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Capital Assessment & Mechanical Systems

Representative Work Sample

The following pages are excerpted from an actual portfolio assessment prepared for a multifamily affordable and senior-housing owner. Client and property names, locations, pricing, and equipment serial numbers have been removed to protect the client's confidential information. The content otherwise reflects the original assessment as written.

Portfolio assessment summary

This proposal is the result of comprehensive site assessments conducted across the portfolio, supplemented by detailed equipment inventory review, on-site staff interviews, and field condition documentation. The portfolio presents significant and, in several cases, urgent HVAC capital needs. Multiple central chiller plants are non-operational or operating in a critically degraded state heading into cooling season, posing immediate habitability risk to occupied elderly and affordable-housing residents. Additional near-term replacement needs exist across virtually every property, driven by equipment age, coastal corrosion, deferred maintenance, and the R-22 refrigerant phase-out now fully in effect. Recommendations are sequenced around habitability risk and equipment lead times.

Representative property

The following is a single property from the assessment, with identifying details removed. It is an 82-unit mid-rise built in 2012, served by two 80-ton air-cooled scroll chillers providing cooling to all apartments and common areas through a central chilled-water loop with in-unit fan coil units. Chiller 1 is completely non-operational and requires full replacement. Chiller 2 is operational but has a variable-frequency drive that overheats and shuts the chiller down intermittently, along with severely deteriorated condenser coils.

Equipment inventory and condition

System	Equipment	Qty	Condition	Recommendation
Central chilled-water plant	Air-cooled scroll chiller, 80T (Ch-1)	1	Failed	Full replacement; non-operational, approximately 30-week equipment lead time.
Central chilled-water plant	Air-cooled scroll chiller, 80T (Ch-2)	1	Degraded	Condenser coil replacement and variable-frequency drive replacement.
Air distribution	Blower-coil air handlers	2	Not assessed	Not accessible during this assessment; flagged for follow-up scope.
Hydronic piping	Mechanical-room pipe insulation	1	Degraded	Re-insulation of water lines (time & materials).
In-unit terminal	Chilled-water fan coil units	82	Degraded	Replacement integrated with the chiller scope.

Chiller and fan coil replacement scoped together

At properties served by a central chilled-water plant feeding in-unit fan coil units, replacement of the chiller plant and the fan coils it feeds is recommended together. Replacing chillers without replacing the fan coils they feed rarely delivers the intended capital outcome, for four reasons.

System performance is gated by the fan coils. A new chiller produces precisely controlled chilled water, but in-unit comfort depends on the terminal unit in each apartment. Fouled coils, worn blower motors, deteriorated drain pans, and weak control valves prevent the new chiller's capacity from translating into in-unit cooling.

Operating efficiency is compromised. High-efficiency chillers are engineered to operate across a specific load profile. Aged fan coils with fouled coils force the chiller to produce colder leaving water and to run outside its efficiency envelope, eroding the energy savings that justify the investment.

Old equipment contaminates new equipment. Accumulated scale, biofilm, and corrosion debris in old fan coil coils and loop piping are mobilized when a new chiller is brought online at higher flow rates and updated water chemistry. Concurrent replacement allows the loop to be flushed, treated, and commissioned as a single integrated system.

Mobilization and tenant-disruption costs are largely shared. Rigging, crane access, mechanical-room work, loop draining and refilling, controls recommissioning, and tenant-notice cycles overlap between chiller and fan coil work. Performing both concurrently reduces total project cost and minimizes disruption to occupied units.

The chiller plant and all 82 fan coils at this property are accordingly scoped as a single project.

Recommended scope

Scope item	Qty
Full 80-ton chiller replacement (Ch-1, non-operational). OEM like-for-like, including rigging, piping, start-up and commissioning.	1
Condenser coil replacement on Ch-2 (operational): refrigerant recovery, coil swap, recharge and start-up; water-only cleaning, no corrosive chemicals.	1
Variable-frequency drive replacement on Ch-2, OEM direct swap with start-up and commissioning.	1
Re-insulation of mechanical-room water lines (time & materials).	T&M
In-unit fan coil replacement, integrated with the chiller scope.	82

Equipment protection and ongoing maintenance

Given coastal exposure across much of the portfolio, two provisions are recommended at every chilled-water property to protect the capital investment. All air-cooled chiller replacements are furnished with factory-applied corrosion-resistant coil and cabinet coatings rated for severe coastal duty; these add a single-digit percentage to equipment cost and typically extend air-side coil life by 8 to 12 years. At one property, uncoated condenser coils were observed flaking to the touch within twelve years of installation. Concurrently with replacement, the entire chilled-water loop is flushed, chemically cleaned, and brought to a clean operating baseline before commissioning, with an ongoing quarterly water-quality monitoring program recommended.

Where chiller lead times extend through cooling season, temporary cooling is available as an additive scope, including trailer-mounted rental chillers tied into the existing loop, in-unit portable units for vulnerable residents, and supplemental common-area cooling. An ongoing maintenance program is recommended following replacement: quarterly chiller plant checks, quarterly water-quality sampling, semi-annual condenser coil cleaning, an annual preventive-maintenance shutdown with refrigerant leak testing and EPA Section 608 documentation, and annual fan coil service.

Refrigerant and code compliance

R-22 refrigerant phase-out. R-22 was permanently banned from production and import in the United States effective January 1, 2020. As of 2026 it is available only from existing stockpiles at substantially elevated prices, and any system still operating on it faces increasingly difficult and expensive service. This portfolio carries a significant concentration of R-22 equipment; at one property, 71 residential condensing units are confirmed R-22 from a single installation cycle. All R-22 equipment is recommended for replacement, and all new residential equipment specified uses R-32.

R-410A refrigerant phase-out. R-410A, the refrigerant in every existing chiller across the chilled-water properties, is subject to phasedown under the AIM Act and the EPA Technology Transitions Rule. Effective January 1, 2025, the EPA prohibits manufacture and import of new equipment using refrigerants with a GWP above 700. R-410A has a GWP of 2,088, and new R-410A chiller production has ended. All new chiller equipment specified uses R-454B (GWP 466) or R-32 (GWP 675), both compliant with current and anticipated AIM Act regulations.

Conditions outside HVAC scope

Several conditions identified during the site assessments fall outside HVAC scope but warrant ownership attention, and are consolidated here for visibility. At one property, an aging electrical transformer requires replacement; if it fails before replacement, the building cannot be reconnected without completing the full electrical scope first, resulting in loss of HVAC capacity regardless of the equipment installed. An active pest infestation was observed at one property and pest-related attic ductwork damage at another. A significant sewage and drainage backup at a third property creates flooding risk that directly threatens the property, tenants, and longevity of new equipment. Full plumbing and pest inspections across the portfolio are recommended.

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