

TECHNICAL SPECIFICATIONS – ENGINEERING SERVICES



LEETON
SHIRE COUNCIL

TENDER No. LSC2019-109C

ENGINEERING SERVICES

for the

ROXY THEATRE REDEVELOPMENT

VOLUME 2 of 3

TECHNICAL SPECIFICATIONS (PROJECT REQUIREMENTS)



DATE: MAY 2019

Contents

TECHNICAL SPECIFICATIONS – ENGINEERING SERVICES	1
1 Background	3
1.1 Purpose	3
1.2 Strategic Objectives	3
1.3 Previous Studies	4
2 The Project	4
2.1 Project Scope	4
2.2 Project Objectives and Scope	5
2.3 Consultancy Structure	6
3 Program	6
4 Estimated Project Cost	6
5 Phases of Consultancy Services	7
5.1 Phases to be Undertaken	7
5.2 Phase 1 – Functional Brief	7
5.3 Phase 2 – Schematic Design	8
5.4 Phase 3 – Design Development	9
5.5 Phase 4 – Tender Documentation	10
5.6 Phase 5 – Tender, Evaluation, Award and Contract Administration	10
5.7 Phase 6 – Defects Liability Period	11
6 Roles and Responsibilities – All	12
6.1 Environmental Sustainable Development	12
6.2 Liaison with Project Manager	12
6.3 Value Management and Value Engineering	12
6.4 Safety by Design	13
6.5 Meeting Attendance	13
6.6 Consultant Team Meetings	13
6.7 Design Team Meeting	13
6.8 Design Review	13
6.9 User Group Meeting	13
6.10 Contractor’s Meeting	14
6.11 Project Control Group (PCG) Meeting	14
6.12 Reporting Requirements	14
7 Roles and Responsibilities – Engineering	15
7.1 Engagement	15
7.2 Mechanical Engineering	16
7.3 Electrical Engineers	20
7.4 Hydraulic Engineers	24
7.5 Communications and Security Engineers	28
7.6 Fire Protection Services	32
7.7 Vertical Transportation Engineers	37

1 BACKGROUND

1.1 PURPOSE

The Roxy is a purpose-built cinema and community venue owned by Council located in Leeton in regional New South Wales.

The facility opened in 1930 as a cinema however over the generations it has also been utilised for theatre productions, community events, functions, and civic ceremonies. The Roxy is historically important as a centre for many community gatherings and other local institutions. But its influence, both real and potential, extends further. As an incubator of local ideas, hopes and aspirations extending back many years, it serves as a vector for the community's wider economic and social interests.

The difficult position the Roxy finds itself in is due to the myriad of technical compliance issues surround it. Address one issue and there is a domino effect of occupational health and safety standard that require solution, as well as building compliance issues and in particular addressing disability access. There is a prominent and precious heritage fabric to enhance. What is urgently required is a new functionality for the building, in which compliance challenges are addressed within a constrained building foot print, sympathetic to the cultural legacy of Leeton and the Roxy itself.

This investment will extend far beyond a simplistic architectural touch up and putting in a disability ramp. It takes as its starting point the town's reputation for innovation and adaptability, evident in the translation of the economy from small scale agricultural production and low-value food processing to today's economy based on agribusiness, value-added agricultural products and high-end engineering and international tourism.

1.2 STRATEGIC OBJECTIVES

There are 3 key areas on which this redevelopment will deliver measurable outcomes:

- *Increase Arts and Cultural Participation*
 - Leeton and the surrounding community are content generators meaning that The Roxy experiences high attendances for activity generated by community, however the building is operating at 35% capacity due to functional and legislative building constraints.
 - Making the building efficient to operate will leverage further economic potential through community generated activity and investment from industry.
 - The reconfigured Roxy brings the building into the 21st century, allowing a mix of cultural activity for the town and region, while also providing a vehicle for external investment in cultural activity by Leeton's industries, that will generate social and economic benefits.
- *Vibrant Civic Centre*
 - Redevelopment of The Roxy will contribute to the social resilience of the town and beyond that, to its civic amenity and tradition of community engagement.
 - The Roxy Redevelopment allows for increased community and educational programming which will attract and increased level of corporate and philanthropic support to deliver increased arts and cultural participation that will directly impact the liveability and activation of the town centre.
- *Heritage Fabric:*
 - It is acknowledged that the Roxy, built in 1930, is a rare surviving example of a 1930's picture theatre still in use and is one of only a few remaining examples of architect Kaberry and Chard's cinemas. The Roxy is valued by several generations of the Leeton and surrounding community as a key centre for social interaction, community events and entertainment for over 80 years. The theatre has been an essential part of the social and cultural fabric of the Leeton community for most of the town's period of existence

-
- A conservation management plan is to be prepared for the Roxy, which will contribute to informed decision making for anyone engaged in caring for the heritage place and for the current proposed redevelopment.

1.3 PREVIOUS STUDIES

Key Reports will be available on request, including:

- Marshall Day Technical Report
- Previous Conservation Management Plan
- Existing Conditions Drawings
- Engineering Report – Existing Conditions – Feb 2019

2 THE PROJECT

2.1 PROJECT SCOPE

The proposed redevelopment works will include conservation and restoration of significant elements of the existing building. A new Conservation Management Plan will be developed to supersede the Conservation Management Strategy of August 2007. All works will be undertaken to meet requirements of the Heritage Act 1977 (NSW).

The original building footprint together with its later additions occupies almost all of the site area up to all boundaries. The undercroft spaces that are currently not utilised as functional floor space are fragmented and require careful consideration for incorporation into potential upgrade strategies for the auditorium and stage or other supporting amenities.

The project will uncover hidden and under-utilised spaces to create new space by removal of redundant fabric or reconfiguration within the total volume of the Roxy. Where possible existing fabric is adjusted for reuse rather than removed.

The 1980s additions are substantially reused and modified.

The works (potential) include:

- a) Disability access to front and side entry, stage, rehearsal area, seating, amenities, foyer
- b) Provision of new function prep kitchen
- c) Optional: boutique smaller cinema
- d) Upgrade of Heating and Cooling
- e) New changeroom / dressing room space.
- f) Access to both sides of the stage.
- g) Upgrade technical cabling, sound, lighting and AV equipment
- h) New motorised rigging system
- i) Install code compliant seats in public spaces
- j) Provide hearing augmentation system
- k) Improve thermal and acoustic insulation
- l) Improve fire protection to the building

2.2 PROJECT OBJECTIVES AND SCOPE

The project aim is to address issues and constraints:

Strategic Considerations:

- Prepare a masterplan that considers surrounding land use and provides options for future proofing Leeton's arts and cultural functional capacity. This may involve architectural, structural and services master planning options analysis of possible future expansion into adjacent areas.

General:

- Maintenance and upkeep
- Limited functional capacity to meet arts and cultural needs of community
- Band-Aid approach is not a sustainable option and is leading to higher ongoing maintenance costs over time

OHS:

- The Roxy currently doesn't meet code in relation to:
 - Disability Access.
 - Occupational health and safety for staff, performers and customers.
 - Fire Safety Compliance as well as the theatre rigging represents a danger.

Infrastructure constraints:

- In addition to the Roxy's current lack of flexible performance and auditorium spaces, there is also a lack of a kitchen/function preparation space. This is limiting the number, type and size of events currently able to be hosted at the Roxy.
- At present there is no loading dock with scissor lift facilities to bring in larger props and equipment in at stage level. This is limiting the number and type of performances that can be delivered at the Roxy. The other related constraint is the efficiency with which the Theatre can transition from one performance/use to the next.
- The lack of smaller rehearsal spaces/theatres means that while the main auditorium is being used, smaller performances or movies screenings can't be accommodated. It makes the theatre less flexible for hosting film festivals and additional events and exhibitions.
- The current facilities for performers are relatively poor. The changing rooms are constrained and there are no separate male/female changing rooms.

Lack of Functional Capacity

- The Roxy currently has one large performance stage and auditorium. There are no smaller rehearsal spaces or theatres and the changing facilities for performers are limited. The lack of smaller spaces limits scheduling flexibility in that only one performance/screen can occur at a time. In addition, the viability of smaller events is limited as the only option is to use the entire theatre, with all the associated staffing and utility costs.
- The Roxy is the centrepiece of Leeton and when the lights are on and people are in town, Leeton is 'alive', spirits are raised, and business and community confidence is high.
- The other civic role that the Roxy plays is that of a de facto Town Hall. The Roxy's current lack of capacity and flexibility means that when the theatre is being used for town hall purposes, other civic activities are unable to take place in the building.

Heritage

- The heritage value of the Roxy has been recognised to be of State significance. This responsibility, that extends far beyond Leeton, represents a heavy cost burden for the community.

Operational

- Attractiveness to new audiences and next generation users.
- Increasing occupancy and participation.
- Increased Programming at The Roxy that encourage visitors to town.
- Increase income streams for The Roxy.
- To be accessible and affordable for cultural group use.

2.3 CONSULTANCY STRUCTURE

The consultants to be appointed for this project are listed below and will each be separately appointed by Leeton Shire Council:

- Principal Consultant/Architect is to be appointed to undertake Architectural and Interior Design services, Structural Engineering, DDA & Acoustic Engineering works and coordination of all design consultants.
- External Project Manager/ Superintendent is to be appointed to provide Project Management and Superintendent services.
- Quantity Surveyor to be appointed to provide Cost Planning and Cost Management services.
- Town Planning Consultant to be appointed to address all statutory planning requirements of the project.
- Heritage Consultant to be appointed to prepare the Conservation Management Plan
- Services Engineer is to be appointed to provide services design including Mechanical, Electrical/ICT/Security, Hydraulics, Vertical Transportation, Fire Protection and Fire Engineering services.
- Theatre Consultant to be appointed to undertake technical and operational theatre design services for the integrated fitout component of the project.
- Building Surveyor is to be appointed to provide building certification and structural certification services.

