



Project management and control (PMC)



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Contents



- Building and Construction
- Project Plan
- Building Contract
- Contractor Organisation



Building design is a team work.

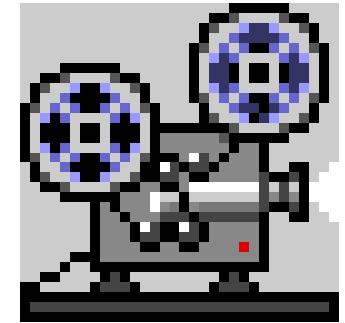
A top-down view of a group of people's hands clasped together in a circle, symbolizing teamwork and unity. The hands are of various skin tones and are wearing different types of watches and bracelets. The background is dark, making the hands stand out. A yellow rectangular box is overlaid in the center, containing the text "Team Working".

**Team
Working**

Building and Construction



- Video: Best Built Environment -- Green Buildings (5:30),
<http://youtu.be/IAhO5maS8O8>



- Architect
- Civil and Structural (C&S) Engineer
- Mechanical & Electrical (Bldg. Services) Engineer
- Quantity Surveyor (QS)
- Project Manager (PM)
- Facility Manager (FM)

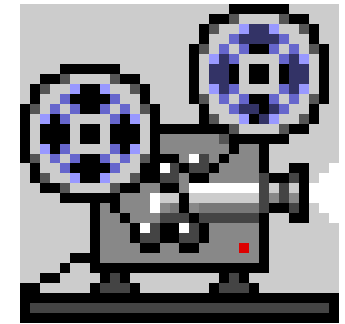
The Six Professionals
in the Construction
Value Chain

Building and Construction

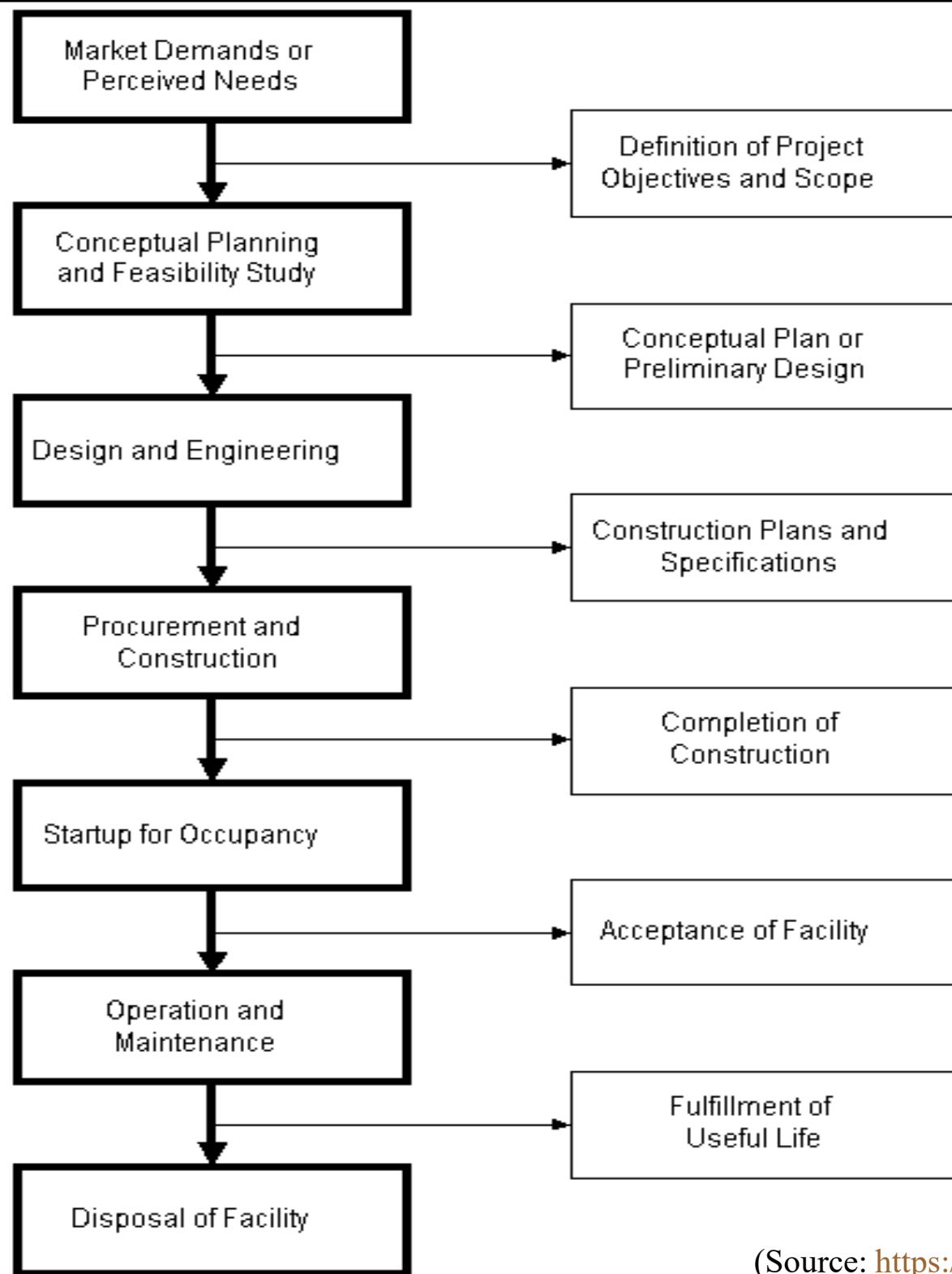


- Video: Hong Kong Construction Industry 香港建造業 (4:55)

<https://youtu.be/VGepsIN2e3g>



- By Hong Kong Construction Association
- Futuristic view of the construction industry
- How people work together in the future
 - Architect, Site Manager, Building Services Engineer (BSE), Quantity Surveyor (QS)
- Experiential Learning on Site Safety 工地安全體驗計劃 (8:22) https://youtu.be/pB_CzgKxMYk



The project life cycle of a constructed facility (the owners' perspective)

