecting and processing of specimens. This can be mobile equipment for bedside or consulting room collection, or a dedicated specimen collection room.

G4.2.2 **Refrigerated Blood Storage**

All hospitals providing surgical and/or obstetric services *shall* provide an on-site refrigerated blood storage facility for transfusions. A blood storage refrigerator *shall* be equipped with temperature monitoring and alarm signals. It should be located to ensure easy staff control.

Consideration *shall* be given to its location in relation to external after hours access and security.

G4.2.3 **Hospital Based Pathology Service**

Dependent upon the surgical and obstetric load, as dictated by the **Statement of Function**, it might well be necessary to provide a dedicated on-site pathology facility.

If the pathology service is based in the hospital, the following facilities *shall* be provided, as a minimum requirement:

(a) **Pathology Laboratory**

Separate room(s), capable of secure isolation, specifically set up to provide a pathology service. Not to be shared. The size of the room(s) *shall* be appropriate to the function, and provide a safe working environment.

(b) Laboratory work bench with space for microscopes, appropriate chemical analyser, incubator(s) centrifuge, etc. Work areas ***shall***

include access to vacuum, gas and electrical services as needed, and sinks with water.

(c) Refrigerated blood storage as noted at G4.2.2 above.

(d) Basin or bench sink for staff handwashing. The bench sink may also be used for the disposal of non-toxic fluids.

(e) Storage facilities for reagents, standards, supplies, and stained specimen microscope slides, etc., including refrigeration, as needed.

(f) **Specimen (blood, urine and faeces) collection facilities. The blood collection area *shall* have a work bench, space for patient seating, and handwashing facilities. The urine and faeces collection room *shall* be equipped with a water closet and handbasin.**

(g) Chemical safety provisions including emergency shower, eye flushing devices, appropriate storage for flammable liquids etc.

(h) Facilities and equipment for terminal sterilisation (autoclave or electric oven) of contaminated specimens before transport. (Terminal sterilisation is not required for specimens which are incinerated on site).

(i) **If radio-active materials are employed, the facility will need to be considered for possible registration under the Radiation Safety Act.** Verification of requirements ***shall*** be obtained from:

The Secretary Radiological Council
GPO Box X2307
PERTH WA 6001

or telephone the Radiation Health Section of the Environmental Health Branch of the Health Department of WA. on (08) 9346 2260.

(j) Administrative area including offices as well as space for clerical work, filing and record maintenance.

(k) Lounge, locker and toilet facilities ***shall*** be conveniently located for male and female laboratory staff.

These may be outside the laboratory area and shared with other departments.

(l) The **Statement of Function *shall*** describe the extent of contracted and/or in-house pathology service.

(m) Natural light is advantageous to laboratory procedures, if achievable.

(n) **The appropriate Australian Standards for laboratories *shall* apply.**

G4.2.4 **Location**

The pathology facility, if in-house, is best located adjacent to the areas that utilise the service the most, ie. the operating and birth suites.

G4.2.5 **Accreditation/Licensing**

As for non hospital based Pathology Laboratories, those in hospitals must be accredited and licensed by the joint National Association of Testing Authorities / Royal College of Pathologists Committee.

G4.3 Obstetric Delivery Suite

G4.3.1 **General**

The number of birth preparation rooms etc., and the size of the associated service areas *shall* be as required by the proposed obstetrical workload as outlined in the Statement of Function.

The obstetrical suite (birth suite) *shall* be located and arranged to prohibit non-related traffic through the suite.

Provision *shall* be made for performing Caesarean sections in accordance with the Statement of Function and as required by the appropriate authorities. The birth suite should be in close proximity to the Operating Suite for this reason, or have its own dedicated operating room and associated service areas and rooms.

When birth and operating rooms are in the same suite, access and service arrangements *shall* be such that neither staff nor patients need to travel through one area to reach another, corridor access exempt. Refer to section G.4.4. for Operating Room requirements.

The birth suite *shall* include the following elements.

G4.3.2 **Birth/Preparation Room(s)**

Each designated birth/preparation room *shall* be for single occupancy and *shall* have minimum dimensions of 3900 x 4800mm. 3900mm is the dimension from the head of the bed to the wall opposite. This size equates to a room with no window, maximum use of wall space, and doors located in positions that have the least impact on the activities within the room.

If the room has a window, which is the preferred option, and to ensure optimum use of available wall and floor space, consideration ***shall*** be given to the impact of the position of the window (and window treatments) in relation to equipment and service locations. Additional floor space may be necessary.

A room size of 4000 x 5000 is recommended.

Selection of equipment, and in particular the type of birthing bed or chair, will have a direct bearing on the final size of the room.

The main functions of the birth/preparation room(s) for which facilities ***shall*** be provided are:

- patient preparation/relaxation during labour;
- charting of medical records;
- parking of dressings/treatment trolley;
- bedhead services (electrical and mechanical);
- access to assisted ensuite adjacent;
- use of nurse call;
- use of staff assistance call;
- use of telephone;
- use of intercom (optional);
- area for delivery bed/etc.;
- giving of analgesics;
- task lighting (examination/minor theatre);
- colour corrected lighting;
- baby resuscitation (gases, power);

- soiled linen and waste disposal;
- timing of procedures (clocks);
- space for additional equipment as necessary (infant incubator, mobile infant overhead heater etc.);
- clinical handwashing (hands off scrub up basin);
- high level of acoustic privacy; and
- space for spouse.

As mentioned above, the inclusion of a window is recommended, with external privacy screening (fence or heavy landscaping). Direct access to an enclosed and private courtyard has been provided in some instances to assist with the relaxation of the patient during the last stages of labour.

Attention to the level of interior design is also important, with emphasis on the "homelike" environment. Colours ***shall*** be chosen which do not alter the observer's perception of skin colour. The Health Department of WA can provide information to assist in the selection of suitable wall and floor colours.

Finishes ***shall*** be selected for ease of cleaning and resistance to strong detergents.

Above all, the patient's right to privacy and dignity must be respected. Curtained screening of entry doors may need to be considered.

G4.3.3 Assisted Ensuite

Each birth/preparation room *shall* have direct access to an assisted ensuite for patient use with staff assistance. Refer to Section G2.2.3(e) for detailed requirements. A single ensuite may be shared between two birth/preparation rooms via a privacy lobby, although dedicated facilities are recommended.

G4.3.4 Staged Delivery Facilities.

The combined birth/preparation room is the recommended facility base module in the obstetrical suite.

Where there is a preference for a "staged" approach to the birthing procedure, then separate rooms may be provided. The separate rooms are:

(a) **Delivery Room** - for the actual birth. The size and facility requirement is as for the Birth/Preparation Room. (G4.3.2).

(b) **Labour Room** - for the labour phase. This room may be multiple bedded, with screened privacy afforded each patient. **Each screened cubicle size will be 2300mm wide by 3000mm long, minimum. Additional floor space as required for circulation, trolley movement, emergency procedures, etc.**

In facilities which have only one delivery room, at least two (2) Labour Rooms *shall* be provided, one of which *shall* be set up to act as an emergency Delivery Room.

The main functions of the Labour Room(s) for which facilities are provided are:

- patient preparation/relaxation during labour;
- charting of medical records;
- parking of trolleys;
- bedhead services (electrical and mechanical);
- access to assisted ensuite(s) adjacent (1 per 4 beds);
- use of nurse call;
- use of staff assistance call;
- use of telephone;
- use of intercom (optional);
- area for bed;
- giving of analgesics;
- task lighting, including reading;
- colour corrected lighting;
- soiled linen and waste disposal;
- timing of procedures (clocks);
- space for emergency resuscitation equipment;
- clinical handwashing (hands-off scrub up basin); and
- space for spouse.

The interior design is an important consideration, with emphasis on the "homelike" environment. Colours ***shall*** be chosen which do not alter the

observer's perception of skin colour. The Health Department of WA can provide information to assist in the selection of suitable wall and floor colours.

Finishes ***shall*** be selected for ease of cleaning and resistance to strong detergents.

Labour rooms ***shall*** have controlled access with doors that are arranged for observation from the nurses workstation.

Windows in labour rooms, if provided, ***shall*** be draped or otherwise arranged to preserve patient privacy from casual observation from the outside.

(c) **Birth/Preparation Room** - for the full procedure. The staged delivery facility type can be enhanced by the inclusion of a single or multiple Birth/Preparation Room(s). It allows flexibility and the potential for isolation of patients. Requirements as detailed in Section G4.3.2.

G4.3.5 **Service Areas/Functions**

The Birth Suite *shall* provide for the following support service areas and functions.

In some instances, alcoves or other open spaces which do not interfere with traffic may be used.

(a) **Control/Nursing Station**

Located to permit observation of all traffic which enters and leaves the birth suite.

(b) **Supervisor's Office or Station**

Level of provision is dependent upon the size of the birth suite and the requirements of the **Statement of Function**. May form part of the Control/Nursing Station in smaller Birth Suites. (One or two Birth Rooms).

(c) **Patient's and Father's Lounge**

Located convenient to the Nurses Station for personal communications between patients, fathers and staff. Toilets, telephones, drinking fountain, tea making facilities, television, storage (tea preparation items) and comfortable chairs

should be provided in, or be convenient to, the lounge. A window to the outside is also highly desirable. Decor to be "homelike".

(d) **Sterile Supply**

Access to a supply of sterile equipment and consumables. Larger facilities may have direct access to a sterile supply department or store.

(e) **Drug Distribution Station**

Provision ***shall*** be made for the controlled storage, preparation and distribution of medication, eg. in smaller models, at the Nurses Station or in the Clean Utility.

(f) **Clean Utility**

A clean workroom is required within the Birth Suite. Requirements as for Section G2.1.3.(g).

A dedicated Clean Supply Room may also be provided for the storage and distribution of clean and sterile supplies. A smaller storage provision within the Clean Utility is still required.

(g) **Dirty Utility**

An enclosed soiled workroom is required within the Birth Suite. Requirements as for Section G2.1.3(h).

A dedicated soiled holding room for the collection and disposal of soiled materials may form part of a larger facility. This should be adjacent to or near the Dirty Utility Room, with preferred access from an external corridor for orderly pickup without the need to enter the Birth Suite.

(h) **Anaesthesia Storage**

Storage space for reserve cylinders of medical gases *shall* be provided as needed. If flammable anaesthetics are used, a separate room ***shall*** be provided in accordance with the relevant code and statutory requirements. May be shared with the Operating Suite.

(i) **Anaesthesia Workroom (only in large Birth Suites)**

For cleaning, testing and storing of anaesthesia equipment. It ***shall*** contain a work counter, sink and provisions for separation of clean and soiled items.

(j) **Equipment Storage Area/Room**

A storage room for equipment and supplies used in a birth suite is required. In smaller facilities, an alcove or part of another area might suffice.

(k) **Staff Change/Toilets/Showers**

Appropriate areas ***shall*** be provided for male and female personnel (technicians, nurses, aids, doctors) working within the Birth Suite. May be a shared central facility.

A minimum of one (1) staff toilet should be located conveniently within or near the Birth Suite.

(l) **Staff Lounge**

A lounge facility for obstetrical staff convenient to all areas within the suite *shall* be provided in large Birth Suite facilities. Access to "on-call" rooms for physicians in large facilities should also be considered. Lounge facilities for staff in smaller Birth Suites can be a shared central provision.

(m) **Conference/Handover Room**

(dependent upon the size of the Birth Suite and the requirements of the Statement of Function).

A room for conference, staff handover, interviews and staff training should be provided in the larger facilities for use by the Birth Suite personnel. The staff lounge may double-up with this function, if policy allows.

(n) **Cleaner's Room**

A cleaner's room exclusively for use by the Birth Suite ***shall*** be provided. It should allow for items/activities as listed in section G2.1.3.(o).

(o) **Stretcher/Trolley/Equipment Park**

An area ***shall*** be provided (off the central Birth Suite corridor) for the storage of stretchers, trolleys and mobile equipment as dictated by the **Statement of Function**.

(p) **Nursery**

If remote from the Maternity ward, then a separate nursery for post birth observation is required adjacent to the birthing suite. Size will be determined by the **Statement of Function.**

(q) **Formula Preparation Room**

A Formula Preparation Room to serve the Nursery at (p) above, may also be required if the Birth Suite is remote from the Maternity Ward.

(r) **Intensive Care (Obstetric)**

It is highly desirable that, if an Intensive Care facility is to be provided for obstetric use, then it be located as near as possible to the Birth Suite.

G4.3.6 **Alternative Birthing Unit**

Alternative birthing within the hospital environment is now a reality. It is a midwife based service which allows the choice of an alternative birthing arrangement without the clinical environment, but with specialist medical support close by.

The size of the unit ***shall*** demonstrate that both patient and staff health and safety issues have been considered.

The unit ***shall*** be located within close proximity of the Birth Suite and the Operating Suite (caesarean facility). This will facilitate safe transfer in an emergency situation.

The following rooms/areas are considered to be the minimum level of provision.

(a) **Birthing/Lounge Room**

A room *shall* be provided which will be large enough to accommodate the following:

- relaxation in domestic lounge chairs;
- dining facilities (kitchen tables and chairs);
- pantry facilities (including stainless steel sink);

- birthing, either on a bed, birthing stool, mat, bean bag etc.;
- storage of equipment;
- storage of sterile stock etc;
- medical gases, either concealed within a cupboard or mobile (nitrous oxide, suction, oxygen);
- privacy; and
- clinical handwashing (inset vanity type recommended).

Direct access to an enclosed landscaped private courtyard is considered highly desirable.

(b) **Entry**

A screened entry *shall* be provided, as a Lobby or similar, to ensure privacy.

(c) **Store**

A separate area/room ***shall*** be provided for the storage of ancillary mobile equipment and stock that would detract from the residential environment within the Birthing/Lounge Room. It should be directly accessible from the Birthing/Lounge Room or Entry Lobby.

(d) **Ensuite/Bathroom**

A room *shall* be provided for assisted toileting, showering, bathing, handwashing and grooming. Consideration might be given to the provision of hydrotherapy facilities within the bath (a spa bath), for the relaxation effect. Fitout, including grip bars, ***shall*** be in accordance with AS1428.1, "Design for Access and Mobility".

(e) **Fitout/Finishes**

Fitout ***shall*** be in a domestic style. Clinical items such as medical gases, equipment, etc are concealed, but within easy reach. Floor coverings within the Birthing/Lounge Room are variable, but non-slip vinyl under the bed area and carpet elsewhere is recommended. Floor covering in the Ensuite/Bathroom ***shall*** be non-slip (mosaic tiles, vinyl etc.). Wall and ceiling finish ***shall*** be domestic in appearance. The provision of curtains is acceptable and recommended.

(f) **Lighting**

Lighting ***shall*** be domestic, although provision ***shall*** be made for a mobile examination light.

(g) **Emergency Egress**

Appropriately sized and located doors ***shall*** be provided for emergency bed transfer to the Birth or Operating Suite.

(h) **Air Conditioning**

The room ***shall*** be air conditioned, with temperature control within the Birth/Lounge Room. This is an important consideration as the body temperature of the expectant/new mother tends to vary.

(i) **Acoustics**

The unit ***shall*** have High Acoustic Isolation from the surrounding areas, in accordance with B5.2.5.

G4.3.7 **Construction Standards and Finishes**

General and detailed Birth Suite requirements are provided in sections B2 and B3.

G4.3.8 **Engineering Services**

General and detailed Birth Suite Requirements are provided in Section E, Facility Engineering Services.

G4.4 Operating Suite

G4.4.1 **General**

The number of operating theatres, recovery beds and support service areas ***shall*** be based on the expected surgical workload of the unit. The operating suite ***shall*** be located and arranged to prevent non related traffic through the area.

Consideration ***shall*** also be given to location in relation to exit and evacuation logistics.

Appropriate colour selection ***shall*** be made for internal surfaces, walls, floors and the like. Refer to Section G.4.4.6.

The areas required are as follows.

G4.4.2 Operating Room(s)

General purpose operating rooms, unless specified otherwise, *shall* have a preferred clear floor area of 36 square metres (30 square metres minimum), exclusive of any built-in items, shelves, etc.

In cases where an operating room is to be used for orthopaedic or cardiothoracic surgery, the preferred clear floor area ***shall*** be 42 square metres (36 square metres minimum).

The above operating rooms, *shall* have a minimum width of 6000mm.

Final levels of equipment provision ***shall*** also have an impact on the final size of the room, eg. fixed 'C' arm, computer and audio-visual equipment etc.

Variations and allowances to size will be considered by the Commissioner where operating rooms are to provide a restricted service, and where large floor areas are not required, eg. minor procedures, endoscopies etc. This will be as determined by the **Statement of Function**. (Refer also to Section G11.8 Endoscopy Units).
Where an operating room is commissioned for restricted service, it ***shall* not** be used for any other purpose.

