



We respect the ocean before we touch it.

Smart X begins where water begins — in the sea.

Designed around restraint, responsibility, and respect,
Smart X interacts with the ocean carefully and deliberately.

Marine-safe intake systems reduce flow velocity, protect marine life,
and preserve suringing ecosystem.

Marine-safe Intake • Low velocity flow • No ecological disturbance

Nothing uncontrolled moves forward.



SMART X

Before seawater reaches advanced treatment,
it passes through multiple physical protection barriers.



Coarse screening · Self-cleaning filtration · Ultrafiltration (UF)

The system knows the water before humans touch it.

Snap-Id continuously analyzes water quality and performs automated deep analysis every night at 03:00. Deviation is detected, verified, and acted upon before water is distributed.

Conductivity
▶ 1131 $\mu\text{S}/\text{cm}$

Terductivity

0.05 NTU_{ME}

Microbiology

E. coli, Cryptosporida, 0 Cm
Coliform, 0 CFU

03:00

Continuous sensing · Automated verification · Fail-safe logic

Physics, perfected.

High-efficiency seawater reverse osmosis removes salt, fluoride, arsenic, heavy metals, and dissolved contaminants. Integrated energy recovery maximizes efficiency while maintaining full membrane integrity control.



SWRO • Energy recovery

Continuous integrity monitoring

Pure is not enough. Stable matters.

Smart X restores mineral balance, stabilizes pH,
and applies final UV disinfection.

The result is water that is safe for people, pipes,
and long-term distribution.



Remineralization • UV disinfection • Distribution protection

Infrastructure that disappears into daily life.

Smart X integrates directly into buildings — from schools to skyscrapers.

Every apartment receives centrally verified water with final Snap-On protection at the kitchen tap.

— Snap-On Mule

Central purification • Apartment-level safety • Invisible reliability

Efficiency without compromise.

Potable and non-potable systems are fully separated.

Toilet water is distributed through a dedicated gravity-fed loop with zero cross-connection risk.



