DESIGN BASIS

Climate: An Giang, hot-humid. Indoor 24-26 C, 50-60 % RH. Outdoor design ~35 C db.
Air-con: CONCEALED DUCTED indoor units in lowered ceiling zones (+3.10 F1 / +6.79 F2) over halls, foyer and dressing rooms; linear slot supply grilles above doors / under the cornice; returns at each unit.
2 multi-split inverter outdoor units on a raised rack in the backyard; refrigerant in a clad chase up the rear wall.
Ventilation: extract fans in every wet room + laundry, ducted outside (roof space vents / facade / courtyard).
Hot water: one 300 L heat-pump water heater on the rear roof platform (replaces the solar heater), pipes in the roof space, down risers S1 / S2 / S3, the S4 box (powder) and drop K (kitchen, clad backyard chase); return loop.
Cold water: existing roof tank + booster pump (unchanged); PPR pipes, hot pipes insulated.
Drainage: soil/waste stacks S1-S3 (+ vent S4) to the septic tank; rainwater R1-R5 separate to the rain pit; AC condensate trapped into a stack (S1-S3) or a basin waste - never into the S4 vent.
Electrical: 3-phase 380/220 V supply, 3 x 50 A (see load estimate); MDB in the garage, sub-boards DB-F1 (garage) and DB-F2 (laundry); RCBO on wet-area and outdoor circuits; SPD; earth electrode.
Lift: screw-drive home lift, 2 stops, own 230 V 16 A supply + isolator at the top landing, battery lowering, alarm.

AIR-CONDITIONING SCHEDULE

TAG	FLOOR	SERVES	AREA m2	BTU/h	kW	OUTDOOR	CONDENSATE
AC-1	F1	Living + foyer	26.6	18,000	5.3	OU-1	to S2 stack
AC-2	F1	Kitchen + dining	28.4	24,000	7.0	OU-1	to S3 stack
AC-3	F1	Bedroom 1 + dressing	19.7	12,000	3.5	OU-1	to powder basin waste
AC-4	F2	Bedroom 3 + altar	17.9	12,000	3.5	OU-2	to S2 stack
AC-5	F2	Bedroom 2	13.5	9,000	2.6	OU-2	to S2 stack
AC-6	F2	Master bedroom	20.6	12,000	3.5	OU-2	to S1 stack
AC-7	F2	Master dressing + bath	19.3	12,000	3.5	OU-2	to master basin waste

Outdoor units: OU-1 multi-split ~14 kW (AC-1/2/3), OU-2 ~12.5 kW (AC-4..7), on a galvanised rack +0.30 in the backyard.
Hall + stair, garage, wet rooms: not conditioned (spill air from the rooms; extract only).

VENTILATION SCHEDULE

TAG	ROOM	l/s	DISCHARGE
EF-1	F1 rear bathroom	25	rear facade (backyard wall)
EF-2	F1 powder room	15	duct in the S4 box to the roof
EF-3	F2 bathroom A	25	roof space -> roof vent
EF-4	F2 bathroom B	25	roof space -> roof vent
EF-5	F2 master bath + shower	40	roof space -> roof vent
EF-6	F2 master WC	15	roof space -> roof vent
EF-7	F2 laundry	30	courtyard wall grille (louvred)
KD-1	F1 hob downdraft (peninsula)	100	recirculating, or 150 duct to the backyard

ELECTRICAL LOAD ESTIMATE

LOAD	kW	DIV.	DEMAND
Air-con, 2 outdoor units (input)	8.0	0.9	7.2
Heat-pump water heater 300 L (+2 kW backup)	3.0	0.6	1.8
Screw-drive home lift	2.2	0.5	1.1
Induction hob	7.2	0.5	3.6
Oven + microwave	4.5	0.3	1.3
Dishwasher	2.0	0.5	1.0
Washer + dryer	4.5	0.5	2.2
Lighting (LED, all scenes)	1.6	0.8	1.3
General sockets	6.0	0.3	1.8
Booster pump + recirculation pump	1.0	0.7	0.7
Extract fans + hob downdraft	0.6	0.8	0.5
EV charger, garage (optional)	7.4	0.6	4.4
Low voltage, CCTV, network	0.4	1.0	0.4
TOTAL	48.4		27.4

-> about 48 kW connected, ~27 kW peak demand: ask EVN for 3-phase 3 x 50 A (3 x 40 A if the EV charger is left out); single-phase not advised.

EQUIPMENT ON THE ROOF PLATFORM (rear-left, +7.40):
roof water tank (existing) + booster pump; heat-pump water heater 300 L (~0.6 m dia x 1.8 m); service access via the roof hatch.