If considered appropriate, the Commissioner will issue a letter of approval confirming the inclusion of an operating room with a smaller floor area.

The main functions of the operating room for which facilities *shall* be provided are:

- conduct of surgical procedures;
- administration of anaesthetics;
- recording of operating information;
- timing of procedures, both time of day and elapsed time;
- shadowless illumination/task lighting;
- viewing of x-rays with minimum provision of a double viewing screen; and
- communication.

A window to an external space is considered highly desirable. If the window is provided, it ***shall*** have a privacy/blackout facility, eg. electric roller shutter fitted externally to the operating room.

G4.4.3 Anaesthetic Room(s)

An Anaesthetic Room is not a mandatory requirement as pre-operative anaesthetic procedures can be carried out in the patient bedroom with the final anaesthetic being delivered in the Operating Room.

If an Anaesthetic Room is part of the proposed facility design and described in the Statement of Function, then the following *shall* apply.

The room ***shall*** provide for the following main Operating Suite functions:

- anaesthetising of patient;
- observation of patient including skin tone, blood pressure and pulse rate measurement;
- resuscitation of patient, if required;
- bench level activities and storage;
- storage of clean linen;
- clinical handwashing;
- drug storage;
- nurse call and staff assistance call;
- use of telephone; and
- timing of procedures.

The design of the anaesthetic room ***shall*** be such that suitable space is provided for all functions and equipment requirements. The location of the room will be as determined by the above requirements, the operating suite design and the proposed anaesthetic procedure.

Patient dignity and privacy ***shall*** be an important consideration.

G4.4.4 Recovery Room

A recovery area *shall* be located in close proximity to the Operating Rooms and *shall* provide for the following main functions:

- recovery of patients from anaesthetic;
- observation of patients including skin tone, blood pressure and pulse rate measurement;
- resuscitation of patients, if required;
- bench level activities and storage;

- storage of clean linen;
- clinical hand washing;
- storage of drugs, some of which may require refrigeration;
- nurse call and staff assistance call;
- use of telephone; and
- timing of procedures.

Privacy *shall* also be afforded the recovering patient. Bedscreen curtains are recommended. Mobile curtain tracking between beds are also recommended to maximise the enclosed private floor area during a resuscitation procedure.

The design of the Recovery Room *shall* provide space for all functions and equipment requirements. Adequate space must be provided to cater for patient trolleys and their movement in and out of the room.
Minimum Dimensions *shall* be:

- **between bed/trolley centres - 2300mm;**
- **clearance between bed/trolleys - 900mm;**
- **clearance between bed/trolley and side walls - 900mm; and**
- **clearance from foot of bed/trolley to nearest obstruction (wall, bench or parked equipment) - 2100mm.**

A minimum of two (2) bed/trolley spaces *shall* be provided per operating room, although where only one (1) operating room is to be provided, consideration should be given to increasing the number to three (3). It is stressed that these are minimum requirements and the use of the operating suite, as determined by the **Statement of Function**, may increase this number.

G4.4.5 **Service Areas/Functions**

The Operating Suite *shall* provide for the following support service areas and functions.

(a) **Entry/Exit Control**

The main entry and exit points of the operating suite should be capable of visual observation and control from within the suite.

(b) **Staff Change Rooms**

Separate male and female change areas *shall* be provided for all operating suite staff. Each room ***shall*** provide secure lockers, change areas, toilets, showers, uniform storage and handwashing facilities.

The design of the Operating Suite ***shall*** be arranged to encourage a one-way traffic pattern which ensures that the change areas are accessible from outside the theatre suite.

(c) **Staff Base**

A supervisory control point *shall* be provided in a prominent area within the Suite. It ***shall*** have direct communication with all zones; ie. visual, audio or electronic, or a combination of, or all three.

Facilities ***shall*** be provided for:

- routine clerical and record functions;
- doctor's write up;
- stationery storage; and
- communication.

(d) **Scrub-up Facilities**

A scrub-up facility, with at least two (preferably three) scrub-up positions, *shall* be provided adjacent to the entrance to each operating room. In instances where two operating rooms are in close proximity, the scrub-up facility may be shared, provided it is located adjacent to the entrance of each operating room, and the minimum allocation of two positions per operating room is observed ie. 4 positions for 2 rooms.

It should be noted though that studies indicate that all Operating Rooms in a multiple room suite should be identical in layout and orientation, including the position of the scrub-up. This apparently allows staff to work in any operating room in the suite without confusion as to where Scrub-Up, Set-Up, etc. are. Shared scrub-ups

create mirror imaged operating rooms. Included for consideration, but not mandatory.

Elbow, foot or electronic sensor devices *shall* be considered for tap valve activation. Hands off activation *shall* be provided.

Scrub up troughs ***shall*** be designed and installed to prevent contaminated water from splashing back onto users.

(e) **Holding Area**

An area, in proximity to the operating rooms, but out of the main operating suite traffic route, *shall* be provided to accommodate all patients waiting for surgery.

The Holding areas ***shall*** accommodate:

- minimum of two patient spaces for one or two Operating Rooms; and
- one additional patient space for each additional two Operating Rooms.

Where possible this area should be under the visual control of the Nurse Station/Control point.

2100 mm between centrelines of beds *shall* be provided.

In general, patients will be held on a trolley or bed prior to surgery.

Bedscreen curtains, providing individual privacy for patients *shall* be provided.

Patient privacy must be considered at all times. Pre-operative problems will require bedscreen separation.

The main functions of this area for which facilities *shall* be provided are:

- Clinical observation of patients including blood pressure, skin tone and pulse rate measurement.
- Resuscitation of patients, if required.
- Nurse call and staff assistance call.
- Clinical handwashing.
- Consideration ***shall*** also be given to acoustic privacy from staff in scrub-up

areas and the staff lounge, and to minimise the impact of recovery activities.

(f) **Set-Up**

A Set-Up room, with direct access to the operating room, *shall* be provided. Sharing of one set-up room between two or more operating rooms is acceptable provided layout and size of the room facilitates such sharing.

The Set-up Room is the clean workroom in the suite where clean or sterile materials are held and arranged prior to use in the operating rooms. The main functions, for which facilities *shall* be provided, are:

- Sterilisation of dropped and specialised instruments. Where a Theatre Sterile Supply Unit (TSSU) service is available, this function may be omitted. Alternatives to flash sterilisation shall be sought.
- Storage of instruments and materials.
- Holding of sterile supplies and packs.
- Storage of lotions in a special purpose warming cabinet.
- Preparation of dressing and instrument trolleys.
- Storage of drugs including scheduled drugs.
- Dry waste disposal.
- Use of telephone.

g) **General Storage**

An area ***shall*** be provided for storage of operating suite equipment and supplies. The design of this area should recognise the need for storage of specialised operating equipment including mobile x-ray apparatus, orthopaedic surgery equipment, etc.

Testing of operating equipment also requires consideration in the planning stage to determine

on-site facility need. Part of the Operating Suite General Store might be used for this function, or a dedicated room might even be necessary.

The design of the operating suite should allow for ease of access to the storage area for delivery of operating suite consumables. Controlled access from an external corridor is required.

(h) **Sterile Storage**

An area *shall* be provided for storage of the sterile packs and items to be used in operating suite procedures. This may be provided as part of a Theatre Sterile Supply Unit/Central Sterile Supply Department (TSSU/CSSD) facility, if available, and ***shall*** be accessible and convenient to the Operating Suite.

Where a remote CSSD is provided, or an external supply of sterile packs is envisaged, a dedicated sterile store *shall* be provided. The design of this area ***shall*** recognise the volume and range of surgical activity to be performed.

The design of the operating suite should allow ease of access to this area for delivering of supplies. Controlled access from an external corridor is required.

(i) **Lounge Facilities**

Within an operating suite there ***shall*** be a lounge area provided for staff. The lounge ***shall*** provide facilities for staff to relax and to prepare and consume beverages.

Attention ***shall*** be given to the acoustic isolation of this room to ensure that patients in recovery, or on transfer to the Anaesthetic Room (if provided) etc., do not overhear confidential discussions or levity from within.

Provision ***shall*** also be made for staff communication eg. telephone, intercom, radio page etc.

A window to an external space is considered highly desirable.

(j) **Clean Up/Disposal**

An operating suite *shall* have a Clean-Up area for the dedicated use of operating suite staff. A separate soiled holding area may also be provided where central Clean-Up facilities are to be provided and a system exists for collection and disposal of soiled materials. Pickup from an external corridor is recommended.

The main functions of the clean-up area for which facilities *shall* be provided are:

- receiving and holding of soiled / contaminated operating instruments, materials and items for disposal;
- disposal of fluids and body wastes in a slop hopper or equivalent disposal device;
- cleansing of instruments for re-sterilising;
- cleaning of trolleys, buckets, etc., prior to return to the operating suite;
- dry waste disposal; and
- hand washing.

The Disposal and Clean-Up activities associated with the Recovery function may be accommodated within the Clean-Up area if layout of the suite permits.

Alternatively, the Disposal functions associated with the Recovery area should be provided for in a separate area adjacent to recovery.

The functions of the Disposal area for which facilities *shall* be provided are:

- receiving and holding of soiled / contaminated material and items for disposal;
- disposal of fluids and body wastes in a slophopper or equivalent disposal device;
- pan and bottle sanitising;
- dry waste disposal; and

- hand washing.

(k) **Cleaner's Room**

Within an operating suite there *shall* be a dedicated cleaners room. This area *shall* be for the exclusive use of the operating suite and *shall* provide for storage of cleaning materials and equipment and disposal of cleaning wastes.

G4.4.6 **Interior Design/Colours**

In all areas where patient observation is critical, operating room, anaesthetic room, recovery area/room, holding area/room, colours ***shall*** be chosen which do not alter the observer's perception of skin colour. The Health Department of WA. can provide information to assist with suitable colour selection.

G4.5 Mortuary/Autopsy

G4.5.1 **General**

A Mortuary/Autopsy Unit is a facility for the holding of bodies, the conducting of Post Mortems/Autopsies and for the viewing of bodies by authorised persons.

The provision of a Mortuary/Autopsy Unit, that may only include holding and viewing of a body with autopsies conducted elsewhere, would be at the discretion of the Private Health Services Management and ***shall*** be clearly defined in the **Statement of Function.**

G4.5.2 **Classification of Autopsy**

Autopsies are classified as follows:

(a) **Forensic (Coroner's) Autopsies.**

Carried out in the event of the death of a person due to unnatural causes eg.

- suicides
- motor vehicle accidents etc.

Also included are cases where the person has died from natural causes but the actual cause of death is unknown.

These autopsies are directed by the 'Coroner' and are carried out by The Western Australian Centre for Pathology and Medical Research - Path Centre - at the State Mortuary, The Queen Elizabeth II Medical Centre, (QEII).

(b) **Hospital Autopsies**

Carried out at the request of the attending Medical Practitioner. Permission ***shall*** be granted by the next of kin where Coronial direction is not given.

G4.5.3 **Public Health Facility Autopsy Process**

The process for public Health Facility 'Hospital Autopsies' in the country is for the small health Facilities (Levels 1, 2 and 3) to provide a regional autopsy service with the 'Path Centre' (QEII) sending qualified mortuary technicians when this service is required.

The process for the Level 5 Health Care Facilities (Major Metropolitan Hospitals) is similar ie. to provide a viewing facility only with all autopsies being conducted at the State Mortuary (QEII).

This service is classified into 4 levels:

- LEVEL 1 - Holding only - no autopsy
- LEVEL 2 - Holding only (with viewing) - no autopsy
- LEVEL 3 - Holding (with viewing) and autopsy
- LEVEL 4 - Holding and autopsy (teaching capacity)

Further information is available from the Facilities and Assets Branch, Health Department of WA.

G4.5.4 **Private Health Facility Autopsy Process**

The extent of an Autopsy/Mortuary facility for a 'Private Health Facility' would generally be as for 'Public Health Facilities (selected from levels 1-4).

In the event of the 'Private Health Facility' providing holding/viewing only for the body and no provision for the conducting of autopsies, the State Mortuary (QEII), if requested to do so, will conduct the necessary autopsy at the expense of the Private Health Service Management.

The Director, Pathology Services, The Queen Elizabeth II (QEII) Medical Centre, ***shall*** be consulted at the time of initial planning.

G4.6 Dental

G4.6.1 General

The facilities for major dental surgery as a function of an operating suite are described in this section.

Facilities for minor procedures and freestanding dental suites are not covered. Standards for the latter facilities are not controlled by the Health Department of WA.

The dental operating suite can be a stand alone unit or attached to a general surgical facility.

The **Statement of Function *shall*** outline the role of the dental health facility. Only those rooms of an operating suite, which are directly affected by the dental surgery procedure, are covered here. As such, for the balance of requirements, refer to section G4.4 Operating Suite Service.

G4.6.2 Operating Room

The level of provision is as for section G4.4.2, Operating Rooms, although if the room is a dedicated dental O.R., then the minimum acceptable dimensions are 5000mm by 5000mm.

Support equipment will determine the final size of the room.

Besides the normal equipment required for surgical procedures, eg. operating table, anaesthetic machine, trolleys etc., items considered essential for dental procedures are as follows:

- one (1) compressed dental air outlet (Ryco or equivalent) situated close to the service panels for medical gases, suction and electrical outlets, with the provision of a regulated bottle of appropriate

compressed air as emergency backup or secondary use;

- a minimum of six (6) power outlets with an additional four installed for an emergency. (Total 10); and

- facilities for dental x-ray.

G4.6.3 **Equipment Storage/X-Ray Developing**

Additional space ***shall*** be required for the following:

- portable dental x-ray unit;

- dental x-ray developing facility;

- storage for lead aprons (patient, operator, anaesthetist) required for x-ray procedures during surgery;

- dental chart with canister for distilled water and attachment for:

  (a) electrically operated slow speed motor and handpiece

  (b) triple syringe (air, water, air/water)

  (c) air turbine, high speed handpiece

- ultrasonic cleaner;

- amalgamator for dental amalgams;

- curing light for synthetic fillings;

- mobile cupboard for medicaments and sundries; and

- ultrasonic burr cleaner.

The Radiation Health Section of the Environmental Health Branch of the Health Department of WA ***shall*** be consulted to ensure that all steps have been taken to provide facility radiation protection.

The following are not mandatory, but are highly recommended:

- modified dental cart instead of the described unit above, with attachments for:

  (a) air driven slow speed handpiece

  (b) triple syringe as above

  (c) two (2) lines for air turbine high speed handpiece with fibre optics

- electro-surgery unit; and
- cryotherapy unit.

G4.6.4 **Set-Up (Trolley Preparation)**

The level of provision is as for section G4.4.5(f), Set Up. In addition, trolley setups should be available for:

- maxillo-facial surgery;
- dento-alveolar surgery;
- operative (conservative) procedures;
- paediatric dentistry; and
- periodontics.

The following is optional:

- Trolley set up for osseo-integration procedure.

G5 ALLIED HEALTH CARE

General

Allied Health Care covers a range of services which are primarily concerned with the provision of rehabilitation therapy.

The Statement of Function for the proposed facility *shall* identify the extent to which therapy services *shall* be included in the project. Appropriate facilities and equipment *shall* be provided to ensure the effective function of the stated range and scope of services.

The extent of physical provision for most Allied Health Care Services may vary greatly, ranging from large, purpose designed, central facilities for inpatients and/or outpatients, to basic on-ward or bedside services. In each

instance the appropriateness of proposed provision will be assessed in light of the service plan prescribed in the **Statement of Function.**

The minimum requirements for each Allied Health Care Service are set out in the following sections.

G5.1 Physiotherapy

Where a physiotherapy service is to be provided the following functions or facilities *shall* be allowed for:

- **Individual treatment area or areas which provide for patient privacy.**
- **Staff handwashing facilities within or in close proximity to each treatment space. One handwashing facility may serve several treatment spaces.**
- **An exercise area with facilities appropriate for the level of intended service.**
- **Clean linen storage. This may be provided either in the form of built in cupboards, cabinets or on mobile storage trolleys.**
- **Storage for equipment and supplies.**
- **Storage for soiled linen and waste.**
- **Facilities for patient dressing and changing; secure storage of clothing, valuables, etc.; showering and use of toilet facilities.** These requirements ***shall*** apply where the physiotherapy service is also for outpatient use and they ***shall*** be capable of access and use by the disabled.
- **Ice-making facilities to be available in or near the department.**

G5.2 Occupational Therapy

Where an occupational therapy service is to be provided the following functions or facilities *shall* be allowed for:-

- handwashing facilities;
- storage for equipment and supplies;
- access to toilet facilities for the disabled; and
- group activity area(s).

