2. DESIGN PROCESS

Introduction

2.1.00 SCHEME DESIGN STAGE

Many opportunities for cost savings occur in the sharing and co-planning of plant and reticulation systems e.g. co-operation between disciplines in scavenging waste heat etc and co-ordination of plant room space.

Schematic design stage is, in many ways, the most important stage of the project where major decisions are made determining the overall form and configuration of the building, floor to floor heights, plant room locations etc.

Therefore the opportunities for cost savings through the sharing and co-planning of plant and reticulation systems need to be encouraged and pursued. These decisions are not readily changed as they represent 'the foundation' upon which the rest of the design is built. Interestingly, Scheme Design is often the shortest phase in the design process.

The opportunity for user group demands to inflate project costs has been well documented; the briefing and Scheme Design stage represents the best opportunity to control this input. For this reason considerable emphasis is placed upon briefing in this document.

2.1.05 OBJECTIVES & APPLICATION

The aims of this document is:

- To ensure adequate, appropriate and complete briefing occurs at each stage
- To ensure appropriately timed and formatted design reviews occur during Scheme Design
- To ensure informative and consistent cost reporting of Engineering Services
- To ensure a consistent and straightforward Life Cycle Costing method is applied to plant and equipment decisions on all projects.

This document will apply to all health building projects.

The Brief

2.2.00 The project brief must be completed before design work commences. Engineers will be engaged at the briefing stage to ensure services requirements are adequately defined.

For Design and Construct type projects, engineering input will be required for brief formulation and for the assessment of proposals. For traditional delivery methods, engineering input into the brief will be required for either the preparing or reviewing of the final document.

Room Data Sheets

2.3.00 Room Data Sheets are to be finalised and approved before commencement of detailed design. The engineers' engagement is to include input into Room Data Sheet briefing.

Engineers are to certify briefing information is complete and adequate before Room Data Sheets are finalised.

Compliance

2.4.00 Engineering services installations must comply with the relevant provisions of the Building Code of Australia (see Introduction Clause 1.8). Where compliance with the BCA is considered onerous, unreasonable or unduly expensive, NSW Health should be approached to seek a dispensation from compliance with the particular clause(s). (It may be that this will lead to a modification of the BCA, if the arguments presented are sound and have broad application.)

Engineering services shall similarly be designed in accordance with this document and the standards set out in the NSW HFG (Health Facility Guidelines).

In some cases (e.g. air-conditioning), provision of an engineering service needs to be justified on the basis of the services provided within the unit. Departures from the Guidelines or HFGs must be justified.

Scheme Design

2.5.00. REVIEW TIMING

The timing of design reviews shall be decided on a project-by-project basis with the aim of confirming the proposed design as being the optimum solution. Generally two Design Reviews will be required, large projects may require three or more.

The first Design Review of Scheme Design proposals shall be at an early stage while several schemes are still being considered. Engineering design issues and their interaction with the overall project and consequential costs shall be important agenda items. These reviews shall include all disciplines and appropriate client and Departmental representatives.

The second design review, late in the Scheme Design process, will be conducted to ensure the proposal has not drifted away from the objectives agreed in the first review.

2.5.05. REVIEW FORMAT

Scheme Design Reviews shall include all disciplines and review all aspects of the design. For the review conducted in the early (formative) stages of scheme design, the engineering services portion of the review shall focus on the interaction between the proposed building design and the resultant services configurations. In particular the following should be addressed:

- Shutdown parameters
- Planning decisions leading to services costs
- Sub-station location
- Mains route onto site
- Emergency generator location
- Sub-mains reticulation routes
- Main switchboard location
- Appropriate plant room sizing/location
- Appropriate plant room configuration
- Riser shafts
- Planning of A/C and non A/C spaces in associated clusters
- Services reticulation allowances especially floor to floor heights.
- Review of number of lifts

The review held late in the Scheme Design process should include all of the above and follow the structure of the Scheme Design Report. Particular attention should be paid to:

- Proposed departures from the guidelines
- Consequential costs resulting from sub-optimal plant configurations plant and equipment subject to life-cycle costing

Costings

2.6.00 REPORTING

Engineering services cost estimates are to be prepared in the cost format (as described within the guideline for each discipline) and included as part of the Project Definition Plan and Scheme Design Reports.

2.6.05 MONITORING

Engineering services cost estimates will be monitored throughout the design process in the cost format included in the Scheme Design Report. Consultants will submit a cost report at each design stage.

2.6.10. LIFE CYCLE COSTING

Life cycle costing shall be carried out to justify plant and equipment selection for items as required in Scheme Design Reports. Where it is required, life cycle costing shall be carried out in accordance with the method described in Appendices of this document.

Departures from Guidelines

2.7.00. Any departure from the guidelines are to be referred to NSW Health 'Asset and Contract Services'.

Future Expansion

2.8.00. Other than as described in individual guidelines, future expansion allowances will only be permitted in accordance with the requirements approved in the Project Definition Plan.

Post Occupancy Evaluation

2.9.00. The post-occupancy evaluation of each project shall include an assessment of all engineering services. The review shall be conducted 12-24 months after commissioning and include such issues as:

- User satisfaction
- User understanding and acceptance of systems
- Operating costs
- Maintenance issues (accessibility, reliability and cost)
- Appropriateness of service

Definition of Critical Care Areas

2.10.00. To assist in clarification of services needs, the term 'Critical Care Areas' has been defined as those areas where acute resuscitation procedures occur on a regular basis and will include:

- Resuscitation bays in the Emergency Department. In a Level 5 and 6 facility this may also extend to several treatment bays
- Operating rooms, Anaesthetic Bays and the Recovery area of the Operating Suite
- Day Procedures Rooms
- Coronary Care Unit
- Intensive Care Unit
- Neonatal Intensive Care Unit
- Cardiac Catheterisation Rooms
- Some areas of Medical Imaging.

Other areas, such as High Dependency, will require assessment at the Design Briefing Stage of the planning process to determine if they qualify to be included in this classification.

Critical Care Areas, once defined, will qualify for a higher concentration of services. Although these service needs will change over time because of evolving clinical management trends, the minimum service provision per bay shall comply with the minimum requirements provided in Part B - NSW HFG - RDS e.g. Level 5 / 6 ICU Bays re. Gases and power.

The briefing team should designate Critical Care Areas early in the briefing stage to assist in clear definition of engineering services provision and to minimise subsequent debate.

Because of their high level of service provision Critical Care Areas have the potential to generate significant capital costs. Briefing teams should exercise considerable restraint when identifying these areas.