



Paper for Design of Café, Restaurant, Hotel, Fresh/Waste/Sewage Water & MVAC Ventilation

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Fcibse, Mashrae, Fcipse, Fie.Aust (E&M), Maib, Fcabe, Mifiree, Mhkie (Bs, Elec, Fs, Cai), Fimeche, Mhkicm, Bd As(Ventilation), Rmwc(1&3), Wsd Rpc & Ar, Qps, Emsd Rec, Rew(C0), Epd Ev Consultant

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Abstract / Content

Café design & Interior design

- Just eaten in a small café serving Chinese dim sim and bowls rice. A&A minimal, but clean and tidy, kitchen not messy. Price very cheap, 2 persons ate 2 bowls of rice , 2 hkd tea. Bill 52\$. For eating dinner, each person 26\$, even cheaper than morning tea yum cha.
- Size 700 sq ft. About 10 big and small tables in total. The food serving wooden counter cabinet and all walls are painted black as nice skirting duct. Good idea that the paint can be water resistant to avoid cleansing floor water to touch the wood cabinet bottom, will rot on long time wet with floor cleansing water. Good idea for all cafes, save skirting duct cost. This Café use 3 layers trolley to put clean dish/bowls on top layer, dirty re-collected dish in 2nd layer, good management to replenish clean dishes/bowls in dining hall and take away dirty dishes/bowls concurrently at one time. Time management good.
- One good advice for this café, use sofa seats-tables along the inside wall perimeter of café. Use underneath sofa as storage space for the paper boxes now placed in café. Then café more neat and pleasant looking. Have more space to put extra table, or bigger table in lieu of small table. Sofa seat-table size can be 4 persons each or 2 persons each. Flexible sofa seat-table size (2 or 4 persons) to match the existing space available. Sofa seat-table has advantage to integrate a layer underneath table to store the utensils, tissues, manual. Table no need to put utensils, manual, table size then can be smaller. Release more space to café. Bigger usable area.
- A&A subcon beside can construct good design /appearance facilities required in hotel, café, restaurant , their kitchens, their guest rooms, must know about interior design, giving more usable area from fixed GFA to these owner to use. Hotel can provide meeting/office/seminar room with PC/printer facilities/Audio visual/PA for guest to rent to use . Restaurant/cafes can put in more tables. Then all can earn more.

Interior Design for Restaurant/Café for bigger usable area from gross area

- High quality A&A beside meeting the Govt requirements to get F&B license, can use interior design knowledge to spare out more space to put more dining tables for F&B proprietors.
- Dining table and sofa seats can provide storage layer or cabinet below the outside surface, to put in café stuff, paper boxes, manual, forks and spoon, tissues, etc. No put in dining hall. Neat. The door of the seat cabinet storage ,can use the no handle type, use a recess at door top, put your finger into the slot and pull the cabinet door to open. Outside look like surface panel, incorporating the cabinet. This cabinet for storage of not often used items in day time, take them out in evening after hours to use them in next day.
- For items to be used in daytime business, (A) use multi storey cabinet frame in dining hall, having different layers and shelves and surfaces at different height. 1. Flat surface near hand level, for counter, check out bills, order dim sim, 2. higher shelves for put in towels, table cloth, eating utensils, at hand



reach level at upper shelves. These are clean items for dining table, put at higher level. 3. Lower level designed to be drawers, for use by waitress to get things from there eg, put in eating utensils inside drawers. Lower level to design as enclosed drawers so that not get dirt from floor. (B) Partition a vertical space merged with existing structural columns, outside look like a whole column, same design and decoration, but can have an access door to enter the integral storage room. Learnt from fast food café this design. Also learnt from hospital use this design, to run the vertical pipes risers in this vertical duct space integral with structural columns. Outside look like a complete structural column.