G5.3 Allied Health Care - Other

A range of other Allied Health Care Services may be provided. These may include Podiatry, Speech Pathology, Dietetics, Psychology and Social Work.

In general, the minimum requirement for provision of these services ***shall*** be the availability of appropriate consultation space, waiting areas, and access to outpatient department facilities (as per G3.2).

Although consultation spaces should have a level of acoustic treatment sufficient to ensure a good standard of privacy and confidentiality, the requirements of the speech pathology service, in particular, should be given special consideration since the effective provision of the service requires significant reductions in intrusive noise levels. (Refer to Section B5.2.9).

Psychological counselling and social worker interviews will also require speech privacy to be assured.

G6 ADMINISTRATION

The level and range of facilities provided for general office and executive administration functions will vary greatly depending on the size of the proposed facility, the range of services prescribed in the **Statement of Function** and the management arrangements which will apply.

Minimum requirements for administration functions are set out in the following sections.

G6.1 Facility Administration

This service should be provided, where possible, in reasonable proximity to the main entrance of the facility and in association with the following functions or activities:

- reception, direction and provision of information to visitors and patients;
- public waiting area(s);
- public toilet facilities; and
- public telephone.

In addition, facilities ***shall*** be provided to accommodate the following administrative activities:

- admission of patients;
- private interview space which may include admission procedures;

- storage space for wheelchairs, out of the path of normal traffic, but near the entry point;
- general and/or individual office accommodation for appropriate clerical, administrative, medical and nursing personnel, if required;
- storage of office equipment, stationery and supplies; and
- multi-purpose conference room.

Consideration ***shall*** be given to the role of computers in the planning and design of the area. Ergonomic design, lighting, etc. ***shall*** address the very real occupational health issues. A guide document titled "Guidelines for Clerical and Screen based Work stations" is available for reference from Human Resource Services, Health Department of WA.

G6.2 Medical Records

Facilities *shall* be provided for the secure storage and retrieval of patient records. The following functions *shall* be allowed for:

- secure storage of all patient records, including secondary and tertiary storage, which includes fire rated construction of enclosure as indicated in the Building Code of Australia, Clause C2.5(g);
- clerical and administrative activity associated with medical records management;
- review of medical records and report preparation; and
- storage of Ledgers, account forms, vouchers etc.

G6.3 Staff Facilities

The Administrative and Clerical staff *shall* have access to toilet and dining facilities which may be shared with other hospital staff.

G7 SUPPLY SERVICE

G7.1 Bulk Storage

In addition to supply facilities in individual departments, a central store *shall* also be provided. General stores may be located in a separate building on site, but the preferred location is within the main building. Protection against inclement weather during transfer of supplies ***shall*** be provided. Fire protection and security are important considerations.

The following *shall* be provided:

- off street unloading facilities;

- a dedicated receiving area; and

- general storage room(s) with a total area appropriately sized to cope with the delivery and storage arrangements. Storage may be in separate concentrated areas within the institution or in one or more individual buildings on site. A centrally located facility is recommended.

G7.2 Catering

The food service facilities and equipment *shall* comply with the requirements of the:

- Health (Food Hygiene) Regulations made under the *Health Act, 1911;*

- "Food at Work" (Planning Employee Food Services), volume 26 in the Occupational Safety and Health Working Environment Series;

- "Food at Work" (Use and Care of Food Service Equipment), volume 27 in the Occupational Safety and Health Working Environment Series;

and as necessary to meet the requirements of the **Statement of Function**.

These may consist of on-site or off-site conventional or convenience food preparation systems, or any appropriate combination thereof.

The following facilities *shall* be provided in size and number to implement the type of food service selected.

G7.2.1 **Food Preparation Facilities**

Conventional food preparation systems require space and equipment for receipt, storage, preparing, cooking and baking. Convenience food service systems such as frozen prepared meals, bulk packaged entrees, individual packaged portions, or systems using contractual commissionary services, require space and equipment for refrigeration, holding, thawing, portioning, cooking and/or baking.

G7.2.2 **Assembly and Distribution**

Facilities for assembly and distribution of meals. The distribution service must ensure food is delivered to the patient hot or cold as required.

G7.2.3 Warewashing

Dedicated crockery, utensil and cutlery washing (warewashing) facilities as remote as is practical from the food preparation and serving area. It is recommended that where practical, a warewashing space be located in a separate room or alcove.

Commercial type washing equipment is recommended.

Space ***shall*** also be provided for receiving, scraping, rinsing, sorting and stacking soiled tableware.

G7.2.4 Pot scrubbing

Pot scrubbing facilities which incorporate emergency ware washing facilities in the event of equipment failure.

G7.2.5 Staff Handwashing

Staff handwashing facilities located in or close to the food preparation area.

G7.2.6 Storage

Storage space for at least a four (4) day supply of food. Separate space will be required for refrigerated (cold and frozen) storage, dry foods storage and crockery, utensils and cutlery storage.

Note 1: Operating and food handling ***shall*** be in accordance with the Health (Food Hygiene) Regulations.

Note 2: Facilities in remote areas may require proportionally more food storage facilities than needed for the 4 days recommended.

G7.2.7 Cleaner's Room

A cleaner's room *shall* be provided within the catering service area. A cleaner's sink, equipment storage, including shelving and trolley park floor area is required.

G7.2.8 Staff Toilets

These may be shared facilities with other hospital departments, as long as they are within easy under cover walking distance.

G7.2.9 **Staff Dining**

A room or rooms *shall* be provided for staff dining and relaxation. Space provision ***shall*** be as detailed in volume 26 of the Occupational Safety and Health Working Environment series, as mentioned above.

Space must be provided to cater for all staff potentially requiring sit down dining space during any single shift.

Staggered dining sessions is an acceptable way of reducing the size of this room.

G7.2.10 **Office**

Dependant upon the size of the hospital and catering facility, an office for the senior catering officer may be necessary. It is not mandatory. Standard desk, seating, lighting, power and communication provisions are required.

G7.2.11 **Ice making**

Self dispensing ice making facilities may be located in the food preparation area or in a separate room, but must be easily cleanable and convenient to the catering/dietary function.

G7.2.12 **Unobstructed Vision**

To prevent accidents, all internal kitchen doors *shall* have clear glazing to the top half.

G7.2.13 **Insect Control**

In addition to the requirements in section B2, where a door in a kitchen opens directly to an external space, and where that door is used for deliveries or regular traffic flow and therefore a flywire door is impractical, an air curtain ***shall*** be provided. This situation will only apply to the remodelling of existing facilities. Planning of new facilities will not include direct traffic routes from a kitchen to an external space.

G7.2.14 **Garbage Disposal**

Provision *shall* be made for regular wet and dry garbage storage, removal and disposal. Refer to section G8 for details of the central facility garbage holding area. Garbage pickup from the kitchen ***shall*** be

at the end of each day. All garbage, and in particular wet garbage, ***shall*** be stored in acceptable sealed containers. The bins ***shall*** be kept clean.

G7.2.15 **Trolley Wash**

An area ***shall*** be provided for the washing and disinfection of trolleys, carts etc. This provision should be remote from the food preparation and storage areas.

G7.3 Laundry and Linen

Each facility *shall* have provisions for storage and processing of clean and soiled linen for appropriate patient care. Processing may be done within the facility, in a separate building on or off the site, or in a commercial or shared laundry.

Specific facilities and equipment ***shall*** be as required for cost effective operation as described in the **Statement of Function.**

G7.3.1 **Minimum Level of Provision**

As a minimum, the following elements *shall* be included:

- **A separate room for receiving and holding soiled linen until ready for pick up or processing.**
- **A central, clean linen storage and issuing room(s) in addition to the linen storage required at individual patient units.** The

  central storage capacity ***shall*** be sufficient for the efficient operation of the hospital.
- **Cart storage areas for separate parking of clean and soiled linen carts out of traffic paths, usually at patient unit level.**
- A clean linen inspection and mending room or area, located on or off the site, as part of the main linen service, all as determined by the system identified in the **Statement of Function**.
- **Handwashing facilities *shall* be provided in each area where unbagged soiled linen is handled**.

G7.3.2 **Linen Processing Outside the Building**

If linen is processed outside the building, provision *shall* also be made for:

- **A service entrance protected from inclement weather for loading and unloading of linen. This may be a shared delivery service entrance.**
- **A control station for pick-up and receiving.**
- **Separated delivery and pick-up points for clean and soiled linen.**

G7.3.3 **Linen Processing Within the Building**

If linen is processed in a laundry facility which is part of the project (within or as a separate building), the following *shall* be provided in addition to G7.3.1 above:

- **Receiving, holding and sorting room for control and distribution of soiled linen.** Discharge from soiled linen chutes may occur within this room or into a separate room.
- **Laundry processing room with commercial type equipment which can process at least a seven day supply within the regular scheduled work week.**
- **Storage for laundry supplies.**
- **Employee handwashing facilities in each separate room where clean or soiled linen is processed and handled.**
- Arrangement of equipment ***shall*** permit an orderly work flow with a minimum of cross traffic that might mix clean and soiled operations.
- **Compliance with all of the relevant statutory requirements and regulations is required.**
- **Convenient access to employees' lockers, showers, lounge etc.** These are usually shared facilities with the remainder of the hospital staff.

G7.4 Pharmacy

G7.4.1 **General**

The size and type of service to be provided in the pharmacy will depend upon the type of drug distribution system used, number of patients to be served, and extent of shared or purchased services. This ***shall*** be described in the **Statement of Function**.

The pharmacy room or suite ***shall*** be located for convenient access, staff control, and security. Facilities (including satellite, if applicable) and equipment, ***shall*** be as necessary to accommodate the requirements of the **Statement of Function.**

Relevant State and Federal statutory requirements are to be complied with.

Note 1: If manufacturing, refer to the "Code of Good Manufacturing Practice for Therapeutic Goods".

As a minimum, the following elements *shall* be included as required:

G7.4.2 **Dispensing**

- Controlled pick-up and receiving point (counter).
- Area for review and recording of orders.
- Extemporaneous compounding area.
- Work counter and cabinets for pharmaceutical activities.

G7.4.3 **Manufacturing**

- Bulk compounding area.
- Provision of packaging and labelling.
- Quality control area.

G7.4.4 **Storage**

In the form of cabinets, shelves, and/or separate rooms or closets:

- Bulk storage.
- Active storage.

- Refrigerated storage.
- Volatile fluids and alcohol storage with construction as required by the relevant regulations for substances involved.
- Secure storage for narcotics and controlled drugs.
- Storage for general supplies and equipment not in use.

G7.4.5 **Administration**

- Provision for cross check of medication and drug profile of individual patient.
- Cabinet or shelf storage for the drug information retrieval system.
- Separate room or area for office function including desk, filing, communication, and reference.
- Provisions for patient counselling and instruction (may be in room separate from the pharmacy).
- Room for education and training (may be in a multi-purpose room shared with other departments).

G7.4.6 **Other**

- Handwashing facilities ***shall*** be provided within each separate room where open medication is handled.
- Provide for convenient access to employees' lockers, showers, lounge etc. These are usually shared facilities with the remainder of the hospital staff.
- If intravenous solutions are prepared in the pharmacy, provide a sterile work area with laminar flow bench and hood. Arrangement and construction ***shall*** comply with the relevant Australian Standards and statutory requirements. Consideration is to be given to the physical requirements of specialist activities such as cytotoxic preparations, if carried out.

- When dispensing of medication to outpatients forms part of the **Statement of Function**, provide for consultation and patient education.

G7.5 Sterile Goods Supply

See National Standard for the Operation of Sterile Supply Service in Health Care Facilities produced by the National Consultative Council for Therapeutic Goods, "NCCTG".

The size and role of the sterile goods supply service ***shall*** be clearly defined in the **Statement of Function**.

The sterilisation process may be carried out entirely or partially on site, the latter relying on an external supply source to regularly restock the hospital sterile goods store. The scale of operation can be very small or very large, dependent upon the requirements of the serviced departments eg. Operating Suite requires a Theatre Sterile Supply Unit (TSSU) or full Central Sterile Supply Department (CSSD) services, whereas an acute ward requires only a basic sterile supply service.

Infection control and good manufacturing principles are to be observed when designing the unit/department.

The planning of the facility must provide for security and separate clean and dirty working areas. The following are the principle facility requirements of a sterile goods supply service:

G7.5.1 Receiving and Decontamination

A room *shall* be provided which *shall* contain work space and equipment for sorting, decontamination and cleaning medical and surgical equipment and for disposal of used/soiled material. It *shall* include handwashing facilities.

There will be a need to provide special types of cleaning equipment, dependent on the level of service, eg. Ultrasonic cleaners, anaesthetic tubing washers and dryers etc. Where provided, they ***shall*** be installed and commissioned to the requirements of all relevant Australian Standards and Occupational Health requirements.

G7.5.2 Clean Workroom

A room *shall* be provided which will contain handwashing facilities, work space and equipment

for terminal sterilising of medical and surgical equipment and supplies. Linen folding ***shall*** be carried out in a separate room. The air handling system ***shall*** be filtered or discharged direct to the outside to prevent lint build-up and related industrial and fire safety problems. High level supply and low level exhaust is the recommended air-flow pattern, with localised high level extraction for heat removal only. It is preferable that linen folding is carried out in the laundry. Special attention ***shall*** be given to the height and depth of work benches to allow staff to work sitting or standing.

Consideration should be given to the provision of floor area for steriliser trolley parking A cooling area for 'hot' trolleys following sterilisation should be considered. Packs should not be handled until cool.

Views to the outside are considered highly desirable.

Sterilising ***shall*** be undertaken in appropriate porous load sterilisers, either downward displacement or high pre-vacuum.

Special consideration ***shall*** be given to the location of the sterilisers. External access (to a steriliser duct) is highly desirable so that repairs or routine maintenance do not interfere with the activities within the Workroom. A duct enclosure can also minimise heat build up within the Workroom. Exhaust over the front of the steriliser(s) ***shall*** also be considered, to extract both heat (cabinet) and steam (opening door).

Specialised sterilisers, eg. ethylene oxide, require separate installation and accommodation.

G7.5.3 Clerical

A separate room, or space within the Workroom, *shall* be provided for routine clerical/administrative procedures. The provision of a separate office will depend upon the size of the unit/department. An area for write-up and storage of stationery and files ***shall*** be provided. A pin-up/whiteboard should also be considered.

G7.5.4 Storage

(a) **A room *shall* be provided for the storage of processed sterile packs etc.** Ventilation, humidity and temperature control is required. Air

supply ***shall*** be positive with surrounding areas and the level of filtration ***shall*** equal or exceed that of the Operating Room as defined in Section E1.2.5. Storage cupboards shall be fitted with doors.

(b) **A separate room *shall* be provided for the storage of 'clean' stock (not sterile).** Access to this room from without the unit/department (for stocking) and from within (for drawing stock to process) is required.

(c) **Other storage provision is required at Nursing Unit or Specialist Department (eg. Birth Suite) level for storage of equipment and supplies used in the delivery of patient care.** This normally constitutes a cupboard in the Clean Utility.

(d) **Space *shall* also be provided for the storage of distribution trolleys as required.**

(e) **Facilities *shall* also be provided in the change room for the storage of caps, overalls and footwear protection. 'Barrier' principles are observed when entering the unit.**

G7.5.5 **Distribution**

A distribution point, if required, ***shall*** be provided in the form of a staffed counter or stable door, or a pass through cupboard from the sterile store into an adjacent service corridor. No general access is allowed to the Department.

G7.5.6 **Garbage**

and soiled and damaged linen storage is to be provided in each respective area. Regular pickup and disposal routines are to be assured.

G7.5.7 **Staff Amenities**

Showers, toilets and secure lockers for staff employed in this area *shall* be provided. Conveniently located and shared facilities with the Operating Suite staff (where the Sterile Supply Department is attached) is acceptable. Entry to the Department must be controlled (barrier) to ensure the best possible infection control. A lunch room can be a

shared central facility outside the Sterile Supply Department.

G7.5.8 **Air Filtration**

Where the Sterile Supply Unit is attached to Operating Rooms, ventilation is provided by a treated air supply, with air conditioning to AS 1386 and HEPA filters to AS 1324. Refer to Section E1.2.6 (d).

For a separate Sterile Supply Unit ventilation must conform to Section E1.2.6 (c).

G7.5.9 **Communications**

A telephone or intercom system should be installed within the clean workroom and/or office to allow communication with outside departments etc., without breaching the "clean barrier" regime which is achieved by good departmental management and observance of principles of good manufacturing practice.