3 PROGRAM

The indicative Program is as follows:

- Consultant Appointment –late May 2019
- Complete Master plan options and Schematic Design – July 2019
- Complete Design Development – August 2019
- Complete Contract Documentation – October 2019
- Construction Tender Award – December 2019
- Commence Construction – February 2020
- Complete Construction – December 2020
- Commissioning & Training – March 2021

The consultants are to provide a preliminary program to reflect the targets based upon traditional construction procurement approach. The program should highlight workshops, progressive design reviews (as applicable) and allow a minimum of two weeks for client review and approval prior to conclusion of each phase of the project.

Consultants should allow a minimum of 10 trips to Leeton to adequately service the project as follows:

- 3-4 trips during design & documentation phases
- Balance during construction phase

Consultants should demonstrate in their tender submission how they will effectively service the project given its remote location and manage travel costs in the most effective manner.

4 ESTIMATED PROJECT COST

The estimated **Total Construction Cost (TCC)** is **\$3.5M** exclusive of GST. The TCC includes demolition, construction, integrated fitout and FF&E costs and excludes property acquisition, consultants' fees and authority charges.

This amount is to form the basis for the consultant's fee submission.

5 PHASES OF CONSULTANCY SERVICES

5.1 PHASES TO BE UNDERTAKEN

The consultant is to provide services for each phase in accordance with the details set out below.

The phases applicable to this project will be:

Phase 1	Masterplan Options including Functional Brief involving key stakeholders
Phase 2	Schematic Design
Phase 3	Design Development
Phase 4	Contract Documentation
Phase 5	Contract Administration
Phase 6	Defects Liability Period

5.2 PHASE 1 – FUNCTIONAL BRIEF

This phase involves:

- Masterplan Options
- Preparation of the Functional Brief
- Site due diligence and construction staging sequencing
- Communication and Stakeholder Engagement Plans

5.2.1 MASTERPLAN OPTIONS

The Principal Consultant (Architect) is to prepare a options paper on adjoining land uses and how this might improve Leeton's cultural capacity whilst integrating current scope and budget.

This is envisaged as 2-3 week analysis concurrent with Functional Brief and Site due diligence.

5.2.2 FUNCTIONAL BRIEF

The Principal Consultant (Architect) is to prepare a Functional Brief to articulate and test functional and design requirements and involve development and inclusion of the Schedule of Accommodation and associated details. It will be used to test design options against and to finalise design.

5.2.3 SITE DUE DILIGENCE AND CONSTRUCTION STAGING SEQUENCING

Complete detailed site due diligence including assessment of site constraints such as accessibility of the site during construction.

Review the scope of works from a construction implementation perspective and resolve the broad staging sequencing to support the ongoing operation of the Roxy. This will involve inspection of site and the various work fronts, assessment of these areas in the context of construction access, materials movement in and out, impacts on the operations and development of a programme for completion of the works. Detailed review with Leeton Shire Council is required to discuss and agree the constraints that need to be put in place to deal with the various work fronts and maintain ongoing operation of The Roxy during the construction phase.

5.2.4 COMMUNICATION AND STAKEHOLDER ENGAGEMENT PLANS

Input and involvement will be required in the preparation of communication and stakeholder engagement plans, the stakeholder engagement process and the development of reports to support and implement public communication strategies and the like to assist the project governance team. Consultants will be involved in the preparation and presentation of material for forums as required that will be concurrent with key milestones.

5.3 PHASE 2 – SCHEMATIC DESIGN

This phase involves:

- design sketches for the agreed development option
- the preparation of a Limit of Cost Estimate (Cost Plan C) for the agreed development option, and
- the preparation and submission of planning approval applications. This applies to both architectural and engineering services design.

A Schematic Design Report will be prepared that demonstrates that a thorough analysis of design and engineering service systems has occurred ensuring that the intent of the Functional Brief has been met including the preparation of a Comparison Schedule of Accommodation (comparing briefed to designed areas).

The report will also demonstrate how the performance requirements of the BCA Part J will be met, as well as including studies and recommendations relating to operational issues, such as:

- Cinema and theatre events and activities
- Communications
- Energy Systems
- Fire safety systems
- Maintenance systems
- Deliveries and Loading
- Waste Management
- Catering, etc.

Typical documentation required at the completion of this stage shall include the following:

- Cost Plan C(including life cycle recurrent costs/square metre)
- Development Application documentation, if required.
- Elevations and Sections (1:100 or 1:200).
- Floor and roof plans (1:100 or 1:200).
- Building Services systems description (including energy consumption / hour / square metre)
- Preliminary Room Data Sheets.
- Preliminary Specification for all materials and finishes (including low maintenance issues).
- Presentation Standard Perspectives.
- Site Plan (1:500) including identification of setbacks, built forms, vehicular & pedestrian routes, easements, emergency access routes.
- Title Survey Plan (if not already provided).
- Typical Construction Details and Sections for facade, walls, floors and roof (1:100).

A review of the project programme of key milestone dates and procurement method may be required at this phase and, if so, consultants should prepare an updated report on options considered and confirm the recommended project delivery methodology.

The approval of the PCG is required before proceeding to the next phase.

5.4 PHASE 3 – DESIGN DEVELOPMENT

This phase involves the ongoing development and refinement of the approved design by all consultants and the incorporation of all Authority requirements into the design, including those in the BCA Part J. A further Cost Plan (C2) estimate will be prepared to demonstrate that the project is still within budget.

A Design Development report will be prepared that demonstrates that issues of planning, design, materials selection, constructability, building services, (structural, civil, fire safety, mechanical, electrical, hydraulic and energy services) have been coordinated and integrated into the proposal to ensure an effective project outcome.

Typical documentation required at the completion of this stage should be based on the approved Schematic Design developed in more detail. It will include but not necessarily be limited to the following:

- Asset Management Plan (including items listed below)
- Building Services including plant, reticulation, monitoring and control systems.
- Construction sections (1:50) for facade, perimeter wall sections showing finishes at junctions of walls and floors, ceilings, etc.
- Coordinated reflected ceiling plans (1:100).
- Developed Room Layouts (1:50).
- Equipment Briefing Schedules.
- Lift, stair and riser details (1:50).
- Plans, Sections and Elevations (1:100).
- Roof layout and drainage details.
- Room Data Sheets.
- Site Plan.
- Site works and landscaping layouts.
- Review & confirm Cost Plan C (including life cycle & recurrent costs / square metre).
- Description of the project operations in terms of:
 - users' performance requirements (e.g. low maintenance and low energy consumption)
 - design parameters (e.g. architectural / engineering capacity of structure and systems).

Note: The Asset (or Facility) Management Plan is to be prepared to enable the facility to be managed across its operational life. The Plan will include, but not be limited to:

- an asset register including age, condition, value and supplier data
- operating plan(s) (including cleaning, energy services)
- maintenance plan(s) (including replacement / refurbishment schedules)
- compliance issues e.g. maintenance of essential services
- projected costs for annual (recurrent/ongoing) requirements, e.g. energy or cleaning, and anticipated costs for the life cycle of the facility e.g. major plant or refurbishment of systems.

Approval of the PCG is required before proceeding to the next phase.

5.5 PHASE 4 – TENDER DOCUMENTATION

This phase involves the development of properly coordinated documents, suitable for tendering and subsequent construction either as a lump sum or a number of contracts. The documents, and the project, must have all relevant Authority approvals.

A pre-tender estimate Cost Plan D will also be prepared to demonstrate that the project will remain within budget.

Typical documentation required at the completion of this stage should include but not necessarily be limited to the following:

- Contract including special conditions.
- Cost Plan D
- Specification.
- Tenderer's Brief.
- Working Drawings.
- Program of key milestone dates.

Note: If the adopted project delivery method is non-traditional (e.g. Early Contractor Involvement such as Managing Contractor or Construction Management or a hybrid approach) then contractor procurement will occur earlier in the project.

Approval of the Phase 4 - Tender Documentation by the PCG is required before proceeding to the next phase.

5.6 PHASE 5– TENDER, EVALUATION, AWARD AND CONTRACT ADMINISTRATION

This phase involves the calling, evaluation and awarding of tender(s), and contract administration. It also involves the appropriate commissioning of the building.

Typical documentation required at the award of tender stage should include but not necessarily be limited to the following:

- Bank guarantee
- Contract documents (including Instrument of Agreement, legal contract and technical documents)
- Financial check
- Compliance with OHS, IR and local content requirements
- Insurance evidence
- Selection report and endorsement
- Statutory declaration (comply with Code of Practice)
- Building Permit, including permits for staged construction or separable portions;
- Construction issue drawings in electronic format (AutoCAD and PDF) that can be released to the successful Building Contractor for completion of Shop and As Built drawings, as required. Any change to drawings during the Construction Phase is expected to be accompanied by issue of updated CAD and PDF files in time for the building contractor to produce As Built drawings.

The construction phase involves contract administration, and quality management through the construction period.

All consultants must complete the following activities in the construction period:

- Respond to RFI's from the Building Contractor within 2 business days of receipt in writing via email or other agreed method. Note: Formal response to RFI's are by Architects or Engineering instruction only and not in meeting minutes. Site instructions must be followed up with a formal Architect or Engineering instruction;
- Conduct site walks on a fortnightly basis or as agreed with the Project Manager. Take images of as built conditions that may not be visible once complete (e.g. in wall services);
- Conduct detailed defect walks prior to Practical Completion, or at nominated times, as informed by the Project Manager;
- Review As Built documentation, Operations and Maintenance Manuals and Asset Registers and provide confirmation to the Project Manager that all information contained therein accurately reflects what has been constructed and is complete.

5.7 PHASE 6 – DEFECTS LIABILITY PERIOD

This phase involves monitoring the works and having all discovered defects addressed by the Contractor. The consultants shall provide advice and support to the Principal regarding defects, including faulty materials and workmanship. Where the matter is critical to the service delivery functions or occupant safety, the Superintendent shall arrange for the Contractor to promptly rectify the defect. In the case where this fails, the Superintendent, on behalf of the Principal, may arrange for an alternative means to be used utilizing the security retained for this purpose.

The consultants are to arrange for a coordinated report to be provided to the Principal, initially for review and sign off, in sufficient time to be forwarded to the Contractor during the Defects Liability Period.