CHU HUNG TOWNHOUSE - An Giang **M-001**

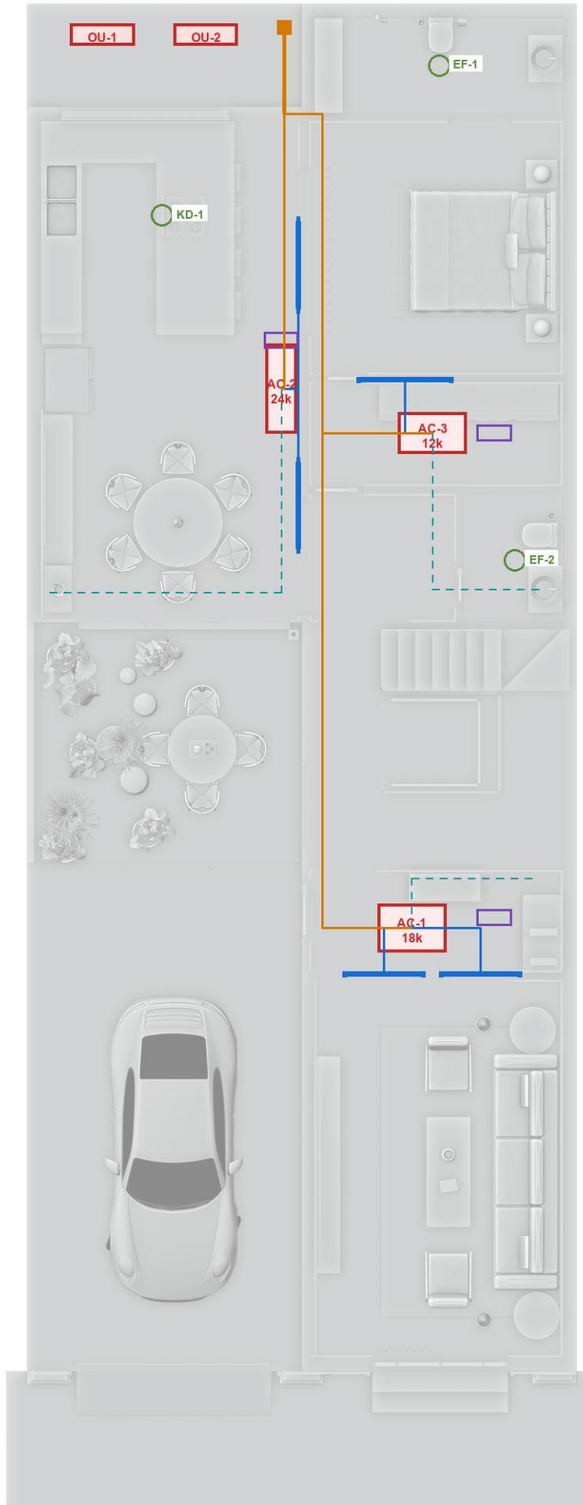
MEP DESIGN BASIS + SCHEDULES

Concept sizes - confirm with load calculation

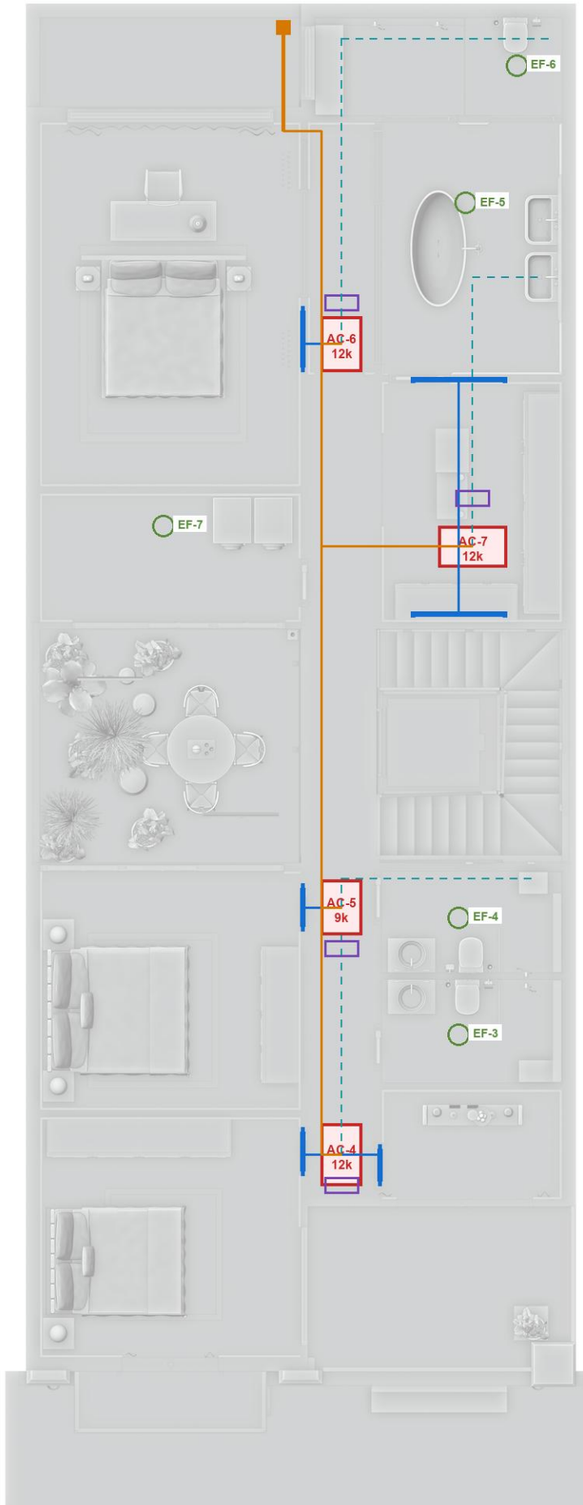
MEP CONCEPT - engineer to size and certify

07 Nov 2026 based on the current 3D model

GROUND FLOOR - AIR-CON + VENTILATION



UPPER FLOOR - AIR-CON + VENTILATION



LEGEND

- Ducted indoor unit (in lowered ceiling) / outdoor unit
- Linear slot supply grille + supply duct
- Return grille at the unit
- Refrigerant pipes (insulated) / riser chase
- Condensate drain (trapped) to the stack
- Extract fan (ducted outside)

NOTES

- Units sit in 300 mm lowered ceilings over halls, the foyer and dressing rooms; rooms keep their full height + cornices.
- Supply through slim slot grilles above the doors or under the cornice; return grille at each unit (no grilles on panelling).
- Bedrooms 2/3, master: units in the hall bulkheads, side-throw through the wall above each door.
- Outdoor units OU-1/OU-2 on a raised rack in the backyard; refrigerant up a clad chase on the rear wall into the F1 ceiling void and the F2 roof space.
- Condensate trapped to S1-S3 or a basin waste (S4 = vent); P-102.
- Extract fans: wet rooms to the roof space vents, rear facade or courtyard; hob downdraft recirculating (KD-1).
- Hall + stair and garage are not conditioned.
- Sizes are concept values: engineer to confirm by load calc.