Hotel guest room water piping & chilled air duct route. Hotel swimming pool design

- In hotel, special knowledge & experience on acoustic design & FSIs for guest room, seminar, meeting room. Knowledge in design swimming pools in hotel -Provide warm indoor pool water by gas boiler/heat exchanger, filter recirculating pool water by sand filter, carbon filter, 6-way valve, pumps. Design submerged under pool water light fittings, design water resistant wall and floor of swimming pool etc. are needed. My Lordray/SMA is experienced consultant, very familiar with these design and the regulations. Also guest room operate on different modes, vacant/awaiting guest/guest occupied different status to save MVAC energy. Use DC fan coil which is quiet. Fresh water supply, waste/sewage water risers, chilled & return water pipes in a common cabinet duct between 2 guest rooms, to serve these 2 rooms, cabinet duct vertically from top to bottom of hotel for each pair of guest rooms.
- Determining on 1. Each floor its total areas of windows in regard to hotel corridor area (less than 6% need staircase pressurization and smoke extraction), and 2. The cubical extent of hotel specified in FSD COP, smoke extraction & staircase pressurization may be required in hotel

MVAC design

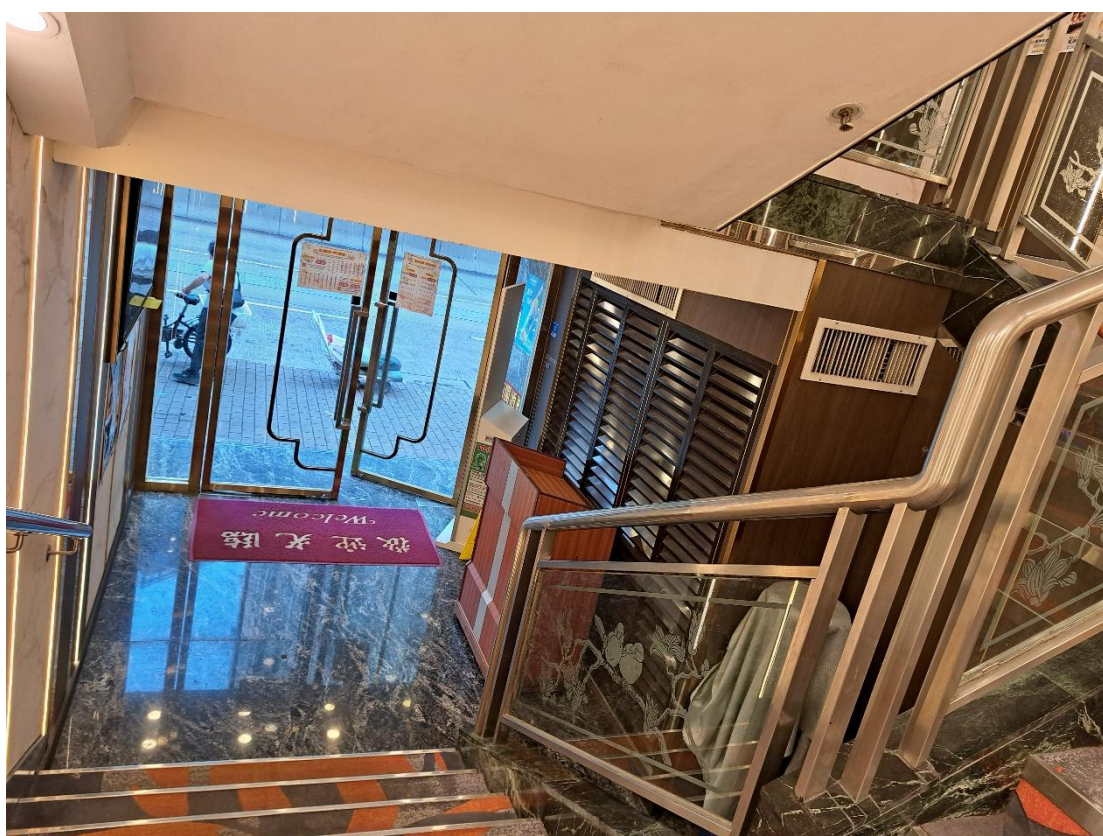
- MVAC chilled air duct connect guest rooms via room false ceiling space to lobby ceiling space then to AHU in each floor. Provide fresh air preliminary chilled by PAU then to AHU further chilled, mix with return air to guest rooms as Supply air. Guest room thermostat control room temperature by controlling the amount of chilled water through the guest room fan coil. In summary, temperature is controlled by controlling the flowrate of chilled water, set at 7C-11C. Air flowrate is controlled by PAU, AHU by remote controlled motorized air dampers. All DDC automatically controlled. PAU must set to allow minimum 6 air change of fresh air per hour. Total ventilation air flowrate comply with CIBSE/ASHRAE in the number of air change per hour for each premise, usually minimum 12 air change per hr. Follow the CIBSE/ASHRAE table to get the minimum number of air change per hour, then to determine the total air flowrate for the building. Load estimation to determine the thermal load. With these 2 figures, select the size of chiller capacity, and how many chillers required. Nowadays use 500ton (1 ton=12000 Btu per hour, or 3.5KW) chiller usually, allow another spare chiller, same capacity as the designed chiller. Select cooling tower cooling capacity, 20% more than chiller capacity to dissipate the heat generated by each chiller. Also provide another spare cooling tower, same size as designed cooling tower.
- I like to sit in sofa seat-table than isolated table-chair. More comfortable, can sit for longer time browsing phone or TV in café.