Post Occupancy Evaluation (POE) is required to be undertaken as part of the project consultancy quality assurance process. It usually takes place 12 months after the completion of the construction and occupation by the agency. The POE shall review the functions and suitability (i.e. fit-for-purpose) in terms of the original brief and shall make comment on:

- assessment of current operations,
- project objectives have been met, and
- the requirements to be considered for future projects.

6 ROLES AND RESPONSIBILITIES – ALL

6.1 ENVIRONMENTAL SUSTAINABLE DEVELOPMENT

The project team and all consultants are to prepare designs and documentation that embody objectives of improved indoor environment quality, low carbon emissions, sustainable transport options, efficient use of water, minimal impact on the local environment and minimising waste to landfill.

The project team shall take a whole-of-life approach to sustainability. The Project Team shall design and deliver systems which support positive behavioural practices from staff and visitors.

The project team shall undertake design and documentation of building systems, materials and engineering infrastructure which are robust and low maintenance and reflect sound engineering design principles. Building design and Engineering systems selected should promote low carbon solutions to reduce the carbon footprint of the facility.

6.2 LIAISON WITH PROJECT MANAGER

Leeton Shire Council will have an internal Project Manager to provide local project management support for the project. In addition, it is proposed to appoint an external Project Manager to provide superintendency services and to provide overall project management of the project team.

The external Project Manager is the primary contact for the consultant team and is the main conduit to the Client. The external Project Manager is to provide technical expertise in the processes of planning, procurement and implementation of assets, buildings and associated infrastructure works.

The external Project Manager will engage, direct and monitor the services, responsibilities and duties of the consultants throughout all stages of the appointment.

All consultants are to liaise with the PCG through the external Project Manager.

Consultants are engaged to facilitate the planning and redevelopment of the Roxy. All consultants are to work as a consultant team to plan and deliver the stated facility.

6.3 VALUE MANAGEMENT AND VALUE ENGINEERING

Value management and engineering processes must be undertaken throughout the project and the Consultants role is to:

- Carry out a documented value management/engineering process with the Project Manager and the Quantity Surveyor at the completion of each design phase;
- Provide a scope of works at each design stage for scope and cost verification;
- Ensure designs and documentation seek best value for money in considering capital and recurrent cost ramifications;
- Ensure that the design solution submitted complies with the budget constraints of the project;
- Consider the lifecycle costs of design and make the Client aware of any aspect of the design that may result in a significant increase in costs over the lifecycle of the project;
- Provide cost reduction options that may be needed to maintain the project cost within budget;
- Ensure that the project remains within the established budget always. If it is the opinion of the Architect/Lead Consultant that increased value for the Client might be obtained by a scope deviation at increased cost, this must be brought to the attention of the Project Manager and direction from the PCG obtained prior to any changes being implemented.

6.4 SAFETY BY DESIGN

All consultants are required to demonstrate that Safety by Design has been considered when developing design documentation. All design and construction methodologies must be of the highest industry standards in relation to OHS and limit all safety hazards as far as reasonably practicable. This relates to demolition, material selection, construction methodology, maintenance and decommissioning / disposal.

Where shown to be required by Risk Assessment, a Safety by Design process is required to be carried out in each design phase. Actions are to be documented and coordinated with drawings which are marked up by each consultant for their discipline. If risks are identified that cannot be mitigated to a satisfactory level within the design, they must be referred to the Client for acceptance prior to being transferred to maintenance operations at the completion of the project.

6.5 MEETING ATTENDANCE

All consultants are required to attend regular (e.g. fortnightly) meetings throughout each phase of the project. Meetings they are expected to attend include but are not necessarily limited to:

- Consultant Team meetings
- Design Team meetings
- Design Review Workshops
- User Group meetings
- Contractor's meetings
- Project Control Group meetings.

6.6 CONSULTANT TEAM MEETINGS

All consultants are required to attend regular Consultant Team meetings (e.g. fortnightly) throughout the design and documentation phases of the project. Consultant Team meetings manage all activities and report on the status of the project to the Project Control Group. The meetings are chaired and minuted by the Project Manager (Consultant) or where there is no Project Manager, the Principal Consultant.

6.7 DESIGN TEAM MEETING

All consultants are required to attend regular Design Team meetings at which all design and technical issues are discussed in detail. Design Team meetings are chaired and minuted by the Project Manager (or Principal Consultant).

6.8 DESIGN REVIEW

All consultants are required to prepare information for briefings and participate in Design Reviews as required by the Project Manager (Consultant) or Principal Consultant.

6.9 USER GROUP MEETING

An intensive programme of User Input is expected. This is achieved primarily through regular meetings with the project User Groups during key stages of the design, documentation and commissioning phases.

User Group meetings determine the performance requirements to be met for each service, within reasonable financial limits. User requirements are subject to the approval of the Project Control Group. The meetings may be used as a checklist for compliance checking of documents, with verifying records produced at the end of each applicable design phase.

All consultants attend as required by the Project Manager or Principal Consultant. The Services Engineer and the Quantity Surveyor attend, with other engineering consultants in attendance as requested. The structure and format should have prior agreement with the Project Manager. The Principal Consultant minutes all User Group meetings and distributes copies prior to the next meeting.

6.10 CONTRACTOR'S MEETING

Consultant Team meetings and Design Team meetings are replaced by Contractor's meetings when construction commences. All consultants must attend as required by the Superintendent. This is generally for the duration of the contract administration phase for their area of responsibility. The Quantity Surveyor is to attend all Contractor's meetings. The meetings are chaired and minuted by the Contractor and held on site if feasible.

6.11 PROJECT CONTROL GROUP (PCG) MEETING

All consultants may be required to attend Project Control Group (PCG) meetings at the request of the Project Control Group or the Project Manager. Project Control Group Meetings are generally attended by the Project Manager, Principal Consultant and Quantity Surveyor, and for the majority of projects, the main Services Engineer is to attend. Other consultant engineers or specialised consultants may be required to attend from time to time, as required by the Project Manager.

6.12 REPORTING REQUIREMENTS

All consultants must prepare monthly progress reports (generally no more than 3 pages in length) for inclusion in the Project Manager's Monthly Report to the Project Control Group. The consultant's progress report should include a brief summary of the status of the work and outline any key issues or critical decisions to be made regarding their area of responsibility.

7 ROLES AND RESPONSIBILITIES – ENGINEERING

7.1 ENGAGEMENT

The Engineering Consultant is directly responsible to the Project Control Group, but is under the day-to-day direction of the Project Manager.

The Engineering Consultant is engaged to facilitate the planning and development of The Roxy redevelopment and will include the following engineering specialities:

- Mechanical
- Electrical
- Hydraulic
- Communications and security
- Fire services
- Fire engineering
- Vertical Transportation services

Engineers must be qualified as specified in the Building Regulations.

The principal responsibilities of the Engineering Consultant is to:

- Provide professional services consistent with best practice for their area of specialisation.
- Support the Project Manager, Principal Consultant or Architect in meeting the accommodation and performance requirements of the project.
- Assess the demands and circumstances of the project. Investigate existing conditions as necessary to confirm site infrastructure capacity and connection points and prepare documentation showing all points of connection.
- Report on options as requested by the Project Control Group, detailing the relative capital development cost and ongoing operating and maintenance costs of each system.
- Assist in identifying the most appropriate solution to the needs of the project, the client and users in the immediate and the long term.
- Plan, design, document and inspect all of the building systems and service components within their area of responsibility, throughout all stages of the project to ensure they are functional, fit for purpose, comply with the construction documents, and achieve the design intent.
- Ensure that all building systems, service components and their installation comply with all, statutory and regulatory requirements, particularly in relation to essential services.
- Collaborate in a systematic analysis of energy efficiency and energy cost saving opportunities. Collaborate in the preparation of BCA Part J certificates to be submitted for approval by the Building Surveyor.
- Develop contingency plans for all systems.
- Ensure that systems meet asset management (i.e. life cycle) objectives including:
 - Reliability
 - Low maintenance costs
 - Energy efficiency
 - Flexibility of use.
- Ensure site infrastructure meets the requirements for all buildings on the site and can accommodate future expansion.

7.2 MECHANICAL ENGINEERING

7.2.1 SCOPE OF SERVICES

Mechanical engineers have a general responsibility for the following service components of a project:

- Space heating
- Ventilation
- Air conditioning
- Smoke control
- Refrigeration and chilled water systems
- Gas

Note: Acoustic engineering related to the mechanical services and/or the building components may require the separate engagement of an Acoustic Consultant.

7.2.2 ROLES AND RESPONSIBILITIES

Mechanical engineers have general responsibilities to:

- Communicate with relevant authorities, determine the availability and adequacy of the utility (specifically gas) and record all discussions regarding upgrades, tapping in and surety of supply.
- Monitor the project throughout the design, documentation and development phases to ensure conformity with statutory requirements.
- Report any areas of non-compliance to the Project Control Group.
- Prepare design, documentation and technical advice commensurate in detail with each stage of the project.
- Prepare cost estimates for major plant and reticulation systems in terms of:
 - capital costs;
 - life cycle costs; and
 - energy costs (including embodied energy and energy costs for operation).
- Develop clear and coordinated construction documentation that allows the contractor to carry out their work efficiently.
- Advise on the selection, installation and type of services to any specialist equipment.
- Contribute to the preparation of tender documents, asset register, operation and maintenance plan and energy management plan.
- Prepare the design and documentation of the services systems to ensure that the systems are low maintenance, have low energy requirements and comply with any energy efficiency requirements of the Building Code of Australia.
- Prepare a BCA Part J certificates as required.
- Advise on acoustic treatment to various locations, including rooms, corridors plant rooms, etc., to minimise noise, especially plant room noise or vibrations; advise on the engagement of a specialist acoustic consultant as appropriate.
- Administer the mechanical services components of the work during the construction stage and issue the relevant completion certificates as required.
- Maintain quality control systems that ensure all information and documentation provided is complete, comprehensive, up to date, checked and coordinated.
- Liaise with the Project Manager, Principal Consultant and other consultants throughout all phases of the project.
- The more specific responsibilities of mechanical engineers are to:
- Analyse environmental and functional requirements as well as performance standards to be met by systems.