CHU HUNG TOWNHOUSE - An Giang **M-101**

AIR-CONDITIONING + VENTILATION PLANS

Concealed ducted units, slot grilles, outdoor units, extract

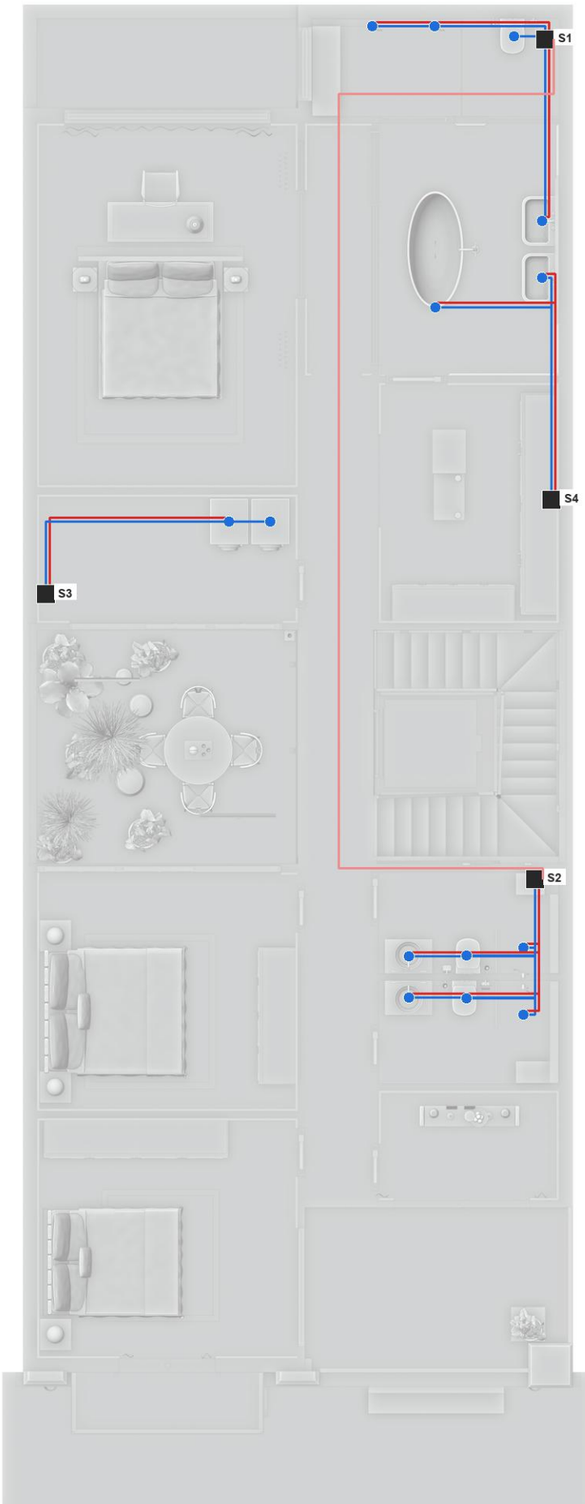
MEP CONCEPT - engineer to size and certify

07 Nov 2026 based on the current 3D model

GROUND FLOOR - WATER SUPPLY



UPPER FLOOR - WATER SUPPLY



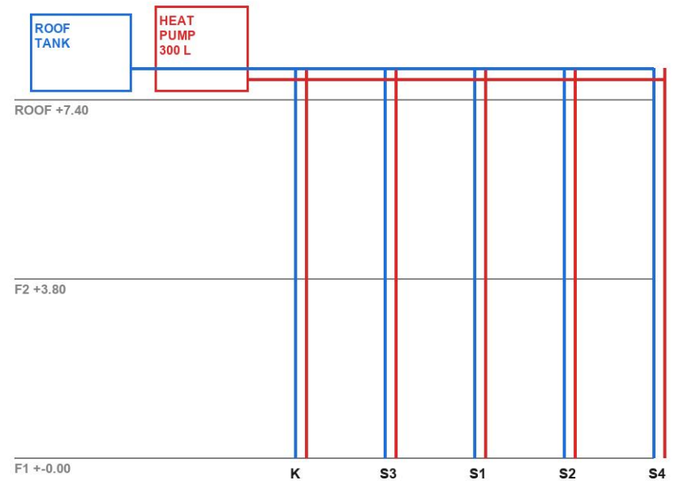
LEGEND

- Cold water (from roof tank + booster pump)
- Hot water (from heat-pump tank)
- Hot-water return loop (small pump)
- Riser: boxes S1-S4 / kitchen drop K (backyard chase)
- Fixture connection

NOTES

- Roof platform (rear-left, +7.40): existing roof tank + booster pump, NEW 300 L heat-pump water heater.
- Pipes run in the roof space to the risers in boxes S1, S2, S3, the S4 box (powder) and drop K to the kitchen in the clad rear-wall chase (backyard).
- Hot-water return loop from the far baths (A/B) back to the tank keeps hot water at every tap within seconds.
- Thermostatic mixing valve at the heat pump (scald guard, max 50 C at the taps); isolation valve per room.
- PPR PN20 hot / PN10 cold; hot + return insulated 13 mm.