Drainage in café, restaurant kitchen

- **2 different ways of doing drainage pipes**
 1. Kitchen must have water around for cooking food, splash water to floor, wet can cause slippery and accident, must have floor drainage.
 2. F&B A&A, raise the existing concrete level. Leave a trench for drainage. All wash basin waste water pvc pipe embedded in raised concrete floor. Lead to trench to discharge waste water. or put metal frames on floor slab. Put tiles on top of frame. Run stainless steel drainage troughs or CI pipes inside the cavity of raised floor to discharge waste water to sewage sumps at bottom of building, usually at lowest basement carpark floor (if café or restaurant not at lowest floor of building), then

sewage submerge pumps there to pump the sewage to ground floor surface, by gravity flow to municipal manhole. Also kitchen waste water is oily, cannot discharge directly to waste water drainage, must go through oil traps to filter the grease, filtered waste water, will be discharged to the sewage sump as above, Grease collected at oil traps tanks will be sucked by environmental vans regularly to be rightly disposed... this is environmental regulation for F&B business.

3. Another environmental requirement from EPD and FEHD is fresh air, must comply with minimum 5-6 air change of fresh air as specified by CIBSE, ASHRAE and BD. How to do? Adjust the inlet fresh air volume at PAU, to let in this adequate amount of fresh air, precool and feed to AHU, then combined with return cold air and feed to Fan Coils as Supply Air. To maintain the AC room with adequate fresh air, need to exhaust a certain volume as exhaust air to outside atmosphere and diluted by fresh air from PAU. All set by DDC automatically by motorized air dampers at AHU air ducts. CO2 sensor at AC room detecting high CO2 volume, or other gases SO2, NO2 etc high volume will give signal to AHU to admit more fresh air and emit more exhaust air. The exhaust air has cold energy, hence on route to outside atmosphere, will pass through economizer heat exchanger to pre cool the incoming fresh air at PAU, before rejected to outside atmosphere. In restaurants or cafes, fresh air into their AC dining areas should be precooled before feed to Fan Coils to avoid outside high humidity hot air contact with cold return air, condensation happens and drip water down to dining tables. In small scale restaurant/cafes localized AC design, usually use split AC units, install outside units on building walls, inside units at restaurant and cafes, Hence to comply with 5-6 air changes per hour, need to feed in fresh air at the indoor unit, or from atmospheric at entrance to restaurant/café. Some AC design, locate the return air louvres at the entrance so that return air suck in outside fresh air, then combine to feed to Fan Coil. See photo below.



Summary

- Responsible Consultant's design beside meeting regulations and functional needs, then interior design to increase useable areas with beauty appearance. Clients must be happy. Also be honest, no say lie to get business eg drone not feasible and not commercial competitive, say it has great potential, cause clients lost big investment money to make drones. Honest, although lost engineering opportunity, Lord will give more other business opportunities eg import/export, not necessarily construction. Lord give wisdom, can see many good opportunities and develop in other areas.