Building and Construction

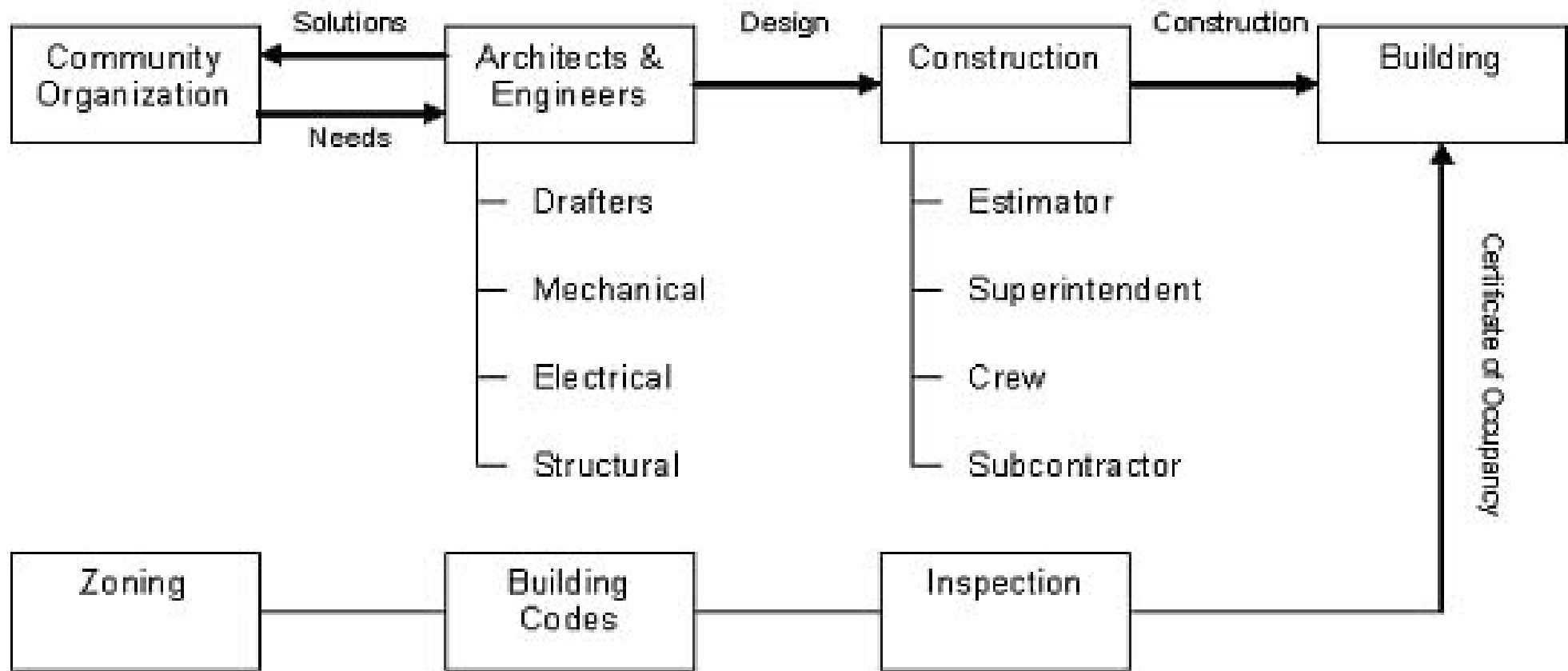


• Development Cycle 建設流程

- 1. Feasibility Study 可行性研究
- 2. Leasing land/purchasing buildings/renting buildings 租地/買樓/租樓
 - New Development 新建
 - Redevelopment 重建
 - Conversion 改造
 - Renovation 翻新
- 3. Design 設計
- 4. Planning Approval 規劃許可
- 5. Tendering 招投標
- 6. Construction 施工
- 7. Use / Repair and Maintenance 使用/維修保養

Do you know which professionals are involved?

The Design and Construction Team



* See also: Organisation of Parties to Construction 建設組織架構

<https://kctang.com.hk/web/organisation-parties-construction-jianshezuzhijigou>

- Developer / Owner / Employer 建設單位 / 業主 / 發包方

- Main Contractor 總承包方

- Other Separate Contractors and Suppliers 其他獨立承包方及供應商

- Statutory Undertakings and Utility Companies 法定承辦商及市政配套單位

- Purchasers and Users 買家 / 用家

Building and Construction



- Selection of professional services
 - Financial Planning Consultants
 - Architectural and Engineering Firms
 - Design/Construct Firms
 - Professional Construction Managers (CM's)
 - Operation and Maintenance (O&M) Managers
 - Facilities Management (FM)



Building and Construction



- Construction contractors

- General Contractors (Builders)
- Specialty Contractors (Sub-contractors)
- Material and Equipment Suppliers