Non-Potable Water

Potable Water

Separate risers • Gravity distribution • Zero cross-connection

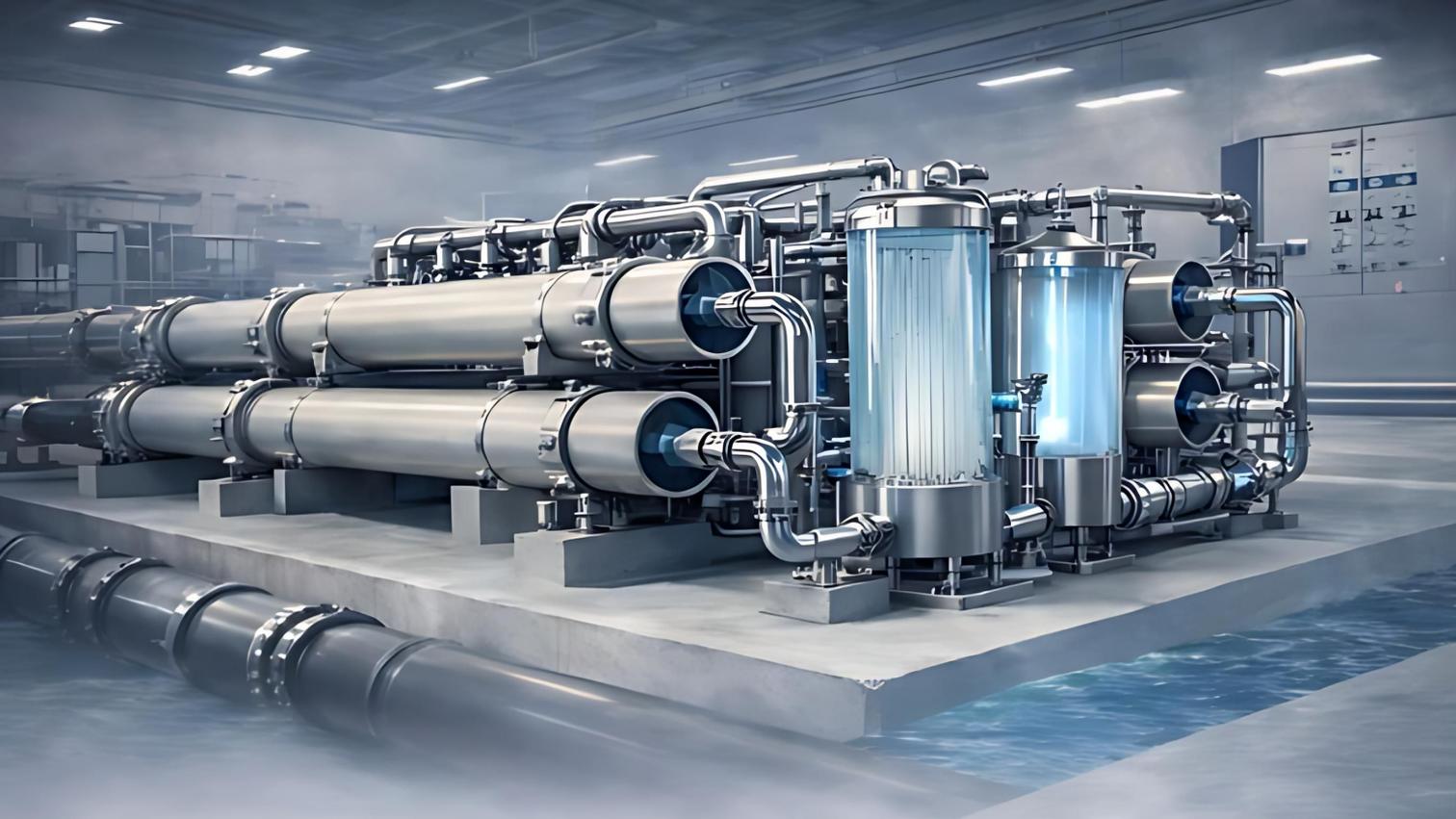
What we borrow, we return responsibly.

Energy is recovered before discharge.

Brine is returned to the ocean through engineered diffusers,
ensuring rapid dilution and environmental compliance.



Separate risers · Gravity distribution · Zero cross-connection



Verified water. Responsible infrastructure.

Smart X Ecosystem is a scalable platform for water security—
intelligent by design, fail-safe by default, and respectful to the environment.
Water is too important to leave to assumptions.



Energy recovery · Controlled discharge · Environmental responsibility



1 School – 100–200 People (5–10 m³/day)

Rectangular footprint (L x W): 4.0 m x 3.5 m (14.0 m²)

Clear ceiling height ≥ 2.7 m clear:

