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MISSION-CRITICAL DATA CENTER

Custom Air Handler Noise Control

Using baffled plenum silencers to mitigate exhaust noise from custom air handlers

A new mission-critical data center used dozens of custom air handlers for facility cooling, some of which were creating non-compliant levels of exterior noise. Parklane was called in by the owner's engineering and construction team to help bring the facility into compliance, but with an important caveat: We would need to take steps throughout the mitigation process to maintain the already compressed construction schedule.

The Project Facility

A mission-critical data center located near a densely populated urban area

The Noise Source

Custom Air Handlers

The Solution

PMA CF Plenum Silencers

Project Team

Data Center Constructor
Architect / Mechanical Engineer
Acoustic Consultant

Reason for Mitigation

Provincial ordinance; Compliance with local regulatory limits for exterior noise emissions

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The Challenge

We were tasked with attenuating noise from the large custom air handlers in a short period of time—in this case by effectively integrating our solution to the exhaust air section of the new AHU's. That meant factoring in everything from air dispersion challenges to spatial limitations (the exterior air handlers were tightly packed), along with various architectural, structural and mechanical issues that arose throughout the construction process.

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The Solution

We implemented a custom baffled plenum silencer to mitigate discharge air noise from the air handlers.

The design required close collaboration with the equipment OEM to ensure the equipment functioned and remained serviceable after the addition of our sound attenuation components. This included integration of the AHU's weather hood and modulating damper assembly to the new silencer design. To support the additional gravity and wind loads, our structural team coordinated a low-profile structural solution that embedded into the body of the AHU to conserve space between the units.

To accommodate the positioning of the AHUs (which were situated partially outside the building), the custom design incorporated an offset in the plenum and baffled sections to maintain airflow and maximize acoustic performance. We then worked closely with the building envelope designer to ensure the delivered solution was watertight.

The end solution was closely coordinated within the site BIM model by the Parklane CAD Team to ensure all major site integration elements were addressed.

Agile Approach

Once the design was complete, our agile engineering and trades team completed the full turnkey delivery of the new silencer arrangements. This required close coordination with hundreds of other contractors working on-site to avoid facility start-up disruptions.

The Parklane Team's technical agility was further called upon for other on-site technical challenges that arose, unrelated to the sound attenuation scope. A few to note were critical alterations to a structural racking system for cable trays that would accommodate additions to the facility's electrical system.

As thermal challenges emerged, we provided temporary heat shields for a series of generator exhaust stacks to facilitate expedited commissioning. We also engineered, fabricated and installed an entire network of maintenance catwalks for the generator farm and managed a portion of the supply chain to expedite acquisition of building envelope materials.

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Existing OEM Weather Hood
with integral damper
New design to interface/support
with hood

PMA Plenum Silencer
Attentuates Exhaust Fan Noise

Existing Custom AHU
Casing to support silencer

Modular Access Plenum
Provides complete access
for maintenance staff

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The Result

The air handler noise issue was attenuated within the specified performance parameters, and Parklane's turnkey implementation process was successfully deployed to maintain the project's critical path schedule. Our team also acted as an agile construction partner, playing a vital role in mitigating a range of technical challenges that helped keep the project on track.

Designed Performance

Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
Required (dB)	-	10	19	20	25	22	15	-
Insertion Loss (dB)	15	18	24	30	38	29	24	14
Volumetric Flow Rate, Q (CFM)	**61875**							
Linear Flow Rate, V (FPM)	**520**							
Pressure Drop, PD (in. wg)	**0.02**							

Noise Control Simplified

We're dedicated to your success. Whether working with industry, acoustic engineers and consultants, or contractors, we’re committed to providing effective solutions to noise and vibration challenges—no matter the size or scope.

+01 (905) 844-5020
1180 Speers Rd, Oakville, ON
Canada L6L 2X4

parklanemechanical.com

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