RISER DIAGRAM



CHU HUNG TOWNHOUSE - An Giang **P-101**

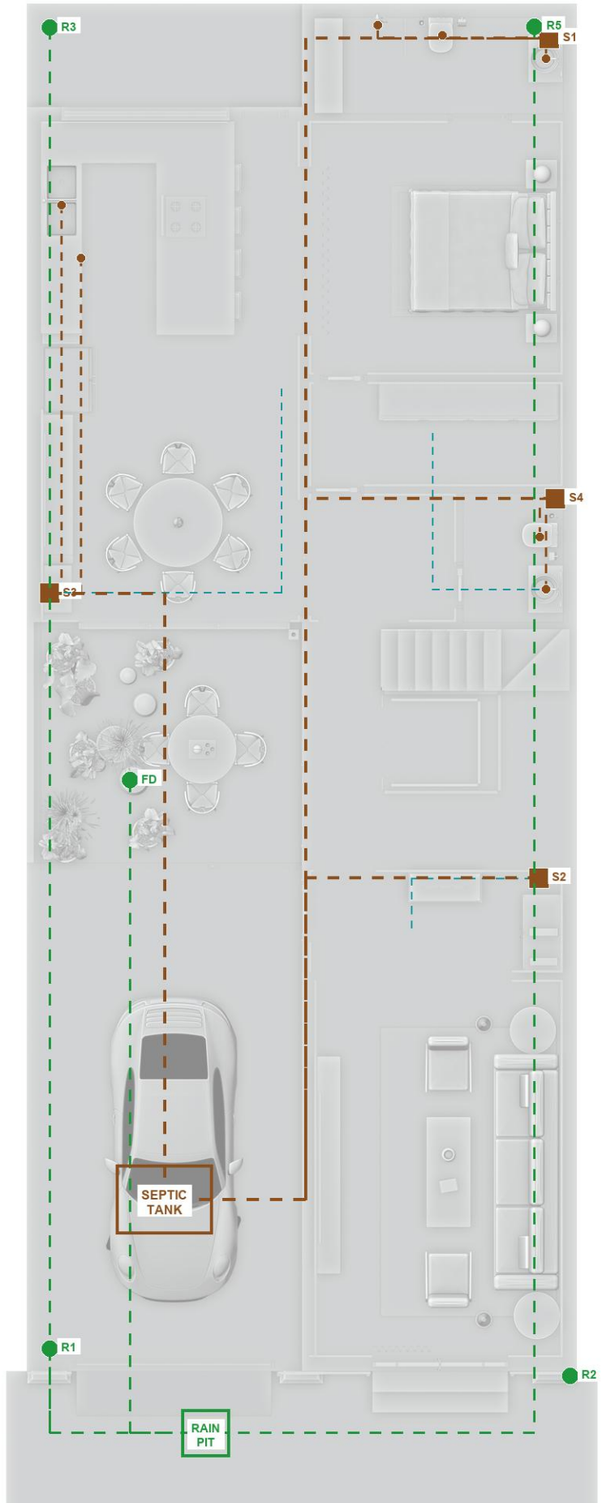
WATER SUPPLY - COLD, HOT + HOT RETURN

PPR pipes; hot + return insulated

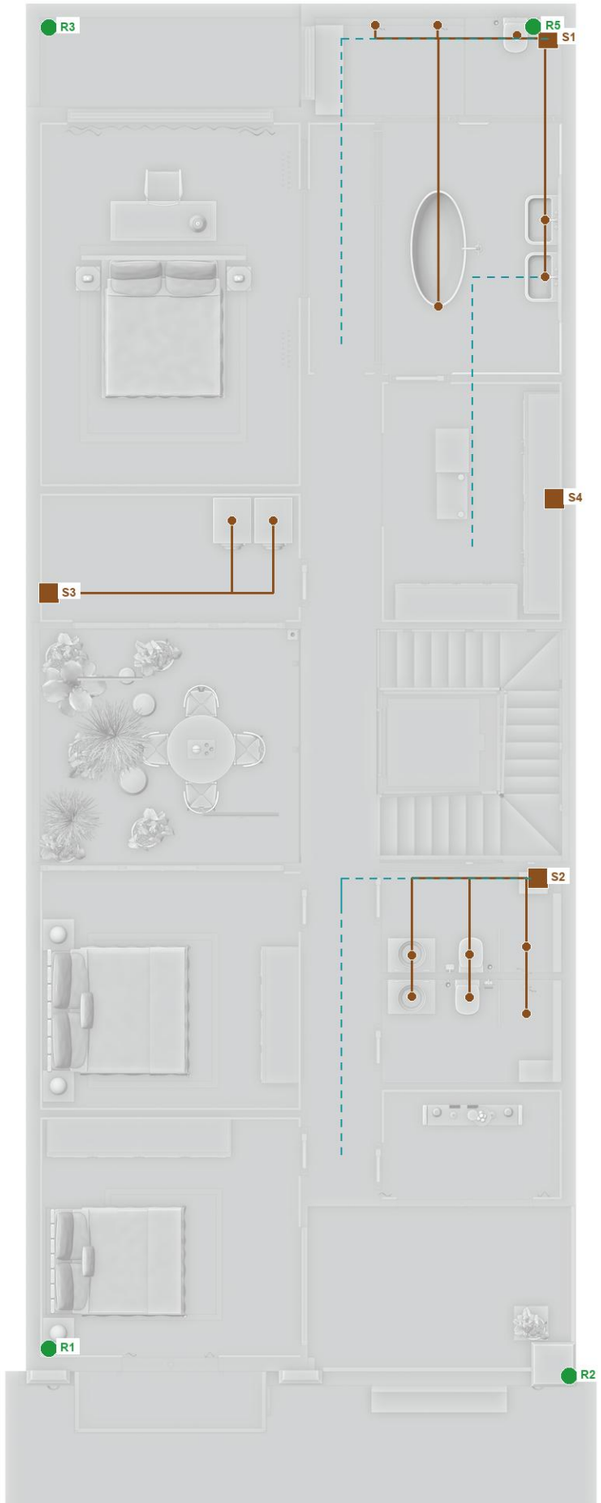
MEP CONCEPT - engineer to size and certify