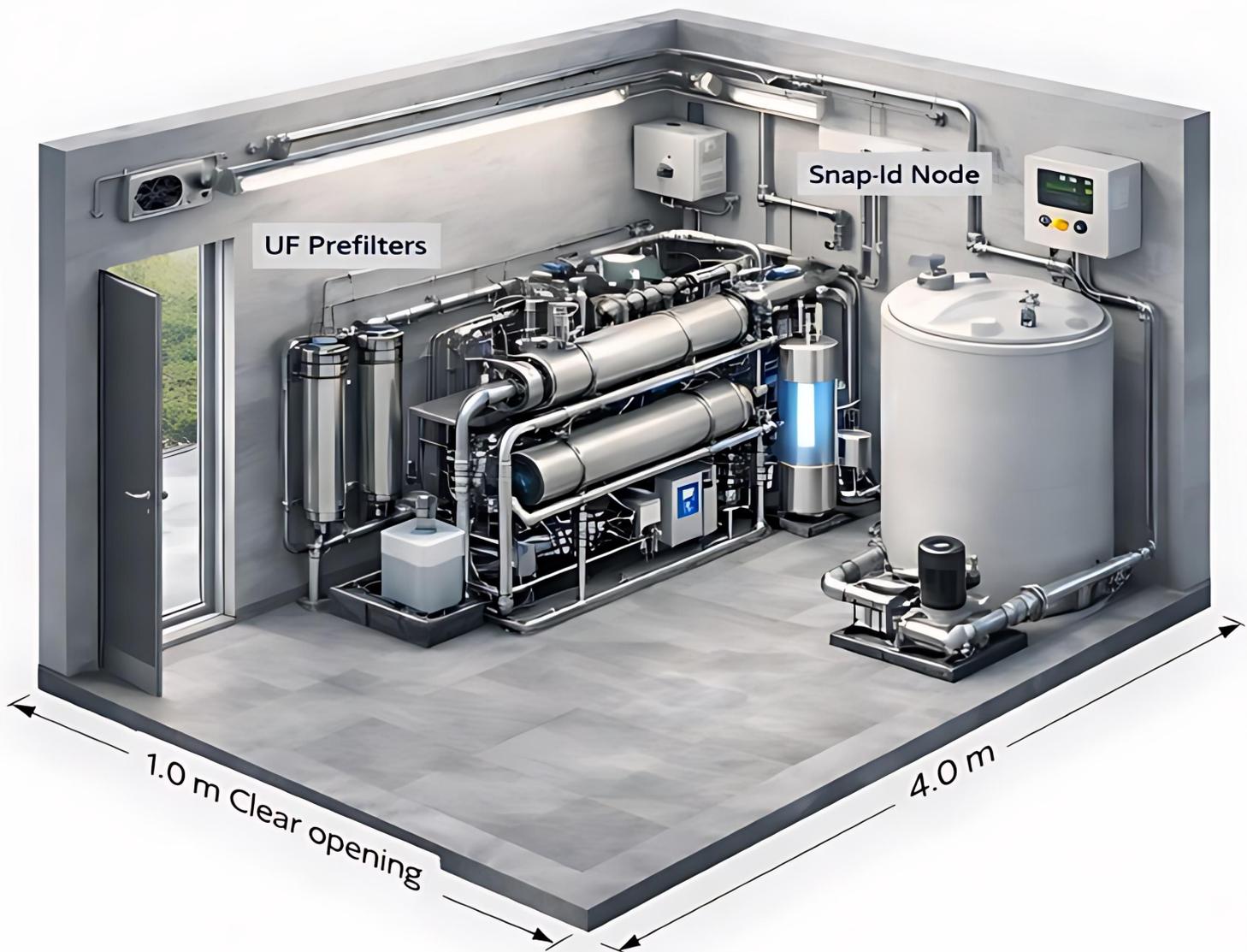
Door / access: 1.0 m clear opening door (preferred 1.2 m);
direct exterior access if possible.

Primary layout intent Single-skip compact layout; prioritize simple
service access and short pipe runs.

Suggested equipment zoning (plan view): 4.0 m x 3.5 m (14.0 m²)

≥ 2.7 m Clear ceiling height:

1.0 m clear opening door (preferred 1.2 m);
direct exterior access if possible.



1 School – 200–500 People (10–25 m³/day)

Rectangular footprint (L × W): 5.5 m × 4.0 m (22.0 m²)

Clear ceiling height ≥ 2.9 m clear

Door / access 1.2 m clear opening (preferred double-leaf 1.6 m);
direct access route

Primary layout intent Two-skip layout with defined wet and dry zones;
allows for standby RO and larger buffer tank.

