

A DISCHARGE PLENUM SILENCER CASE STUDY

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## Silencer and acoustic barrier solution caps noise for a condominium air cooled chiller

A condominium in a dense part of downtown Toronto was struggling with major noise emissions from a new, air-cooled chiller. Its constant rattle and tonal hum were causing problems for locals and residents who could hear the chiller even with their windows shut. The property manager faced a raft of complaints from abutting neighbors, resulting in forced action imposed by the city's by-law department.

### **Project Facility**

High Rise Condominium

### **Noise Source**

Air Cooled Chiller

### **The Solution**

Discharge plenum silencer and a perimeter acoustic barrier

### **Project Team**

Property Management Company  
Acoustic Consultant HGC

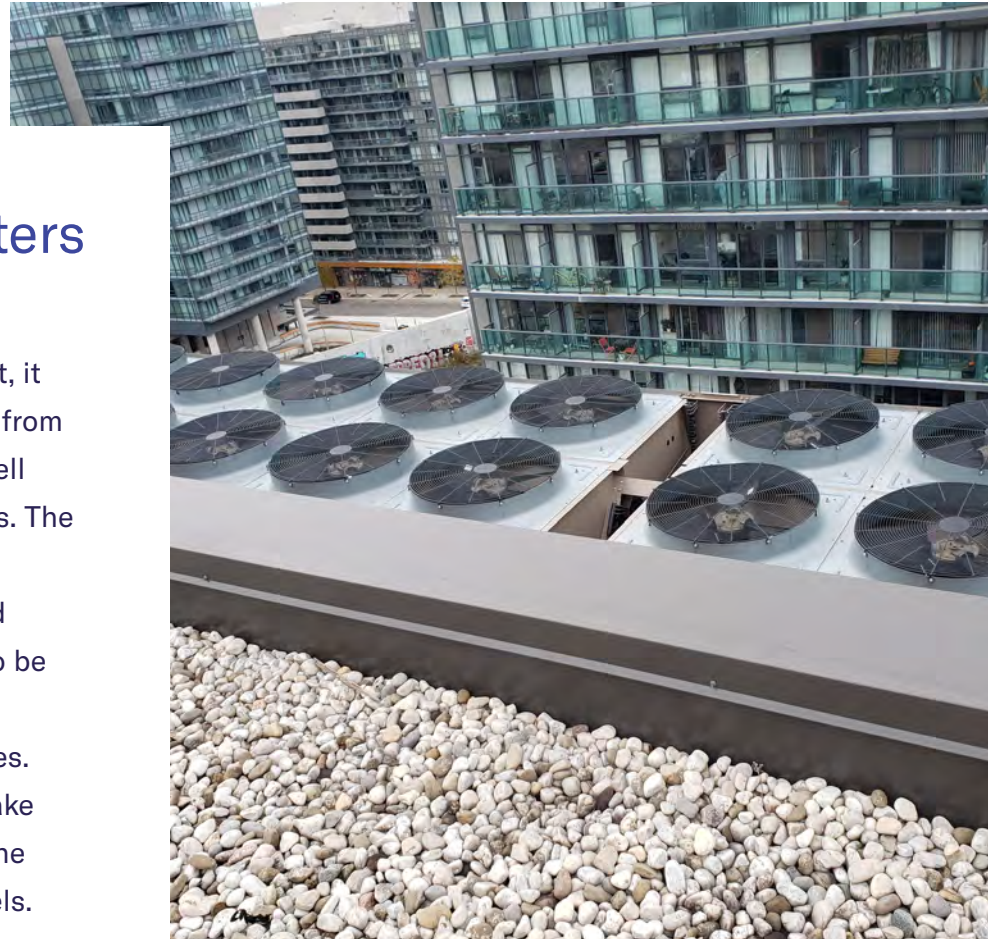
### **Reason for Mitigation**

Municipal Noise Bylaw



## Stringent Parameters

Collaborating with the acoustical consultant assigned to the project, it became obvious that noise levels from the chiller were significant and well outside acceptable acoustic limits. The consultant conducted extensive testing and discovered that sound levels from the unit would need to be lowered to 53 decibels from 71 to comply with local noise ordinances. The solution design also had to take into account the tonal nature of the equipment's operating sound levels.



