

MEBS6000: Utility Services

Summary of Teaching 2002-2003: First Semester

(Topics taught by Dr. Sam C. M. Hui)

Cold Water Supply

- Water sources, water quality and water treatment, waterworks in Hong Kong
- Cold water supply systems: mains water supply, distribution systems
- Components and materials: pipework, water tanks, water pumps

Video presentation: “樓下門水喉” (History of Hong Kong waterworks) [25 min.]

Hot Water Supply

- Water heaters: instantaneous, gas-fired, electric, solar, heat pumps
- Centralised hot water systems: direct system, indirect system, systems for large buildings
- Safety and statutory requirements in Hong Kong: non-centralised, centralised

Design of Cold and Hot Water Systems

- Water consumption and demands: simultaneous demands, design flow considerations
- Pipe sizing and water storage: pipe sizing, water storage allowance, recovery rate
- Pump systems and performance: pump considerations, characteristics
- Other design considerations

Video presentation: “Basic plumbing systems: residential” [38 min.]

Further reading: Pipe sizing examples; demand units in design; hot & cold water systems using booster pumps

Steam Systems

- Properties of steam
- System components: basic arrangements, steam traps, boilers and calorifiers
- Design considerations: steam pipe sizing, condensate recovery, safety precautions, regulations in Hong Kong

Video presentation: “Harnessing steam” [20 min.]

Further reading: Steam systems; steam pipe sizing

Sanitary & Stormwater Drainage

- Sanitary appliances, sanitary provisions
- Sanitary drainage: fluid flow in waste pipes, trap seal protection, pipe sizing and pipe materials, types of systems
- Stormwater drainage: roof drainage, disposal of stormwater, drainage formula
- Drainage below ground: drainage systems, connection of drainage to sewer

Video presentation: “Simplified drainage systems for large buildings” [8.5 min.]

Further reading: Sanitary appliances; flow in drains and open channels, sewage disposal; rainwater pipes and gutters, flow over weirs

Sewage Disposal

- Methods of sewage disposal: dilution, conservancy, treatment
- Sewage treatment process: septic tank, biological filter, settlement tank, biodisc treatment plant
- Sewage pumping: sewage pumping stations, sewage ejector, design considerations

Video presentation: “Sewage services and charges” [8 min.]

Further reading: Guidelines for the design of small sewage treatment plants