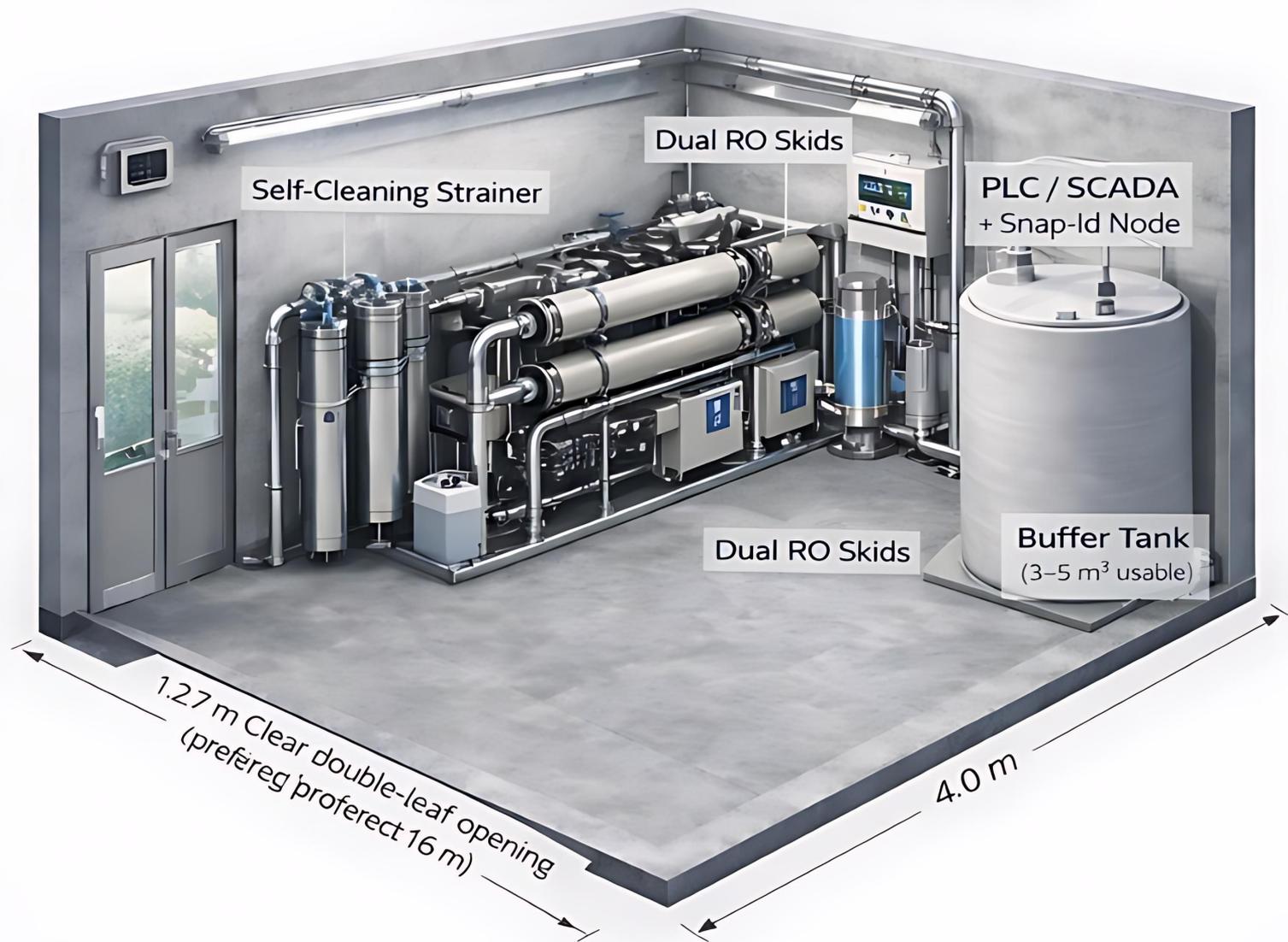
Suggested equipment zoning (plan view): 5.5 m × 4.0 m (22.0 m²)

≥ 2.9 m clear ceiling height; ≥ 2.7 m operiaf2.2.5 m*

1.2 m clear opening (preferred double-
6.6'1.6);direct access route.

Dry zone near entrance: PLC/SCADA + Snap-Id Node: sampling manifold (sleeper-splash-protected)

Tank zone: 3–5 m³ buffer tank (often best outside adjacent to room) with short header penterations.



1 Apartment Building – 50 Apartments (25–40 m³/day)

Rectangular footprint (L × W): 8.0 m × 4.5 m (36.0 m²)

Clear ceiling height ≥ 3.2 m clear

Door / access Double-leaf 1.6–1.8 m recommended; include straight-line removal path for RO membranes/vessels; direct access route.