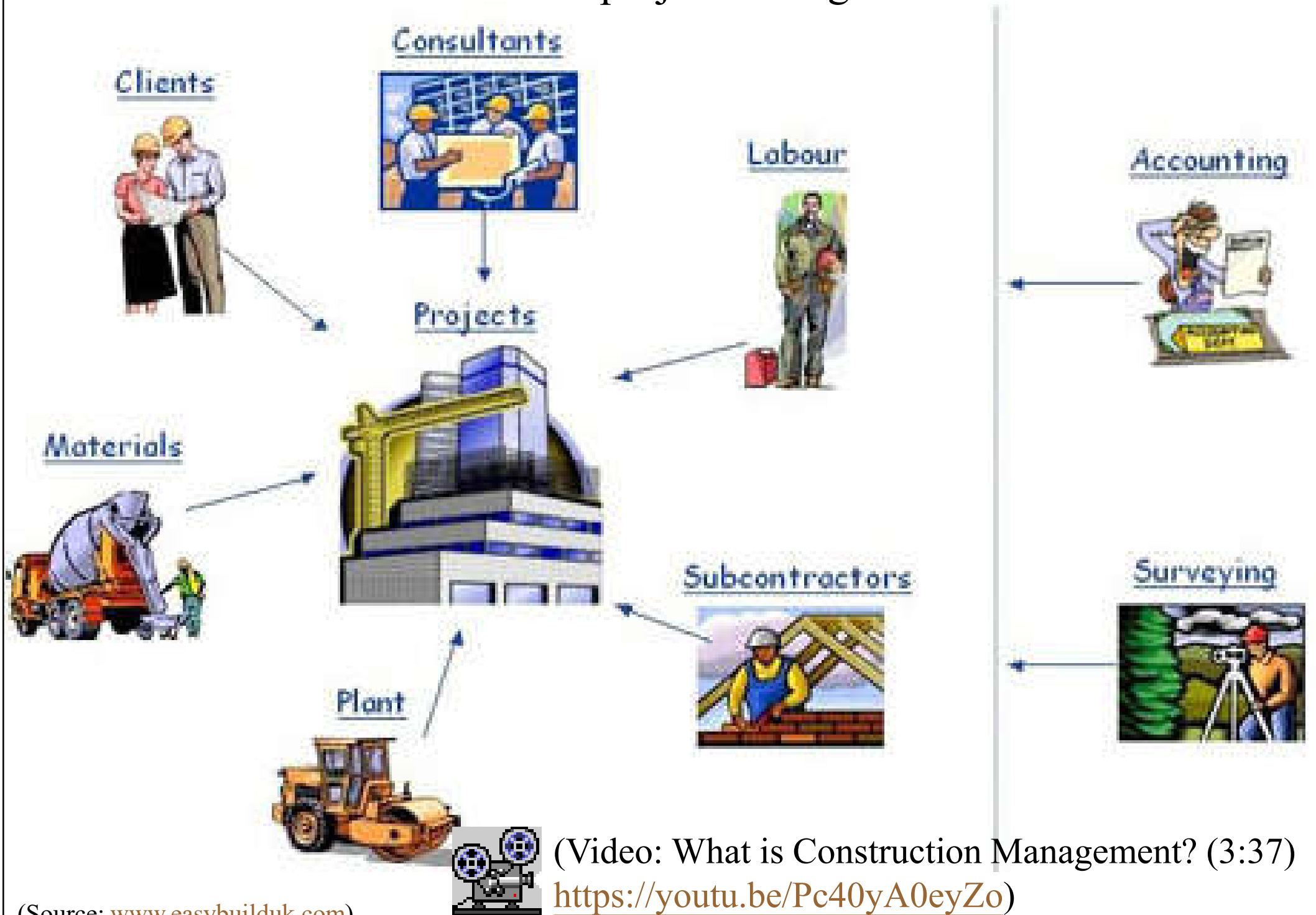


- Legal and regulatory requirements:

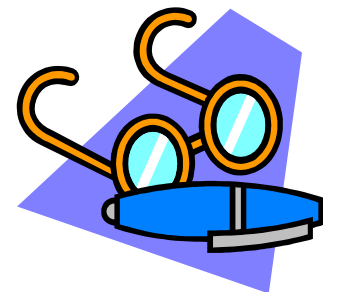
- Legal responsibilities
- Mitigation of conflicts
- Government regulations (building codes)