G7.5.10 **Light Fittings/Ceiling**

The ceiling *shall* be of a flush type and sealed against the walls. Light fittings *shall* be of the fully recessed type and selected to prevent the ingress of dust and insects.

Light level ***shall*** be not less than 400 lux.

G7.5.11 **Floors/Walls/Windows**

Floor finishes *shall* be easily cleaned. Welded sheet vinyl, coved up the wall, is recommended. Wall finishes *shall* also be easily cleaned, with special consideration for damage by trolleys. Windows, if provided, must not be openable.

G7.5.12 **Signage**

Door signs are required to provide instruction as to the closed nature of the department and the limited access points for services.

G8 ENVIRONMENTAL SUPPORT

G8.1 General

All facilities, no matter how large or small, will require environmental support services in the form of:

- cleaning services
- maintenance services
- waste disposal

G8.2 Cleaning

The cleaning service may be contracted or in-house. In addition to the cleaners' rooms already requested in the specialist departments, others may be required throughout the facility to maintain a clean and sanitary environment.

Refer to the Acute Nursing Unit Cleaner's Room, item G2.1.3(o) for level of provision.

There *shall not* be less than one cleaners' room per floor.

G8.3 Maintenance Service

A maintenance service *shall* be provided. It may be in-house or contracted, with an on-call repair service. The complexity of the services within and provided by the facility will obviously dictate the nature and extent of the maintenance service required.

The maintenance service is provided to effect preventative maintenance and repairs to all elements of the facility, from the building fabric to items of specialist equipment.

Areas that require a 24 hour per day, 7 day per week "on-call" maintenance service are:

- medical gases and suction systems
- lifts
- fire systems
- bio-electronic equipment
- any life-support systems
- emergency power systems

The potential life threatening nature of the failure of any of the above systems justifies an around the clock service.

The following is considered the minimum facility provision to effect the above mentioned maintenance service. Add or subtract areas

as dictated by the scope of service outlined in the **Statement of Function**.

G8.3.1 Engineer's Office

If on-staff, an engineer's office ***shall*** be provided with file space and provision for protected storage of facility drawings, records and manuals etc.

G8.3.2 Workshop

A general maintenance workshop ***shall*** be provided for repair and maintenance. Sufficient space is required for a workbench, drill press, angle grinder, stainless steel trough, tool peg board, storage cabinets, and floor space for the standing of equipment during repairs. Adequate lighting, power and ventilation are required.

Maintenance workshops incorporating carpentry, metal fabrication, plumbing, refrigeration or other noise generating trades ***shall*** be acoustically isolated from non-maintenance areas. Refer to Section B5.2.

G8.3.3 Storage Room

A storage room ***shall*** be provided for the storage of building maintenance supplies. Storage for solvents and flammable liquids ***shall*** be as required by the "Explosives and Dangerous Goods Act" - 1961 as enforced by the Department of Mines.

G8.3.4 Electronics Workshop

A separate workshop may be provided specifically for the storage, repair and testing of electronic and other medical equipment. The amount of space and type of utilities will vary with the type of equipment involved and types of service and maintenance contracts used.

G8.3.5 Service Yard

Yard equipment and supply storage areas ***shall*** be located so that equipment may be moved directly to the exterior without interference with other work.

G8.3.6 Gardener's Store/Facilities

A room (or shed) ***shall*** be provided for the storage of all the necessary gardening equipment and material.

Depending upon the size of the grounds team, consideration ***shall*** also be given to the provision of a head gardener's office (if necessary), handwashing facilities, toilet facilities (if necessary), showering facilities etc.

G8.4 Waste Management

Facilities *shall* be provided for the safe storage and disposal of waste. Requirement will be determined by the policy on waste management as contained in the **Statement of Function**. Effective waste management depends on staff awareness of waste minimisation and careful segregation of waste categories at source. Floor layout and the location of waste collection points are important in facilitating best waste management practice. The flow diagram shown as figure 1 provides a basis for development of specific hospital waste handling systems.

Colour coded mobile carts such as 240 litre Sulo bins are used effectively to collect separate waste categories in a variety of hospitals. Particular hospital waste quantities or space available for waste collection areas may suggest an alternative cart size as appropriate. Current colour coding of carts is recommended so that familiarity with waste segregation is developed with staff shifting between hospitals.

Waste minimisation measure can be monitored using bar code labelling and computerised weighing systems. This may be difficult to justify in some smaller hospitals but soon becomes an effective tool in larger institutions where waste disposal incurs significant cost. Centrally managed sites accommodating several costs centers can also control waste volumes by introducing 'user pays' principal based on measured waste quantities.

Waste storage areas should be designed to secure the material, reduce organic decomposition, contain odours and allow hygienic cleaning of storage areas and carts.

Larger institutions may benefit from the installation of a mechanised bin washing facility.

Reticulated steam, pressure cleaning systems and air blow drying facilities may be appropriate in these location.

Liquid waste emanating from disinfection procedures will require stabilisation before disposal in sewerage systems.

G8.4.1 **Waste Management Regulations**

Medical waste management policy has been developed over the last five years since general incineration of cost

hospital waste was discontinued. The Health Department of Western Australia (HDWA) developed a code of practice for producers, transporters and disposal contractors in 1994. This code has no regulatory base but was written to assist the health industry and disposal contractors to manage the waste in a satisfactory manner.

The *Explosives and Dangerous Goods Act, 1961* is the only directly relevant regulation covering specific handling of medical waste apart from environmental acts and regulations pertaining to general waste (Dangerous Goods and Transport Regulations). These regulations require vehicles transporting hazardous materials as defined in the Australian Dangerous Goods Code to be marked with a placard identifying the waste category. The subsequent handling of these materials has been affected by other guidelines and codes of practice.

The National Health and Medical Research Council released draft Guidelines for the Management of Clinical and Related Wastes for comment in May 1996. Although this document has not yet been formalised, the recommendations given here comply with the standards set by the National Health and Medical Research Council (NH &MRC) in those Guidelines.

Currently the Department of Environmental Protection (DEP) is preparing a Code of Practice for the Management of Clinical and Related Wastes which includes the option for licensing medical waste transporters. This code is likely to be gazetted in July, 1997. The regulations derived from this code will be known as the *Environmental Protection (Clinical and Related Waste) Regulations.*

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Standards Australia have released a draft standard for comment on the Management of Clinical and Related Wastes (DR 97123 - Revision of NZS 4304:1990).

Although this draft standard advocates incineration of most clinical waste where possible, it is not a requirement of HDWA or DEP policy. The following recommendations have been prepared on the understanding that most clinical waste can still be satisfactorily disposed to land fill in Western Australia.

The Water Corporation has waste water regulations that control chemical and bacterial discharge from hospital environments.

Other regulatory standards will apply to building specifications for waste disposal areas and liquid disposal routes associated with the waste management process. Appraisal of necessary compliance with these standards, codes and regulations is expected to be undertaken by the relevant sub-consultant to that service.

G8.4.2 **Work Station Collection Points**

G8.4.2.1 ***Clinical Areas***

Adequately sized, purpose designated space needs to be allocated for storage of 240L carts in strategic collection points for each clinical section. Work station collection points need to be easily accessible to the staff responsible for disposal and those servicing the facility in removing and replacing the carts. An important aspect of satisfactory waste management is convenience to the waste producer in complying with the segregation process. Most cart locations in clinical areas should be sited within treatment rooms.

Other areas may require an alcove for cart storage. Walls and floors in areas used for cart storage should be tiled or sealed to allow easy cleaning.

Handwashing facilities should be located adjacent to the waste collection area where clinical material is handled.

The carts should not be accessible to the public and should preferably be out of sight in a reasonably secure area.

The hospital management policy may call for a large part of the recycling process to be undertaken at user level. Segregation of recycled materials at user points will require increased storage over commingled methods of recyclable collection.

Estimates of 240L carts required for each hospital section should be based on the

commingled option for recycled material collection, as provision of individual cart space for each recycled material is considered impractical in ward areas.

Special waste handling procedures ***must*** be provided for satisfactory sharps, human tissue, cytotoxic and radioactive materials disposal. Sharps ***must*** be safely contained in either disposable (AS 4031 - Australian Standard for non-reusable containers for the collection of sharps in health care areas) or recyclable containers manufactured for the purpose (AS/NZS 4261 - Australian/New Zealand Standard for reusable containers for the collection of sharps used in health care areas). Adequate disposal points are needed in treatment areas so that containment of sharps can be readily effected once they are ready for disposal. This usually requires wall mounting of the container.

The disposable containers may be discarded through the clinical waste stream providing the disposal contractor has approval for this disposal route. Some hospitals management teams require incineration of all sharps although there is no justification for this providing correct packaging and disposal is undertaken.

Recycled sharps container disposal is usually effected by the contractor supplying the container and does not require a removal process other than contractor access.

Human tissue, cytotoxic and radioactive materials are only likely to occur irregularly and in small quantities unless the hospital has specialised facilities. Provision of storage space for these materials will not generally be necessary in treatment areas.

Small containers should be provided in sections producing human tissue for disposal. This material should be transported to the waste management handling area soon after discard for

freezing if necessary and subsequent incineration.

Disposal of cytotoxic and radioactive materials should be supervised by qualified personnel, usually the pharmacist. Routine provision for disposal of these waste categories is not expected to be necessary.

G8.4.2.2 ***Clerical Areas***

Adequately sized, purpose designated space needs to be allocated for storage of 240L carts in strategic collection points for each clerical section. An important aspect of satisfactory waste management is convenience to the waste producer in complying with the segregation process. General waste disposal carts should always be located near recycled paper carts to overcome indiscriminate disposal of general waste with recycled material. Work station collection points need to be easily accessible to the staff responsible for disposal and those servicing the facility in removing and replacing the carts. The carts should not be accessible to the public and preferably should be out of sight in a reasonably secure area.

Hospital Management Policy may call for shredding of confidential records prior to dispatch to the recycling area (waste management handling area). Strategically placed shredding facilities may need to be located adjacent to storage areas for carts in which confidential records are discarded. A central disposal area for all confidential material may provide improved security for records.

G8.4.3 **240 Litre Cart Requirements**

Cart requirements should be based on the waste categories expected from each waste source.

G8.4.4 **240 Litre Cart Relocation Route and Multi Cart Movement**

The efficient servicing of work station collection points within the various work areas will depend on ease of movement for carts and trolleys where multiple cart loads are transported.

A flow chart for cart movement is shown in Figure 1.

An option to be considered is for provision of a purpose built trolley capable of accommodating six 240L carts which can be moved by hand or tug pulled. The design could be enhanced by centrally located wheels that allow a tight turning circle to be achieved. A second option is the linking of a series of carts that can be tug pulled.

Servicing of waste and linen storage areas should be undertaken via thoroughfares that avoid regular public, patients and staff facilities. Particular attention should be made to avoiding food handling and high profile public areas. A service lift that is devoted to materials movement within the hospital will enhance the efficiency and aesthetics of the hospital operation.

G8.4.5 **Cart Feeder Storage**

Adequate numbers of backup carts to replace those used over 24hrs need to be readily accessible to the various sections on each floor of the hospital. This will reduce the urgency for immediate servicing and allow variability of waste loads to be accommodated.

Projected waste loads for each floor should be made to indicate cart storage area requirements.

Allowance should be made for variation in daily waste loads to ensure adequate space has been allocated for cart storage areas.

Cart requirement for linen may also need to be estimated where soiled linen is to be housed within waste storage areas. The cart storage areas should be confined to waste handling so that a high level of cleanliness, orderly control of waste and efficient cart movement can be achieved.

The cart storage area will allow scheduled collection and replacements of carts to be undertaken at preferred low congestion periods during the day. Where possible the storage area should be adjacent to the service lift so that cart movement on each floor is minimised.

Doors accessing cart storage areas need to be 800mm wide and need a closing and locking facility. Wall and

floor surfaces need to be tiled or sealed to allow cleaning of spills. A graded floor with drainage should be provided although routine wash down of this area will not be necessary. A hand basin should be located near the access door.

Cart storage areas are to be situated close to clean treatment facilities. Potential odours need to be minimised by controlled temperatures and preferably negative air pressures to these areas.

G8.4.6 **Waste Management Handling Area**

Adequate, covered space needs to be provided for collection, storage and sorting of waste materials. This area needs to be exclusively used for waste management purposes.

The following space allocations will be required within the waste management handling area:

- Enclosed work management station.

  A dust free work space with telephone and computer outlet. Benched area to undertake recording, analysis for audits and statistical reporting. The are should have visual control of the waste handling facility.

- Cart receiving.

  A spacious area with room for pull tug and cart trolley access. Cart sorting, recording and weighing should be undertaken in this area.

- Cart weighing and recording station.

  A floor level digital cart weighbridge and bar code recorder will facilitate close controls on waste management. This will also allow user pays break downs for waste handling costs.

- General waste compaction with direct contractor

  General waste may be compacted on site. Projected general waste loads should be calculated to ensure that compaction is economic. Provision for front load bins may need to be considered.

- Clinical waste cart storage; or

- Clinical waste receiving hopper including cart lifter and direct access for removal.

  There are two options for clinical waste disposal. Carts can be emptied by contractors on site which entails storage of the waste in the carts pending collection. Calculations regarding the space required and frequency of removal need to be done.

  The other means of disposal is to discharge the carts into a holding hopper pending removal. A mobile cart lifter is usually necessary with this system. Using this disposal method carts can be cleaned and returned to service immediately.

  A decision regarding the preferred disposal method will need to be made or provision for either process including in the design.

- Recycling materials cart storage.

  Providing commingled recycling collection is used, cart storage space needs to be allocated. The required space, depending on frequency of collection, needs to be calculated.

- Recycling sorting area.

  If hospital policy requires 'at source' segregation recycled material, a crate storage area will need to be established to accommodate each recycled material.

  This would seem to be labour intensive and of doubtful benefit to the health care effort.

- Clean cart storage area.

- Freezer to store tissue pending disposal.

  A 240L upright freezer will be required to store tissue pending dispatch for incineration.

- Consumable storage space.

  Plastic bin liners and cleaning materials will need

secure storage. This facility could be sited adjacent to the enclosed work management station.

Other requirements include:

- Controlled temperature.

  The waste handling area should be maintained at a temperature which helps control odours. Ideally a negative pressure environment should be provided in waste holding areas to contain odour spread.

- Vermin and rodent proof.

  Areas used to store waste materials need to be secure from vermin and rodent infestation.

- Wash down facility.

  A high pressure wash down unit should be provided for the adequate cleaning of the area.

- Cart washing facility (may require disinfection and drying).

  Until this facility is finalised it is difficult to specify services needed for the operation. Drainage to this area may include disinfectants and liquid waste may require special treatment prior to discharge. Disinfection material options include chlorine based detergents, quaternary ammonium compounds, formaldehyde and glutaraldehyde. Formaldehyde and glutaraldehyde are unlikely options considering the toxic properties of these substances.

- Sealed floors and walls to 2m.

  The waste handling area will require frequent wash down. Walls and floors should be sealed to withstand this treatment and the floors graded to allow run off. Drainage to this area may include disinfectants and liquid waste may require special treatment prior to discharge.

G8.4.7 **Bulk Waste Movement**

It is important that adequate traffic access is provided for delivery and removal of all waste categories including site clinical out station units. The waste handling area will require frequent servicing by site and contractor's vehicles. The access roads need to be adequate and turning areas uncongested. Commercial operators will be removing waste in carts and front loading bulk bins. Noise levels may be significant during waste collection periods.

Cart movement around the site and during the disposal process may require that the carts are accessible from various levels. Clinical waste discharge into a waste vehicle may require handling at ground level. Dispatch and receival of carts may require loading at trailer or vehicle tray level. As a result, a loading bay with variable level platform should be provided.

Provision should be made for delivery and retrieval or bulk bins from with the enclosed waste handling area.

G8.4.8 **Waste Disposal**

Most medical waste can be disposed of using land fill facilities in Western Australia. Some regulations apply to certain categories of waste. These requirements are detailed in the *Environmental Protection (Clinical and Related Waste) Regulations* referred to in G8.4.1.

G8.4.8.1 ***Land fill***

The preferred option for most Medical waste is supervised disposal at an approved solid waste land fill site. This will need negotiation with the Local Authority. Strict protocols must be observed when carrying and disposing of medical waste. The Local Environmental Health Authority Officer should be consulted.

G8.4.8.2 ***Incineration***

If medical waste is to be incinerated, then the incinerator must be approved by the Environmental Protection Authority. This implies that incineration should be carried out by large scale existing approved commercial facilities, or if a new facility is to be built as part of a hospital development, then it ***shall*** comply with the Environmental Protection Authority

requirements. The requirements are cost prohibitive for a single hospital. It would need to serve a region or number of hospitals to be commercially viable. Where an incinerator is provided, consideration ***shall*** also be given to:

- capacity (to suit the incinerator's minimum working load);
- construction and installation (fire isolation etc);

  and

- potential for recovery of waste heat (energy conservation).