Primary layout intent Modular plant room with separated pretreatment and high-pressure RO zone; include CIP corner and service bay.

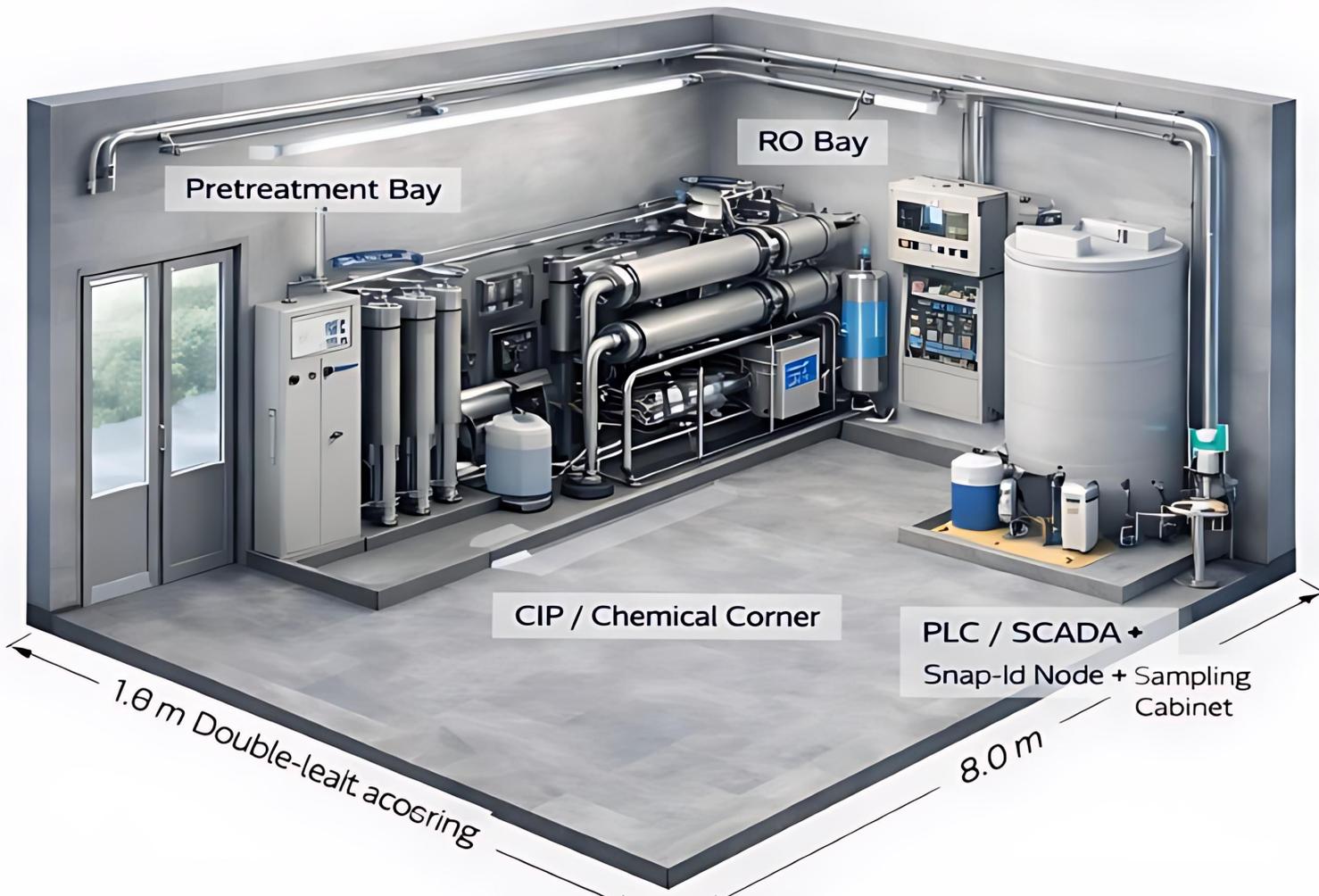
Suggested equipment zoning (plan view): 8.0 m × 4.5 m (36.0 m²)

≥ 2.5 m Clear ceiling Height:

Pretreatment strainers (w/nt) AL tnpw, Floor drain nearby.

