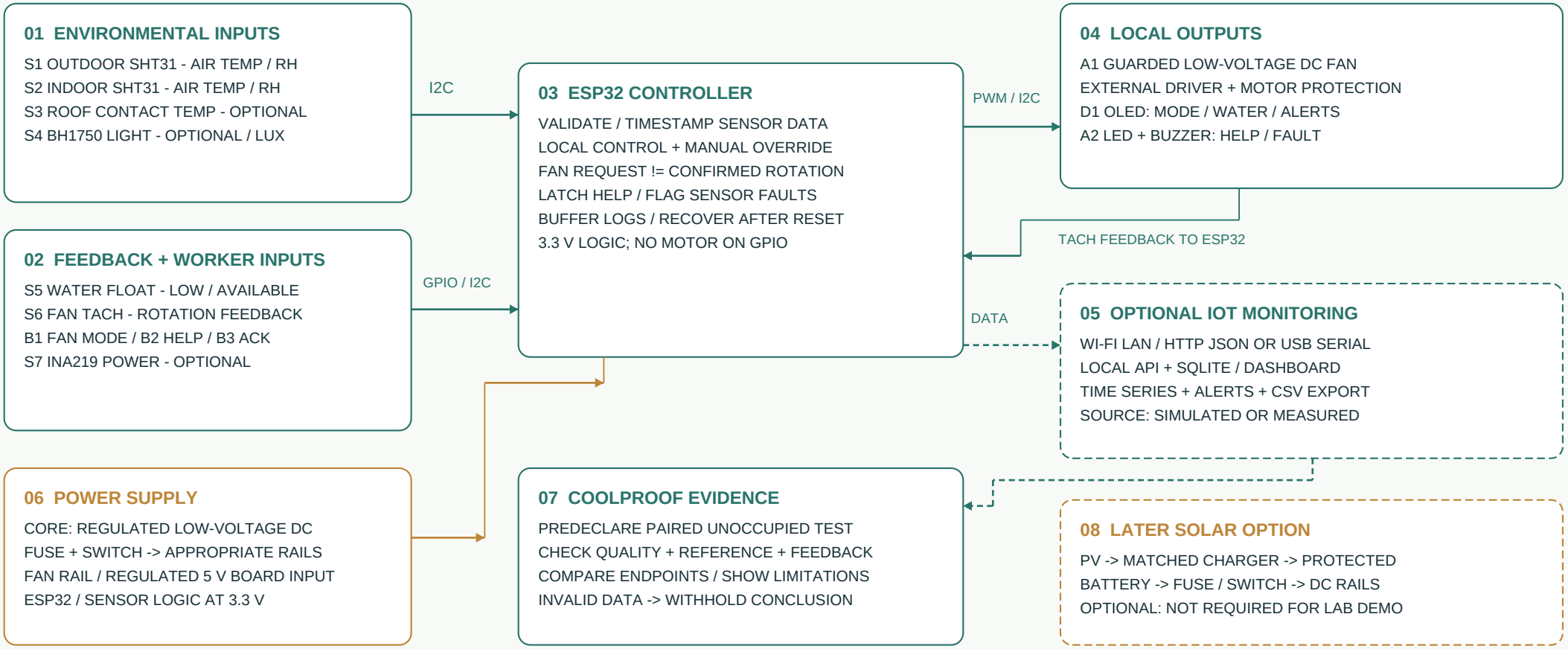
IOT ARCHITECTURE / BLOCK DIAGRAM

CLIMATE-ADAPTIVE SHADE FOR OUTDOOR WORKERS | LOCAL CONTROL FIRST | NETWORK OPTIONAL



DATE: _____ VENUE / TIME: _____ SLOT: _____

STUDENT NAME / REG. NO.: _____

COURSE NAME / CODE: _____

SIGNATURE / DATE: _____

LINES: GREEN = SIGNAL / DATA; AMBER = POWER; DASHED BOX = OPTIONAL OR LATER MODULE.

BLOCK-LEVEL DESIGN: RAIL RATINGS, DRIVER CIRCUIT AND COMPONENT PINOUTS REQUIRE PART-SPECIFIC CHECKS.