-
- Identify options and report on the recommended mechanical systems including:
 - Design, location, area, size and approximate weight of equipment;
 - Plant rooms sizes and locations (including access for maintenance, repairs and replacement);
 - All ductwork/pipe risers including ceiling, vertical and floor reticulation and prepare single line duct layout;
 - Specifications including testing and commissioning regimes for the major equipment, system(s) and other interfaces; and
 - Proposed standby and emergency arrangements.
 - Coordinate location of system components such as major plant and equipment, structural penetrations, set downs and plinths with other services and architectural requirements.
 - Meet functional requirements to ensure system is fit for purpose, including essential services.
 - Liaise with the electrical consultant regarding normal and critical power load of air conditioning, heating, , chilled water, ventilation and smoke spill.
 - Identify all work by others relating to service provision, including the builder and other services consultants.
 - Define builder's work in relation to services.

7.2.3 ATTENDANCE AT MEETINGS

For meeting attendance requirements for the mechanical engineer, refer to the requirements for "All Consultants" above.

The mechanical engineers may be required to attend Project Control Group meetings at the request of the Project Control Group or the Project Manager.

7.2.4 REPORTING REQUIREMENTS

The mechanical engineer must prepare monthly progress reports (generally no more than 3 pages in length) for inclusion in the Project Manager's Monthly Report to the Project Control Group. The engineers' progress report should include a brief summary of the status of the work and outline any key issues or critical decisions to be made regarding their area of responsibility.

7.2.5 DESIGN REVIEWS

Mechanical engineers are required to:

- Identify areas of high recurrent costs for consideration by the Project Control Group at the Design Review.
- Provide cost reduction options that may be needed to maintain the project cost within Budget.

7.2.6 SCHEMATIC DESIGN

During schematic design the mechanical engineer is required to carry out the following tasks in relation to their area of professional responsibility:

- Analyse environmental and functional (area and room data sheets) requirements and confirm performance standards to be met by mechanical systems.
- Identify requirements for redundancy and for future expansion for sizing of major plant.
- Prepare a schematic design Report following a comprehensive assessment of possible alternative solutions to the project's service requirements, including capital development costs and ongoing operating and maintenance costs of each alternative.
- Provide the Project Manager and Project Control Group with advice and recommendations on issues associated with their area of professional responsibility.
- Ensure the schematic design for their area of responsibility conforms to the scope of work and budget for the project.

-
- Continuously monitor architectural, structural and civil engineering and services decisions, drawings and documentation for their functional, capital and/or recurrent cost impact.
 - Prepare benchmarks for evaluation of the Schematic Design against comparable projects.

7.2.7 DESIGN DEVELOPMENT

During design development the mechanical engineer is required to carry out the following tasks in relation to their area of professional responsibility:

- Resolve any outstanding design issues, including any changes to the Schematic Design required as a result of the Design review.
- Prepare a report that includes evaluation statements for all major decisions for inclusion in the Design Development Report for the project.
- Ensure design development for their area of responsibility meets the functional requirements of the brief and is in accordance with the project budget.
- Provide any information necessary to identify issues associated with special facilities and/or major plant and equipment.
- Ensure that all exposed furniture, fixtures and fittings are designed in accordance with requirements for harm minimisation and are vandal proof.
- Provide the Quantity Surveyor with estimates of the cost of mechanical services for inclusion in Cost Plan C2.
- Provide the Architect with all the information required to finalise Room Data Sheets.
- Prepare draft Specification if required.
- Review all systems to ensure they coordinate with all others (e.g. architectural, structural, electrical etc.).

7.2.8 CONTRACT DOCUMENTATION

During contract documentation the mechanical engineer is required to undertake the following tasks in relation to their area of professional responsibility:

- Prepare contract documentation suitable for competitive tendering of the project including:
 - Specifications
 - Documentation
 - Description of maintenance requirements for essential services, major plant and equipment and any specialised facilities.
- Ensure that documentation remains within the briefed areas and budgeted cost parameters for the project.
- Ensure that all documents are checked and coordinated in accordance with quality control requirements.
- Ensure tender documentation is available for checking, coordination and costing two weeks prior to the date of tender.
- Prepare a list of suitable sub-contractors where required.
- Liaise with the Project Manager and Architect in the preparation of a construction schedule.
- Establish agreed contract administration procedures with the Superintendent for the proper handling of issues (e.g. variations) that arise throughout the project.

7.2.9 TENDER, EVALUATE AND AWARD

The mechanical engineer is required to undertake the following tasks in conjunction with the Project Manager and other consultants:

- Respond to requests for information.

-
- Review all tenders received and prepare detailed tender reports and recommendations on the relevant sections.
 - Assist in detailed assessment and recommendations during the negotiation period if required.
 - Conduct reference checks on contracting firms and ascertain the availability of equipment and replacements if needed.
 - Ensure that the successful contractor completes all schedules, programmes, and cash flow before commencing work on the project.

7.2.10 CONSTRUCTION

During construction the mechanical engineer is required to:

- Carry out all duties associated with their profession including those of Superintendent's Representative (SR) when required.
- Obtain all required local authority approvals and liaise with authorities regarding inspections and other requirements.
- Identify hazardous areas or equipment to maintain safe work practices.
- Incorporate services requirements for "Client Supplied Equipment".
- Monitor the installation of services to ensure they comply with the construction documents and achieve the design intent.
- Provide regular reports regarding the work's progress, quality and compliance with construction documents.
- Examine and endorse all relevant shop drawings.
- Check all off-site fabrication.
- Provide any documentation required for the processing of variations.
- Respond to Contractor's requests for information and on site queries.
- Amend contract drawings as required during construction and provide 'as built' drawings upon completion.
- Ensure that the client is provided with:
 - All approved operating and maintenance manuals.
 - As-built drawings.
 - Negatives/computer disks of installed services.
- Ensure that a building services commissioning program is undertaken with maintenance operators and that all guarantees and warranties are processed.
- Witness the testing of all major equipment, systems and the interfaces with other services.
- Make the final inspection and report to the Project Manager.
- Issue a defects lists at Practical Completion.
- Inspect the works at intervals during the Defects Liability Period.

7.2.11 ASSET MANAGEMENT

The mechanical engineer is to:

- Prepare a register of all major plant and equipment included in the project that records:
 - Type, model and name of manufacturer.
 - Date of acquisition, purchase value and location of spares/back up.
 - Design capacity, redundancy and life expectancy of elements.

-
- Prepare an asset maintenance budget in conjunction with the Quantity Surveyor, indicating the anticipated cash flow and annual budget for the life of the facility (say 15 to 20 years) with a replacement or refurbishment schedule. It must include:
 - Energy consumption costs (e.g. electricity and gas for lighting, power, heating and cooling).
 - Operating and maintenance costs.
 - Other sundry operating expenses.
 - Contract management and supervision of out-sourced contracts
 - The Asset Management Plan must be provided in electronic and hard copy format. Documents are to be recorded in a form suitable for monitoring and reporting (essential services and annual compliance checks).

7.2.12 POST OCCUPANCY EVALUATION

The mechanical engineer is required to participate in the Post Occupancy Evaluation of the completed project.

7.3 ELECTRICAL ENGINEERS

7.3.1 SCOPE OF SERVICES

Electrical engineers have a general responsibility for the following service components of a project:

- Power
- Lighting (including emergency lighting and external lighting)
- Illuminated egress and Exit signage
- Uninterrupted Power Supply (UPS)
- Emergency power generator
- Alternative energy systems e.g. central energy facility, cogeneration, solar and photovoltaic etc.)

7.3.2 ROLES AND RESPONSIBILITIES

Electrical engineers have general responsibilities to:

- Communicate with relevant authorities, determine the adequacy of the utility and record all discussions regarding upgrades, tapping in and surety of supply.
- Determine appropriate tariff and contractual arrangements for the client.
- Monitor the project throughout the design, documentation and development phases to ensure conformity with statutory requirements.
- Report any areas of non-compliance to the Project Control Group.
- Prepare design, documentation and technical advice commensurate in detail with each stage of the project.
- Prepare cost estimates for major plant and reticulation systems in terms of:
 - Capital costs
 - Life cycle costs
 - Energy costs (including embodied energy and energy costs for operation)
- Develop clear and coordinated construction documentation that allows the contractor to carry out their work efficiently.
- Advise on the selection, installation and type of services to any specialist equipment.
- Contribute to the preparation of reports for tender documents, asset register, operation and maintenance plan and energy management plan.

-
- Ensure that services systems are low maintenance, have low energy requirements and comply with any energy efficiency requirements of the Building Code of Australia.
 - Prepare a BCA Part J certificates as required.
 - Administer their components of the work during the construction stage and issue the relevant completion certificates as required.
 - Maintain quality control systems that ensure all information and documentation provided is complete, comprehensive, up to date, checked and coordinated.
 - Liaise with the Project Manager, Principal Consultant and other consultants throughout all phases of the project.

The more specific responsibilities of electrical engineers are to:

- Analyse environmental and functional requirements as well as performance standards to be met by systems.
- Identify options and report on the recommended electrical services systems including:
 - Design, location, area, size and approximate weight of equipment.
 - High Voltage and Low Voltage supply and preferred route of cables into substation from boundaries.
 - Number and location of substations, meters and switch rooms including room sizes.
 - Proposed standby and emergency arrangements including power supply backup and essential engineering services loads.
 - Mechanical, fire, communications and security distribution reticulation (cable trays used and their location to be recorded).
 - Lighting and power layout designed in accordance with the ring main and alternative supply arrangements.
 - Specifications including testing and commissioning regimes for the equipment, systems and other interfaces.
- Coordinate location of system components such as major plant and equipment, lighting and power with other services and architectural requirements.
- Meet functional requirements to ensure system is fit for purpose including load shedding, alternative supply and maintenance of essential services. The consultant is to ensure the facility can be supplied from portable equipment and the converters and system can accommodate the contingency plan guideline.
- Evaluate the performance and maintenance aspects of light fittings and high recurrent cost elements and provide recommendations to the Principal Consultant.
- Identify all work by others relating to service provision, including the builder and other services consultants.
- Define builder's work in relation to services.
- Prepare energy monitoring and management activities.