07 Nov 2026 based on the current 3D model

GROUND FLOOR - DRAINAGE (+ underground)



UPPER FLOOR - DRAINAGE



LEGEND

- Soil / waste branch (falls 1-2 %) to stack
- Stack in technical box S1-S4 (vent to roof)
- Underground drain (F1)
- Rainwater pipe R1-R5 / courtyard drain FD
- Underground rain drain to pit
- AC condensate (trapped)

NOTES

- uPVC: WC 114, waste 60-90, stacks 114, vents 60 to roof.
- Showers: linear / point floor drains with 50 mm water seal, membrane clamp ring (S-103).
- Rainwater fully separate from soil; to the rain pit, then to the street drain.
- Septic tank position under the garage slab is CONCEPT: confirm with site survey + local authority.
- Cleanouts at every stack foot and change of direction.
- AC condensate trapped into the stacks (no air-break smells): see M-101.

CHU HUNG TOWNHOUSE - An Giang **P-102**

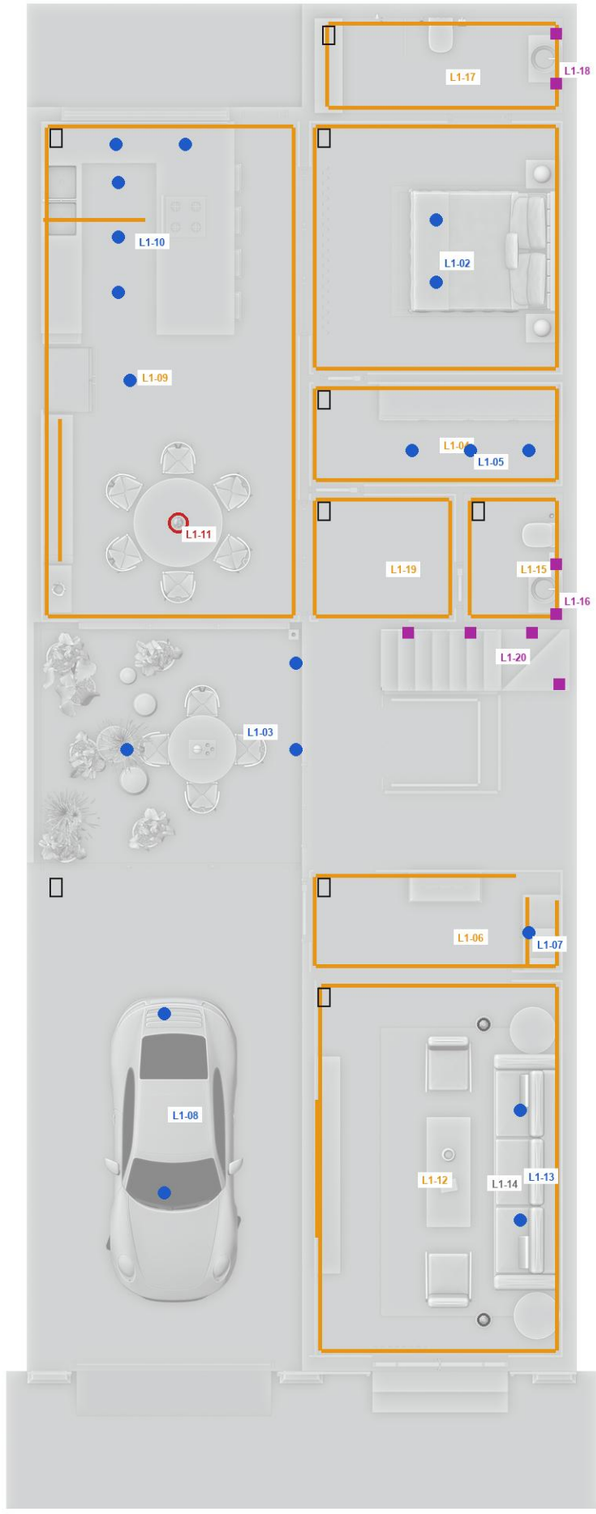
DRAINAGE - SOIL, WASTE, VENT, RAIN, CONDENSATE

uPVC; stacks S1-S3, vent S4, rainwater R1-R5

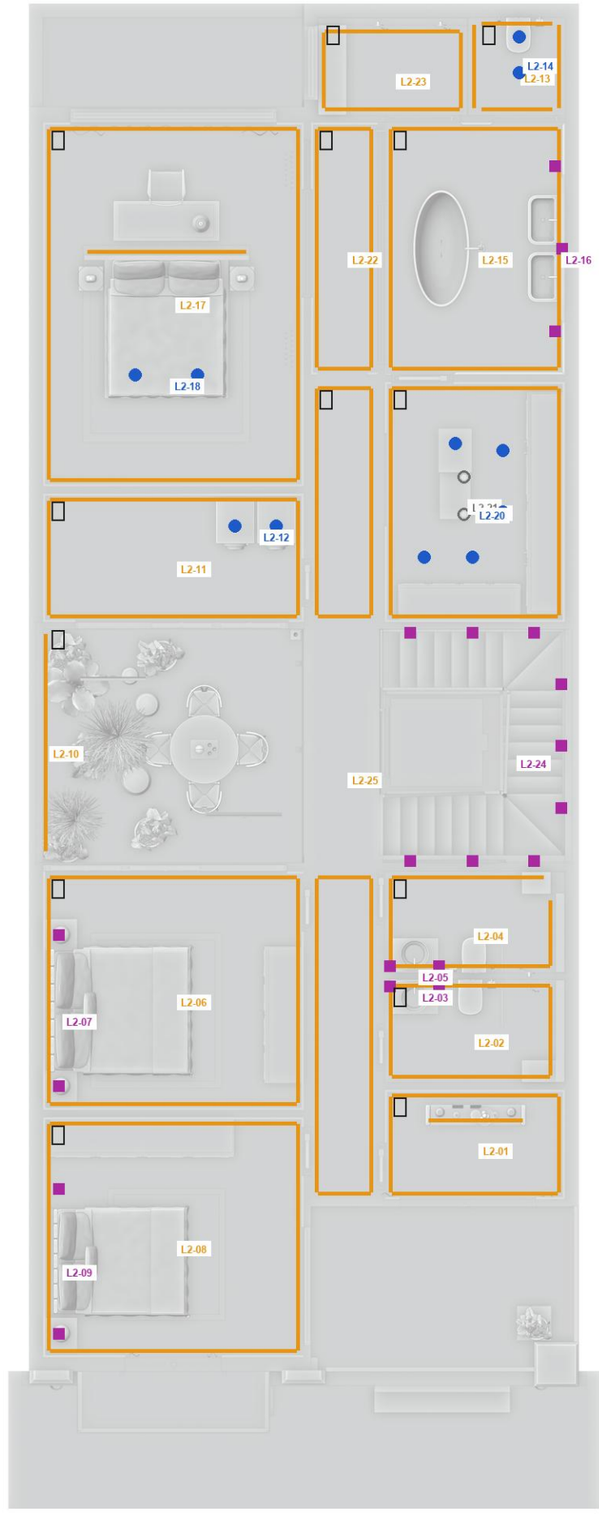
MEP CONCEPT - engineer to size and certify

07 Nov 2026 based on the current 3D model

GROUND FLOOR - LIGHTING



UPPER FLOOR - LIGHTING



LEGEND

- Concealed LED cove / strip / linear grazer
- Downlight / spot / IP65 wall light / in-ground uplight
- Wall sconce / mirror light
- Pendant (enamel dish)
- Lamp on 5 A switched socket
- Scene keypad at the room entrance

NOTES

- Every room has scene keypads (e.g. Bright / Evening / Night / Off); coves + downlights dimmable, 2700-3000 K.
- Circuit tags L1-xx / L2-xx = one dimmer channel each; max ~10 fittings or 1.2 kW per channel.
- Stair: bar sconces L1-20 / L2-24 + nosing LEDs, with a motion-sensor night level; facade + courtyard on a timer/photocell (L-EXT).