RO bay (Wall B): 2 SWRO trains + ERD pipe on plinths with vibration isolation.

CIP/chemical corner: PLC/SCADA + Snap-id Node + Sampling Cabinet
Buffer Tank Header Wall (8–12 m² outside zone...)



I Apartment Building – 100 Apartments (50–80 m³/day)

Rectangular footprint (L x W) 10.0 m x 5.5 m (55.0 m²)

Clear ceiling height ≥ 3.2 m clear

Door / access Double-leaf 1.8 m preferred + overhead lifting point/ monorail for membrane service

Primary layout intent Three-train layout with N+1 philosophy; provide dedicated service corridor and clear separation of wet/dry areas.

Suggested equipment zoning (plan view): 10.0 m x 5.5 m (55.0 m²)

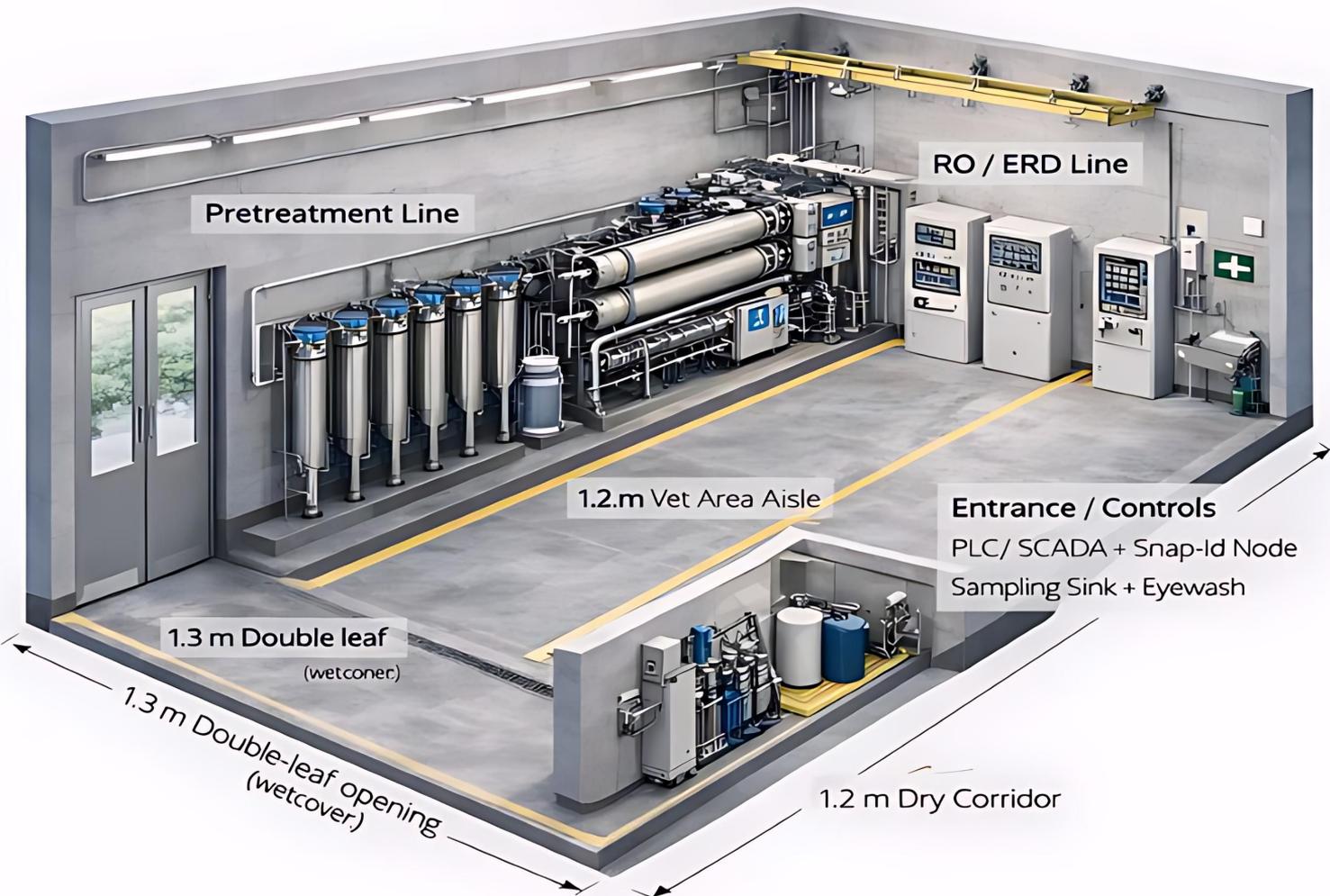
Pretreatment Line: multi-UF racks (Wall A) with 1.2 m service aisle and direct drain trench