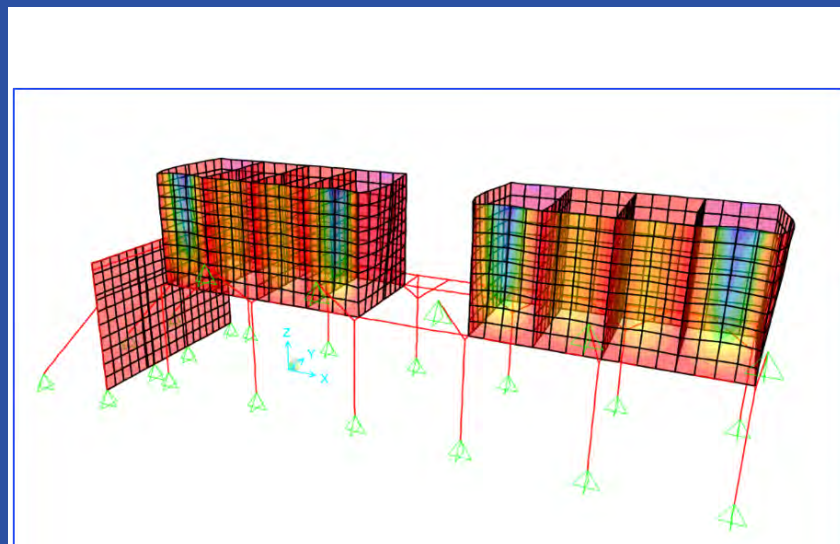
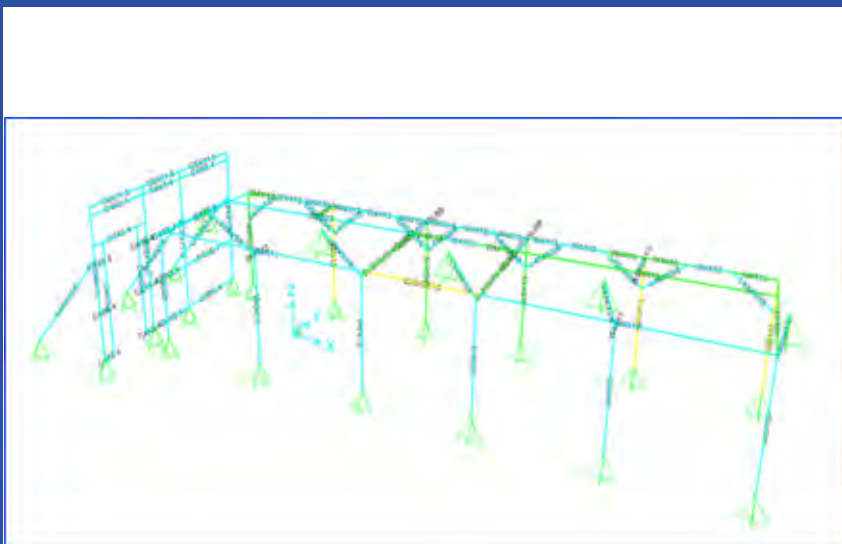
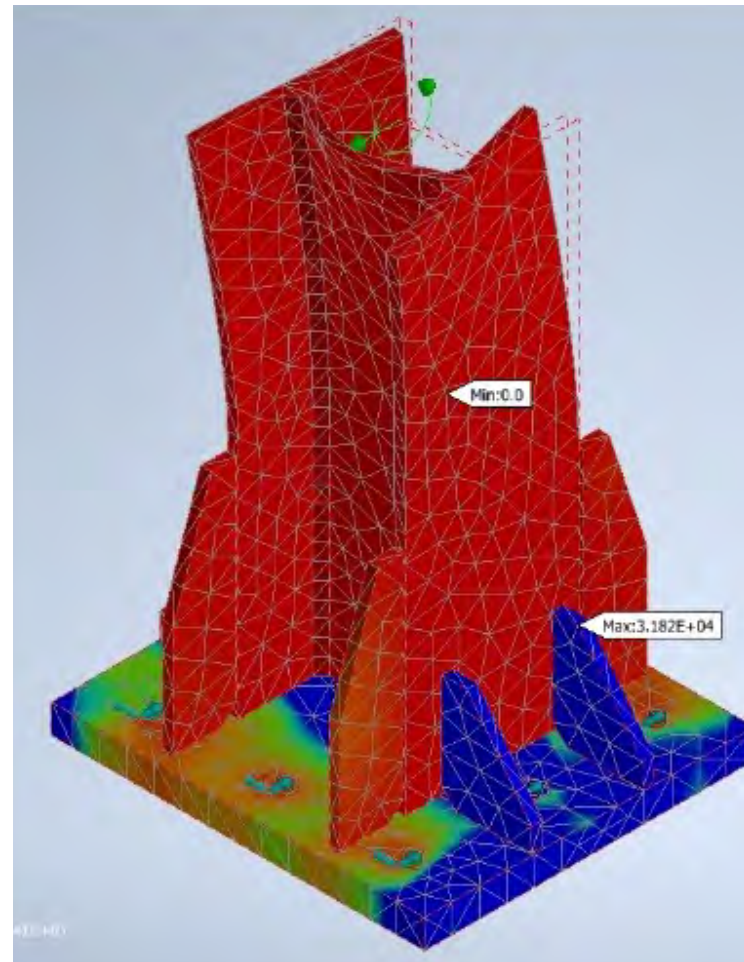
## Location