Construction project management



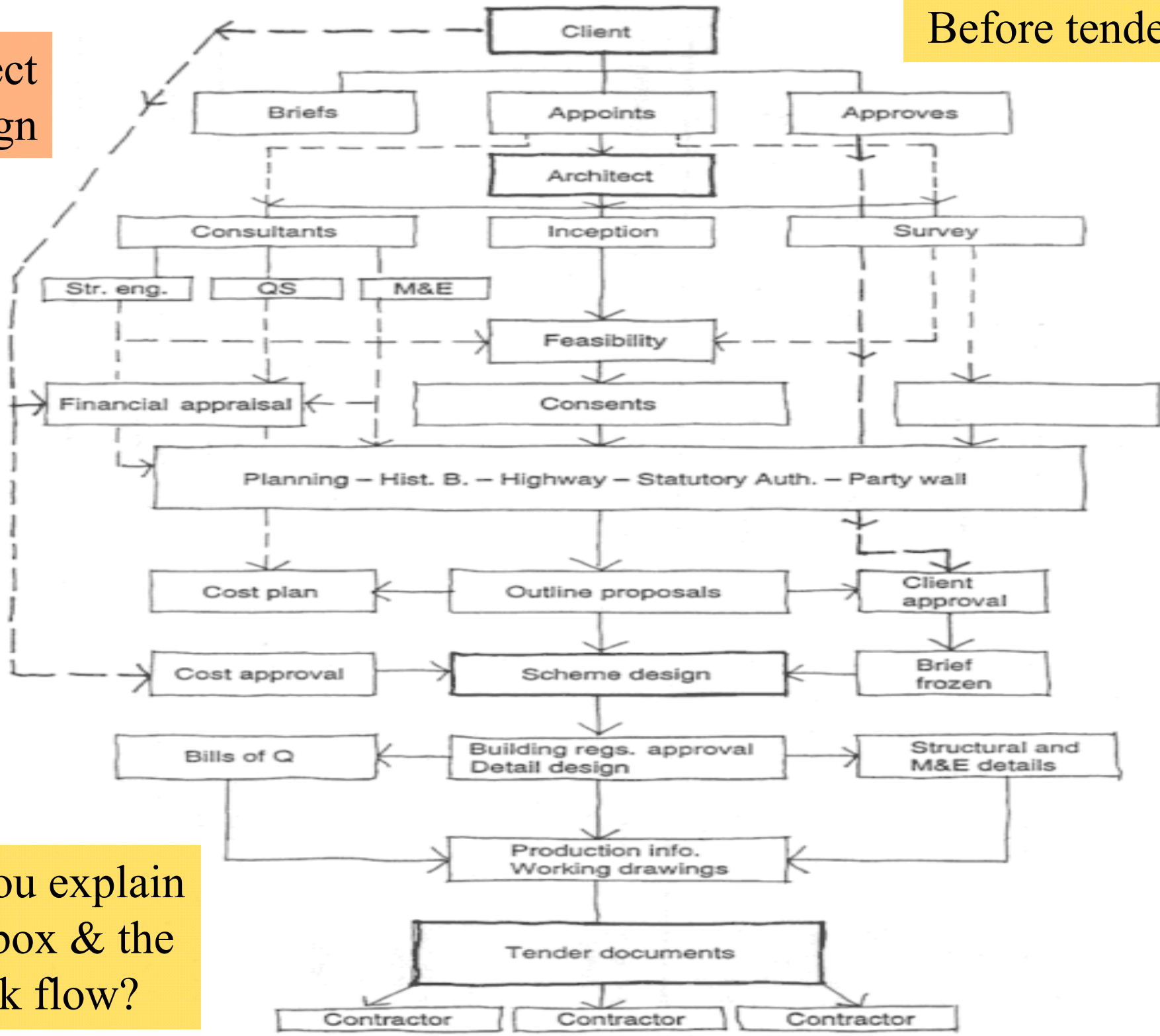
Project Plan



- Project design (see flow chart diagram)
 - Pre-tender stages
 - How the idea comes out & develop into design
 - Major outcome: tender documents
- Project construction (see flow chart diagram)
 - Post-tender stages
 - Contract administration
 - Site operation, completion & payments

Before tendering

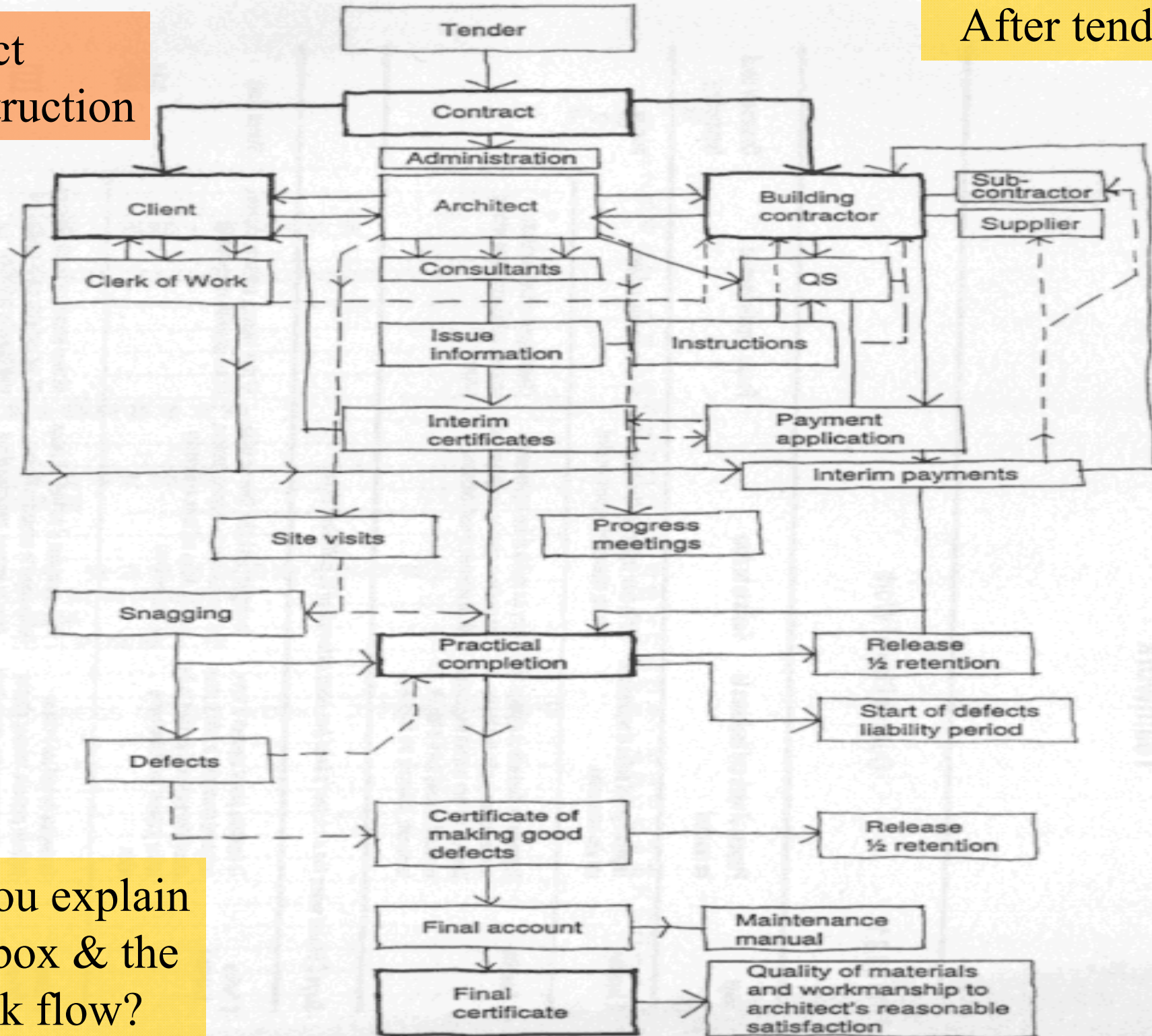
Project Design



Can you explain each box & the work flow?

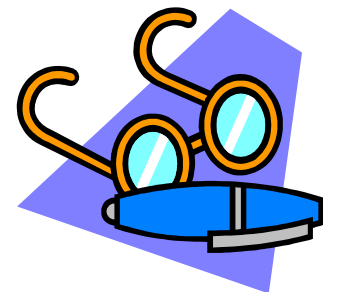
Project Construction

After tendering



Can you explain each box & the work flow?

