Category	Item	Details/Notes	Quantity
Microcontrollers	Raspberry Pi Pico W	5 pcs (4 used + 1 spare)	5
Sensors	Smoke sensor	MQ-2 or MQ-135, 5 V supply, output divided to ≤3.3 V for Pico ADC	2
Sensors	Water-leak sensor	Grove-style 3.3 V analog or bare pads + 1 MΩ pull-up	2
Actuators	12 V DC fan	80 mm PC fan or similar, ~0.1–0.3 A	2
Actuators	Active buzzer	3.3 V preferred; 5 V okay with transistor	2
Actuators	High-brightness LED/beacon	Optional + resistor	1 set
Driver & protection	Logic-level N-MOSFET	e.g., AO3400 SOT-23 or IRLZ44N TO-220	6
Driver & protection	Flyback diode	1N5819 or 1N4007 for inductive loads	6
Driver & protection	NPN transistor	e.g., 2N2222/SS8050 for buzzer/relay	6
Driver & protection	Gate/base resistors	100 Ω (MOSFET gate), 1 kΩ (NPN base)	10 each
Driver & protection	Pull-down/up resistors	100 kΩ (MOSFET gate), 1 MΩ (leak pad pull-up), 10 kΩ assorted	10 each
Power	12 V DC supply	≥1–2 A for fan/LED	1
Power	USB 5 V supplies + micro-USB cables	One per Pico W or powered USB hub	4–5 sets
Power	Optional battery	3.7 V Li-Po + 5 V boost or USB power bank	1
Wiring & hardware	Solderless breadboards + jumpers / breadboards	Male/male jumpers	Few sets - at least 3
Wiring & hardware	Pin headers (male)	For Pico W	5 sets
Wiring & hardware	JST-PH 2-pin connectors/cables	For battery/12 V options	as much required
Optional UX	Status LEDs	3.3 V + 1 kΩ resistors on each node	6 to 10
Optional UX	Small piezo beeper	3.3 V for local node chirps	2