- Bathrooms: IP44+ fittings; showers IP65.

CIRCUIT SCHEDULE

CCT	ROOM	TYPE	N	CONTROL
L1-01	Bedroom 1	cove	4	dim (DALI/0-10V)
L1-02	Bedroom 1	down	2	dim
L1-03	Courtyard	down	3	dim
L1-04	Dressing 1	cove	4	dim (DALI/0-10V)
L1-05	Dressing 1	down	3	dim
L1-06	Foyer	cove	5	dim (DALI/0-10V)
L1-07	Foyer	down	1	dim
L1-08	Garage	down	2	dim
L1-09	Kitchen dining	cove	6	dim (DALI/0-10V)
L1-10	Kitchen dining	down	6	dim
L1-11	Kitchen dining	pendant	2	dim
L1-12	Living	cove	5	dim (DALI/0-10V)
L1-13	Living	down	2	dim
L1-14	Living	lamp	2	5 A switched socket
L1-15	Powder	cove	4	dim (DALI/0-10V)
L1-16	Powder	sconce	2	switch
L1-17	Rear bath	cove	4	dim (DALI/0-10V)
L1-18	Rear bath	sconce	2	switch
L1-19	Shared hall	cove	4	dim (DALI/0-10V)
L1-20	Stair hall	sconce	4	switch
L2-01	Altar	cove	5	dim (DALI/0-10V)
L2-02	Bath A	cove	4	dim (DALI/0-10V)
L2-03	Bath A	sconce	2	switch
L2-04	Bath B	cove	4	dim (DALI/0-10V)
L2-05	Bath B	sconce	2	switch
L2-06	Bedroom 2	cove	4	dim (DALI/0-10V)
L2-07	Bedroom 2	sconce	2	switch
L2-08	Bedroom 3	cove	4	dim (DALI/0-10V)
L2-09	Bedroom 3	sconce	2	switch
L2-10	Courtyard (high)	cove	1	dim (DALI/0-10V)
L2-11	Laundry	cove	4	dim (DALI/0-10V)
L2-12	Laundry	down	2	dim
L2-13	Master WC	cove	4	dim (DALI/0-10V)
L2-14	Master WC	down	2	dim
L2-15	Master bath	cove	4	dim (DALI/0-10V)
L2-16	Master bath	sconce	3	switch
L2-17	Master bedroom	cove	5	dim (DALI/0-10V)
L2-18	Master bedroom	down	2	dim
L2-19	Master dressing	cove	4	dim (DALI/0-10V)
L2-20	Master dressing	down	5	dim
L2-21	Master dressing	lamp	2	5 A switched socket
L2-22	Master hall	cove	4	dim (DALI/0-10V)
L2-23	Master shower	cove	4	dim (DALI/0-10V)
L2-24	Stair hall	sconce	11	switch
L2-25	Upper hall	cove	8	dim (DALI/0-10V)