7.3.3 SCHEMATIC DESIGN

During schematic design the electrical engineer is required to carry out the following tasks in relation to their area of professional responsibility:

- Analyse environmental and functional (area and room data sheets) requirements and confirm performance standards to be met by electrical systems.
- Identify requirements for redundancy and for future expansion for sizing of supply and major equipment.
- Prepare a Schematic Design Report following a comprehensive assessment of possible alternative solutions to the project's service requirements, including capital development costs and ongoing operating and maintenance costs of each alternative.
- Identify the cost of capital required to achieve recurrent savings.
- Provide the Project Manager and Project Control Group with advice and recommendations on issues associated with their area of professional responsibility.

-
- Ensure the schematic design for their area of responsibility conforms to the scope of work and budget for the project.
 - Continuously monitor architectural, structural and civil engineering and services decisions, drawings and documentation for their functional, capital and/or recurrent cost impact.
 - Prepare benchmarks for evaluation of the Schematic Design against comparable projects.

7.3.4 DESIGN REVIEW.

Electrical engineers are required to:

- Identify areas of high recurrent costs for consideration by the Project Control Group at the Design Review.
- Provide cost reduction options that may be needed to maintain the project cost within Budget.

7.3.5 DESIGN DEVELOPMENT

During design development the electrical engineer is required to carry out the following tasks in relation to their area of professional responsibility:

- Resolve any outstanding design issues, including any changes to the Schematic Design required as a result of the Design Review.
- Prepare a report that includes evaluation statements for all major decisions for inclusion in the Design Development Report for the project.
- Ensure design development for their area of responsibility meets the functional requirements of the brief and is in accordance with the project budget.
- Provide any information necessary to identify issues associated with special facilities and/or major plant and equipment.
- Ensure that all exposed furniture, fixtures and fittings are designed in accordance with requirements for harm minimisation and are vandal proof.
- Provide the Quantity Surveyor with estimates of the cost of electrical services for inclusion in Cost Plant C2.
- Provide the Architect with all the information required to finalise Room Data Sheets.
- Prepare draft Specification if required.
- Review all systems to ensure they coordinate with all others (e.g. architectural, structural, mechanical etc.).
- Ensure design of safety and security systems are suitable for maintenance by a single contractor.

7.3.6 CONTRACT DOCUMENTATION

During contract documentation the electrical engineer is required to undertake the following tasks in relation to their area of professional responsibility:

- Prepare contract documentation suitable for competitive tendering of the project including:
 - Specifications
 - Documentation
 - Description of maintenance requirements for essential services, major plant and equipment and any specialised facilities.
- Ensure that documentation remains within the briefed areas and budgeted cost parameters for the project.
- Ensure documentation of safety and security systems is suitable for maintenance by a single contractor.
- Ensure that all documents are checked and coordinated in accordance with quality control requirements.

-
- Ensure tender documentation is available for checking, coordination and costing two weeks prior to the date of tender.
 - Prepare a list of suitable sub-contractors where required.
 - Liaise with the Project Manager and Architect in the preparation of a construction schedule.
 - Establish agreed contract administration procedures with the Superintendent for the proper handling of issues (e.g. variations) that arise throughout the project.

7.3.7 TENDER, EVALUATE AND AWARD

The electrical engineer is required to undertake the following tasks in conjunction with the Project Manager and other consultants:

- Respond to requests for information.
- Review all tenders received and prepare detailed tender reports and recommendations on the relevant sections.
- Assist in detailed assessment and recommendations during the negotiation period if required.
- Conduct reference checks on contracting firms and ascertain the availability of equipment and replacements if needed.
- Ensure that the successful contractor completes all schedules, programmes, and cash flow before commencing work on the project.

7.3.8 CONSTRUCTION

During construction, the electrical engineer is required to:

- Carry out all duties associated with their profession including those of Superintendent's Representative (SR) when required.
- Obtain all required local authority approvals and liaise with authorities regarding inspections and other requirements.
- Identify hazardous areas or equipment to maintain safe work practices.
- Incorporate services requirements for Client Supplied Equipment.
- Monitor the installation of services to ensure they comply with the construction documents and achieve the design intent.
- Provide regular Reports regarding the work's progress, quality and compliance with construction documents.
- Examine and endorse all relevant shop drawings.
- Check all off-site fabrication.
- Provide any documentation required for the processing of variations.
- Respond to Contractor's requests for information and on site queries.
- Amend contract drawings as required during construction and provide 'as built' drawings upon completion.
- Ensure that the client is provided with:
 - All approved operating and maintenance manuals.
 - As-built drawings.
- Ensure that a building services commissioning program is undertaken with maintenance operators and that all guarantees and warranties are processed.
- Witness the testing of all equipment and systems and the interfaces with other services.
- Make the final inspection and report to the Project Manager.
- Issue a defects lists at Practical Completion.

-
- Inspect the works at intervals during the Defects Liability Period.

7.3.9 ASSET MANAGEMENT

The electrical engineer is to:

- Prepare a register of all major plant and equipment included in the project, recording:
 - Type, model and name of manufacturer.
 - Date of acquisition, purchase value and location of spares/back up.
 - Design capacity, redundancy and life expectancy of elements.
- Prepare an asset maintenance budget in conjunction with the Quantity Surveyor, indicating the anticipated cash flow and annual budget for the life of the facility (say 15 to 20 years) with a replacement or refurbishment schedule. It must include:
 - Energy consumption costs (e.g. electricity for lighting, power, heating and cooling).
 - Operating and maintenance costs.
 - Other sundry operating expenses.
 - Contract management and supervision of out-sourced contracts

The Asset Management Plan must be provided in electronic and hard copy format. Documents are to be recorded in a form suitable for monitoring and reporting (essential services and annual compliance checks).

7.3.10 POST OCCUPANCY EVALUATION

The electrical engineer is required to participate in the Post Occupancy Evaluation of the completed project.

7.4 HYDRAULIC ENGINEERS

7.4.1 SCOPE OF SERVICES

Hydraulic engineers have a general responsibility for the following services components of a project:

- Sewer drainage reticulation.
- Sanitary plumbing system including sanitary fixtures and fittings.
- Water supply.
- Domestic hot and cold water reticulation systems, including thermal fixtures to bathrooms and kitchens.
- Rainwater gutters and downpipes to main stormwater lines (Note: Stormwater drainage is by the civil engineer).
- Waste water drainage to sewer or stormwater lines.

7.4.2 ROLES AND RESPONSIBILITIES

Hydraulic services engineers have general responsibilities to:

- Communicate with relevant authorities, determine the availability and adequacy of the services and record all discussions regarding upgrades, tapping in and surety of supply.
- Monitor the project throughout the design, documentation and development phases to ensure conformity with statutory requirements.
- Report any areas of non-compliance to the Project Control Group.
- Prepare design, documentation and technical advice commensurate in detail with each stage of the project.
- Prepare cost estimates for major plant and reticulation systems in terms of:
 - Capital costs
 - Life cycle costs
 - Energy costs (including embodied energy and energy costs for operation)

-
- Advise on the selection, installation and type of services to any specialist equipment.
 - Develop clear and coordinated construction documentation that allows the contractor to carry out their work efficiently.
 - Contribute to the preparation of reports for tender documents, asset register, operation and maintenance plan and energy management plan.
 - Ensure that services systems are low maintenance, have low energy requirements and comply with any energy efficiency requirements of the Building Code of Australia.
 - Administer their individual components of the work during the construction stage and issue the relevant completion certificates as required.
 - Maintain quality control systems that ensure all information and documentation provided is complete, comprehensive, up to date, checked and coordinated.
 - Liaise with the Project Manager, Principal Consultant and other consultants throughout all phases of the project.

The more specific responsibilities of the hydraulic building services engineers are to:

- Analyse environmental and functional requirements as well as performance standards to be met by systems.
- Identify options and report on the recommended hydraulic services systems including:
 - Design; confirm areas, locations and size including all interfaces with mechanical, electrical, communications and security systems.
 - Water supply tapping and alternative supply arrangements.
 - Proposed standby and emergency arrangements.
 - Consider alternative systems e.g. solar hot water.
 - Specifications including testing and commissioning regimes for the equipment, system(s) and other interfaces.
- Coordinate with other services and architectural consultants the location of all system components including:
 - Ring main
 - Meters
 - Risers
 - Sewer drainage systems
 - Trade waste systems
 - Sanitary plumbing system
 - Domestic hot and cold water supply systems.
- Meet functional requirements to ensure system is fit for purpose including essential services.
- Identify all work by others relating to service provision, including the builder and other services consultants.
- Define builder's work in relation to hydraulic services.

7.4.3 SCHEMATIC DESIGN

During schematic design the hydraulic services engineer is required to carry out the following tasks in relation to their area of professional responsibility:

- Analyse functional requirements and confirm performance standards to be met by hydraulic services systems.
- Identify requirements for redundancy and for future expansion for sizing of services.
- Prepare a schematic design Report following a comprehensive assessment of possible alternative solutions to the project's service requirements, including capital development costs and ongoing operating and maintenance costs of each alternative.
- Identify the cost of capital required to achieve recurrent savings.

-
- Provide the Project Manager and Project Control Group with advice and recommendations on issues associated with their area of professional responsibility.
 - Ensure the schematic design for their area of responsibility conforms to the scope of work and budget for the project.
 - Continuously monitor architectural, structural and civil engineering and services decisions, drawings and documentation for their functional, capital and/or recurrent cost impact.
 - Prepare benchmarks for evaluation of the Schematic Design against comparable projects.

7.4.4 DESIGN REVIEW.

Hydraulic services engineers are required to:

- Identify areas of high recurrent costs for consideration by the Project Control Group at the Design Review.
- Provide cost reduction options that may be needed to maintain the project cost within Budget.