3D PRODUCT / COMPONENT PLACEMENT

EXPLODED ISOMETRIC CONCEPT | DIMENSIONS IN MM | ROOF LIFTED / TRANSLUCENT TO REVEAL COMPONENTS

PV SOLAR PANEL [LATER]

R2 WHITE REMOVABLE ROOF

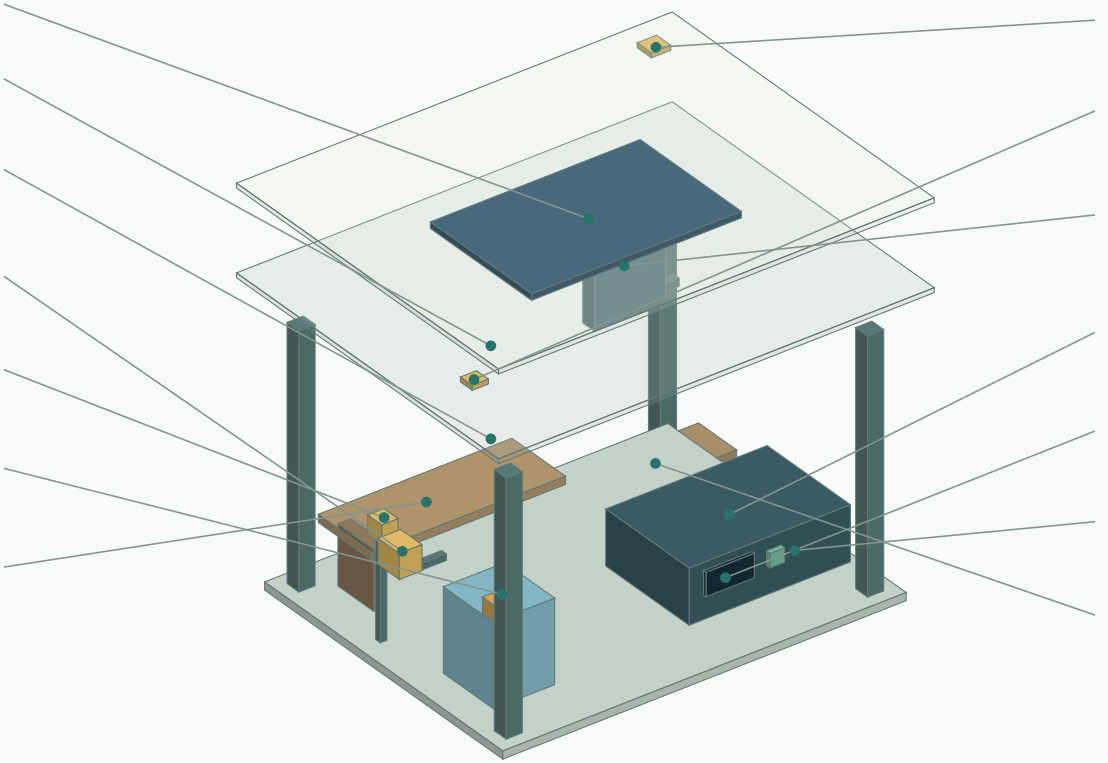
R1 LOWER RADIANT BARRIER

S1 OUTDOOR TEMP / RH

S2 INDOOR TEMP / RH

W1 / S5 WATER + FLOAT

SE BENCH / REST AREA



S4 LIGHT SENSOR [OPTIONAL]

S3 ROOF TEMP [OPTIONAL]

A1 / S6 FAN + TACH

E0 ESP32 ELECTRONICS BOX

D1 OLED / LOCAL STATUS

B1-B3 MODE / HELP / ACK

PWR BATTERY [LATER]

MAIN DIMENSIONS

BASE: 250 X 200 X 5
ROOF: 270 X 220 / PILLARS: 160 HIGH
CLEAR ROOF GAP: 12 / PANEL: 3 THICK
BENCH: 120 X 45 / SEAT TOP: Z = 48
ENCLOSURE: 100 X 70 X 35

PLACEMENT RULES

OUTDOOR SENSOR: SHADED AIR SHIELD
INDOOR SENSOR: OUTSIDE DIRECT FAN JET
GUARDED FAN: TOWARD SEATED AREA
WATER LEFT / ELECTRONICS RIGHT
WIRES: CLIPPED TO FRAME / DRIP LOOPS

MEASUREMENT EXTENSIONS

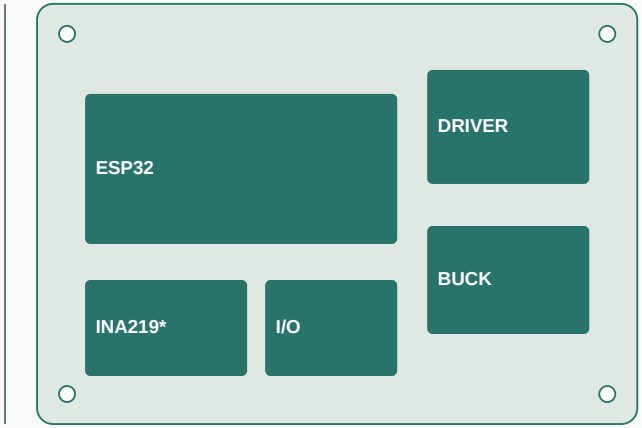
S7 POWER MONITOR: INSIDE DRY BOX
S8 AIR-SPEED METER: AT SEATED ZONE
S9 CALIBRATED WBGT: PILOT ONLY
REFERENCE RIG: SEPARATE MATCHED UNIT
MINIATURE != HUMAN-SCALE VALIDATION