REFERENCE

1. CIBSE Guide B MVAC (5-6 air change per hour)
2. ASHRAE Handbook Fundamentals, Handbook (5-6 air change per hour)
3. BD & FEHD Fresh air requirement (6 air change per hour) (5-6 air change per hour)
4. CIPHE plumbing manual, CIPHE 水電與暖氣工程雜誌年度訂閱
5. FSD FSIs for elderly hostel (sprinkler & smoke detector), smoke extraction & staircase pressurization, installation_1994.pdf or latest version

APPENDIX 1

Qualifications of Ir Dr Assoc Prof KP Samuel Lip, (v8.8.2026)

Academic & professional qualifications

- Proprietor & Founder of Lordray Engineering Co. Ltd. (www.lordray.com.hk)
- Proprietor & Founder of SMA (Macau) Consultant & Construction Co. Ltd.
- Proprietor & Founder of SMA (Australia) Consultant & Construction Co. Ltd.(progressing to register)
- Proprietor & Founder of SMA (Germany) Consultant & Construction Co. Ltd. (progressing to register)
- PhD Mech, PhD(Structure) student, HD&HC (Civil), MSc, PgD, BSc,
- CEng (Construct), CPE, RPE, RCM, CBE,
- FCABE, FCIBSE, FIMechE, FCIPHE, FHKICA,
- FIE.Aust (E&M), MHKICM , MIET, MASHRAE, MIFireE,
- MHKIE (BS, Elec, Fire, CAI).

Fire Services Experience

- MSc Fire, PgD BS
- MIFireE, MHKIE (Fire),
- Thorn Security (HK) FS Company, Senior Engineer 2002-2006, Samuel did Airport new wing extension FS installations & commissioning.
- Lordray did Airport new extension FS installations with Build King IEM company 2020 plus.
- Lordray did miscellaneous FS hydraulic calculations for pml on FS upgrade eg at TST, Jordon bldgs and MTR louvre size calculation for subcon 2013
- FSD Standard Safety Advisory Group 2005 Samuel nominated by HKIE (https://drive.google.com/file/d/1ns-g3ZmIv5p6GZJ-cg1rSniD_8kY1iTu/view?usp=sharing)
- Lordray doing FS314, 501, 501A work since 2013
- Lordray doing FS502, 572 work since 2013
- Samuel as Guest speakers in giving FS talks to corporations and institutions

Assessor & Auditor REA Experience:

- BSc Elec, PgD BS, MSc Fire, PhD Mech, HD&HC Civil
- EMSD REA since 2010 Cap 610. Do Energy audit, FOC, COCR since 2010



- FCABE (Panel Interviewer/Chairman), VTC E&M Assessor. HK Beam Society, Beamplus Technical Expert (2013) (Assessed New Bldg. Beamplus award applications), HOKLAS Assessor, Govt QSPs (Samuel & Lordray) Carbon Auditor, HKICA Reg. Carbon Auditor. Done 10 energy & carbon audits for Fugro, and ongoing with Fugro International Corporation at Tuen Mun & Kwai Fong.

Training & Education Experience:

- BSc Elec, PgD BS, MSc Fire, PhD Mech, HD&HC Civil
- RPE, MHKIE, HKIE Scheme A Engineering Supervisor (BS, Env) for Viewco, Telemax, Paul Y since 2018. HKIE only allow maximum 3 companies employers. Have to turn down others for seeking me as engineering supervisor.
- Lordray's SMA is Govt OGCIO Dept Reg. Training School, UK TQUK branch in HK (Training Courses are recognisable by CIBSE), Senior Curriculum Manager in EMHK (www.emhk.org) (2013-2023)
- Lecturer (FT & PT) in HKU, PolyU, CityU & SCOPE, VTC IVEs (1995-2018) teaching students from High Certificate level to Master degree level, then continue to teach in own SMA school to industrial peers and as Guest Speakers in giving various engineering disciplines talks to corporations and institutions

Building & Survey Experience:

- PhD (structure) in progress, publishing construction papers
- HD & HC in Civil Engineering
- FCABE Chartered Building Engineer,
- Member of Australia Institute of Building
- Registered Construction Manager, MHKICM
- BD RMWC Class 1 certify minor work completion certificate for subcon since 2020.
- BD AS(Venti), BD RMWC3
- Building Survey on Gratia College (Shek Kip Mei) for own Lordray project 2024,
- Building Survey at TST1881 Hotel for Paul Y in 2018,

Elevator & lift experience:

- BSc Elec, PhD Mech
- MIAEE
- EMSD Registered Lift Engineer Exam(written test passed in 2012). Assistant Manager in Chevalier Lift Company (2012-2013). EMSD Lift Legislative Branch, Contract EME (2001-02). HKHA Maintenance Dept, Lift Maintenance Branch (1979-81)