7.4.5 DESIGN DEVELOPMENT

During design development the hydraulic services engineer is required to carry out the following tasks in relation to their area of professional responsibility:

- Resolve any outstanding design issues, including any changes to the Schematic Design required as a result of the Design Review.
- Prepare a report that includes evaluation statements for all major decisions for inclusion in the Design Development Report for the project.
- Ensure design development for their area of responsibility meets the functional requirements of the brief and is in accordance with the project budget.
- Provide any information necessary to identify issues associated with special facilities and/or major plant and equipment.
- Ensure that all exposed furniture, fixtures and fittings are designed in accordance with requirements for harm minimisation and are vandal proof.
- Provide the Quantity Surveyor with estimates of the cost of hydraulic services for inclusion in Cost Plant C2.
- Provide the Architect with all the information required to finalise Room Data Sheets.
- Prepare draft Specification if required.
- Review all systems to ensure they coordinate with all others (e.g. architectural, structural, electrical etc.).

7.4.6 CONTRACT DOCUMENTATION

During the contract documentation stage the hydraulic services engineer is required to undertake the following tasks in relation to their area of professional responsibility:

- Prepare contract documentation suitable for competitive tendering of the project including:
 - Specifications
 - Documentation
 - Description of maintenance requirements for essential services, major plant and equipment and any specialised facilities.
- Ensure that documentation remains within the briefed areas and budgeted cost parameters for the project.
- Ensure that all documents are checked and coordinated in accordance with quality control requirements.
- Ensure tender documentation is available for checking, coordination and costing two weeks prior to the date of tender.

-
- Prepare a list of suitable sub-contractors where required.
 - Liaise with the Project Manager and Architect in the preparation of a construction schedule.
 - Establish agreed contract administration procedures with the Superintendent for the proper handling of issues (e.g. variations) that arise throughout the project.

7.4.7 TENDER, EVALUATE AND AWARD

The hydraulic services engineer is required to undertake the following tasks in conjunction with the Project Manager and other consultants:

- Respond to requests for information.
- Review all tenders received and prepare detailed tender reports and recommendations on the relevant sections.
- Assist in detailed assessment and recommendations during the negotiation period if required.
- Conduct reference checks on contracting firms and ascertain the availability of equipment and replacements if needed.
- Ensure that the successful contractor completes all schedules, programmes, and cash flow before commencing work on the project.

7.4.8 CONSTRUCTION

During construction the hydraulic services engineer is required to:

- Carry out all duties associated with their profession including those of Superintendent's Representative (SR) when required.
- Obtain all required local authority approvals and liaise with authorities regarding inspections and other requirements.
- Identify hazardous areas or equipment to maintain safe work practices.
- Incorporate services requirements for Client Supplied Equipment.
- Monitor the installation of services to ensure they comply with the construction documents and achieve the design intent.
- Provide regular Reports regarding the work's progress, quality and compliance with construction documents.
- Examine and endorse all relevant shop drawings.
- Check all off-site fabrication.
- Provide any documentation required for the processing of variations.
- Respond to Contractor's requests for information and on site queries.
- Amend contract drawings as required during construction and provide 'as built' drawings upon completion.
- Ensure that the client is provided with:
 - All approved operating and maintenance manuals.
 - As-built drawings.
- Ensure that a building services commissioning program is undertaken with maintenance operators and that all guarantees and warranties are processed.
- Witness the testing of all equipment, systems and the interfaces with other services.
- Make the final inspection and report to the Project Manager.
- Issue a defects lists at Practical Completion.
- Inspect the works at intervals during the Defects Liability Period.

7.4.9 ASSET MANAGEMENT

The hydraulic services engineer is to:

- Prepare a register of all major plant and equipment included in the project, recording:
 - Type, model and name of manufacturer.
 - Date of acquisition, purchase value and location of spares/back up.
- Design capacity, redundancy and life expectancy of elements.
- Prepare an asset maintenance budget in conjunction with the Quantity Surveyor, indicating the anticipated cash flow and annual budget for the life of the facility (say 15 to 20 years) with a replacement or refurbishment schedule. It must include:
 - Energy consumption costs (e.g. electricity and gas for hot water, pumps).
 - Operating and maintenance costs.
 - Other sundry operating expenses.
 - Contract management and supervision of out-sourced contracts

The Asset Management Plan must be provided in electronic and hard copy format. Documents are to be recorded in a form suitable for monitoring and reporting (essential services and annual compliance checks).

7.4.10 POST OCCUPANCY EVALUATION

The engineer is required to participate in the Post Occupancy Evaluation of the completed project.

7.5 COMMUNICATIONS AND SECURITY ENGINEERS

7.5.1 SCOPE OF SERVICES

Communication and Security engineers have a general responsibility for the following service components of a project:

- PABX, telephones, intercoms and site radio systems
- Public Address System
- CCTV surveillance
- Security systems including duress alarms, electric strike door locks and restricted door access
- Emergency and Evacuation Warning System
- Computer network, cabling and fibre optics
- Audio-visual equipment including remote video facilities, recording facilities, display
- (MA)TV system

7.5.2 ROLES AND RESPONSIBILITIES

Communications and security engineers have general responsibilities to:

- Communicate with relevant authorities, determine the adequacy of the utility and record all discussions regarding upgrades, tapping in and surety of supply.
- Monitor the project throughout the design, documentation and development phases to ensure conformity with statutory requirements.
- Report any areas of non-compliance to the Project Control Group.
- Prepare design, documentation and technical advice commensurate in detail with each stage of the project.

-
- Prepare cost estimates for major plant and reticulation systems in terms of:
 - Capital costs
 - Life cycle costs
 - Energy costs (including embodied energy and energy costs for operation)
 - Develop clear and coordinated construction documentation that allows the contractor to carry out their work efficiently.
 - Advise on the selection, installation and type of services to any specialist equipment.
 - Contribute to the preparation of reports for tender documents, asset register, operation and maintenance plan and energy management plan.
 - Ensure that services systems are low maintenance, have low energy requirements and comply with any energy efficiency requirements of the Building Code of Australia.
 - Administer their components of the work during the construction stage and issue the relevant completion certificates as required.
 - Maintain quality control systems that ensure all information and documentation provided is complete, comprehensive, up to date, checked and coordinated.
 - Liaise with the Project Manager, Principal Consultant and other consultants throughout all phases of the project.

The more specific responsibilities of the Communications and Security Engineering Consultants are to:

- Analyse environmental and functional requirements as well as performance standards to be met by systems.
- Identify options and report on the recommended communication and security services systems including:
 - Design; confirm area and size including approximate weight of equipment.
 - Proposed standby and emergency arrangements.
 - Equipment rooms sizes and locations (including access for maintenance, repairs and replacement).
 - Communication systems layout including fibre optic cables
 - Voice and data point layouts.
 - Specifications including testing and commissioning regimes for the equipment, systems and other interfaces.
- Integrate systems for radio, pager and mobile devices including duress alarm.
- Prepare a single line plan of communications and security distribution systems.
- Coordinate the location of all system components with other services and architectural requirements.
- Meet functional requirements to ensure system is fit for purpose including essential services.
- Identify all work by others relating to service provision, including the builder and other services consultants.
- Define builder's work in relation to communications and security services.

7.5.3 SCHEMATIC DESIGN

During schematic design communications and security engineers are required to carry out the following tasks in relation to their area of professional responsibility:

- Analyse functional requirements and confirm performance standards to be met by communications and security systems.
- Identify requirements for redundancy and for future expansion for sizing of major equipment.
- Prepare a schematic design Report following a comprehensive assessment of possible alternative solutions to the project's service requirements, including capital development costs and ongoing operating and maintenance costs of each alternative.

-
- Identify the cost of capital required to achieve recurrent savings.
 - Provide the Project Manager and Project Control Group with advice and recommendations on issues associated with their area of professional responsibility.
 - Ensure the schematic design for their area of responsibility conforms to the scope of work and budget for the project.
 - Continuously monitor architectural, structural and civil engineering and services decisions, drawings and documentation for their functional, capital and/or recurrent cost impact.
 - Prepare benchmarks for evaluation of the Schematic Design against comparable projects.

7.5.4 DESIGN REVIEWS

Communications and security services engineers are required to:

- Identify areas of high recurrent costs for consideration by the Project Control Group at the Design Review.
- Provide cost reduction options that may be needed to maintain the project cost within Budget.

7.5.5 DESIGN DEVELOPMENT

During design development the communications and security services engineer is required to carry out the following tasks in relation to their area of professional responsibility:

- Resolve any outstanding design issues, including any changes to the Schematic Design required as a result of the Design Review.
- Prepare a report that includes evaluation statements for all major decisions for inclusion in the Design Development Report for the project.
- Ensure design development for their area of responsibility meets the functional requirements of the brief and is in accordance with the project budget.
- Provide any information necessary to identify issues associated with special facilities and/or major plant and equipment.
- Ensure fire safety and security systems for secure facilities are fully integrated, that all exposed furniture, fixtures and fittings are designed in accordance with requirements for harm minimisation and are vandal proof.
- Provide the Quantity Surveyor with estimates of the cost of communications and security services for inclusion in Cost Plant C2.
- Provide the Architect with all the information required to finalise Room Data Sheets.
- Prepare draft Specification if required.
- Review all systems to ensure they coordinate with all others (e.g. architectural, structural, electrical etc.).

7.5.6 CONTRACT DOCUMENTATION

During the contract documentation stage the communications and security services engineer is required to undertake the following tasks in relation to their area of professional responsibility:

- Prepare contract documentation suitable for competitive tendering of the project including:
 - Specifications
 - Documentation
 - Description of maintenance requirements for essential services, major plant and equipment and any specialised facilities.
- Ensure that documentation remains within the briefed areas and budgeted cost parameters for the project.
- Ensure that all documents are checked and coordinated in accordance with quality control requirements.

-
- Ensure tender documentation is available for checking, coordination and costing two weeks prior to the date of tender.
 - Prepare a list of suitable sub-contractors where required.
 - Liaise with the Project Manager and Architect in the preparation of a construction schedule.
 - Establish agreed contract administration procedures with the Superintendent for the proper handling of issues (e.g. variations) that arise throughout the project.