Project Plan



- The **RIBA Outline Plan of Work**
 - By Royal Institute of British Architects (RIBA)
 - Organises the process of managing, and designing building projects and administering building contracts into a number of key Work Stages
 - Key project stages; description of key tasks
 - A shared framework for design and construction
 - For various procurement methods (e.g. open tender, design & build, management contract)
- Different versions: 2007 and 2013

RIBA Outline Plan of Work 2007

A. Appraisal	Preparation
B. Design brief	
<hr/>	
C. Concept	Design
D. Design development	
E. Technical design	
<hr/>	
F. Production information	Pre-construction
G. Tender documentation	
H. Tender action	
<hr/>	
J. Mobilisation	Construction
K. Construction to practical completion	
<hr/>	
L. Post practical completion	Use

(* RIBA = Royal Institute of British Architects)

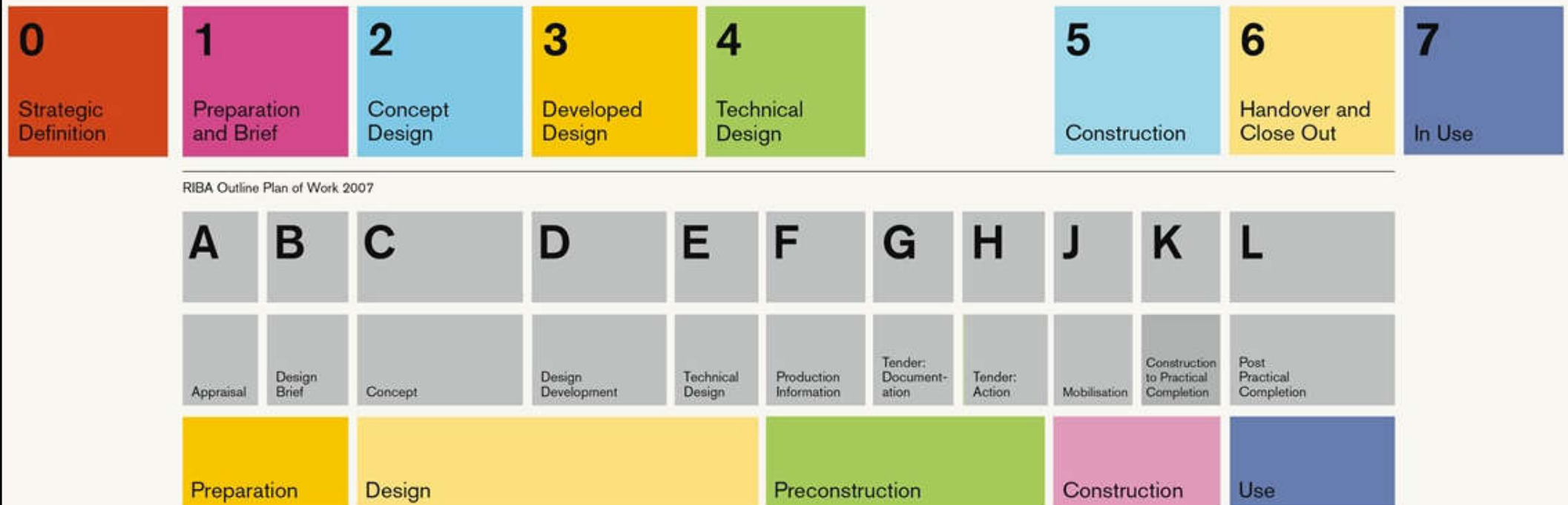
RIBA Outline Plan of Work 2013*

- Stage 0. Strategic definition
- Stage 1. Preparation and brief
- Stage 2. Concept design
- Stage 3. Developed design
- Stage 4. Technical design
- Stage 5. Construction
- Stage 6. Handover and close out
- Stage 7. In use

* The 2013 version reflects increasing requirements for sustainability and Building Information Modelling (BIM).

(Source: <https://www.architecture.com/knowledge-and-resources/resources-landing-page/riba-plan-of-work>)

RIBA Plan of Work 2013 compared with RIBA Outline Plan of Work 2007





Building Contract

- **Contract** (= offer and acceptance)
 - An agreement between 2 or more parties/persons to do or not to do some act or acts, their intention being to create a legal relationship which is enforceable by law
 - Express terms and implied terms; liability and breach of contract
- Typical templates of construction contracts:
 - Standard Form of Building Contract
 - Sub-contracts (e.g. w/ sub-contractors/suppliers)



Building Contract

- Tender Documentation 招標文件
 - 1. Conditions of Tendering / Instructions to Tenderers 投標條件 / 投標須知
 - 2. Form of Tender 回標書
 - 3. Form of Contract 合同書及條款
 - 4. Specification or Employer's Requirements/Brief 工料規範或發包方要求
 - 5. Pricing Schedules 計價單
 - Bills of Quantities 工程量清單
 - Summary of Tender, Schedule of Rates or Schedule of Quantities and Rates, Schedule of Works; Quotation
 - 6. Tender Drawings 招標圖紙



Building Contract

- Contract/tender documents:*

Contract document	Definition	Clarification
Instructions to tenderers	Rules of play	for tender phase
Conditions of contract		for construction phase
Production drawings	Description of work	graphical
Specification		written
Quantities		numerical
Schedule of work		list

- HK Standard Form Contract (Main Contract)
 - Between the Client and the main contractor
 - 1997 version, and the latest version: 2005/2006

Hong Kong Standard Form of Building Contract (1997 version)