Electronic Security & Access Control Experience:

- BSc Elec



- MHKIE (Elec, CAI), MIET
- HK Police Electronic Security Cat 3, & electronic security D licence,
- Lordray did electronic security & access system, CCTV, audio visual, PA for a catholic church at Tai Po 2022
- Thorn Security (HK) Tyco Group, Senior Engineer, done electronic security installations in CLP substations, MTR stations 2002-06

Plumb Drain Experience:

- PgD BS, PhD Mech
- FCIPHE, FCIBSE, FIE.Aust(E&M)
- WSD QPs, RPC (AR),
- RPE (BS) in site plumb drain FS pipes Interim Inspections & pipes hydraulic testing since 2013, notably for Paul Y Data Centre Bldg in airport
- Nominated Tutor by WSD Registered Trainer EMHK to provide CPD training to LPs for WSD award (gold, silver, bronze) (2013-2023)
- DSD Project Dept, Temporary EME(1999-2001)

Electrical & Building Services Experience

- BSc Elec, PgD BS, PhD Mech
- RPE, MHKIE(Electrical, BS),
- REW(C0), MIET, FCIBSE, MASHRAE, FCIPHE, FIE.Aust (E&M)
- EPD Registered Consultant for EV Chargers design & installation since 2020
- WR2 work at Lohas Park estates 2021, Tuen Mun Supermarket 2022, which need REW(C0)
- ICE, CxA work since since 2020

ICE & CxA, Beamplus T&C experience

- BSc Elec, PgD BS, MSc Fire, PhD Mech
- RPE, MHKIE(Electrical, BS), REW(C0), MIET, FCIBSE, MASHRAE, FCIPHE, FIE.Aust (E&M)
- RCx Pro, CxA, ICE
- Lordray is Nominated Consultant of Gammon since 2025 & REC since 2020,
- Tutor in EMHK teaching Beamplus classes to LPs (2013-2023)
- CxA in Beamplus T&C compliance for Fugro at Long Ping estate 2023, Gammon at Cyber Port Extension 2025 and some subcons since 2020.
- HK Beam Society Technical Expert 2013 in assessment of Beamplus award applications



MVAC experience

- PhD Mechanical, Post Graduate Diploma (Building Services)
- FCIBSE, MASHRAE, BD AS (Ventilation), PhD (Mechanical), FIMechE, FIE.Aust (E&M)
- Sizing for AC duct for subcon at Kowloon Bay 2020
- Investigation of chiller failure and cooling towers discolouration, did report for Build King IEM at Wanchai Sport Ground and Causeway Bay bldg 2020
- Tutor on BD AS (Venti) exam preparation course, Data Centre MVAC, Psychiatric Chart usage, for own SMA Training school since 2020
- Consultant employed by Chun Wo for toilet upgrading ventilation contract in airport
- 2020.
- RPE (BS) to certify cooling towers operation satisfactory annually to comply with EMSD COPs at zero carbon centre at Kowloon Bay, and for subcons in HK everywhere since 2020
- REA doing COCR and FOC for Chiller installations for subcons and Lap Kei MVAC HKEx listed company since 2020

Lifting & Hoisting experience

- FIMechE, FIE.Aust (Mechanical), PhD Mechanical
- Lordray did wheelchair and elderly bed mechanical certification for Jockey Club charity organisation 2024
- Lordray did 25 heavy metal gates mechanical certification for CIC 2024.
- Lordray did Tower crane mechanical certification at Gammon Construction site at Lohas Park 2021
- Lordray did investigation and rectification report for entrance metal gate failure at an estate at So Guan Wat, Gold coast 2023.
- Lordray did mechanical load test for luminaires mounting 2023

APPENDIX 2 : Asset

Lordray offices (3 self-owned properties in The Cloud, 111 Tung Chau Street, Tai Kok Tsui, HK) description video weblink

[https://drive.google.com/file/d/1MMkDRsRpMOaBcdzEnpJU7-6pj_wKI6Eb/view?usp=share link](https://drive.google.com/file/d/1MMkDRsRpMOaBcdzEnpJU7-6pj_wKI6Eb/view?usp=share_link)