7.5.7 TENDER, EVALUATE AND AWARD

The communications and security services engineer is required to undertake the following tasks in conjunction with the Project Manager and other consultants:

- Respond to requests for information.
- Review all tenders received and prepare detailed tender reports and recommendations on the relevant sections.
- Assist in detailed assessment and recommendations during the negotiation period if required.
- Conduct reference checks on contracting firms and ascertain the availability of equipment and replacements if needed.
- Ensure that the successful contractor completes all schedules, programmes, and cash flow before commencing work on the project.

7.5.8 CONSTRUCTION

During construction the communications and security services engineer is required to:

- Carry out all duties associated with their profession including those of Superintendent's Representative (SR) when required.
- Obtain all required local authority approvals and liaise with authorities regarding inspections and other requirements.
- Identify hazardous areas or equipment to maintain safe work practices.
- Incorporate services requirements for Client Supplied Equipment.
- Monitor the installation of services to ensure they comply with the construction documents and achieve the design intent.
- Provide regular Reports regarding the work's progress, quality and compliance with construction documents.
- Examine and endorse all relevant shop drawings.
- Check all off-site fabrication.
- Provide any documentation required for the processing of variations.
- Respond to Contractor's requests for information and on site queries.
- Amend contract drawings as required during construction and provide 'as built' drawings upon completion.
- Ensure that the client is provided with:
 - All approved operating and maintenance manuals.
 - As-built drawings.
- Ensure that a building services commissioning program is undertaken with maintenance operators and that all guarantees and warranties are processed.
- Witness the testing of all equipment, systems and the interfaces with other services.
- Make the final inspection and report to the Project Manager.

-
- Issue a defects lists at Practical Completion.
 - Inspect the works at intervals during the Defects Liability Period.

7.5.9 ASSET MANAGEMENT

The communications and security services engineer is to:

- Prepare a register of all major plant and equipment included in the project, recording:
 - Type, model and name of manufacturer.
 - Date of acquisition, purchase value and location of spares/back up.
 - Design capacity, redundancy and life expectancy of elements.
- Prepare an asset maintenance budget in conjunction with the Quantity Surveyor, indicating the anticipated cash flow and annual budget for the life of the facility (say 15 to 20 years) with a replacement or refurbishment schedule. It must include:
 - Energy consumption costs (e.g. electricity for communication and security systems).
 - Operating and maintenance costs.
 - Other sundry operating expenses.
 - Contract management and supervision of out-sourced contracts

The Asset Management Plan must be provided in electronic and hard copy format. Documents are to be recorded in a form suitable for monitoring and reporting (essential services and annual compliance checks).

7.5.10 POST OCCUPANCY EVALUATION

The communications and security engineer is required to participate in the Post Occupancy Evaluation of the completed project.

7.6 FIRE PROTECTION SERVICES

7.6.1 SCOPE OF SERVICES

Fire protection consultants have a general responsibility for the following services components of a project:

- Manual and automatic fire suppression systems including:
 - Fire extinguishers
 - Fire hydrant and hose reel systems
 - Sprinkler systems
 - Water storage tanks
 - Hydrant and sprinkler booster connections and services fit-out to fire control and valveroom
- Automatic smoke detection, communication and alarm systems, including connection to fire brigade.
- Smoke management measures, including dampers and air-conditioning shutdown, door hold open and release mechanisms.
- Gas shutoff where applicable in sprinklered areas.

7.6.2 ROLES AND RESPONSIBILITIES

Fire protection consultants have general responsibilities to:

- Communicate with relevant authorities and obtain all necessary approvals.
- Check the availability and capacity of engineering services to the site.
- Meet and minute discussions with Statutory Authorities regarding the estimated cost and programming of works to ensure availability of engineering services and supply arrangements.
- Check the costs associated with any requirement regarding availability and capacity of services to the site.

-
- Monitor the project throughout the design, documentation and development phases to ensure conformity with statutory requirements.
 - Report any areas of non-compliance to the Project Control Group.
 - Prepare design, documentation and technical advice commensurate in detail with each stage of the project.
 - Prepare cost estimates for major equipment and reticulation systems in terms of :
 - capital costs
 - life cycle costs
 - energy costs (including embodied energy and energy costs for operation)
 - Develop clear and coordinated construction documentation that allows the contractor to carry out their work efficiently.
 - Advise on the selection, installation and type of services to any specialist equipment.
 - Contribute to the preparation of reports for tender documents, asset register, operation and maintenance plan and energy management plan.
 - Ensure that services systems are low maintenance, have low energy requirements and comply with any energy efficiency requirements of the Building Code of Australia.
 - Administer their components of the work during the construction stage and issue the relevant completion certificates as required.
 - Monitor and check the work of each sub-consultant (if relevant).
 - Maintain quality control systems that ensure all information and documentation provided is complete, comprehensive, up to date, checked and coordinated.
 - Liaise with the Project Manager, Principal Consultant and other consultants throughout all phases of the project.

The more specific responsibilities of the fire protection consultant are to:

- Analyse environmental and functional requirements as well as performance standards to be met by systems.
- Identify options and report on the recommended fire protection services systems including:
 - Design; confirm areas, locations and size including all interfaces with mechanical, electrical, communications and security systems.
 - Fire control room and valve room area requirements.
 - Establish site water supply availability, pressure and flow rate.
 - System layout and size, tappings including fire main, sprinkler hydrant/risers and layout.
 - Sprinkler head and smoke/heat detector layout.
 - Hydrants, sprinklers riser and size of hydrant cupboards and sprinkler booster connections.
 - All water storage requirements including approximate weight of storage in relation to architectural and structural design, including any structural penetrations etc.
 - Proposed standby and emergency arrangements.
 - Specifications including testing and commissioning regimes for the equipment, system(s) and other interfaces.
- Coordinate location of all system components with other services and architectural requirements.
- Ensure all passive, detection and suppression fire safety items required by the risk assessment have been incorporated into the design.
- Ensure all interfaces with mechanical, security and communication systems are integrated.
- Identify all work by others associated with the fire services installation.
- Define builder's work in relation to fire protection services.

7.6.3 SCHEMATIC DESIGN

During Schematic Design the fire protection consultant is required to carry out the following tasks in relation to their area of professional responsibility:

- Analyse environmental and functional requirements and confirm performance standards to be met by fire protection services systems.
- Identify requirements for redundancy and for future expansion for sizing of water supply and major equipment.
- Prepare a Schematic Design Report following a comprehensive assessment of possible alternative solutions to the project's service requirements, including capital development costs and ongoing operating and maintenance costs of each alternative.
- Identify the cost of capital required to achieve recurrent savings.
- Provide the Project Manager and Project Control Group with advice and recommendations on issues associated with their area of professional responsibility.
- Ensure the schematic design for their area of responsibility conforms to the scope of work and budget for the project.
- Continuously monitor architectural, structural and civil engineering and services decisions, drawings and documentation for their functional, capital and/or recurrent cost impact.
- Prepare benchmarks for evaluation of the Schematic Design against comparable projects.

7.6.4 DESIGN REVIEW

Fire protection consultants are required to:

- Identify areas of high recurrent costs for consideration by the Project Control Group at the Design Review.
- Provide cost reduction options that may be needed to maintain the project cost within Budget.

7.6.5 DESIGN DEVELOPMENT

During design development the fire protection consultant is required to carry out the following tasks in relation to their area of professional responsibility:

- Resolve any outstanding design issues, including any changes to the Schematic Design required as a result of the Design Review.
- Prepare a report that includes evaluation statements for all major decisions for inclusion in the Design Development Report for the project.
- Ensure design development for their area of responsibility meets the functional requirements of the brief and is in accordance with the project budget.
- Provide any information necessary to identify issues associated with special facilities and/or major plant and equipment.
- Ensure fire safety and security systems for secure facilities are fully integrated, that all exposed furniture, fixtures and fittings are designed in accordance with requirements for harm minimisation and are vandal proof.
- Provide the Quantity Surveyor with estimates of the cost of fire protection services for inclusion in Cost Plant C2.
- Provide the Architect with all the information required to finalise Room Data Sheets.
- Prepare draft Specification if required.
- Review all systems to ensure their coordination with all other systems, e.g. architectural, structural, electrical etc.).

7.6.6 CONTRACT DOCUMENTATION

During contract documentation, the fire protection consultant is required to undertake the following tasks in relation to their area of professional responsibility:

- Prepare contract documentation suitable for competitive tendering of the project including:
 - Specifications
 - Documentation
 - Description of maintenance requirements for essential services, major equipment and any specialised facilities.
- Ensure that documentation remains within the briefed areas and budgeted cost parameters for the project.
- Ensure that all documents are checked and coordinated in accordance with quality control requirements.
- Ensure tender documentation is available for checking, coordination and costing two weeks prior to the date of tender.
- Prepare a list of suitable sub-contractors where required.
- Liaise with the Project Manager and Architect in the preparation of a construction schedule.
- Establish agreed contract administration procedures with the Superintendent for the proper handling of issues (e.g. variations) that arise throughout the project.

7.6.7 TENDER, EVALUATE AND AWARD

The fire protection consultant is required to undertake the following tasks in conjunction with the Project Manager and other consultants:

- Respond to requests for information.
- Review all tenders received and prepare detailed tender reports and recommendations on the relevant sections.
- Assist in detailed assessment and recommendations during the negotiation period if required.
- Conduct reference checks on contracting firms and ascertain the availability of equipment and replacements if needed.
- Ensure that the successful contractor completes all schedules, programmes, and cash flow before commencing work on the project.

7.6.8 CONSTRUCTION

During construction fire protection consultants are required to:

- Carry out all duties associated with their profession including those of Superintendent's Representative (SR) when required.
- Obtain all local authority approvals required and liaise with authorities regarding inspections and other requirements.
- Identify hazardous areas or equipment to maintain safe work practices.
- Incorporate services requirements for Client Supplied Equipment.
- Monitor the installation of services to ensure they comply with the construction documents and achieve the design intent.
- Provide regular reports regarding the project work's:
 - Progress
 - Quality
 - Schedule.
- Examine and endorse all relevant shop drawings.
- Check all off-site fabrication.