RO/ERD line: 3 SWRO trains (Wall B/C) with shared permeate header and brine header.

CIP roomette or bay; separate 2.0 m x 2.0 m bay (*within footprint*) for CIP tanks and chemical dosing (bunded).

Controls & Snap-Id:

Entrance / Controls; near entrance with 1.0 m electrical clearance; include sampling sink and eyewash.



1 Apartment Building – 200 Apartments (90–120 m³/day)

Rectangular footprint (L x W) 12.0 m x 7.5 m (90.0 m²)

Clear ceiling height ≥ 3.6 m clear

Door / access Double-leaf 1.8–2.0 m + dedicated equit delivery route; recommend monorail/gantry for vessel handling

Primary layout intent Four-train plant room designed for continuous operation during maintenance; include service bay for swap-out skids.

Suggested equipment zoning (plan view): 12.0 m x 7.5 m (90.0 m²)

Pretreatment hall: multi-rack UF redundant backwash pumps; 1.2 m aisles both sides where cartridges are serviced.

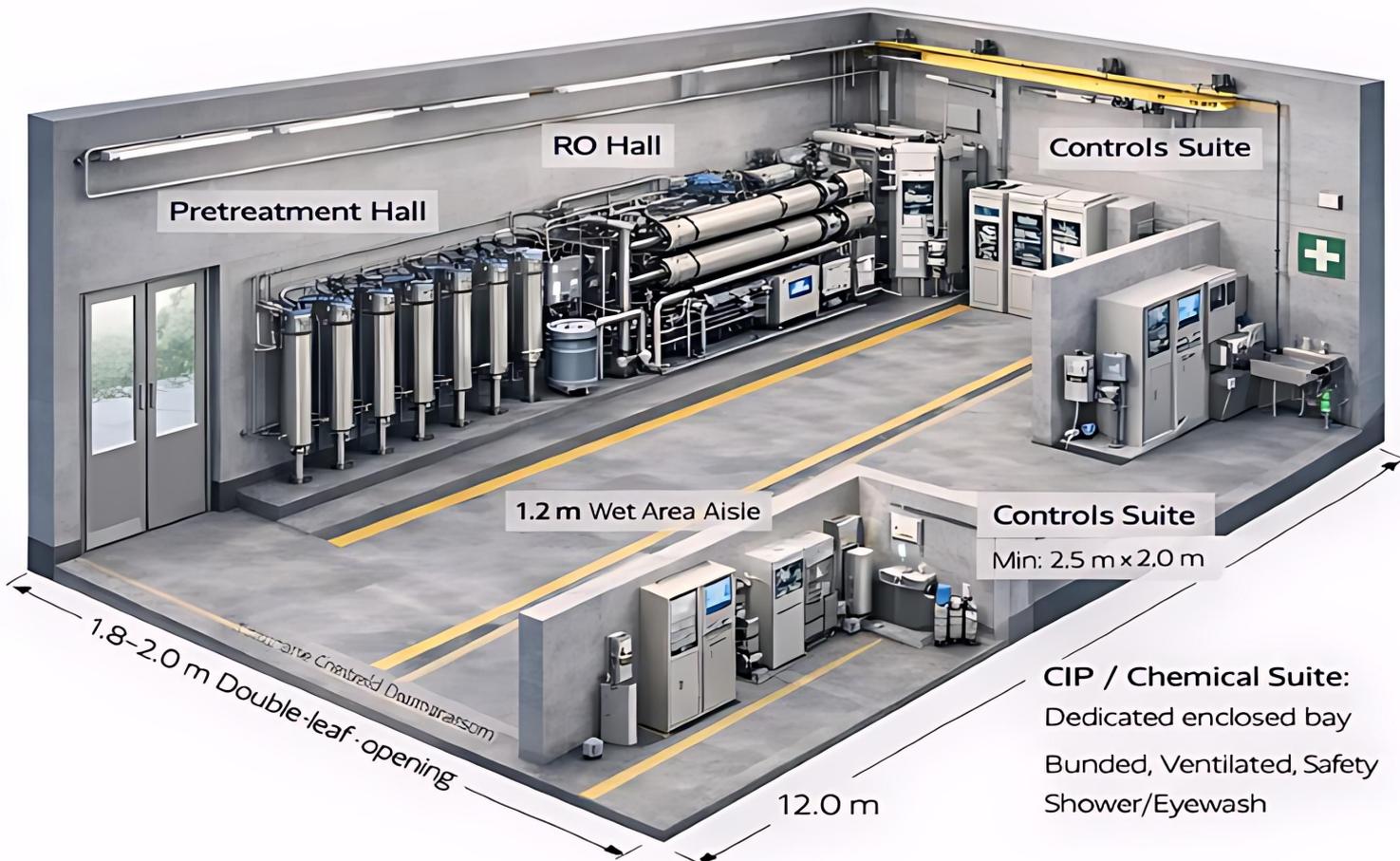
RO Hall: 4 SWRO trains (3 duty – 1 standby) + ERDs; keep straight pipe runs and common headers.

