1. Maintenance

1.1 Reasons for maintenance

- Functions of building are to withstand the effects of weather, retain stability, give weather resistance, thermal & sound insulation, function efficiently under the worst possible conditions with a minimum of maintenance
- However, buildings are always with bad details, poor choice of finishes, interior materials & components, inadequate attention, lack of funding & resources, lack of building data & records, inadequate legislation, etc.
- Problems such as drop in value, deteriorating quality of life, environmental health, nuisance and even personal safety.
- Lack of consideration of the total building life cycle, and fail to appreciate the significance of other maintenance functions.

1.2 Definitions

Maintenance	Works undertaken in order to keep or restore every facility to an acceptance standard
Alteration	Changing the structure of a building to meet new requirements
Conversion	Making a building of one particular type fit for the purposes of another type of usage
Extension	Increasing the floor area of a building, whether vertically by increasing height or horizontally by increasing plan area
Adaptation	Accommodating a change in the use of a building, including alterations & extensions
Improvement	Bringing a building up to an acceptable standard, possibly including alterations, extensions or some degree of adaptation
Conservation	Looking for a place in order to retain its cultural significance
Preservation	Maintaining a building structure in its existing state and retarding deterioration
Restoration	Returning the existing building structure to an earlier state by reassembling existing components w/o introduction of new materials
Re-construction	Returning a building structure to an earlier state by the introduction of new materials

1.3 Advantages of maintenance

- Retain value of assets and property for corporation
- Ensure maximum usage of the building & allow business to function effectively
- Lower the maintenance cost now than much higher in the future
- Comply with manufacturer's warranties
- Maintain energy efficiency of equipments
- Contribution to better environment, e.g. less pollution emitted
- Optimize the use of building components, minimize the replacement cycle, e.g. clean air-conditioner to keep a longer life
- Maintain users' health & safety, and retain quality staff
- Compliance with legislation and avoid prosecution, e.g. ensure an unobstructed fire escape, carry out mandatory checks, repair leaking pipes, repair spalling concrete, etc.
- Enhance corporate image and publicity to suppliers & customers

1.4 Results of poor maintenance

- Unclear maintenance policy & planning, and inadequate T&C b4 handover
- Inadequate awareness on the effects of poor maintenance, and consideration of health & safety requirements
- Inadequate communications between different parties, as well as feedback and involvement of maintenance services providers
- Inadequate resources to support maintenance, including well-trained labour force & equipments
- Too much bearing on capital cost rather than life cycle cost
- Inadequate formal routine for checking, repairs, disaster recovery, audits and evaluation of standards & performance
- Building services are so complex that partial repairs or replacements are impossible
- Too much or too little technical information and records for efficient maintenance

1.5 Considerations when introducing maintenance

- Establish a strategic maintenance objective, which must fit with the building facilities plan and within users' needs. Consider what should be achieved & any corporate mission.
- Benefits of maintenance should be identified, agreed & communicated
- A structured maintenance department for management purpose
- Compete for fund with other functions
- Breakdown maintenance cost, identify tasks, standards and budget
- Choice of direct labour or sub-contracting
- Use of computer-aided facility management and/or building management system

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2. Maintenance Contract

2.1 Types of contractual arrangement → refer to notes

(a) Lump sum contract
(b) Cost reimbursement contract
(c) Fixed price maintenance contract
} Also refer to traditional procurement notes

(d) Term contract
(e) D&B contract
(f) Turnkey
(g) Direct labour

2.2 Flow chart of works

(a) Tendering → BQ w/o qty (SOR) with taking off & detail breakdown
→ compare with previous projects / previous editions of HKHA SOR
→ find the differences of rates, any new & deleted items in the new edition of SOR
→ MC estimator will depend on such differences & market trends to price a profit
→ then a "trade % for any works order" (could be +ve/–ve) will be calculated and filled in FOT
→ the tender with the lowest trade % will be accepted and awarded