CONTENT 目錄

Clause No. 條款	Page 頁
1. MAIN CONTRACTOR'S OBLIGATIONS 建造商的義務	1
2. ARCHITECT'S INSTRUCTIONS 建築師的指示	2
3. CONTRACT DOCUMENTS 合約文件	6
4. STATUTORY OBLIGATIONS, NOTICES, FEES AND CHARGES 法定義務、通知、費用與收費	9
5. LEVELS AND SETTING OUT OF THE WORKS 平水與開線	11
6. MATERIALS, GOODS AND WORKMANSHIP TO CONFORM TO DESCRIPTION, TESTING AND INSPECTION 材料、貨物及手工須符合說明、測試及檢驗	12
7. ROYALTIES AND PATENT RIGHTS 版權與專利權	13
8. FOREMAN-IN-CHARGE 地盆總管	14
9. ACCESS FOR ARCHITECT TO THE WORKS 建築師有權進入地盆	14
10. CLERK OF WORKS 工程監督	15
11. VARIATIONS, PROVISIONAL AND PRIME COST SUMS 改動、預算金額與基本定額	16
12. CONTRACT BILLS 合約數量單	21
13. CONTRACT SUM 合約金額	22
14. MATERIALS AND GOODS, UNFIXED OR OFF-SITE 未安裝或存放地盆外之物料	22
15. PRACTICAL COMPLETION AND DEFECTS LIABILITY 實質完工與保固	23
16. SECTIONAL COMPLETION 分段完成	25
17. ASSIGNMENT OR SUB-LETTING 轉讓或分判	27
18. INJURY TO PERSONS AND PROPERTY AND EMPLOYER'S INDEMNITY 受傷與財物損毀及保障業主	28
19. INSURANCE AGAINST INJURY TO PERSONS AND PROPERTY 傷亡與財物損毀保險	29
20. INSURANCE OF THE WORKS AGAINST FIRE, ETC 為工程投購火險等	32
21. POSSESSION, COMPLETION AND POSTPONEMENT 接收地盆、完工與擱置工程	40
22. DAMAGES FOR NON-COMPLETION 過期賠款	41
23. EXTENSION OF TIME 展期	42
24. LOSS AND EXPENSE CAUSED BY DISTURBANCE OF REGULAR PROGRESS OF THE WORKS 工程進度受到干擾做成之損失和額外開支	44
25. DETERMINATION BY EMPLOYER 業主解僱	46
26. DETERMINATION BY MAIN CONTRACTOR 建造商終止受僱	51
27. NOMINATED SUB-CONTRACTORS 指定承判商	55
28. NOMINATED SUPPLIERS 指定供應商	63
29. ARTISTS AND TRADESMEN 美術家與技工	68
30. CERTIFICATES AND PAYMENTS 種單與付款	68
31. SURETY BOND 擔保	75
32. OUTBREAKS OF HOSTILITIES 戰爭爆發	76
33. WAR DAMAGE 戰火破壞	79
34. ANTIQUITIES 古物	81
35. ARBITRATION 仲裁	82
36. FLUCTUATION IN WAGE RATES 工人日薪波動	85

Some current or older books are still referring to the 1997 version.

Hong Kong Standard Form of Building Contract (2005/2006 version)

1	Interpretation and definitions	21	Insurance against injury to persons or property
2	Contractor's obligations	22	Insurance of the Works
3	Master programme	23	Possession, commencement and completion
4	Architect's instructions	24	Damages for non-completion
5	Documents forming the Contract and other documents	25	Extension of time
6	Statutory obligations	26	Delay recovery measures
7	Setting out the Works	27	Direct loss and/or expense
8	Materials, goods, workmanship and work	28	Notice of claims for additional payment
9	Intellectual property rights	29	Nominated Sub-Contractors and Nominated Suppliers
10	Contractor's site management team	30	Persons engaged by Employer
11	Access for the Architect to the Works	31	Facilities for statutory undertakers and utility companies
12	Architect's representative	32	Certificates and payments
13	Variations, Provisional Quantities, Provisional Items and Provisional Sums	33	Surety bond
『 14	[Not used] 』 【 14	34	Antiquities
	Contract Bills 】	35	Determination by Employer
15	Contract Sum	36	Determination by Contractor
16	Materials and goods on or off-site	37	Determination by Employer or Contractor
17	Substantial Completion and defects liability	38	Fluctuations
18	Partial possession by Employer	39	Notices, certificates and other communications
19	Assignment and sub-letting	40	Recovery of money due to the Employer
20	Injury to persons and property and indemnity to Employer	41	Settlement of disputes

Agreement & Schedule of Conditions of Building Contract for use in the Hong Kong Special Administrative Region, Private Edition – 【 With Quantities, 2005 Edition 】

『 Without Quantities, 2006 Edition 』

(Source: <https://kctang.com.hk/web/standard-form-building-contract-20052006>)



Building Contract

- Clauses most relevant to our study: (1997 ver.)
 - 2. Architect's Instructions
 - 3. Contract Documents
 - 10. Clerk of Works
 - 11. Variations, Provisional and Prime Cost Sums
 - 15. Practical Completion and Defects Liability
 - 23. Extension of Time
 - 24. Loss and Expense
 - 30. Certificates and Payments
 - 35. Arbitration
 - 36. Fluctuation in Wage Rates



Hong Kong Standard Form of Building Contract (2005 version)

HKIA, HKICM and HKIS, 2005. *Agreement & Schedule of Conditions of Building Contract for Use in the Hong Kong Special Administrative Region: Standard Form of Building Contract: Private Edition: with Quantities*, 2005 ed.

Clauses most relevant to our study: (2005 version)

- 4. Architect's instructions
- 5. Documents forming the contract and other documents
- 12. Architect's representative
- 13. Variations, provisional quantities, provisional items and provisional sums
- 17. Substantial completion and defects liability
- 25. Extension of time
- 27. Direct loss and/or expense
- 32. Certificates and payments
- 38. Fluctuations
- 41. Settlement of disputes

You should download this Standard Form document for study.

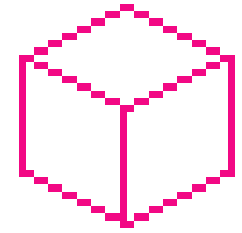
Our study topics



Project management and control (PMC)
Site organisation and supervision (SOS)
Claim management and settlement (CMS)
Alternative dispute resolution (ADR)



Contractor Organisation



- Organisation of building services contractors (see examples in the figures)
 - Usually acting as sub-contractors
 - On site and off site personnel
 - Technical and non-technical staff, e.g.
 - Project manager
 - Project engineer
 - Supervisor, foreman
 - Operatives



* If you have taken summer training, please draw up the organisation chart of your training company.