G9 AMENITIES SERVICE

G9.1 Village Amenities

The type and range of village amenities provided for the public, patients and staff will be as outlined in the **Statement of Function**.

The only mandatory requirement is the provision of a cool palatable water supply (cold water drinking unit) in a convenient public location. Multiple units will be necessary to service large facilities. A minimum of one per floor ***shall*** be provided.

Larger facilities might provide other "village" amenities such as:

- florist
- snack bar/coffee shop
- gift shop
- pharmacy
- banks or agencies
- hairdresser
- and others as considered viable

Vending machines are also a popular way of providing 24 hour per day consumer services to the public, patients and staff.

The relevant health, council and statutory regulations are to be complied with when planning for any of the above.

G9.2 Staff Amenities

Facilities ***shall*** be provided for the following staff functions:

- changing (change room)
- secure storage of street clothing and valuables
- grooming/handwashing
- toileting
- showering
- relaxation (lounge)

Staff is to be interpreted as meaning both employees and volunteers.

Staff lounges should be located with views to the outside, and if feasible, access to outdoor areas. They are to incorporate facilities for relaxation, the eating of meals and the preparation of hot beverages.

Staff amenity facilities as described above ***shall*** be in addition to and separate from those required for specialist department functional needs, eg. dedicated change rooms/showers/toilets and lounges for operating suites.

Facility provision ***shall*** comply with the requirements as outlined in the Occupational Health, Safety and Welfare Regulations - 1988, unless detailed otherwise in these Guidelines.

G9.3 Quiet Room/Chapel

Dependent upon the size and nature (religious base?) of the facility, it is highly desirable, but not mandatory, to provide an acoustically private multi use room, or separate rooms with singular functions, for:

- the consoling of distressed relatives
- confidential interviews
- multi denominational religious services

Location and outlook are important considerations in the planning of such a facility.

The room must allow for easy access by disabled persons.

G9.4 Child Care

To enable the hospital to attract the best possible staff, it is recommended that consideration be given to the provision of facilities for child care.

This includes, but is not limited to:

- a playroom
- toilets suitable for children and staff
- coat hanging and shoe storage
- a restroom (for sleeping)
- storage for toys etc
- an office
- a kitchen/pantry
- external secure play space
- views to the outside

Compliance with any statutory requirement for the establishment of such a service is required.

G9.5 Ambulance Facilities

Refer to C6 - Roads and Pathways.
Refer to C7 - Parking.

G9.5.1 **Ambulance Access**

Access for Ambulance ***shall not*** conflict with other vehicular or pedestrian traffic.

G9.5.2 **Ramps**

The specific requirements of the St. John Ambulance Association ***shall*** be obtained in relation to ramp gradients and ambulance park/unloading area gradients.

G9.5.3 **Ambulance Pick up/Delivery**

Pick up and Delivery points in any Hospital, Day Procedure Unit at any facility covered by these Guidelines, must be discreet and ***shall*** be covered.

The entry/exit in the building ***shall*** be located away from public entrances and ***shall*** be screened from public view.

Access ways, suitable for ambulance trolley use ***shall*** be provided between the entry/exit and the departments requiring access.

Trolleys ***shall not*** pass through public areas.

G10 TEACHING SERVICE

To improve the level of patient care, and to create a stimulating atmosphere in which staff can develop, it is recommended that opportunities and facilities be provided for staff training. This is not mandatory but a highly recommended provision. What opportunities and facilities are provided ***shall*** be as determined by the **Statement of Function**.

Consideration should be given to the following areas:

G10.1 Conference/Seminar/Demonstration

A room should be provided on each floor for tutorials, group discussions etc. The room might be a multi function space, for staff hand overs, therapies etc. Programming of room activities would be essential if a multi function facility was preferred.

This room might also be set up as a demonstration ward, with a variety of ward level fixtures for training purposes. The level of fitout would be determined by the commitment of the facility to all levels of staff training.

Recommended minimum room size is 28 sq.m.

G10.2 Library

A room or space fitted out for the storage of, and referral to, all types of reference material is also recommended. A section of the Conference/Seminar/Demonstration Room would be considered an appropriate minimum level of provision. Sufficient and appropriate desks/tables and chairs should be considered. Audio-visual facilities should also be considered.

G10.3 Lecture Room

Dependent upon the size of the hospital and the level of commitment to staff training, a lecture room would be considered beneficial, although certainly far from mandatory.

G10.4 Store

A room for the storage of demonstration equipment, attached to the Conference/Seminar/Demonstration Room, is considered highly desirable.

G10.5 Construction Standards and Finishes

Refer to Sections B2, "Construction and Design Standards", and B3, "Finishes".

G10.6 Engineering Services

General and detailed engineering requirements are provided in section E, "Facility Engineering Services".

G10.7 Support Services

Support services such as cleaning and supply would be shared facilities with the remainder of the hospital.

G11 DAY PROCEDURES UNITS

G11.1 General (Day Procedures)

The clinical accommodation of a Day Procedure Unit relates to the facilities provided in the Operating Theatre area of a hospital. Clauses in this section ***shall*** be cross referenced with clauses in Section G4.4 - Operating Suite.

The Hospitals and Health Services Act 1927 states: "Day Hospital Facility" means premises that are not attached to, or, that are set apart from, a hospital being premises at which persons are received for professional attention or professional medical attention in a class of professional attention determined by the minister under subsection (3) to be professional attention but not being premises at which overnight accommodation is provided: (interpretation).

Also under section 2 (3) of the Act - determine that any elective surgical or medical procedure which involves the administration of a general , spinal or epidural anaesthetic, is professional attention for the purposes of the definition of "day hospital facility" in section 2 (1) of the Act.

The Statement of Function is critical. It *shall* outline which procedures are to be performed in the operating and/or procedure rooms. Applicants *shall* receive approval from the Health Department of WA. to carry out the nominated procedures before proceeding to the design phase.

The level of facility provision ***shall*** suit the need to ensure a safe working environment for the staff and a safe clinical environment for the patient.

Formal links between stand alone day procedure centres and local hospitals ***shall*** cover emergency situations, including overnight observation.

The larger the facility, ie. multiple operating/procedure rooms, the less duplication of support provision is necessary, although the

size and number of support areas ***must*** suit the operational need. The design principle of the operating suite will also have a bearing on the need for duplication of support areas.

A day procedure service, although providing a facility for procedures requiring general anaesthetic, is not a major acute service. Therefore, principles such as the smaller size of the operating/procedures room; width of entry/exit corridors/doors; the nature and size of the pre-operative preparation and waiting area; hours of operation; relative/friend attendance during recovery; paediatric service etc., all require consideration in the development of the design. **It is stressed that the consideration of the principles of asepsis control in the development of the design is still very important.**

The day procedures facility can be a stand alone, attached or shared service. If the facility is part of an acute care hospital or other medical facility, services can be shared, as appropriate to minimise duplication.

Where day procedures (outpatient surgical service) is provided within the same area as inpatient acute surgery (shared facility), the design ***shall*** consider the need to separate the two distinct functions at the incoming side and resolve a detailed schedule for the sharing of the operating rooms. **This *shall* be identified in the Statement of Function.** The design ***shall*** also preclude unrelated traffic from the operating suite.

The design *shall* separate waiting patients from those recovering or undergoing procedures. Waiting patients *shall not* be exposed to frightening and distasteful noises.

Consideration ***shall*** be given to patient privacy and dignity (bed screens).

To assist with the design of a Day Procedure Unit a Patient Flow Diagram and Design check list are included at the end of this section. Refer to:

G11.10 Patient Flow Diagram

G11.11 Design check list

G11.2 Size

The type and size of diagnostic, clinical and administrative facilities to be provided will be determined by the service contemplated and the estimated patient load, as described in the **Statement of Function.**

G11.3 Access for Physically Impaired

Refer to section B6.

G11.4 Parking/Ambulance Pick-Up

Refer to Section C7 for Car Parking

Refer to Section G9.5 and G11.7(o) for Ambulance Pickup.

G11.5 Administration and Public Areas

(a) **General**

Refer to Section G3.2 - Outpatient Consultation - for basic accommodation. Waiting Area and Public Toilets including facilities for Physically Impaired ***shall*** be included.

(b) **Entrance**

A covered entrance for pick up of patients after surgery ***shall*** be provided. May be shared with other areas, eg. Outpatients.

(c) **Lobby Area**

It ***shall*** include:

- convenient access to wheelchair storage;
- reception and information counter or desk;
- waiting spaces. Where an organised paediatric service is part of the outpatient facility, provisions ***shall*** be made for separation of paediatric and adult patients;
- convenient access to public toilet facilities;
- convenient access to public telephones; and
- convenient access to drinking fountains.

This area may be a shared outpatient facility.

(d) **Interview Rooms/Cubicles**

Interview rooms or cubicles for private interviews relating to social services, credit, admission etc. ***shall*** be provided.

Consideration ***shall*** be given to patient confidentiality.

In smaller units, this might be a shared office.

(e) **General and Individual Offices**

General and individual offices ***shall*** be provided as required for business transactions, records and administrative and professional staff. These ***shall*** be separate from public and patient areas with provision for confidentiality of records. Provide enclosed office spaces for administration and consultation.

(f) **Multipurpose Room(s)**

Other rooms for staff conference, library storage, etc. may be provided as required.

(g) **Medical Records**

A secure room ***shall*** be provided with provision for storage, recording and retrieval of medical records.

If geographically appropriate, and if the day procedures unit is part of, or attached to, an acute hospital, the general medical records facility might be used in lieu of a dedicated and separate room. It might also be a shared outpatient facility.

(h) **Secure Storage**

Secure storage ***shall*** be provided for employees' personal effects, eg. locked drawers and/or cabinets.

(i) **General Storage Facilities**

Secure storage facilities ***shall*** be provided for equipment, stationery etc.

G11.6 Sterilising Facilities

A system for sterilising equipment and supplies ***shall*** be provided. This may be off-site or remote, provided that provisions are made to ensure adequate sterile supplies are on hand for the maximum demand of one days' case load. If on-site, refer to requirements at G7.5.

Where endoscopic procedures requiring entry into sterile body cavities/tissues are performed, provision ***shall*** be made for sterilising equipment (not disinfection), see also G11.8.

G11.7 Clinical Facilities

(a) Day Procedures Change Areas

A separate area *shall* be provided where outpatients can change from street clothing into hospital gowns and be prepared for surgery. It *shall* be convenient to the Waiting Area.

This ***shall*** include:

- waiting room(s);
- lockers;
- toilets/showering facilities;
- clothing change or gowning areas; and
- space for the administration of medications (if identified in the **Statement of Function**).

Provision ***shall*** also be made for the security of patients' personal effects.

A policy ***shall*** be established to manage patients' changing, clothing and personal effects in the facility. Consideration ***shall*** be given to patients' access pre- and post-operation.

Patients' clothing may be stored in keyed lockers or in sealed clothing bags/cases that travel with the patient on the bottom of the trolley throughout the operation process. Patient personal effects eg. purse/wallet, watch, jewellery, etc. may be stored in keyed lockers in change rooms or at the reception area.

(b) Examination Room(s)

At least one room ***shall*** be provided for examination and testing of patients prior to surgery. This may be an examination room or treatment room as described in "The Design of Doctors' Surgeries", a design handbook

prepared on behalf of the Royal Australian College of General Practitioners.

This room may be part of the day procedures facility if completely stand alone, or attached in consulting or outpatient suites, as appropriate.

(c) **Anaesthetic Room(s)**

If the day procedures facility is a stand alone type, a separate Anaesthetic Room may be considered necessary. If provided, the requirements are as for **Section G4.4.3, Anaesthetic Room(s).**

If the facility is connected to a surgical ward and/or the **Statement of Function** describes the Anaesthesia procedure as being carried out within the patient bedroom pre-operation area (pre-operation preparation) and the operating room (anaesthetising of patient), then a dedicated Anaesthetic Room is not necessary.

(d) **Pre-Operation Preparation/Holding**

An area where gowned patients enter after changing and either wait for their procedure or are prepared for anaesthetising, as required.

A theatre trolley with privacy screening, work bench with sink, handbasin, trolley storage, seating, all as appropriate to the proposed service ***shall*** be provided.

The Statement of Function *shall* clearly set out the type of procedures to be used in the unit and the accommodation required to hold the waiting patients.

It is important to acknowledge that the majority of patients are apprehensive about what is to occur and it is very important that the Holding Area is warm and friendly with comfortable seats, entertainment (T.V., music, magazine, etc.) and usually screened from action within the Day Procedures Unit.

(e) **Operating Room(s)**

Each room ***shall*** have a floor area compatible with the range of procedures to be carried out.

Where general surgical procedures, which require the

general anaesthetising of patients, are to be performed, then the requirements of the room (less plan dimension) ***shall*** be as described in **Section G4.4.2, Operating Rooms.**

Where rooms are being utilised exclusively for minor procedures not requiring major local or general anaesthetic, the requirements of the room ***shall*** be as required for the safe delivery of the service. **Where the anaesthetising of patients for general surgical procedures occurs and optimum flexibility of use is required, the minimum size of the operating room is recommended to be 5000mm by 5000mm.** Smaller rooms have, in practice, been utilised but staff comment indicates that the above is the preferred minimum.

As above, the minimum size of the minor procedures room ***shall*** be determined by the nature and size of the equipment to be used and the safe delivery of the service. An emergency communication system (intercom or similar) connecting the operating and minor procedures rooms to the surgical suite control station ***shall*** be provided.

Refer to section G11.8 for the requirements of Endoscopy Rooms/Units.

(f) **Recovery Room (Stage 1)**

Room(s) for post anaesthesia and procedure recovery of Day Procedure surgical patients ***shall*** be provided. Fit-out ***shall*** be as described in **Section G4.4.4**, **Recovery Room**, although **the width of a cubicle can be reduced to 1800mm, conditional upon the exclusive use of theatre trolleys as recovery beds, with the inclusion of mobile intermediate bedscreen tracking to provide for emergency procedures.** Cubicle sizes are to be increased where trolley sizes are increased.

If paediatric surgery is part of the function, the Recovery Room ***shall*** provide for parents/attendants.

A disposal facility for bed pans and bed pan cleaning and storage ***shall*** be provided within easy access of Recovery.

A resuscitation trolley *shall* be located in this unit.

The number of bed/trolley spaces will be dependent upon the nature of surgery or procedures as outlined in the **Statement of Function** and the proposed throughput,

but **as a minimum, 2 bed/trolley spaces per operating/procedures room *shall* be provided.**

(g) **Recovery Room (Stage 2)**

A room to accommodate:

- patients who have regained consciousness after anaesthesia but require further observation; and
- patients who have undergone procedures with local anaesthetic.

The patient is required to remain under observation until ready to change into street clothes.

Minimum space requirement should be at least 3 bed/trolley spaces per Procedures Room and some comfortable seating for ambulant patients.

(h) **Recovery Lounge**

It is strongly recommended that a separate supervised room, or a second stage of the Recovery Room, be provided for patients who are mobile and do not require post anaesthesia recovery, but need additional time for vital signs to be stabilised before the patient may safely leave the facility. The area ***shall*** contain a control station, space for visitors, and provision for privacy.

In larger facilities it is often considered desirable to have a 3 stage recovery area flowing from an intensive first stage supervision to a second stage with changing facilities in more casual surroundings and into a third stage where the patient is fully mobile and takes visitors. Supervision of the patient is vital at each stage.

Recovery lounges ***shall*** have convenient patient access to adjacent toilets and showers which are large enough for patient and assistant.

Patients in this area normally recover in recliners/chairs. **A ratio of two chairs (minimum) to each operating/procedure room, in addition to the above bed requirement, is considered appropriate.**

Views to external spaces, and even controlled access to external secure courtyards, is considered desirable.

Convenient access to the **Day Procedures Change Areas (Clause G11.7A)** for patient changing back into street clothes, ***shall*** be provided.

Facilities for the storage and preparation of hot and cold liquid refreshments and television/video should also be provided.

Consideration ***shall*** be given for direct access to this area by relatives/visitors/transport providers from the lobby/waiting area and additional chairs provided.

(i) **Surgical Service Areas**

The following areas ***shall*** also be provided, in accordance with detailed information in **Section G4.4.5.**, Operating Suite Service Areas/Functions:

- entry/exit control
- staff change rooms (male and female)
- staff base
- scrub-up facilities
- holding area
- set-up
- general storage (including equipment)
- sterile storage
- staff lounge facilities
- clean-up
- cleaner's store

In a stand alone facility, the Holding area listed above would probably be a Pre-operation Preparation / Waiting Area, Refer to G11.7(d).