The downtown location created significant logistical constraints around the site. Access was limited, and the high rise building had residents who needed 24-hour access to the complex. Our team worked with city officials to schedule road closures, while limiting traffic and carefully managing crane time. Parklane designed the entire solution in a modular fashion to dramatically reduce the need for on-site fabrication.

## Building Capacity

Because of the retrofit nature of the project, the solution design had to work within the weight capacity of the building and available space for implementation.

Given the building's proximity to Lake Ontario, significant wind loads also needed to be accounted for. The uniquely designed operational array made effective use of the strongest parts of the building structure to avoid any intrusive enhancements or additional support requirements.



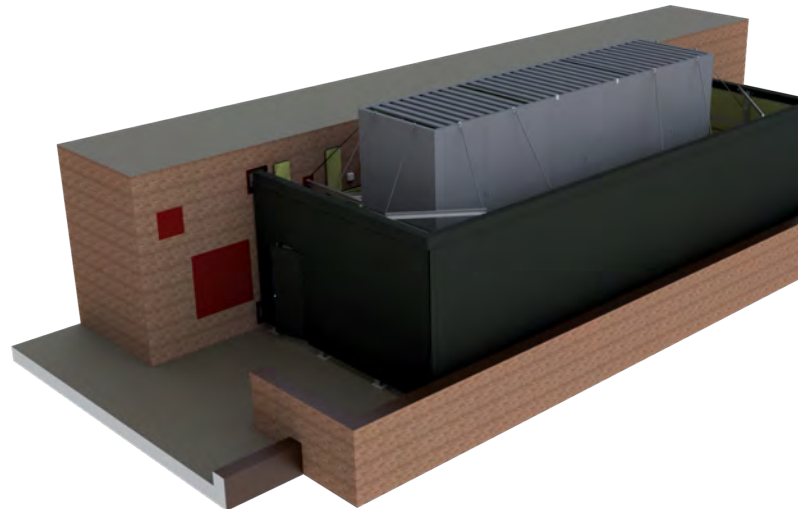
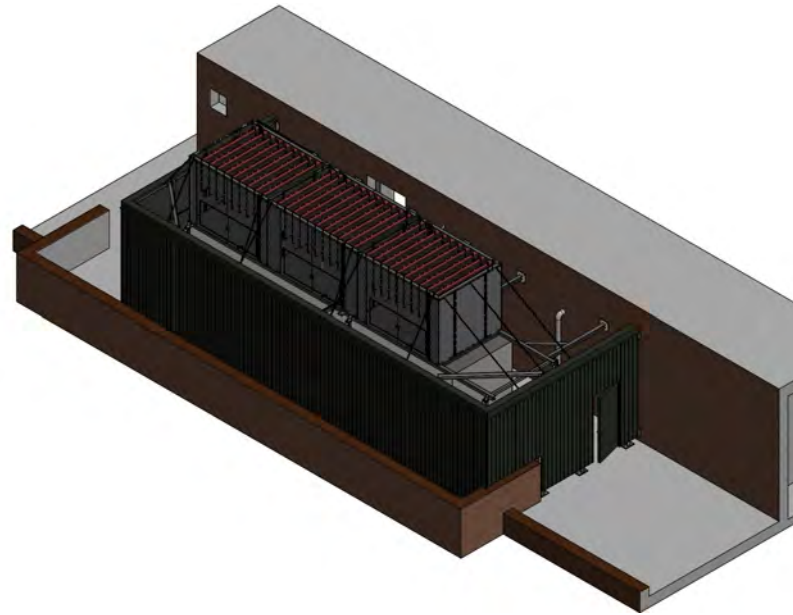
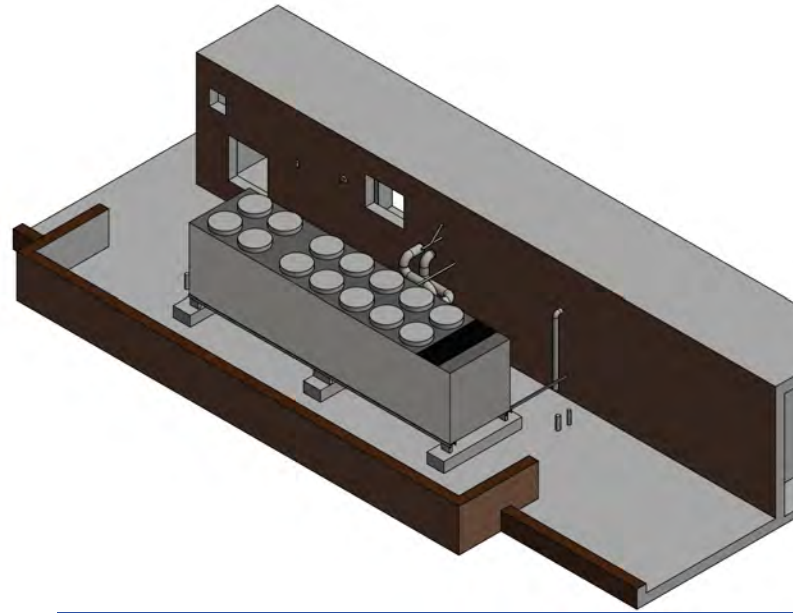


## Design

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In order to bring the noise into line with the municipal bylaws, Parklane implemented a two-part solution. First, a plenum silencer at the top of the chiller with maintenance door access for its fan components, paired with a perimeter acoustic barrier wall to shield the lower-level compressors and intake air noise.

But our team of engineers understood that the silencer and barrier wall alone wouldn't be enough. The noise emanating from the chiller was being absorbed on three sides by the barrier wall, allowing sound to reflect off of the fourth side. To prevent that reflection, we installed the second part of our mitigation solution: perforated, galvanized steel acoustic panels to absorb the remaining sound.