(b) Contract award
(c) Estimate for each work order → submit to consultants & HKHA
(d) Receiving formal work order
(e) Executing maintenance works
(f) Submitting dimension book for IPA, which is a condition for payment valuation
→ if not submit, MC has to re-pay the certified amount
→ valuation (site measurement & taking off) by consultants including variations
(g) Prepare final bill

2.3 Pricing strategy & commercial considerations

(a) Pricing strategy

- Conditions of contract, SOR & prelim items → any sectional LD / bond / prelim?
- Scope & extent of contract
- Previous contracts
- Practice & management style of client
- Market conditions
- Sub-contracting / direct labour

(b) Commercial considerations

- Quality, safety & environmental issues
- EOT & LD risks
- Cashflow & financial supports to SC

3. Serial Contracts

- A series of contracts is **let to a single contractor**
- Serial tender a standing offer to carry out a series of projects on the **basis of competitive tender**
- The series usually **contains 3–15 projects** → further projects could be added by agreement at later stage
- Final design will not be necessarily ready b4 the master contract awarded
- **Suitable for refurbishment** of a series of building structures
- **Adv** → same type of MC's management is needed for all the contracts
- **Disadv** → difficult to secure a firm price commitment over a lengthy period of time
- **Tendering & operation**
  - Each separate contract will be negotiated & agreed based on standard items of the master bill
  - Pre-qualify MC's financial & physical resources for carrying out a lengthy series of projects
  - Added SCC to enable employer to withdraw the contract if the MC is under performed
  - Difficult for MC to cope with a number of small projects spread over several sites over a long time
  - Any unprogrammed activities may lead the MC to resourcing problems
  - ∴ if significant change in programme → worth to consider re-tendering

4. Term Contract → also refer to notes

- A method of controlling the work with a measure of accountability & a simple procurement method
- Envisage a MC for carrying out certain works for a period of time → usually 12 month or longer
- Need **to revise the unit rates annually** to reflect the fluctuation
- Suitable for continuing programmes of **day-to-day building maintenance**, painting & decoration, road-works & other specialists trades
- **Tender documents** will be SOR, which is helpful for MC to prepare a bills of prov'l qty based on previous years' workflow, and give an indication of volume of anticipated work on specific trades
- **MC quotes a single % adjustment** to the base SOR, which included allowances for fluctuations & dayworks
- **Payment & VO** valuations based on SOR, & measurement of WO are carried out by CA or MC

- To ensure MC's workload → continuous **monitoring of MC's performance** is necessary
- If MC fails to complete → the number of WO could be reduced until performance improved again
- WO should be given a **priority rating** which requires MC to carry out the work within specified time
- **Additional payment** could be made **for emergency WO**, which relates to health & safety matters
- **Use of computer programme** based on WO register, linked with comprehensive SOR, a WO generator, and accounts for payment

5. Direct labour

5.1 Advantages

- Full control of the works → quicker response to emergencies & greater flexibility
- Simplify the communication of project information
- Better control of quality through direct supervision, greater incentive to work on individual abilities and limitations
- More effective cost control procedures & knowledge of factors influencing output
- Delay is not incurred in invitation to tender & negotiating procedures
- If the works involves security risks
  → it's better for persons who have knowledge of the background of the operatives, e.g. Police

5.2 Disadvantages

- Lack of specialization in terms of skills & plants
- More expensive than contract works & possibly low productivity
- Lack of provision of supporting facilities, e.g. offices, stores, workshops, additional admin staff
- Financial and other risks are borne solely by the organization employing direct labour

5.3 Considerations on adopting direct labour

- Nature of work → suitable for traditional craft skills, specialist skills & relatively unskilled or semi-skilled works
- Volume of work
  → each trade should be assessed in a regular interval, which identifying the VO, restrictions on the timing of the works
  → at the peak of construction period → appoint other contractors to carry out the works which is beyond the capacity of direct labour's work force
- Direct labour's responding time, quality of works, security of plants & materials, availability of space, market conditions, cash flow