

VRF vs Chilled Water Selection Checklist

A working checklist for choosing between VRF and chilled water on a commercial or high-rise project, including where district cooling is available. Tick each item once confirmed and note the source (manufacturer data, design basis, client brief).

Project	Date
Location	Prepared by

1. Load and scale

☐	Actual peak cooling load confirmed from the load calculation (not a rule-of-thumb TR per area).	
☐	Part-load profile understood: how many hours the plant runs well below peak.	
☐	Number of zones and tenant-level control requirement identified.	
☐	No decision made from TR or floor count alone.	

2. Space and access

☐	Outdoor-unit or plant space confirmed on the architectural drawings (roof, podium, plant room).	
☐	Clear airflow and service access around outdoor units; no crowded roof that can cause recirculation.	
☐	For chilled water: plant room, chillers, cooling tower or air-cooled option, and riser space confirmed.	
☐	Crane, lifting and replacement routes for the largest equipment checked.	

3. VRF refrigerant piping (if VRF is shortlisted)

☐	Maximum refrigerant pipe lengths and level differences checked against the manufacturer's design manual.	
☐	Outdoor units needed at multiple levels? If so, locations and access confirmed.	
☐	Total refrigerant charge per system and per occupied space calculated.	
☐	Leak detection, ventilation and safety design checked against the current ASHRAE 15 edition and local code (confirm the clause yourself).	

4. Gulf and hot-climate conditions

☐	Selected outdoor unit's available capacity read at the project design ambient, not its nominal TR.	
☐	Effect of unit layout on the real operating condition (heat from neighbouring units, airflow) reviewed.	
☐	Water-cooled or air-cooled chiller selection checked at the same design ambient.	

5. District cooling (if available)

☐	Availability, connection capacity and tariff basis confirmed with the provider.	
☐	Energy transfer station scope and space identified early.	

☐	Building-side water equipment, controls and maintenance responsibilities listed. The building still needs its own.	
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6. Fresh air and ventilation

☐	Fresh-air requirement quantified and how each option delivers it (AHU, dedicated outdoor air system).	
☐	Humidity control need for the space types checked.	

7. Redundancy and critical areas

☐	Critical areas listed (healthcare, food, IT, other) with their ventilation, temperature, hygiene and uptime requirements.	
☐	Redundancy and failure response designed for critical areas: what happens when a unit, pump or chiller fails.	
☐	System not selected solely because one option is cheaper per TR.	

8. Operation and maintenance after handover

☐	Who will maintain the system named, and their skills checked for this manufacturer's controls, fault codes and refrigerant procedures (VRF).	
☐	For chilled water: pumps, valves, strainers, controls and water-side balancing ownership confirmed.	
☐	Commissioning records and O&M documentation requirements written into the specification.	
☐	FM team training included in the scope.	

9. Cost comparison

☐	Comparison built from a comparable scope: plant or district-cooling connection, ventilation, controls, pipe routes and maintenance access all included.	
☐	No single per-TR figure used as the basis of the decision.	
☐	Maintenance and replacement over the building's life considered, not only capital cost.	

10. Decision record

Leaning towards: ☐ VRF ☐ Chilled water (own plant) ☐ District cooling ☐ Undecided	
Main reason:	
Open items to resolve:	
Approved by / date:	

This checklist supports engineering judgement and does not replace design calculations, manufacturer data, project specifications or applicable codes and standards. Verify every standard clause and equipment limit against the current edition and the manufacturer's documentation before relying on it. More practical MEP guides and tools at buildmep.com.