Consideration should be given to the provision of a separate work room for anaesthetic equipment storage, cleaning and testing, dependent upon the overall size of the day procedures facility. It should contain work counters, a sink and a handbasin.

(j) **Trolley Storage**

An area ***shall*** be provided for trolley/wheelchair storage/parking which is convenient and out of the direct line of traffic.

(k) **Staff Toilet/Lunch Room**

A toilet and lunch room ***shall*** be provided for staff working outside the operating suite, ie. administrative /reception/ pre-operative staff. This may be a shared facility with the remainder of the hospital, if attached.

(l) **Cleaner's Store**

Separate cleaner's store ***shall*** be provided to service areas both outside and inside the operating suite.

(m) **Emergency Crash Carts**

Provision for immediate access to, and use of, emergency crash carts *shall* be made at both the surgical and recovery areas.

(n) **Day Procedures Ward**

Where a Day Procedures service is attached to an acute hospital inpatient operating suite, in addition to the recovery provision, a dedicated day procedures operating suite ward is normally established, although this is not mandatory. This nursing unit or part nursing unit, provides facilities for waiting, admission, changing, pre-operation preparation, toileting, showering, post recovery waiting, disposal, utility, etc, all as determined by the **Statement of Function.**

Requirements of each area are as for the relevant sections of this document.

The Day Procedures Ward beds can in fact be utilised as "swing beds", providing acute accommodation when called upon to do so.

The location of the Ward should be as close as practical to the Operating Suite.

All of the above should be considered when establishing a joint inpatient/outpatient surgical facility.

(o) **Ambulance Pick-Up**

A **discreet pickup point**, preferably under cover, ***shall*** be provided for the transfer of patients from Recovery to a local hospital for emergency treatment or overnight observation. Refer to G9.5 Ambulance Facilities.

Access ways, suitable for ambulance trolley use, *shall* be provided between Recovery and the pick-up point. This ***shall*** include corridor widths, ceiling heights, door widths, ramps, lift sizes etc. **Refer to Sections B2 & E4.**

Trolleys *shall not* pass through public areas.

G11.8 Endoscopy Units

(a) **General**

Increasingly, Endoscopic (diagnostic and some therapeutic) procedures are being carried out as an outpatient function. As such, Endoscope Rooms are now considered an important addition to most Day Procedure facilities. Stand alone Endoscopic Units are also appearing in various sizes and forms overseas and in this state, hence the inclusion of this dedicated section. **Where the Endoscopic service is attached to an Operating Suite, then the Recovery, Recovery Lounge and Support Services (sections d, e, and f following) can be "common".**

The following checklist of spaces ***shall*** be considered when setting up an Endoscopic service:

- Endoscope Room(s)
- Workroom (scope cleaning, disinfection and sterilising etc.)
- Recovery
- Recovery Lounge
- Holding
- Waiting
- Reception
- Changing (patients and staff)
- Toilets/Showers (patients and staff)
- Clerical/Records
- Manager's Office
- Doctor's Office(s)
- Interview/Consulting Room(s)
- Staff Lounge
- Conference/Library/Multi Purpose
- Staff Duty Station
- Clean Utility
- Dirty Utility/Disposal
- Store(s) – various
- Workshop (scope maintenance, optional).

Also to be considered is the availability of Pathology and CSSD Services.

Fitout and treatments ***shall*** be as for a Day Procedures Unit **(this section G11)**.

The design *shall* separate waiting patients from those recovering or undergoing procedures. Waiting patients *shall not* be exposed to frightening and distasteful noises.

(b) **Endoscope Room(s)**

The number and operation of Endoscope Rooms ***shall*** be as determined by the **Statement of Function**.

Room size will vary, dependent upon:

- the use of video equipment
- electrosurgical laser treatment
- fluoroscopy
- multiple scope activity
- multiple observers
- the use of x-ray (image intensifying)

However, where basic endoscopy is to be performed, the room size *shall* be no smaller than 4 metres by 5 metres. Where video equipment is used, the minimum room size *shall* be 5 metres by 6 metres. Larger sizes, where possible, are recommended for flexibility and future developments. **The ceiling height *shall* be 2700mm or greater.**

The room ***shall*** be fitted out as for a minor theatre ie. suitable for general anaesthetic with appropriate medical gases, power, lighting, air conditioning, ventilation etc. Staff Assistance call ***shall*** be provided. **Consideration *shall* also be given to the special requirements of laser equipment.**

A scrub up basin and sink ***shall*** also be provided within the Endoscope Room, for staff handwashing and initial scope cleaning (prior to transfer to the Workroom) respectively.

Direct Access to the Workroom is strongly recommended.

Appropriate entry door widths ***shall*** be considered for trolley bed/trolley transfer.

Impervious wall, floor and ceiling treatments are essential for ease of cleaning.

(c) **Workroom**

Scope preparation and cleaning ***shall*** be carried out in a separate and dedicated Workroom which is directly connected to the Endoscopy Room or Rooms. The preference for isolation is due to the use of disinfectant chemicals such as glutaraldehyde and the need for controlled ventilation. Refer to section E1.2.13.

Peracetic acid (steris) process requires multiple units with possibly a glutaraldehyde back-up. Steris has specialised installation requirements and fittings.

Provision ***shall*** be made for sterilising endoscopic equipment intended for use in sterile body cavities or tissues. Glutaraldehyde is not acceptable for this purpose.

Glutaraldehyde, an antimicrobial agent commonly used as a 1% or 2% solution, can cause eye, nose, throat and skin irritations. Excessive exposure to vapours may result in headaches, nausea and vomiting and a risk of allergic sensitisation. Eye and skin contact as well as inhalation, must be avoided. Further information including a document "Safe Working Practices When Handling and Using Glutaraldehyde for Endoscope and/instrument Disinfection Purposes" is available by contacting the Environmental and Occupational Health Unit, Health Department of WA.

The Workroom ***shall*** contain:

- facilities for the disposal of liquid and faecal waste (slophopper)
- deep bowl sinks and drainer for the prewashing of scopes
- hot and cold water supply
- benches for benchtop activities including drying, checking and maintenance of scopes, and specimen preparation
- ventilated cupboards for the storage of scopes (or might be located in the Endoscope Room)
- fully automated scope disinfector (highly recommended)
- manual scope disinfection space within a contained and ventilated (high and low level) environment (fume hood)
- handwashing facilities (separate basin).
- waste disposal for general and infectious waste
- appropriate lighting, colour corrected

- drugs storage
- refrigerator/freezer
- ultrasonic cleaning equipment (optional, but recommended)
- ventilation in accordance with E1.2.13
- compressed air and suction for scope cleaning
- power as required on earth leakage
- general storage for scope accessories, equipment etc.
- sufficient floor area for unobstructed
- staff movement with scopes (to limit damage).

Mobile trolley or cylinder type scope disinfectors which do not have directly connected exhaust and plumbing systems ***shall not*** be considered. They encourage transportation of glutaraldehyde solution, may discourage regular changeover of glutaraldehyde contaminated scope rinse solutions and may not have effective fume filters.

Where scope work is carried out within an Operating Room (in an Operating Suite), then consideration ***shall*** be given to the fitting out of the Clean Up, Disposal/Dirty Utility or Instrument Wash (TSSU) Rooms in accordance with the above. Consideration ***shall*** be given to the method of transfer of the disinfected scopes from the cleaning zone to the sterile zone. Design detail such as pass through exhaust hoods which contain the disinfectant solution should be considered between clean and sterile areas.

(d) **Recovery**

Fitout and design ***shall*** be in accordance with Day Procedures Recovery. **Refer to section G11.7 (f)**.

Consider as a guide one recovery bed for every three patients per day, or one bed per 750 patients per year.

(e) **Recovery Lounge**

A Recovery Lounge (with chairs/recliners) can be provided where bed use is not required, and to relieve the Recovery Room on high volume days. Patients at the end of their bed recovery time can be relocated to the Lounge until ready to leave. **Refer to section G11.7 (g)**.

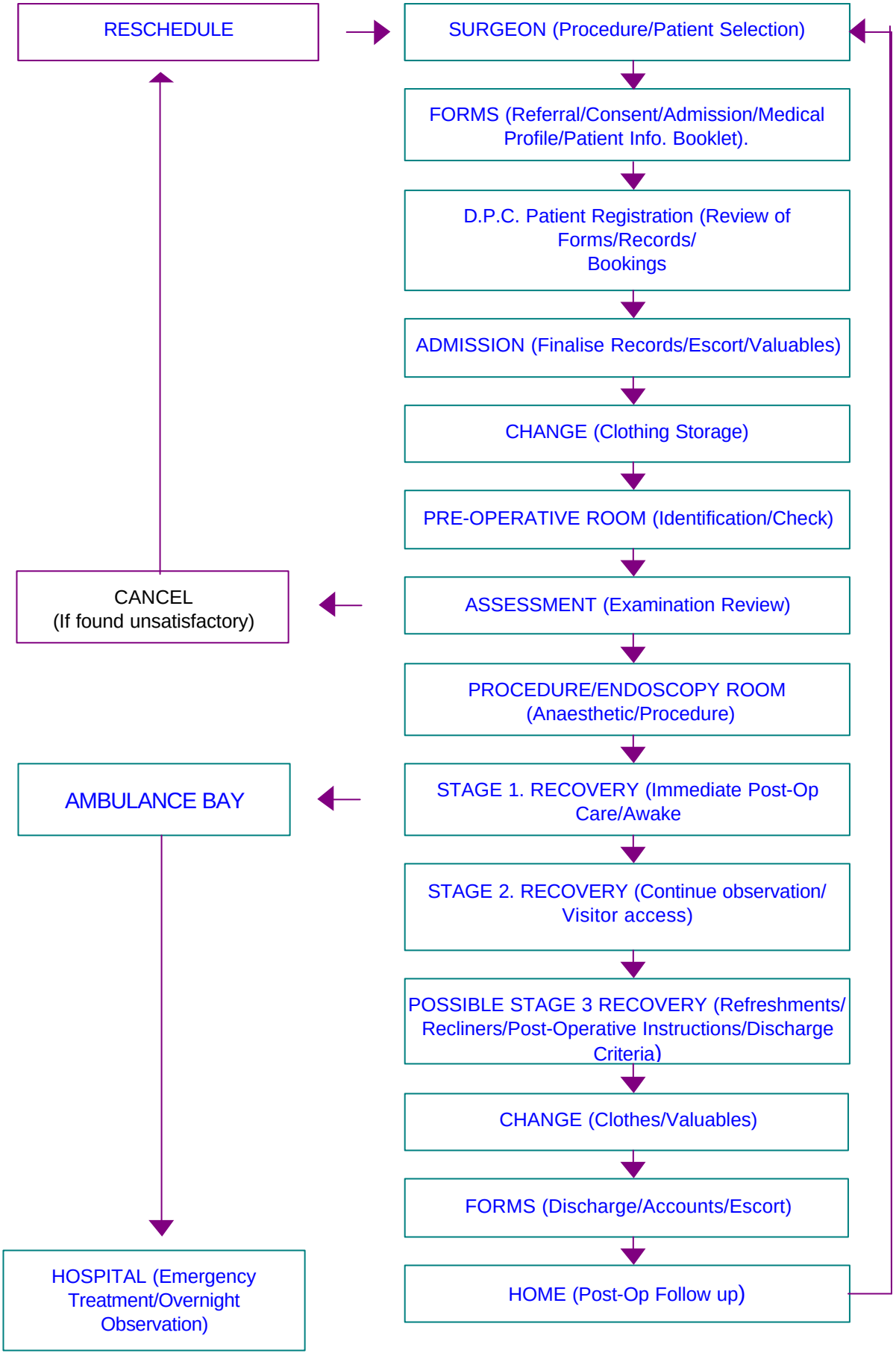
(f) **Support Services**

The balance of the spaces required on the checklist ***shall*** be as detailed in this section **(Day Procedures, G11)**.

G11.9 Other Guideline Sections

All other appropriate sections of this document *shall* apply to a Day Procedures facility, whether the facility is stand alone or attached.

G11.10 Patient Flow Diagram



G11.11 Check List Design Considerations

1. Level of service: stand alone or attached or shared facility?

2. The location of a day procedure centre in relation to main hospital particularly in the event of emergency patient transfer. Access to CSSD, Medical Imaging, Pharmacy, Pathology, etc.

3. Surgeon: selection process

   - procedure selection (duration of procedure, post-operative pain control).
   - patient selection (suitability for day procedure - health, person to accompany patient home.)

4. Examination room adjacent to pre-operative area.

5. Special admission and discharge procedure of day patients - information brochures.

6. Confidentiality of patient's information during admission/discharge.

7. Security of patient's belongings eg. wallet/purse, watch, clothing, etc. during procedure.

8. The orderly flow of patients, visitors, staff, doctors, goods, etc. within the facility.

9. Privacy for patients pre-and post-operative in holding and recovery areas.

10. Possible staged recovery areas with patient transfer from intense first stage supervision in clinical surroundings to second stage recovery in more casual surroundings (and possibly a third stage) with lounge furniture/recliners, visitor access & beverage preparation, television.

11. Visitor/Relative access and waiting area.

12. Responsible person to accompany patient home after certain procedures/sedation's - patient not to drive a vehicle.

13. Friendly, non institutional surroundings.

14. The location of key facilities in relation to each other.

15. The appropriate segregation of internal traffic - particularly pre- and post- operative patients.

16. Flexibly - planned operating room(s) capable of carrying out varied procedures.

17. Provision of adequate sterile & non-sterile storage areas.

18. Preparation and decontamination area adjacent to Endoscopy room(s).

19. Recommended centre guidelines for safe patient care.

20. Capability to handle internal facility changes.

21. Capability to handle expected and unexpected expansion of facilities.

APPENDIX 1.

LEGIONNAIRES' DISEASE

1. GENERAL

Legionnaires' disease was first recognised in July 1976, when an outbreak occurred among delegates attending an American Legion Convention in Philadelphia. The cause of the outbreak eluded scientists for several months, but in January 1977 the Centre for Disease Control, Atlanta reported the isolation of the bacterial agent which they named Legionella Pneumophila.

Legionnaires' disease is a notifiable disease from which several Western Australians die each year. It is an illness characterised mainly by pneumonia. It begins quite abruptly with high fever, chills, headaches and muscle pain. A dry cough soon develops and most patients suffer difficulty with breathing.

L. pneumophila is one member of a large family of the bacteria Legionellaceae. Other species of Legionella have been reported and at least ten serogroups of L. pneumophila have been described.
L. pneumophila serogroups 1 is the organism that is most commonly responsible for Legionnaires' disease.

Most members of the family Legionellaceae including L. pneumophila serogroup 1, are commonly found in water systems, both natural and man-made.

Investigation of outbreaks of Legionnaires' disease has led to the identification of various sources of the organism. Domestic hot water services in large buildings such as hotels, hospitals and nursing homes, and cooling towers serving the air conditioning plant in these types of establishment have been implicated.

In these instances the infection is considered to have been acquired through the inhalation of small droplets carrying the bacteria. Aerosols containing such droplets may be generated by running taps or showers and during the normal operation of cooling towers and evaporative condensers. Survival of the bacterium in an aerosol is enhanced if the ambient relative humidity is greater than 65 per cent and if it is sheltered from direct sunlight. Under suitable wind conditions, viable bacteria may travel a distance of 150 metres or considerably further in favourable circumstances.

The incubation period for humans, the time between exposure to the organism and development of first symptoms, is usually 3 - 6 days, but may range from 2 -10 days. There is no record of person-to-person spread of infection. The bacterium is not highly virulent, but it may infect individuals who are especially susceptible. In most outbreaks less than 5 per cent of people exposed to the source of infection have contracted Legionnaires' disease

although in some hospital units, such as renal and oncology wards, greater attack rates have been reported.

2. SOURCE OF THE BACTERIA

The bacterium is a common one which survives and multiplies in water. It is widespread in natural fresh water including rivers, lakes, streams and ponds and may also be found in wet soil. Airborne dispersal may occur when water droplets are created. There is a strong likelihood of very low concentrations of the bacteria existing in all open water systems including those of building services.

The optimum temperature for multiplication of the bacteria in the laboratory is around 37°C. At higher temperatures the rate of multiplication of legionellae in the laboratory decreases and at 46° multiplication ceases. The bacteria will survive at higher temperatures but the survival time decreases from a matter of hours at 50°C to one of minutes at 60°. At 70°C the organism is killed virtually instantaneously. Below 37°C the multiplication rate decreases and can be considered insignificant below 20°C. The organism can become dormant at much lower temperatures and return to active multiplication whenever more favourable temperatures occur. It appears to be insensitive to pH, and has been found in cold water systems having a wide range of pH values.