-
- Provide any documentation required for the processing of variations.
 - Respond to Contractor's requests for information and on site queries.
 - Amend contract drawings as required during construction and provide 'as built' drawings upon completion.
 - Ensure that the client is provided with:
 - All approved operating and maintenance manuals.
 - As-built drawings.
 - Ensure that a building services commissioning program is undertaken with maintenance operators.
 - Witness the testing of all equipment, systems and interfaces with other services.
 - Make the final inspection and report to the Project Manager.
 - Issue a defects lists at Practical Completion.
 - Inspect the works at intervals during the Defects Liability Period.

During construction the Fire Safety Engineer is required to:

- Review proposals to alter the fire safety strategy
- Prepare a supplementary report assessing the effects of the variations
- Submit the report to the Building Surveyor

7.6.9 ASSET MANAGEMENT

During the Asset Management stage the fire protection consultant is to:

- Prepare a register of all major plant and equipment included in the project, recording:
 - Type, model and name of manufacturer.
 - Date of acquisition, purchase value and location of spares/back up.
 - Design capacity, redundancy and life expectancy of elements.
- Prepare an asset maintenance budget in conjunction with the Quantity Surveyor, indicating the anticipated cash flow and annual budget for the life of the facility (say 15 to 20 years) with a replacement or refurbishment schedule. It must include:
 - Energy consumption costs (e.g. electricity for detection, alarm and communication systems).
 - Operating and maintenance costs.
 - Other sundry operating expenses.
 - Contract management and supervision of out-sourced contracts
- The Asset Management Plan must be provided in electronic and hard copy format. Documents are to be recorded in a form suitable for monitoring and reporting (essential services and annual compliance checks).

7.6.10 POST OCCUPANCY EVALUATION

The Fire Protection consultant is required to:

- Participate in the Post Occupancy Evaluation to assess:
 - If systems are performing adequately
 - Number of false alarms
 - If appropriate systems have been installed.
- Prepare a Post Occupancy Evaluation Report on the adequacy of systems and recommending any corrective actions.

7.7 VERTICAL TRANSPORTATION ENGINEERS

7.7.1 SCOPE OF SERVICES

Vertical Transportation (Lift) engineers have a general responsibility for the following services components of a project:

- New lifts.
- Lift motor room works.
- Upgraded devices and specialised devices

7.7.2 ROLES AND RESPONSIBILITIES

Lift services engineers have general responsibilities to:

- Communicate with relevant authorities and obtain all necessary approvals.
- Check the availability and capacity of engineering services to the site.
- Monitor the project throughout the design, documentation and development phases to ensure conformity with statutory requirements.
- Report any areas of non-compliance to the Project Control Group.
- Prepare design, documentation and technical advice commensurate in detail with each stage of the project.
- Prepare cost estimates for major plant and reticulation systems in terms of:
 - Capital costs
 - Life cycle costs
 - Energy costs (including embodied energy and energy costs for operation)
- Develop clear and coordinated construction documentation that allows the contractor to carry out their work efficiently.
- Advise on the selection, installation and type of services to any specialist equipment.
- Contribute to the preparation of reports for tender documents, asset register, operation and maintenance plan and energy management plan.
- Ensure that services systems are low maintenance, have low energy requirements and comply with any energy efficiency requirements of the Building Code of Australia.
- Administer the individual components of the work during the construction stage and issue the relevant completion certificates as required.
- Maintain quality control systems that ensure all information and documentation provided is complete, comprehensive, up to date, checked and coordinated.
- Liaise with the Project Manager, Principal Consultant and other consultants throughout all phases of the project.

The more specific responsibilities of the lift building services engineers are to:

- Analyse functional requirements and confirm performance standards to be met by transportation systems including:
 - Loads
 - The number, type, size, carrying capacity, speed and waiting time of lift cars.
 - Determine heat loads of lift equipment and power requirements of lifts.
 - Identify options and report on the recommended lift services systems including:
 - Design; confirm areas, location and size including all interfaces with mechanical, electrical, communications and security systems.
 - Lift overrun and shaft sizes.
 - Lift motor room and approximate weights and location of equipment.
 - Proposed standby and emergency arrangements.

-
- Specifications including testing and commissioning regimes for the equipment, system(s) and other interfaces.
 - Coordinate location of all system components with other services and architectural requirements.
 - Identify all work by others relating to service provision, including the builder and other services consultants.
 - Define builder's work in relation to transportation services.

7.7.3 SCHEMATIC DESIGN

During Schematic Design the lift services engineer is required to carry out the following tasks in relation to their area of professional responsibility:

- Analyse functional requirements and confirm performance standards to be met by lift services systems.
- Identify requirements for future vertical expansion for sizing of major lift plant.
- Prepare a Schematic Design Report following a comprehensive assessment of possible alternative solutions to the project's service requirements, including capital development costs and ongoing operating and maintenance costs of each alternative.
- Identify the cost of capital required to achieve recurrent savings.
- Provide the Project Manager and Project Control Group with advice and recommendations on issues associated with their area of professional responsibility.
- Ensure the schematic design for their area of responsibility conforms to the scope of work and budget for the project.
- Continuously monitor architectural, structural and civil engineering and services decisions, drawings and documentation for their functional, capital and/or recurrent cost impact.
- Prepare benchmarks for evaluation of the Schematic Design against comparable projects.

7.7.4 DESIGN REVIEWS

Lift services engineers are required to:

- Identify areas of high recurrent costs for consideration by the Project Control Group at the Design Review.
- Provide cost reduction options that may be needed to maintain the project cost within Budget.

7.7.5 DESIGN DEVELOPMENT

During design development the lift services engineers is required to carry out the following tasks in relation to their area of professional responsibility:

- Resolve any outstanding design issues, including any changes to the Schematic Design required as a result of the Design Review.
- Prepare a report that includes evaluation statements for all major decisions for inclusion in the Design Development Report for the project.
- Ensure design development for their area of responsibility meets the functional requirements of the brief and is in accordance with the project budget.
- Provide any information necessary to identify issues associated with special facilities and/or major plant and equipment.
- Ensure all exposed furniture, fixtures and fittings are designed in accordance with requirements for harm minimisation and are vandal proof.
- Provide the Quantity Surveyor with estimates of the cost of lift services for inclusion in Cost Plant C2.
- Provide the Architect with all the information required to finalise Room Data Sheets.
- Prepare draft Specification if required.

-
- Review all systems to ensure their coordination with all other systems, e.g. architectural, structural, electrical etc.

7.7.6 CONTRACT DOCUMENTATION

During contract documentation the lift services engineer is required to undertake the following tasks in relation to their area of professional responsibility:

- Prepare contract documentation suitable for competitive tendering of the project including:
 - Specifications
 - Documentation
 - Description of maintenance requirements for essential services, major plant and equipment and any specialised facilities.
- Ensure that documentation remains within the briefed areas and budgeted cost parameters for the project.
- Ensure that all documents are checked and coordinated in accordance with quality control requirements.
- Ensure tender documentation is available for checking, coordination and costing two weeks prior to the date of tender.
- Prepare a list of suitable sub-contractors where required.
- Liaise with the Project Manager and Architect in the preparation of a construction schedule.
- Establish agreed contract administration procedures with the Superintendent for the proper handling of issues (e.g. variations) that arise throughout the project.

7.7.7 TENDER, EVALUATE AND AWARD

The lift services engineer is required to undertake the following tasks in conjunction with the Project Manager and other consultants:

- Respond to requests for information.
- Review all tenders received and prepare detailed tender reports and recommendations on the relevant sections.
- Assist in detailed assessment and recommendations during the negotiation period if required.
- Conduct reference checks on contracting firms and ascertain the availability of equipment and replacements if needed.
- Ensure that the successful contractor completes all schedules, programmes, and cash flow before commencing work on the project.

7.7.8 CONSTRUCTION

During construction lift services engineers are required to:

- Carry out all duties associated with their profession including those of Superintendent's Representative (SR) when required.
- Obtain all local authority approvals required and liaise with authorities regarding inspections and other requirements.
- Identify hazardous areas or equipment to maintain safe work practices.
- Incorporate services requirements for Client Supplied Equipment.
- Monitor the installation of services to ensure they comply with the construction documents and achieve the design intent.
- Provide regular reports regarding the project work's progress, quality and schedule.
- Examine and endorse all relevant shop drawings.

-
- Check all off-site fabrication.
 - Provide any documentation required for the processing of variations.
 - Respond to Contractor's requests for information and on site queries.
 - Amend contract drawings as required during construction and provide 'as built' drawings upon completion.
 - Ensure that the client is provided with:
 - All approved operating and maintenance manuals.
 - As-built drawings.
 - Ensure that a building services commissioning program is undertaken with maintenance operators.
 - Witness the testing of all equipment, systems and interfaces with other services.
 - Make the final inspection and report to the Project Manager.
 - Issue a defects lists at Practical Completion.
 - Inspect the works at intervals during the Defects Liability Period.

7.7.9 ASSET MANAGEMENT

The lift services engineer is to:

- Prepare a register of all major plant and equipment included in the project, recording:
 - Type, model and name of manufacturer.
 - Date of acquisition, purchase value and location of spares/back up.
 - Design capacity, redundancy and life expectancy of elements.
 - Prepare an asset maintenance budget in conjunction with the Quantity Surveyor, indicating the anticipated cash flow and annual budget for the life of the facility (say 15 to 20 years) with a replacement or refurbishment schedule. It must include:
- Energy consumption costs (e.g. electricity and gas for lighting, power, heating and cooling).
- Operating and maintenance costs.
- Other sundry operating expenses.
- Contract management and supervision of out-sourced contracts

The Asset Management Plan must be provided in electronic and hard copy format. Documents are to be recorded in a form suitable for monitoring and reporting (essential services and annual compliance checks).

7.7.10 POST OCCUPANCY EVALUATION

The structural engineer is required to participate in the Post Occupancy Evaluation of the completed project.