

HEXATECH	ENGINEERING SERVICES	Page 1 of 4
	Design And Development Procedure	Document Ref: ENG-PRO-01

OBJECTIVE

To outline the procedure by which design and development works are planned and prepared.

SCOPE

This procedure shall for apply for M & E projects.

REFERENCES

MS ISO 9001:2015 Clause 8.3

DEFINITIONS

Design Brief – A detailed report or briefing on the design concepts and viability of M&E requirement of a project.

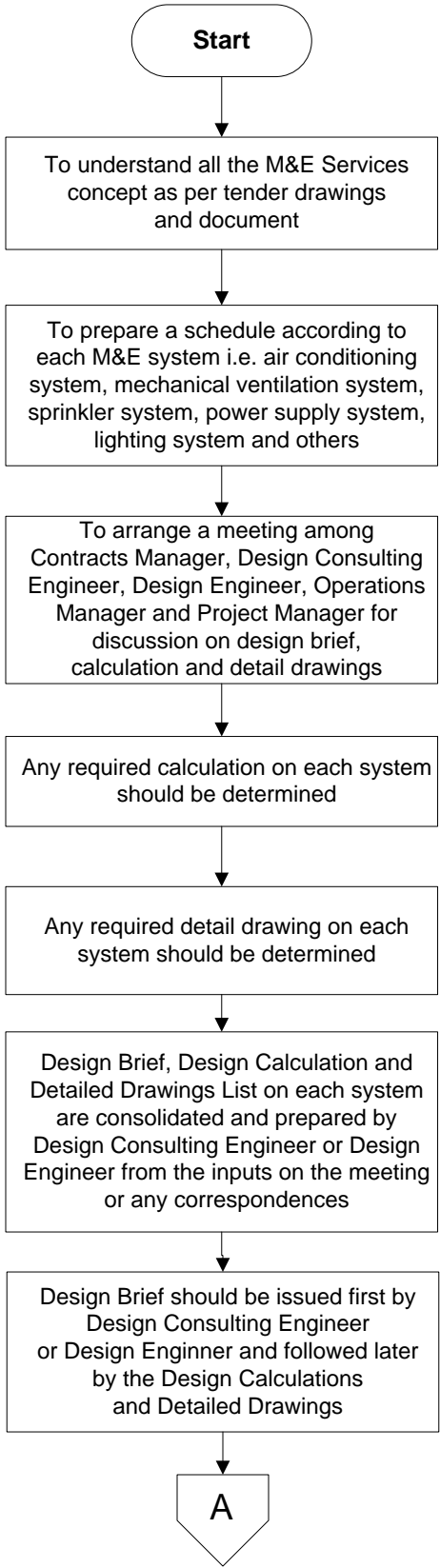
Design Calculations – Technical calculations of M&E design requirement.

Design Consulting Engineer – An independent licensed professional engineer or competent consultant company that undertakes design and development works for a fee.

Detailed Drawings List – A set of drawings for a particular M&E project issued by the customer for tendering purposes.

Shop Drawings – A set of drawings for a particular M&E project generated by either the Design Consulting Engineer or Design Engineer for construction purposes.

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Activity	Responsibility	References
<p style="text-align: center;">  <pre> graph TD Start([Start]) --> A[To understand all the M&E Services concept as per tender drawings and document] A --> B[To prepare a schedule according to each M&E system i.e. air conditioning system, mechanical ventilation system, sprinkler system, power supply system, lighting system and others] B --> C[To arrange a meeting among Contracts Manager, Design Consulting Engineer, Design Engineer, Operations Manager and Project Manager for discussion on design brief, calculation and detail drawings] C --> D[Any required calculation on each system should be determined] D --> E[Any required detail drawing on each system should be determined] E --> F[Design Brief, Design Calculation and Detailed Drawings List on each system are consolidated and prepared by Design Consulting Engineer or Design Engineer from the inputs on the meeting or any correspondences] F --> G[Design Brief should be issued first by Design Consulting Engineer or Design Engineer and followed later by the Design Calculations and Detailed Drawings] G --> End{A} </pre> </p>	<p style="text-align: center;">CM/PM/DE</p> <p style="text-align: center;">CM/PM/DE</p> <p style="text-align: center;">CM/PM/DE</p> <p style="text-align: center;">CM/PM/DE</p> <p style="text-align: center;">CM/PM/DE</p> <p style="text-align: center;">Design Consulting Engineer / DE</p> <p style="text-align: center;">Design Consulting Engineer / DE</p>	<p style="text-align: center;">Minutes of Meeting</p> <p style="text-align: center;">Design Brief Design Calculations Detailed Drawings List Design Input Sheet</p> <p style="text-align: center;">Design Brief</p>

Activity	Responsibility	References
<pre> graph TD A[A] --> D1{Review and comment on the Design Brief based on technical issue} D1 -- Yes --> R1[Return comments to Design Consulting Engineer or DE for amendment] R1 --> D1 D1 -- No Comment --> D2{Review and comment on the Design Brief based on costing issue} D2 -- Yes --> R1 D2 -- No --> D3{Review and comment on the Design Brief based on constructability} D3 -- Yes --> R1 D3 -- No --> R2[Review all the Design Brief on each system that has been commented] R2 --> D4{Submit Design Brief on each systems to customer representative for approval} D4 -- No --> D1 D4 -- Yes --> B[B] </pre>	<p>CM/PM/DE</p> <p>CM/PM/DE</p> <p>CM/PM/DE</p> <p>CM/PM/DE</p> <p>CM/PM/DE</p>	<p>Design Brief</p> <p>Design Brief</p> <p>Design Brief</p> <p>Design Brief</p> <p>Design Brief</p>

Activity	Responsibility	References
<pre> graph TD B{{B}} --> D1{Assign to DE?} D1 -- Yes --> A1[DE undertakes design works in accordance to procedures] D1 -- No --> A2[Issue Letter of Award to Design Consulting Engineer] A1 --> A3[Detailed design generated by Design Consulting Engineer or Design Engineer would be monitored according to the Planning Schedule based on weekly basis as per procedures] A2 --> A3 A3 --> D2{Is issuance of detailed design according to the schedule?} D2 -- No --> A4[Re-schedule the submission with agreement of customer's representative] D2 -- Yes --> A5[Proceed to generate Shop Drawings in accordance to procedure and submit to customer's representative for approval] A4 --> D3{Is new schedule acceptable by PM?} D3 -- Yes --> A5 D3 -- No --> A4 A5 --> D4{Is Shop Drawings approved?} D4 -- No --> A5 D4 -- Yes --> A6[Implement works according to approved Shop Drawings] A6 --> END([END]) </pre>	<p>DE</p> <p>CM</p> <p>Design Consulting Engineer / DE</p> <p>Design Consulting Engineer / DE</p> <p>Design Consulting Engineer / DE</p> <p>PM/OD</p> <p>PM/OD</p>	<p>Letter of Award</p> <p>Design Checklist Shop Drawings</p> <p>Shop Drawings</p>