Cold water services may reach a suitable temperature for multiplication if the building as a whole or the incoming water supply becomes warm in summer. Similarly hot water services may contain deadlegs and other zones which could hold water for long periods within the temperature range at which legionellae multiply actively.

3. SUSCEPTIBILITY OF INDIVIDUALS

Many people have been exposed to legionellae and their body defence system has responded to prevent an illness. Whilst previously healthy people may develop Legionnaires' disease there are, however, a number of factors which have been shown to increase susceptibility. These are:

- increasing age, particularly above 50 years; children are rarely infected;
- sex: males are three times more likely to be infected than females;
- existing respiratory disease which makes the lungs more vulnerable to infection;
- illness, such as cancer, diabetes, kidney disease or alcoholism which weakens the natural defences;

- smoking, particularly heavy cigarette smoking, because of the probability of impaired lung function; and

- patients on renal dialysis or on immuno-suppressant drugs which inhibit the body's natural defences against infection.

4. WATER & AIR HANDLING SYSTEMS CONTAMINATION BY LEGIONELLA -GENERAL

The information given below has been prepared to provide guidelines for the proper maintenance of water and air handling systems in Health Care Facilities in an effort to prevent contamination by Legionella.

While the guidelines are not exhaustive, they provide simple measures which can be undertaken to ensure that housekeeping of these systems is maintained to an acceptable level.

The Standards Association of Australia document AS 3666 "Air Handling and Water Systems of Buildings - Microbial Control" has been adapted into Western Australian legislation, the Health (Air Handling and Water Systems) Regulations 1992. This regulation specifies minimum design, operating and maintenance requirements for prescribed air handling and water systems in buildings.

5. AIR HANDLING SYSTEMS - CONTAMINATION BY LEGIONELLA

The precautionary steps to be taken in Health Care Facilities are prescribed in Australian Standard 3666 which is adapted into State legislation, Health (Air Handling and Water Systems) Regulations 1992.

Principal requirements for maintenance and inspections - are outlined below:

5.1 Air Intakes

Cheek that intakes are located away from cooling towers, chemical stores, air exhausts, carpark vehicle exhaust points, toilet and kitchen exhausts, etc. Air intakes must be kept clean.

5.2 Air filters

All filters require regular cleaning and maintenance and shall be easily accessible.

5.3 Humidifiers

Check moist parts visually for cleanliness. Ensure easy access for cleaning. Check maintenance records to ensure maintenance requirements are strictly followed. As a minimum reservoirs and pipework shall be thoroughly inspected and cleaned twice a year or when shut down for any significant length of time.

5.4 Evaporative Coolers

Requires regular inspections for particulate build up on pads and filters. Minimum cleaning frequency is three months (AS3666.2), however weekly maybe necessary in dusty areas.

The minimum expected service would be:

- Units to be drained, cleaned and left dry over winter.
- During the summer months the water basins to be drained and scoured out at least twice a season.
- Those units fitted with automatic dump valves to have the water dropped regularly.
- Those units not fitted with automatic dump valves should have the continuous bleed discharge monitored regularly to determine water basin change rate.
- At all times the supplier's service manual should be consulted for correct maintenance procedures.

5.5 Cooling Coils - Drip Tray. Sump and Drains

Coils shall be inspected for dust build up and leakage; trays and drains should be accessible and checked for leaks as well as periodic cleaning, draining and replacement (as necessary).

5.6 Fan Assemblies

Cheek for dust, rust, moisture, wear and tear and fan misalignment.

5.7 Duct Work

Check for corrosion and accumulation of dust or particulates on duct work, dampers, vanes, cooling and heating coils. Ensure access openings are provided preceding outside air and return air filters. Inspect internal surfaces of duct work to ensure moisture has not accumulated.

5.8 Physical Access Facilities

Access stairways, ladders, catwalks, ramps and walkways used by operational and maintenance personnel shall be kept safe and well drained and not used as storage areas.

6. WATER STORAGE AND DISTRIBUTION SYSTEMS - CONTAMINATION BY LEGIONELLA

Water is supplied by the Water Authority of WA in a potable condition to health specifications. Every attempt should be made to preserve the quality of the supply.

Hot water should be stored at a temperature of 60°C. This suffices for Legionella control in most water storage, but does not take into account peripheral colonisation of fittings such as taps and showerheads. It is possible to have such fittings colonised by Legionella despite the delivery of water at 60°C. Refer also section E1.3 of 'Private Hospital Guidelines'.

A maintenance program of regular de-sludging should be implemented for any hot water storage vessel where stagnation and stratification in the lower levels of the tank may occur.

Water sampling for the culture of Legionella is not warranted for general hospital areas provided that the maintenance program is strictly adhered to.

Wards with concentrations of renal transplant, oncology and other immuno-compromised patients are considered to be 'high risk' wards. The following additional advice is given for these situations:

- inspection of water distribution systems of the above wards to locate areas of flow stagnation and to plan for their early removal, (Monthly);
- drain sediment from calorifiers as necessitated by water quality, (Monthly);
- remove all shower heads and clean out accumulated sediment and scale, (Monthly);
- remove aerators from taps;
- check all taps for natural rubber washers acid 'O' rings arid replace with synthetic products;
- check all thermostatic mixing valves for natural rubber components and replace with synthetic products. Regularly clean and service these valves, (Quarterly);
- showers and taps that are not frequently used should be flushed through

weekly; and

- ensure water treatment plant, if installed, is checked regularly and is operating efficiently.

If gross contamination is detected, control may be achieved by cleaning of components, attention to water temperature, and/or disinfection, and/or other engineering factors. Discussion of the circumstances is advised.

6.1 Heated Spa Pool

Re-circulated water spa pools are not appropriate for Health Care Facilities. Fan blower type spas shall be used. Spa pools shall be regularly maintained in accordance with AS 2610.1

6.2 Cooling Water Systems

Cooling towers shall be inspected at minimum monthly for cleanliness of wetted areas. Wetted areas (and components) shall be easily accessible and fitted with rapid filling and draining provision for cleaning.

Signs of corrosion, discolouration, slime, sludge, fungi, algae, bacteria, rot, physical damage and surface decomposition should be the focus for visual inspections.

Proprietary biocides should be added regularly at the correct concentration.

These should be drained and cleaned twice a year. Prior to draining, the system should be dosed with chlorine to a level of 5 parts per million and circulation maintained for four hours. The use of anti-scaling compounds and algicides after cleaning will assist in minimising the opportunity for colonisation of the systems by the bacterium.

Overflow and bleedoff systems shall discharge separately to the sewer or equivalent.

6.3 Scheme Water Systems

Cold water storage and feed tanks associated with potable and non-potable (fire sprinkler etc.) systems shall be separated (and identified) and regularly inspected for cleanliness. They shall be located in a shaded area to minimise solar heating. Fly wire shall be fitted to overflow and vent pipes to protect against insects and vermin.

6.4 Hot Water System

Hot water is normally supplied throughout hospitals and nursing homes using the following two methods:

6.4.1 Steam heated calorifiers

Storage vessels with a capacity equal to or more than 900 litres use a steam heated coil fitted inside the tank to generate hot water. This hot water is re-circulated at low velocity throughout the system. The minimum temperature selected is normally 60°C. Where higher distribution temperatures are selected the safety of patients using showers is achieved by fitting thermostatically controlled hot water valves.

These large hot water storage vessels have been recognised as a possible source of contamination mainly due to stagnation and stratification of the stored water in the lower levels of the tank.

6.4.2 Heat Exchange Units

These units comply with the desired requirements for the rapid generation of hot water and operate in conjunction with a continuously pump-circulated distribution system. This eliminates the basic problem of large hot water storage vessels and the stratification due to poor circulation.

The size of the heat exchange coil is dependent on the hot water recovery required.

In the majority of our older country hospitals, maintenance personnel have been instructed to set the thermostats of hot water boilers at 60 - 65°C. Thermostatically controlled hot water valves are installed in Paediatric and Geriatric areas to safeguard patients. In the newer hospitals, a two temperature system operates - hot water at 65°C to supply the laundry and kitchen, and at 45°C to supply all wards.

7. DOCUMENTATION REQUIREMENTS

7.1 Operating Manual

These shall:

- state design, function and performance criteria of plant;
- define and locate plant to be maintained;
- provide instructions for normal operation;
- define routine, shutdown procedure and corrective maintenance; and
- allow for recording breakdowns, repairs and modifications.

7.2 Maintenance Manuals

These shall:

- list routine maintenance and disinfection procedures;
- outline precise nature and reason for maintenance, who did the work and when; and
- record details of further work necessary.

For more details refer AS3666-1995, handbook #32.

Facilities and Assets Branch
Health Department of W.A.
23 July 1998

APPENDIX 2.

HEALTH FACILITY
FIRE DESIGN SUPPLEMENT

1993

This Supplement is to be read in conjunction with the Building Code of Australia

SUMMARY OF CONTENTS

FOREWORD

This fire design supplement is based on the provisions contained in the Building Code of Australia (BCA) 1990, with WA Appendix.

The supplement provides notes which expand on the requirements of the BCA and give direction on specific clauses where doubt may otherwise exist.

More stringent minimum standards are imposed where higher levels of fire protection are considered necessary in Class 9A buildings.

It is strongly recommended that planners and designers liaise with the Fire and Security Officer, HDWA, at the earliest possible stage of a project to allow early resolution of fire protection issues.

SECTION C FIRE RESISTANCE

PART C2 COMPARTMENTATION AND SEPERATION

Add to Part C2.5 Class 9A Buildings, New Sub-Clauses (b) (vii) and (viii).

(vii) The following areas are considered to be fire risk areas and are to be fire isolated with an FRL of not less than 60/60/60.

(A) Bulk stores
(B) Bulk linen storage
(C) Maintenance workshop
(D) Medical gas storage (reticulated)
(E) Gas heaters installed in roof/ceiling spaces.

Note 1 - Where areas (A), (B) or (C) are grouped together they may form one fire isolated compartment provided the total combined area does not exceed 2000m2.

Note 2 - Gas furnaces should be installed in locations where the equipment is visible, readily accessible and maintainable. Where a gas furnace is installed in locations other than as described, the furnace is to be enclosed in a structure which will provide a minimum fire resistance level of 60/60/60.

Due to the potential risk and the prohibitive cost of this enclosure and the associated duct work and fire dampers, it is strongly recommended that gas furnaces NOT be installed in roof spaces.

(viii) Central Sterile Services Department (CSSD) and Theatre Sterile Services Unit (TSSU) may demand fire isolation dependent on the fire loading.

Add to Part C2.7 Separation by Firewalls, New Explanatory Note

Note - All fire wall Is and adjacent structure ***shall*** comply with the following:

(i) New firewalls ***shall*** be designed and constructed to achieve full height structural stability i.e. substantially resist collapse in the event of partial or complete collapse of an adjacent roof (or similar) structure. A fully independent roof structure (from the firewall) is one such method of achieving the designed outcome.

(ii) In existing buildings where firewalls are retro fitted, they are to be designed and constructed to maximise structural stability as defined in (i) above.

(iii) In accordance with Clause C2.7 (C) combustible material, (which includes structural elements) ***shall*** not pass through or cross firewalls. For new firewalls this is not negotiable. For existing walls being upgraded, where the roof structure cannot be modified and where an existing element does pass through or cross the firewall, then the existing element ***shall*** be clad in a material or coating equal to the FRL of the firewall. Where that element is part of a structural system (truss), and if, as a result of a fire, the collapse of a section of the structural system might cause the fire wall to also collapse, then the entire structural system ***shall*** be clad in a material or coating equal to the FRL of the fire wall. The extent and nature of protection ***shall*** be endorsed by the Fire and Security Officer of the Health Department of WA.

Add to Part C2.10 Separation of Lift Shafts New Sub Clause C2.10(d)

(d) All lifts in Class 9A buildings serving patient care areas above the level of egress to open space ***shall*** be as follows:

(i) Where lift shaft and lift doors have FRLs of 120/120/120 and 120/120 - respectively, lift lobbies ***shall*** be smoke isolated in accordance with Clause C2.5 (b) (iii).

(ii) Where lift shaft and lift doors are of lesser fire rated construction, lobby construction ***shall*** be fire rated to bring the total protection up to an FRL of 120/120/- minimum.

(iii) Lobbies ***shall*** be suitably pressurised and vented to ensure they resist the entry of smoke.

PART C3 PROTECTION OF OPENINGS

Add to Part C3.15 Installation Deemed to Satisfy, New Note to Sub-Clause (e).

Note - UPVC pipe is not approved for installation in Class 9A buildings other than single storey construction or where services such as rain water pipes are cast into concrete or in-ground.

SPECIFICATION SECTION C

Add to Specification C1.1 Fire Resisting Construction, New Notes

- To Paragraph 3.1 (c)

Note 1. Walls must be extended through any eaves overhang.

Note 2. Ceilings as described in sub-paragraphs 3.1 (c) (iii) are not approved for Class 9A buildings.

- To Paragraph 4.1 (d)

Note 1. Walls must be extended through any eaves overhang.

Note 2. Ceilings described in sub-paragraph 4.1 (d) (ii) are not approved for Class 9A buildings.

- To Paragraph 5.1

Note In a Class 9A building, internal walls required to have an FRL ***shall*** comply with sub-paragraph 5.1 (d) (iii) and extend through any eaves overhang.

Add to Specification C3.15 Penetration of Walls, Floors and Ceilings by Services, New Note.

- To Paragraph 5.

Note Where in a Class 9A building It is specifically required that an area of cable, or clusters of cables, penetrate a fire wall, details of protection to be provided ***shall*** be submitted for the endorsement of the Fire and Security Officer of the Health Department of WA.

SECTION D ACCESS AND EGRESS

PART D1 PROVISION FOR ESCAPE

Part D1.6 Dimensions of Exits, Amend Sub-Clause (f) (ii) to Read:

(ii) In patient care areas in a horizontal exit and in required exits to open space - 1250mm; or

PART D2 CONSTRUCTION OF EXITS

Part D2.9 Width of Stairways, Add New Sub-Clause (c)

(c) Required stairways in patient care areas ***shall*** be a minimum of 140Omm unobstructed width between handrails.

SECTION E SERVICES AND EQUIPMENT

SPECIFICATION SECTION E

Add to Specification E1.7 Fire Detection and Alarm Systems, New Sub-Paragraph 5 (b) (iii).

(iii) where the thermal criteria within the space detected requires alternative selections.

30 August 1993
Updated March 1996

APPENDIX 3

APPROVAL TO OCCUPY
INSPECTION CHECK LIST

1. GENERAL

The following issues ***shall*** be addressed prior to the Health Department of Western Australia Approval to Occupy Inspection.

An Approval to Occupy Inspection will not be conducted by the HDWA until all components of the works have been certified as having reached "Practical Completion" by the Architect and all Engineering Consultants and Contractors, and full commissioning and certification data, as specified herein, is provided to the Manager, Private Sector Licensing Unit, HDWA.

Note that:

HDWA means Health Department of Western Australia.

Architect means an architect eligible for corporate membership of RAIA.

Engineer means an engineer with relevant NPER-3 registration.

Certification means certification of the design and installation by the Engineer and certification of the installation by the installation contractor or specialist sub-contractor.

2. PRACTICAL COMPLETION

The works *shall* **have reached "Practical Completion", i.e. be ready for safe occupation and** *shall* **have been certified as such by the Architect, Engineering Consultants and Contractors.**

3. STRUCTURAL CERTIFICATION

A statement by the design structural engineer that certifies that the building has been built to the approval design ***shall*** be provided.

4. SYSTEM TESTING

All building systems (fire, mechanical, electrical, hydraulic, etc.) ***shall*** have been fully tested and be working as designed/documented (as approved by the HDWA).

5. ENGINEERING CERTIFICATION

Refer also attachments A, B and C

Certified statements which confirm that complete and tested mechanical, electrical and hydraulic engineering systems comply (in the professional opinion of the Certifier) with the statutory requirements of the various Government controlling agencies (including the HDWA) ***shall*** be provided to the HDWA.

The statement ***shall*** be prepared by professional mechanical, electrical engineers and hydraulic designers. The professional mechanical or electrical engineer or hydraulic designer ***shall*** certify the design and all commissioning and test data complies with relevant Australian standards, the HDWA Guidelines and all other statutory requirements.

Either the installation contractor or specialist subcontractor or the mechanical or electrical engineer or the hydraulic designer ***shall*** certify that the installations comply with the HDWA "Private Hospital Guidelines", relevant Australian Standards and mandatory requirements that were established or implied with the issue of the "approval to construct". Certification of compliance with the other controlling Statutory Authorities (Water Corporation, Worksafe WA, etc) ***shall*** also be provided.