CHU HUNG TOWNHOUSE - An Giang

E-101

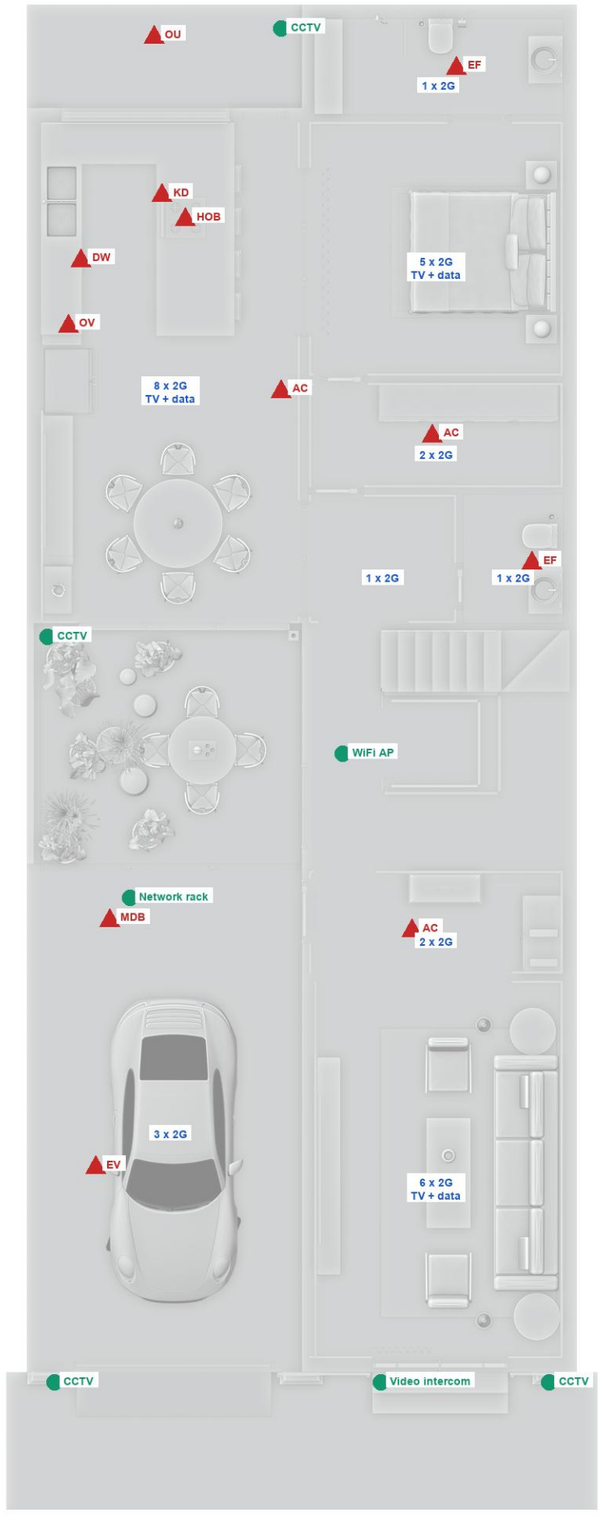
LIGHTING LAYOUT + CIRCUITS

From the fittings in the 3D model; scene keypads per room

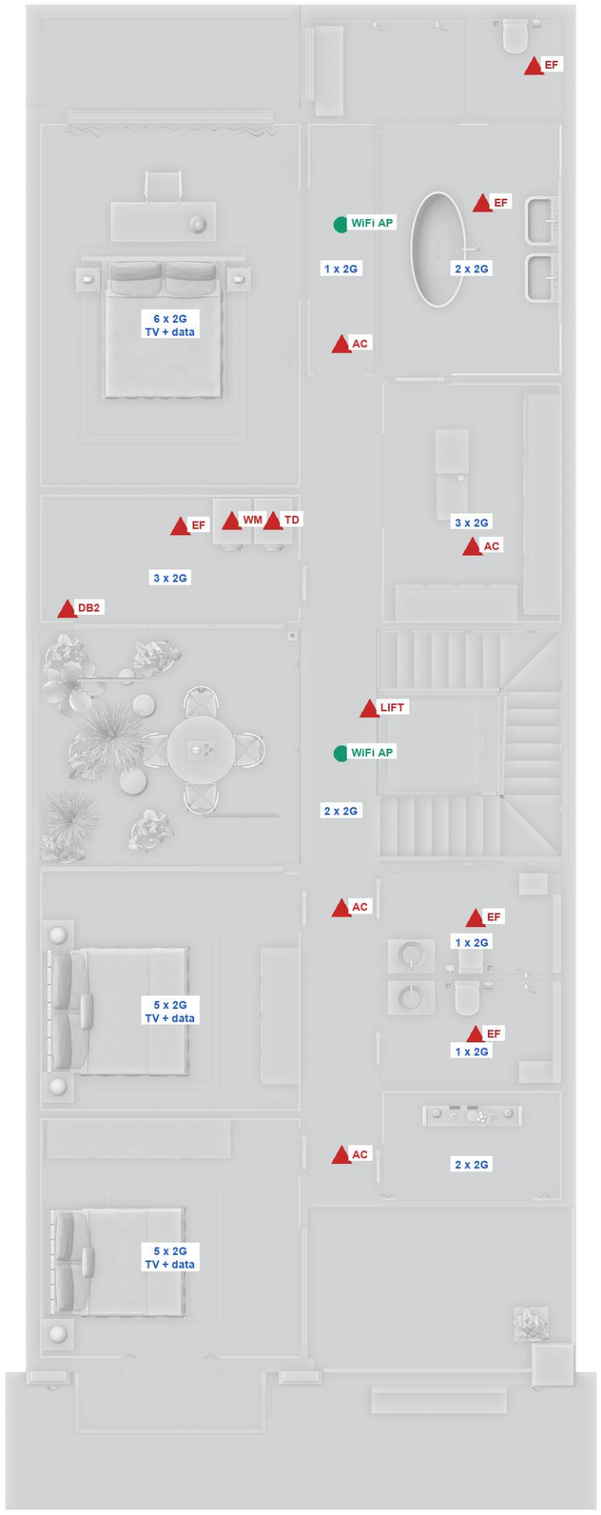
MEP CONCEPT - engineer to size and certify

