Design Documentation Guidelines | Fire Protection

Concept Design Phase

Design Process

Inputs:

- Client brief and budget. ❒
- Architectural sketch concept drawings (e.g., bulk and location). ❒
- Preliminary fire safety report. ❒
- Project time schedule. ❒
- Infra-structure reports, e.g., water flow tests. ❒

Design:

- Review with client building usage requirements. ❒
- Establish design criteria. ❒
- Review preliminary fire safety report – (prepared by others). ❒
- Review applicable authority codes and standards. ❒
- Establish contacts with local authorities and utility companies. ❒
- Review concepts for significant and unusual health and safety risks relevant to the design. ❒

Deliverables

Drawings:

- Sketch drawings (may comprise 'marked-up' architectural drawings) including preliminary plant room requirements and services routes. ❒

Specifications:

- Nil. ❒

Reports:

- Concept services brief – to establish available system concepts, a broad report investigating available options and recommendations, and definition of system requirements and key assumptions. ❒
- Design standards to be used. ❒

Commentary

1. To ascertain client brief and to review/consider applicable options.
2. Agree roles and responsibilities.
3. Concept and preliminary design phases are often combined on smaller projects.
4. Tendering at this stage unlikely to result in 'like for like' bids.
5. No co-ordination completed at this stage.
6. Costing only on per m^2 basis.

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Preliminary Design Phase

Design Process

Inputs:

- Client approval of concept services design and budgetary implications. ❐
- Updated fire engineering report. ❐
- Design time schedule.
- Client approved architectural, structural, and other services concept drawings. ❐
- Assess supply utility requirements and liaise with fire authorities. ❐

Design:

- Develop system concepts and identify special requirements. ❐
- Confirm plant room space/location requirements. ❐
- Develop services route requirements, both horizontal and vertical and space co-ordination with other trades. ❐
- Define interface requirements with other services. ❐
- Review preliminary design for significant and unusual health and safety risks the design may present during construction and maintenance. ❐

Deliverables

Drawings:

- Schematic drawings outlining services concepts. ❐
- Layout drawings locating plant rooms, risers, and primary services routes. ❐
- Preliminary plant room layouts. ❐
- Preliminary sprinkler/heat detector layouts. ❐

Specifications:

- Outline services performance specifications. ❐
- Preliminary equipment schedules for major plant. ❐

Reports:

- Utility services reports. ❐
- Design report including key design criteria, proposed system concepts, and features. ❐
- Preliminary electrical loading. ❐
- Preliminary equipment weights. ❐
- Preliminary building services interface matrix. ❐
- Highlight 'significant and unusual' buildability and health and safety issues. ❐

Commentary

1. Cost estimates at this stage generally cannot be on a full elemental basis, as final distribution is not well defined.
2. Systems could be priced by vendors at this stage but unlikely to get like for like comparison.

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Developed Design Phase

Design Process

Inputs:

- Client approval of preliminary services design and budget ary implications. ❒
- Client approved architectural, structural, and other services preliminary design. ❒

Design:

- Services co-ordination with structural, architectural, and other services. ❒
- Develop and expand the services concepts, selection of typical plant, review of plant room, and services space requirements including sizing of plant and pipe work. ❒
- Identify utility connections. ❒
- Fire authority approved in principle. ❒
- Verify significant and unusual health and safety issues have been addressed in the design. ❒

Deliverables

Drawings:

- Single line pipe work layouts. ❒
- Major plant concepts and layouts. ❒
- Sections as necessary. ❒
- Piping schematics. ❒
- Reflected ceiling plans, preliminary co-ordination. ❒

Specifications:

- Preliminary performance specifications, equipment schedules, and interface requirements with other services. ❒

Reports:

- Updated design features report including options selected. ❒
- Approvals for fire control room, control panel, and utility connections. ❒
- Building services interface matrix. ❒
- Highlight 'significant and unusual' buildability and health and safety issues. ❒

Commentary

1. Cost estimates at this stage can be produced by quantity surveyor on elemental basis, with secondary elements estimated on typical details.
2. Developed design may be sufficient to define the requirements for fire protection services due to the prescriptive nature of the codes and contractor signoff requirements.

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Detailed Design Phase

Design Process

Inputs:

- Client approval of developed services design and budgetary implications. ❒
- Client approved architectural, structural, and other services developed design. ❒
- Final fire reports. ❒

Design:

- Detailed system design including equipment and pipework. ❒
- Co-ordination in principle with structure, architecture, and other building services. ❒
- Finalise utility supplies. ❒
- Fire authority approvals. ❒
- Highlight significant and unusual health and safety risks that were identified through the design process. ❒

Deliverables

Drawings:

- Completed schematic and layout drawings defining services requirements including plans, elevations, and sections. ❒
- Detailed pipe work layouts. ❒
- Plant room layouts including detailed sections. ❒

Specifications:

- Detailed specifications. ❒
- Detailed equipment schedules. ❒
- Performance specifications for fire protection services. ❒

Reports:

- Nil. ❒

Commentary

1. Detailed design generally provides a level of documentation to clearly define the design of all fire protection elements. Design details should be co-ordinated with other disciplines. However, the documents produced in this phase may not directly be able to be 'built' from.
2. Co-ordination. In ceiling zones identified with appropriate clearance from structure and other services. Major penetrations identified. Detailed co-ordination of critical areas.
3. Define in the specification the significant and unusual health and safety risks that were identified in the design.

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Construction Design Phase

Design Process

Inputs:

- For construction design phase, drawings for architectural, structural, and other services. ❒
- Construction time schedule. ❒

Design:

- Production of larger scale detailed shop drawings including seismic details. ❒
- Co-ordination of all services, structure, and architecture. ❒
- Equipment selections and technical submissions. ❒
- Control system programming. ❒
- Detailed layouts of plant rooms. ❒

Deliverables

Drawings:

- Revise detailed design documentation to incorporate buildability changes suggested by contractor if they impact on the design intent. ❒
- Pipe work support and joint detailing. Seismic bracing. ❒
- Equipment plinth details, mounting, and isolation detailing. ❒
- Equipment submissions as defined in detailed design. ❒
- Wiring diagrams and points schedule. ❒
- Detailed layouts of plant rooms.
- Fabrication details of pipework, switchboards, etc.

Review:

- Review shop/fabrication and layout drawings for compliance with design.
- Review equipment submission.

Commentary

1. Normally prepared by the services sub-contractor to enable fabrication of the services design.
2. Deliverables contain sufficient details for elements to be manufactured/constructed without reference to other documents, 'the details have co-ordinated the relevant design information across all disciplines and can be built from'.
3. Equipment ordered.
4. At completion of design as built drawings, manuals and equipment details produced to indicate final installed systems.
5. The contractor is responsible for managing health and safety risks during the construction phase.