6. ENGINEERING SCOPE

The engineering services mentioned in clause 5 above include, but are not limited to:

6.1 Mechanical systems, eg. air conditioning, air cooling, heating, exhaust (see 7), special exhaust, hot water (including domestic and heating water), water filtration/softeners/reverse osmosis. Where specified medical gases (including alarm systems) medical vacuum, air filtration, pressure differentials, sterilisers (steam, dry heat, chemical) washer disinfectors (instrument) steam generators (or similar systems), contamination free air intakes, etc.

Note that where evaporative coolers are used, a statement is required certifying that a system for sanitation for Legionella control has been tested and is operational. The procedure ***shall*** be described in the Maintenance Manual (refer Clause 25).

Commissioning of gas and suction services ***shall*** be in strict accordance with the procedure outlines in AS 2896. This testing ***shall*** be witnessed and certified by the consultant Mechanical Engineer and witnessed by a senior hospital representative.

6.2 Electrical and communication systems eg. switchboard and enclosures, circuit discrimination, emergency sub-mains fire rating, internal and external lighting, lighting for clinical observation, emergency power supplies, emergency evacuation lighting, power accessories, RCD protection, medical treatment areas, telephone systems, evacuation warning, nurse and staff assistance call systems, fire detection, lifts, etc.

6.3 Hydraulic systems, eg. fire hose reels, sprinklers, hydrants, boosters, general water reticulation (with attention given to issues such as provision of backflow preventers to handshowers etc.), sewerage systems, holding/dilution tanks, purified and/or filtered water, isolated water supplies, appropriate materials (PVC, copper, glass, etc.), stormwater, disposal, etc.

7. MECHANICAL VENTILATION AND AIR CONDITIONING SYSTEMS

Specific written data ***shall*** be provided in tabulated form confirming commissioning figures for toilet and general exhaust, ventilation rates (supply and return air), supply air and outside air quantities. The following presentation style is required.

MEASUREMENT LOCATION	CODE REQ'T	DESIGN	ACTUAL	% OF DESIGN
eg: Shared resident toilet and shower	10/Ls.m^2	45 L/s	47 L/s	104

The method of determination and calibration data ***shall*** also be provided to enable assessment of the appropriateness of measurement.

Cold DOP testing of absolute (HEPA) filters ***shall*** be conducted in accordance with AS 1132.9. HEPA filters ***shall*** also be certified in accordance with AS1807.6 or AS 1807.7 as appropriate, after initial installation.

Air flow patterns within, to and from Operating Rooms, and other critical asepsis control areas served by absolute filters, ***shall*** be verified by smoke pencil tests.

8. MEDICAL GAS SERVICES

The Certifying Consulting Mechanical Engineer *shall* **certify that the installation has been undertaken by approved, experienced and competent installers as required by AS2896 "Medical Gas Systems - Installation and Testing of Non Flammable Medical Gas Pipeline Systems".**

Commissioning of gas and suction services ***shall*** be in strict accordance with the procedures outlined in the Australian Standard AS2896. Tests ***shall*** be witnessed by the NPER-3 Certifying Consulting Mechanical Engineer and a representative of the Hospital. Flow test results of oxygen nitrous oxide, medical air and vacuum services ***shall*** be provided. Cross connection and purity tests ***shall*** be provided for each outlet. All test results ***shall*** be submitted in AS2896 format. Procedures for regular reliable ongoing replenishment and service of all systems and equipment ***shall*** be verified as appropriate.

9. ELECTRICAL SYSTEMS

Specific written test data ***shall*** be provided for the electrical installation including routine testing to AS 3194 of all switchboards, testing of the installation to AS 3000 and functional operation of the system.

Where the electrical system incorporates a customer owned HV supply, type test and routine test results ***shall*** be provided to AS 2006 and AS 1025 and all testing and commissioning data for the HV system ***shall*** be provided.

10. EMERGENCY LIGHTING SYSTEMS

Emergency lighting systems ***shall*** be tested in accordance with AS 2293 and full test results in 'log book' format ***shall*** be provided.

11. VITAL POWER SUPPLIES

Full commissioning data ***shall*** be provided for emergency diesel, UPS and any other vital power supplies. Full discharge test results ***shall*** be provided for all battery systems. A certification ***shall*** be provided that the whole of the installation complies with AS 3009.

12. ELECTROMEDICAL AREAS

All electromedical areas ***shall*** be certified by a biomedical engineer or a suitable experienced, NPER-3 registered, electrical engineer.

Full test results to AS 3003 ***shall*** be provided including a complete and certified checklist.

13. NURSE CALL

Functional test results ***shall*** be provided for the Nurse Call/Emergency Call/Staff Assist system. A checklist for each point ***shall*** be provided indicating the operating status at the time of testing.

14. DOMESTIC HOT WATER TEMPERATURE

A certified statement ***shall*** be provided by the Hydraulic Consultant or contractor which confirms that patient use water outlet temperatures have been tested and comply with statutory requirements, ie. 46^0 maximum at the outlet. This is necessary for both low temperature reticulation (50^0C) and higher temperature reticulation with thermostatic mixing valves controlling outlet temperatures. A statement is also required certifying that a system for sanitation (for Legionella control), as appropriate, has been tested and is operational. Consider the following:

14.1 Running the system at 70^0C for 1 hour/month (for low temperature reticulation).

14.2 Calibration of dual temperature thermostats.

14.3 Provision of outlet and valve warning signs.

14.4 Equipment for cleaning aerators etc.

14.5 Maintenance manual information describing the sanitation procedure (refer clause 25).

15. ENVIRONMENTAL TESTS

The cleanliness of Operating Suites, including Set-up Rooms, Sterile Stores, Angiography and Cardiac Catheterisation Rooms, any other room(s) in which such sterile procedures will be done, and Central Sterile Supply Department/Units (CSSD) and/or Theatre Sterile Supply Units (TSSU) ***shall*** be verified by air flow checks and bacterial sampling conducted by an appropriately NATA certified professional. Before testing, the following are required:

15.1 All building and engineering works have been completed.

15.2 The ducting has been cleaned, absolute filters installed, Cold DOP tests satisfactorily completed and air flows verified.

15.3 The theatres have been thoroughly cleaned.

15.4 The plant has been running at maximum power for 24 hours prior to the test.

15.5 There is no activity in the theatre/room/unit.

The room(s) ***shall*** be tested by:

15.6 Noting the direction of air movement using a smoke test.

15.7 Performing counts of bacterial colony forming units in both the air and on surfaces.

This is to be repeated once to confirm that duplication of results is possible.

If the room(s) fail the tests, the Engineer (mechanical) ***shall*** be consulted to confirm air velocities and filter integrity. The tests ***shall*** be repeated once the criteria are met.

16. STERILISER TESTS

The results of appropriate testing ***shall*** be provided. These include:

16.1 Verification of satisfactory cycle check tests and daily leak rate tests.

16.2 Bowie-Dick type test (conforms to BS7720) where applicable.

16.3 Bundle thermocoupling as per Appendix H – AS 4187.

16.4 Access to suppliers tests.

16.5 Calibration of gauges.

16.6 Biological Indicators using 106 colonies of appropriate organisms, which include full batch testing using standard bundles *after* bundle thermocoupling and calibration of gauges has been completed.

17. WASHER / DISINFECTOR TESTS

Washer/disinfector machines, including pan washers, instrument washers and anaesthetic tubing washers ***shall*** pass appropriate cycle and challenge tests for mechanical action and disinfecting activity where applicable, also artificial soil tests and thermocouple tests post installation where indicated. Foil and graphite tests for ultrasonic cleaners. The results of the tests ***shall*** be provided.

18. ANAESTHETIC EQUIPMENT TESTS

Certification is required from a specialist anesthetist that the facilities and equipment are in accordance with the Guidelines for Safe Anaesthetic Practice issued by the Faculty of Anesthetists, Royal Australasian College of Surgeons, in particular:

T1. Recommended Minimum Facilities in Safe Anaesthetic Practice in Operating Suites.

P4. Guidelines for the Care of Patients Recovering From Anesthesia in the Recovery Room.

19. FIRE SAFETY

In addition to the fire alarm and detection system, emergency and exit lighting, and the fire fighting (hydraulic) services mentioned in clause 6 above, certification of the following (where appropriate) ***shall*** be provided:

19.1 Integrity and completeness of fire and smoke barriers, ie. full compartment/isolated space separation as required, with penetrations fully sealed with a material capable of maintaining the fire resistance of the barrier, or protected by an approved device designed for the purpose. Fire and smoke barriers must extend from true floor to the underside of the roof/slab over, and a firewall must be able to maintain its structural integrity in the event of a wall and roof collapse on one side. Appropriate fire resistant packing between the top of a firewall and roof cladding must be installed in a way that provides a continuous seal.

19.2 Fire dampers (in mechanical ductwork) tested and operational.

19.3 Door closers (hydraulic or electro magnetic) on all fire and smoke doors being fully operational and closing speed adjusted for safe operation.

19.4 Door sequence closing devices operational (where double fire/ smoke doors are fitted).

19.5 Fire door certification plates fitted to all fire doors and frames which comply with AS 1905.1.

19.6 Appropriate and permanent smoke seals fitted to all smoke doors.

19.7 Appropriate fire extinguishers and fire blankets installed.

19.8 Appropriate signposting installed in accordance with the relevant codes.

19.9 Special fire suppression systems tested and operational.

19.10 Use of fire resistance rated plasterboard to a tested system (Fyrchek, Boral, etc.) for the construction of fire barriers.

19.11 Appropriate and unobstructed means of egress.

19.12 The installed floor coverings, window treatments and bedscreen curtains in compliance with section C1.10 (specification), early fire hazard indices, of the Building Code of Australia.

19.13 The installation, completeness and operation of the early warning fire system and its integration with all other associated systems.

20. WEST AUSTRALIAN FIRE AND RESCUE SERVICE TESTS

Confirmation of the successful outcome of the following WAFRS tests ***shall*** be forwarded to the HDWA:

20.1 Testing of heating, ventilation and air conditioning (HVAC) systems in relation to smoke control to ensure compliance with Section E2 of the BCA. These tests will involve the use of artificial smoke to assess the movement of smoke and gases produced by a fire, to the greatest extent possible, particularly as to:

20.1.1. means of egress;

20.1.2. exit passageways or other similar areas;

20.1.3. operating suite; and

20.1.4. nurseries, birthing suites, etc.

20.1.5. time taken to activate alarms, fire and smoke doors to close, and for smoke evacuation.

20.2 Testing of hydrant flow and pressure in accordance with AS 2419.1 Section 7.

20.3 Testing of hydrant hose reel flow and pressure in accordance with AS 2441.

20.4 Provision of appropriate access routes and hardstanding for fire trucks. Earlier discussions and agreement with the WAFBB on requirement at the design stage is assumed.

21. SECURITY

A certified statement ***shall*** be provided that confirms successful testing of any special electronic security systems, where provided.

22. FURNITURE AND EQUIPMENT

It is preferable that furniture and equipment be installed so that an evaluation can take place during the Approval to Occupy inspection. Where this is not possible, a written description of the type and quantity of loose furniture and equipment to be installed ***shall*** be provided.

23. OTHER CERTIFICATION ISSUES

Certification of successful testing of any other items or systems that have been installed AND which have not had HDWA approval, along with a description of the system, what is replaced, and why, ***shall*** be provided.

24. "AS CONSTRUCTED" DRAWINGS

A full set of "As Constructed" drawings ***shall*** be available for perusal as required during the Approval to Occupy inspection.

25. CONSULTANT AVAILABILITY

Engineering design consultants, and/or appropriately skilled contract personnel, ***shall*** be available during the Approval to Occupy inspection to answer technical questions and assist HDWA officers in the systems checking process.

26. CLINICAL

A statement of the procedures to be performed in each operating and procedure room **shall** be provided prior to the Approval to Occupy inspection.

Documentation **shall** also be provided that specifies the Operational Procedures for the cleaning and environmental testing of each operating and procedure room.

27. MAINTENANCE MANUAL

Proof ***shall*** be provided that a manual exists which instructs the building proprietor on the maintenance requirements of the engineering systems and all equipment (including air conditioning plant, autoclaves, sterilisers and washer disinfectors, catering equipment, other plant, etc.). Availability of equipment manuals for operators and maintenance staff shall be confirmed.

ENQUIRIES AND SUBMISSIONS

For general enquiries contact:

Private Sector Licensing Unit (PSLU)
PSLU Reception (08) 9222 4027

Veronica Snook
A/Manager PSLU (08) 9222 4023

For building process enquiries contact:

Geoff Burrell
Consultant PSLU (08) 9222 4440

For clinical enquiries contact:

Gillian O'Hara
Consultant PSLU (08) 9222 4017

For clarification of technical issues contact:

Bob Bassett
Consultant Health Architecture (08) 9222 4420

John Debowski
Principal Consultant Health Engineering (08) 9222 4416

Lee Bonser
Consultant Fire and Security (08) 9222 4461

Phil Robins
Consultant, Sterilising Services (08) 9222 2346

All HDWA personnel can be contacted using the following style of e-mail address:
John.Brown@health.wa.gov.au

When submitting certification statements etc, forward to:

Manager
Private Sector Licensing Unit
Health Department of WA
189 Royal Street
East Perth
WA 6004

or

Manager
Private Sector Licensing Unit
Health Department of WA
PO Box 8172
Stirling Street
Perth
WA 6849

JULY 2000

ATTACHMENT A

Typical Consultant's Certification Letter
Add other Services where relevant

Re: ANYWHERE PRIVATE HOSPITAL
ELECTRICAL AND MECHANICAL SERVICES

We advise that the electrical and mechanical services, documented for the……., have been effectively completed.

All engineering services have been tested and found to be working as designed.

To our knowledge the following electrical and mechanical services comply with the contract documents and the Health Department of WA and relevant statutory requirements, including the provisions of the Western Australian Occupational Safety and Health Regulation, 1996.

Mechanical Services

- Air conditioning system serving …….
- Mechanical ventilation systems serving …….
- Commissioning test results are attached

Medical Gas Services

- Flow testing of oxygen, nitrous oxide, medical air and vacuum services to…….
- Cross connection and purity tests for each outlet have been witnessed by the hospital. Test result forms are attached.

Electrical Services

- Electrical Systems
- Emergency Lighting Systems
- Nurse Call System
- Electromedical Treatment Areas
- Fire Detection
- Diesel Generator
- UPS and Vital Supplies

Hydraulic Services

- Domestic Hot Water
  Test result forms are attached.

ATTACHMENT B

Typical installer's certification
Certification is required for each relevant service. See also Attachment C for alternative certification for Electromedical areas and Fire Systems

> We certify that the Emergency Lighting System was installed in compliance with AS 2293, AS 3000, the design specification and drawings and all statutory (including HDWA) requirements.

Electrical Installation (High Voltage)

> Installer's certification, type and routine test results for all equipment, commissioning results and Western Power letter of acceptance.

ATTACHMENT C

Typical Requirements for Contractor's Certification and Test Results

Provide installer's certification and commissioning results for additional services.

ELECTRICAL SERVICES

Electrical Systems (Low voltage)

Installer's certification and AS 3000 and AS 3194 test results and functional test results.

Electrical Installation (High Voltage)

Installer's certification, type and routine test results for all equipment, commissioning results and Western Power letter of acceptance.

Nurse Call

Installer's certification and commissioning results.

Electromedical Areas

Commissioning form as per AS 3003.

Fire Detection System

AS 1670 installation certificate, test results and WAF&RS approval.

Diesel Generator

Installer's certification and commissioning results.

Emergency Lighting

Installer's certification and test results from log book.

UPS and vital supplies

Installer's certification and test results including load test.

MECHANICAL SERVICES

Air conditioning
Installer's certification and commissioning results.

Heating
Installer's certification and commissioning results.

Exhaust
Installer's certification and commissioning results set out as required in Section 7.

Evaporative Coolers
Installer's certification including statement on Legionella control and commissioning results. See Section 6.

Medical gases (including alarm systems)
Installer's certification and commissioning results witnessed by the Consultant and a Hospital representative.

Autoclaves, Sterilisers, Washer Disinfectors, Ultrasonic Cleaners
Installer's certification and commissioning results.

Steam generators (or similar systems)
Installer's certification and commissioning results.

Driers
Access to manufacturers test sheets.

HYDRAULIC SERVICES

Domestic Hot Water
Installer's certification including statements on hot water temperature tests and Legionella control and commissioning results. See Section 11.

PRIVATE HOSPITAL GUIDELINES

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