CIP/Chemical suite: dedicated enclosed bay (min 3.0 m x 2.5 m) with bunding, ventilation, safety shower/eyewash.

Controls & Step 4s

Controls suite: separate dry alcove (min. 2.5 m x 2.0 m) fo PLC/SCADA, Snap-Id servers UPS.

Tank strategy: 25–30 m³ potable buffer tank + roof toilet break tank; potable tank often in adjacent tank room or outdoors.



CIP / Chemical Suite:
Dedicated enclosed bay
Bunded, Ventilated, Safety
Shower/Eyewash

Suggested Rectangular Tank Room Add-On

When buffer tanks are placed indoors. Smart X recommends a dedicated rectangular tank room adjacent to the process room.

- safe access to tank manways
- controlled drainage and waterproofing
- clean separation from process equipment

A minimum 1.0 m clearance is maintained around tanks for inspection and maintenance.

Typical Indoor Tank Room Sizes

Scale	Typical Buffer Tank Volume	Add-On Tank Room (L x W)
School 100-200	1-2 m ³	2.0 m x 2.0 m
School 200-500	3-5 m ³	3.0 m x 2.5 m
50 Apartments	8-12 m ³	4.5 m x 3.5 m (15.8 m ²)
100 Apartments	15-20 m ³	5.5 m x 4.0 m (22.0 m ²)
200 Apartments	25-30 m ³	6.5 m x 4.5 m (26.5 m ²)



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• School 200-500	3-5 m ³	3.0 m x 2.5 m	3.0 m x 2.5 m (7.5 m ²)
• 50 Apartments	8-12 m ³	4.5 m x 3.5 m	4.5 m x 3.5 m (15.8 m ²)
• 100 Apartments	15-20 m ³	5.5 m x 4.0 m	5.5 m x 4.0 m (22.0 m ²)
• 200 Apartments	25-30 m ³	6.5 m x 4.5 m	6.5 m x 4.5 m (26.5 m ²)

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Smart X Ecosystem is a scalable platform for water security – intelligent by design, fail-safe by default, and respectful to the environment.

From schools to skyscrapers, Smart X delivers verified drinking water through engineering, not assumptions.

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www.smartx.eco