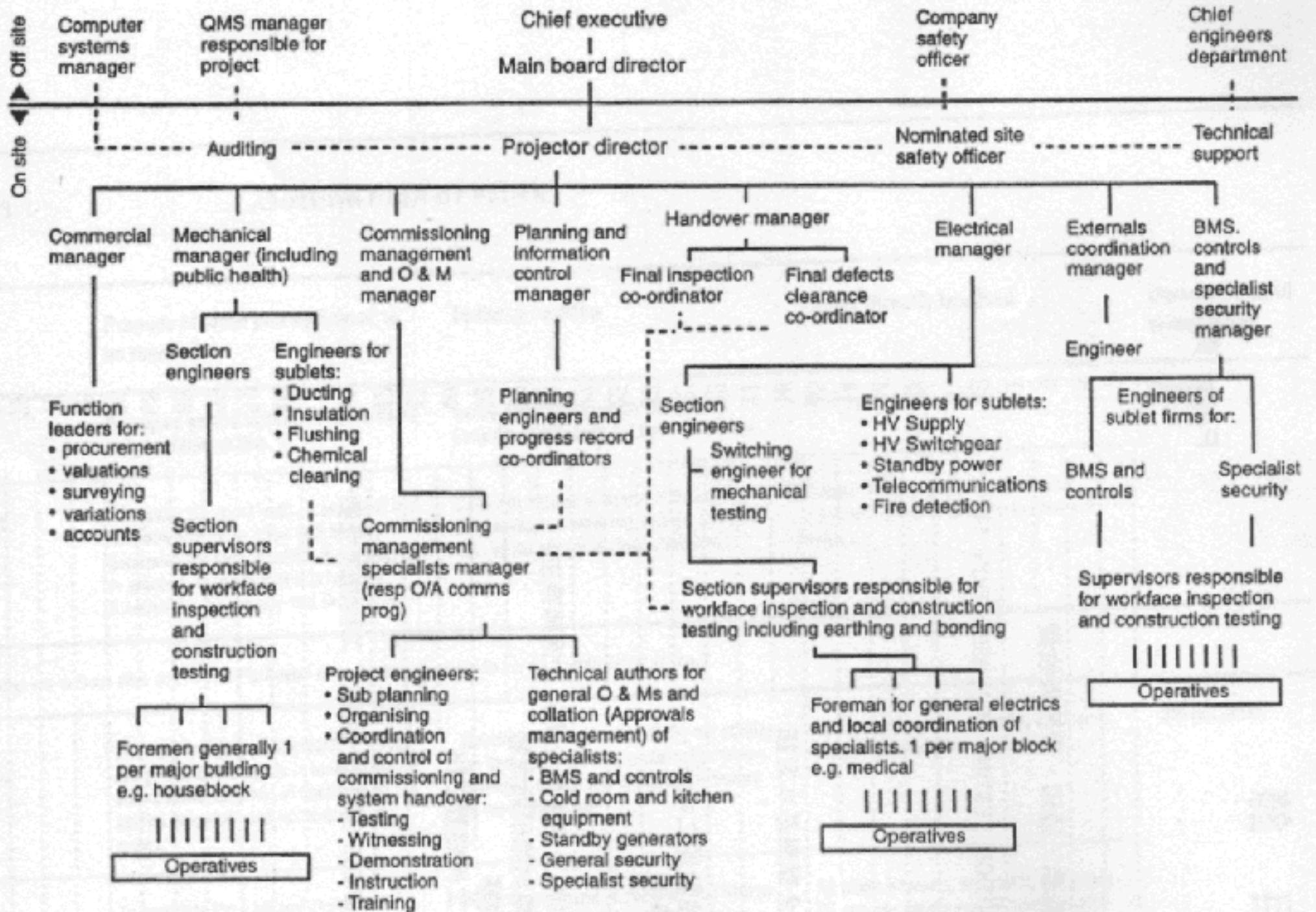


Figure 3.2 Building services contractor – organogram for a new prison.