07 Nov 2026 based on the current 3D model

GROUND FLOOR - POWER + DATA



UPPER FLOOR - POWER + DATA



LEGEND

- Dedicated outlet / isolator (own circuit)
- General sockets: count of double (2G) outlets
- Network / low voltage point

NOTES

- Socket circuits: 2.5 mm2, 20 A RCBO, max ~8 doubles each; kitchen counter on its own circuit.
- Wet rooms: shaver/basin socket on RCBO 30 mA, IP44.
- Bedside: double socket + USB-C each side; desk sockets behind the master headboard.
- CAT6 from the network rack (garage) to every TV/data point and the 3 ceiling Wi-Fi access points.
- CCTV: front, entrance, courtyard, backyard; video intercom at the entrance screen with door release.
- Lift: dedicated 230 V 16 A + alarm/phone line, isolator at the top landing (E-201).
- Heat pump + pumps on the roof platform: 20 A RCBO via the rear chase.

CHU HUNG TOWNHOUSE - An Giang **E-102**

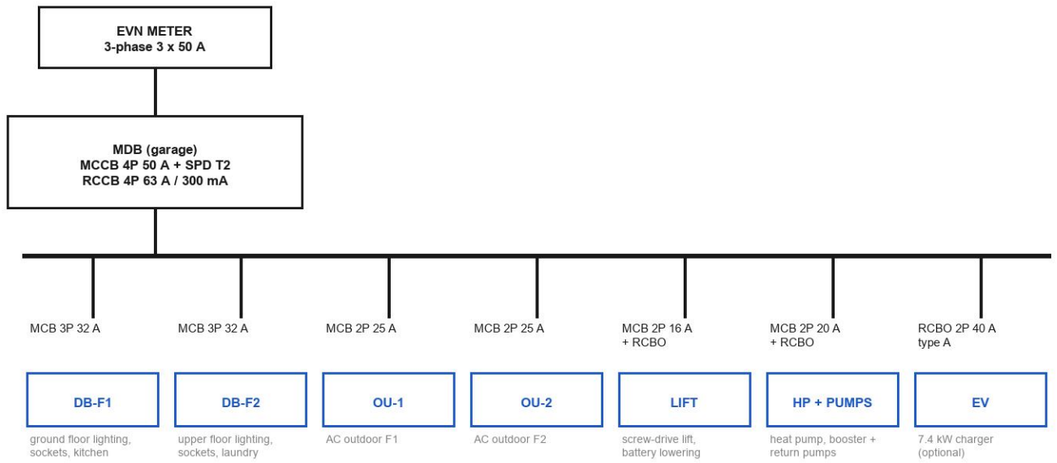
POWER, DATA + LOW VOLTAGE

Dedicated outlets, socket groups, network, CCTV, intercom

MEP CONCEPT - engineer to size and certify

07 Nov 2026 based on the current 3D model

SINGLE-LINE DIAGRAM



Earthing: TN-S, earth electrode < 4 ohm; main equipotential bonding to metal water pipes, the lift frame and shower metalwork.

Phase balance: DB-F1 / DB-F2 / AC / lift / heat pump spread over L1-L3; EV on its own phase.

DB-F1 (ground floor)

CCT	SERVES	PROTECTION
C1	Lighting L1-01..L1-10	10 A RCBO
C2	Lighting L1-11..L1-20 (incl. stair)	10 A RCBO
C3	Sockets living + foyer	20 A RCBO
C4	Sockets kitchen counter	20 A RCBO
C5	Induction hob	32 A RCBO
C6	Oven + microwave	20 A RCBO
C7	Dishwasher + hob downdraft	16 A RCBO
C8	Sockets bedroom 1 + dressing	20 A RCBO
C9	Wet rooms F1 (sockets, fans)	16 A RCBO 30 mA
C10	AC indoor AC-1..3	10 A
C11	Garage, gate, intercom, network	16 A RCBO
C12	Exterior + courtyard lighting	10 A RCBO

DB-F2 (upper floor, laundry)

CCT	SERVES	PROTECTION
C1	Lighting L2-01..L2-12	10 A RCBO
C2	Lighting L2-13..L2-25	10 A RCBO
C3	Sockets bedrooms 2 + 3, altar	20 A RCBO
C4	Sockets master bedroom + desk	20 A RCBO
C5	Sockets master dressing + bath	16 A RCBO 30 mA
C6	Washer	16 A RCBO
C7	Dryer	16 A RCBO
C8	Wet rooms F2 (fans, shaver sockets)	16 A RCBO 30 mA
C9	AC indoor AC-4..7	10 A
C10	Spare x 2	-

CHU HUNG TOWNHOUSE - An Giang **E-201**

SINGLE-LINE DIAGRAM + BOARD SCHEDULES

3-phase 380/220 V, TN-S, 3 x 50 A supply

MEP CONCEPT - engineer to size and certify

07 Nov 2026 based on the current 3D model