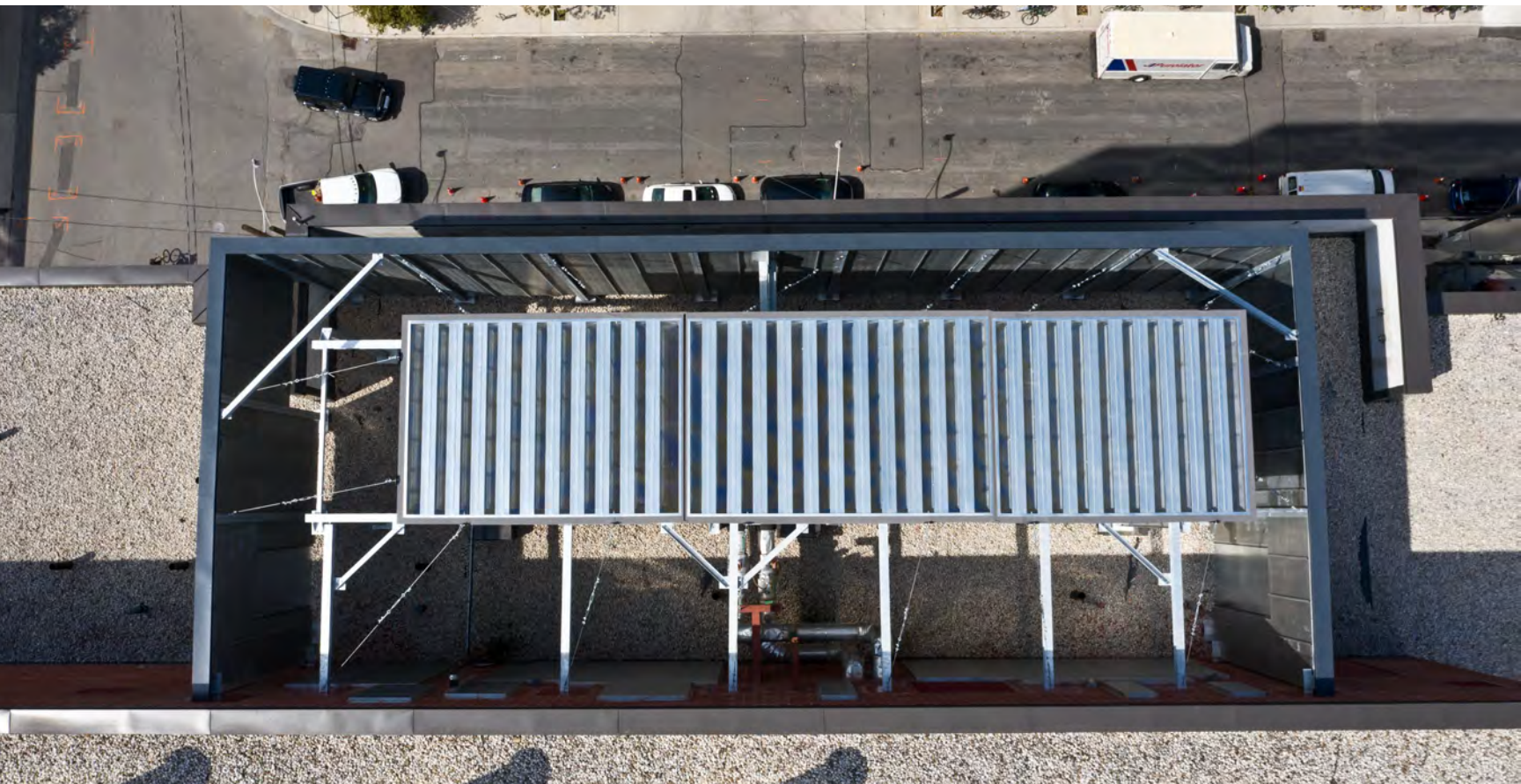
## Integration

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The solution needed to blend into the building façade, while ensuring that all parts could effectively integrate into the equipment and surrounding structure without impeding the function, capacity, or operation of either.

Parklane's uniquely designed structural array made effective use of the strongest parts of the building structure to avoid any intrusive enhancements. To address architectural concerns, pre-finished materials for both the silencer and sound wall were carefully selected to blend into the structure.

The final system design was created collaboratively with the client's acoustical consultant, creating an optimized solution that worked neatly within the site's constraints.



Acoustic Equipment Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
Plenum Silencer DIL (dB)	10	15	22	37	50	51	48	28

## Results

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Our team was able to complete the design and installation process within projected timelines, and HVAC operations within the condominium were not disrupted during the project.

A post-installation audit confirmed that our system effectively reduced noise levels. Local neighbors and the property manager were incredibly happy with the results, and the risk of non-compliance fines has been all but eliminated.



# 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.

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

(917) 672-0050  
205-167 Madison Avenue,  
New York, NY  
United States 10016



[parklanemechanical.com](http://parklanemechanical.com)