OPTIONAL PARTS ARE SHOWN FOR PLANNING. BOXES REPRESENT COMPONENT ENVELOPES, NOT MANUFACTURER CAD.

ENCLOSURE / WORKING / EXPLANATION

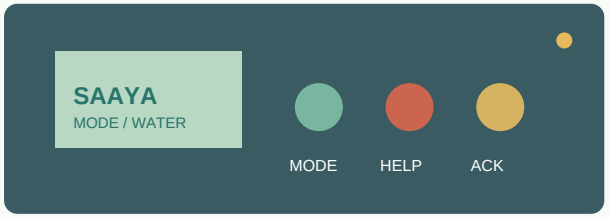
SERVICEABLE DRY ELECTRONICS BAY | FRONT CONTROLS + REMOVABLE LID | COMPLETE LAB EXPLANATION

ENCLOSURE - LID REMOVED / TOP VIEW



2.5 MM WALLS / 4 LID SCREWS / CABLE GLANDS

* OPTIONAL POWER MONITOR. LAYOUT IS NOMINAL.



FRONT: OLED + MODE / HELP / ACK + ALERT INDICATOR

HEIGHT: 35 MM. FIT APERTURES TO PURCHASED PARTS.

WORKING FLOW / DATA COMMUNICATION

1. SENSORS SAMPLE AIR CONDITIONS, WATER AND FAN FEEDBACK.
2. ESP32 CHECKS VALIDITY / AGE; APPLIES LOCAL DEMO RULES.
3. DRIVER OPERATES FAN; OLED SHOWS STATUS; HELP LATCHES ALERT.
4. TACH CHECKS ROTATION. SENSOR FAULTS DO NOT HIDE HELP REQUESTS.
5. SERIAL OR OPTIONAL WI-FI SENDS TIMESTAMPED, SOURCE-TAGGED DATA.
6. COOLPROOF CHECKS PAIRED DATA AND EXPORTS AN EVIDENCE RECORD.

EXPECTED OUTPUT / ONE INNOVATION / ONE LIMITATION

OUTPUT: LIVE READINGS, FAN COMMAND + FEEDBACK, WATER / HELP ALERTS.
INNOVATION: COOLPROOF WITHHOLDS CLAIMS WHEN FEEDBACK OR DATA FAIL.
LIMITATION: TEMP / RH ALONE CANNOT ESTABLISH OCCUPATIONAL HEAT SAFETY.
FAN ROTATION DOES NOT PROVE SEATED AIRFLOW OR HUMAN RECOVERY.
SIMULATED VALUES MUST NEVER BE PRESENTED AS MEASURED RESULTS.

COMPLETE COMPONENT CHECKLIST

CORE: ESP32; 2 X SHT31; FAN / GUARD / TACH; MOTOR DRIVER; OLED;
FLOAT; 3 BUTTONS; LED / BUZZER; REGULATED SUPPLY; FUSE / SWITCH;
FRAME; DOUBLE ROOF; BENCH; SEALED WATER VESSEL; ENCLOSURE / WIRING.
OPTIONAL: ROOF SENSOR; BH1750; INA219; PV / CHARGER / BATTERY;
AIR-SPEED / WBGT INSTRUMENTS; REFERENCE RIG; API / DASHBOARD.

LAB PREPARATION NOTE

REPRODUCE AND EXPLAIN IN YOUR OWN HANDWRITING, ALL CAPITALS.
COMPLETE DURING LAB HOURS AS THE ASSESSMENT SHEET REQUIRES.
PHASE 2: 13 OCT 2026 / 40 MIN / 7 MARKS. FILL ID FIELDS ON SHEET 1.
SOURCE: LAB ASSESEMNT 9 AND 10 R.PDF + APPROVED SAAYA SPEC.

THIS IS AN EDITABLE DESIGN REFERENCE; ENCLOSURE FIT, THERMAL PERFORMANCE AND ELECTRICAL ASSEMBLY ARE UNTESTED.