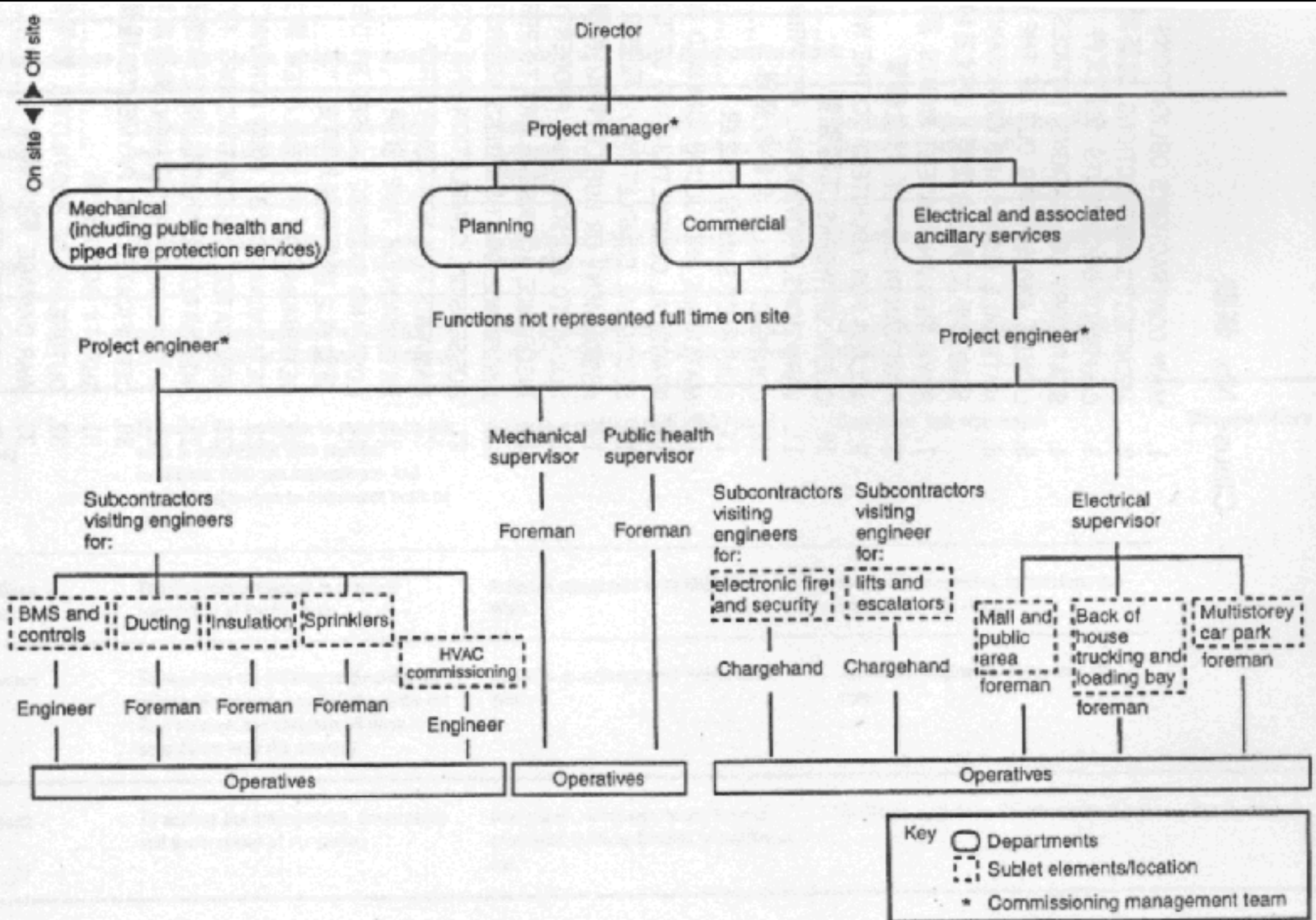
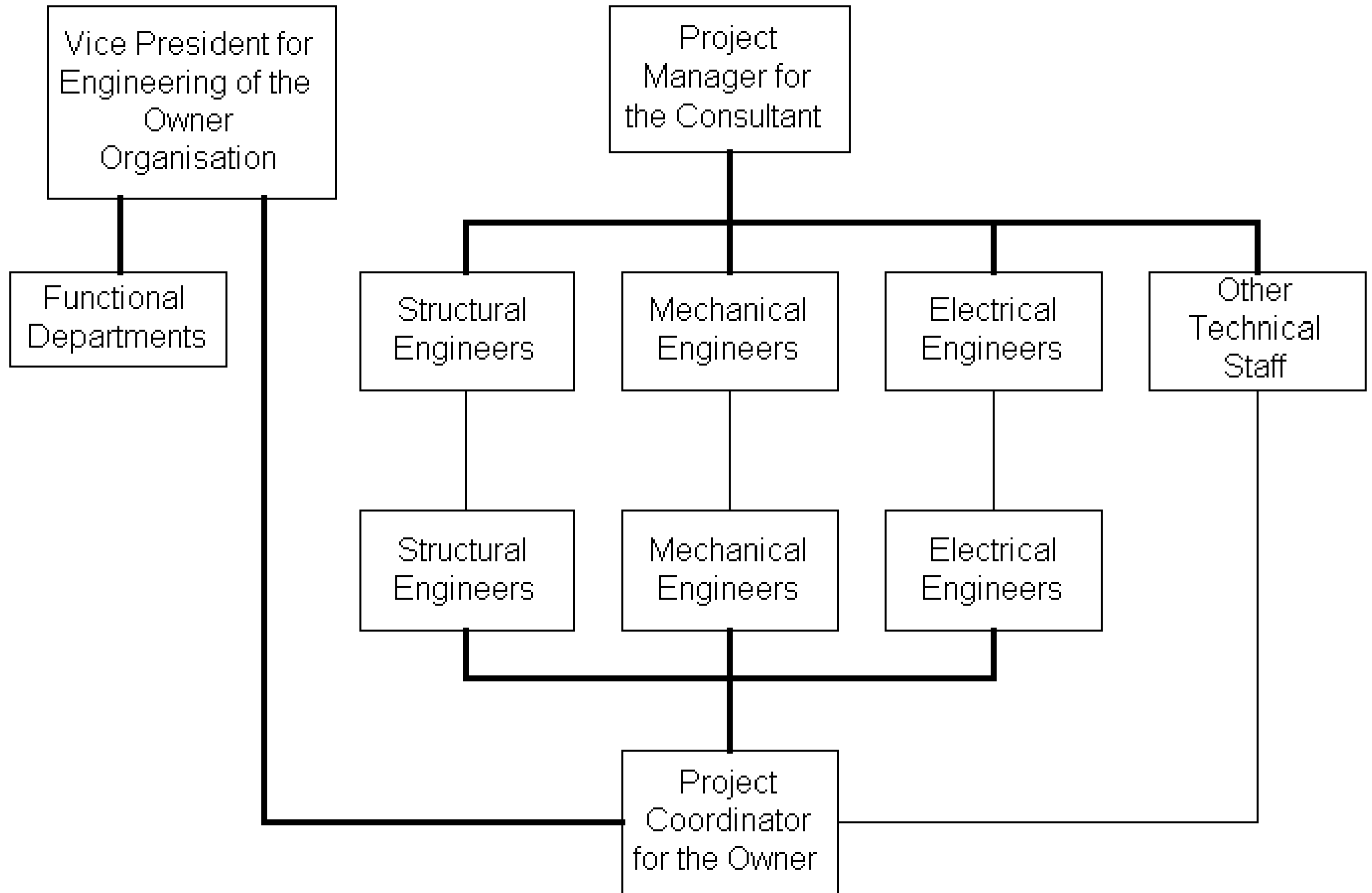
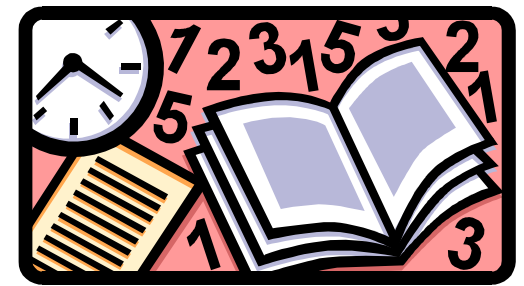


Figure 3.3 Building services contractor – organogram for a shopping centre.

Coordination between owner and consultant in construction management





Further Reading

- Development Cycle 建設流程
 - <https://kctang.com.hk/web/development-cycle-jiansheliucheng>
- Organisation of Parties to Construction 建設組織架構
 - <https://kctang.com.hk/web/organisation-parties-construction-jianshezuzhijiagou>
- RIBA plan of work
 - https://www.designingbuildings.co.uk/wiki/RIBA_plan_of_work
- Tender Documentation 編寫招標文件
 - <https://kctang.com.hk/web/tender-documentation-bianxiezhaobiaowenjian>
- Form of Contract <https://kctang.com.hk/web/form-contract>