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ACUTE HEALTH CARE FACILITY

# Cooling Tower Noise Control

## Using intake plenum silencers to quiet noise from an induced draft cooling tower

Adjacent to the emergency vehicle entrance at Toronto Western Hospital is the power plant building servicing the entire medical facility. On the roof of the power plant building are six cooling towers. With residences across the street and otherwise surrounding the hospital, these cooling towers were part of Phase 3 of the hospital's Noise Abatement Action Plan to bring the site into compliance according to MOECC NPC 300.

### The Project Facility

Toronto Western Hospital, a major healthcare facility in the city's downtown core

### The Noise Source

Induced Draft Cooling Tower

### The Solution

Intake Plenum Silencers

### Project Team

Owner's Representative:
Colliers International

Structural/Mechanical Consultant:
WSP

Acoustical Consultant:
SDK Environmental

### Reason for Mitigation

Phase 3 Noise Abatement Action Plan; non-compliance with Provincial Ordinance (MOECC NPC 300) and residential noise complaints in the surrounding area

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*Existing Site Image*

# The Challenge

The installation window for the units was 2.5 weeks, from the end of January into February—a tight timeline given the design complexities of the project. The custom acoustic plenum silencers had to occupy a small footprint and had to be structurally supported, but fully removable, allowing access to the towers/motors for regular maintenance. A major challenge was establishing a system that worked around pre-existing site conditions such as pipes, while incorporating structural members that could be bolted in after the silencer was in place.

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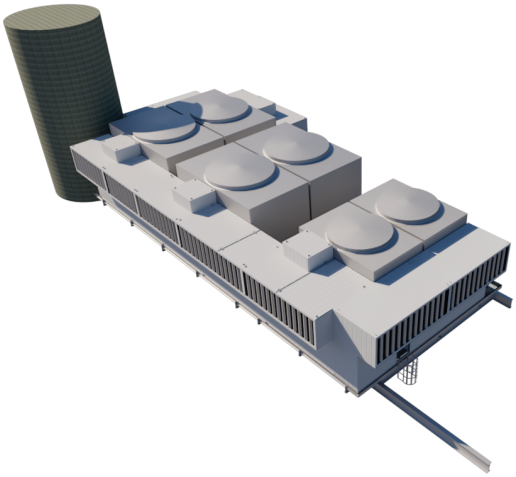
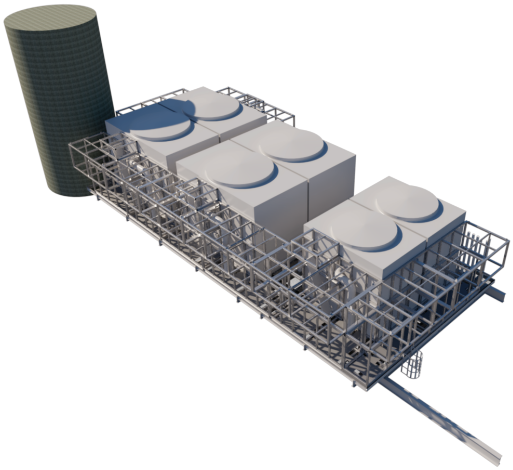
# The Solution





The shipment of 28 silencer sections on eight 48’ trucks over five days was staggered to accommodate the installation schedule, as well as to minimize staging in the limited space.

An accurate base model of existing site conditions, including structural steel, was generated (using advanced 3D-modelling) and used throughout the silencer design. Parklane also provided a structural plan allowing the plenum silencer system to be connected to the existing structural frame ensuring that the stub columns were optimally placed on the existing beams.

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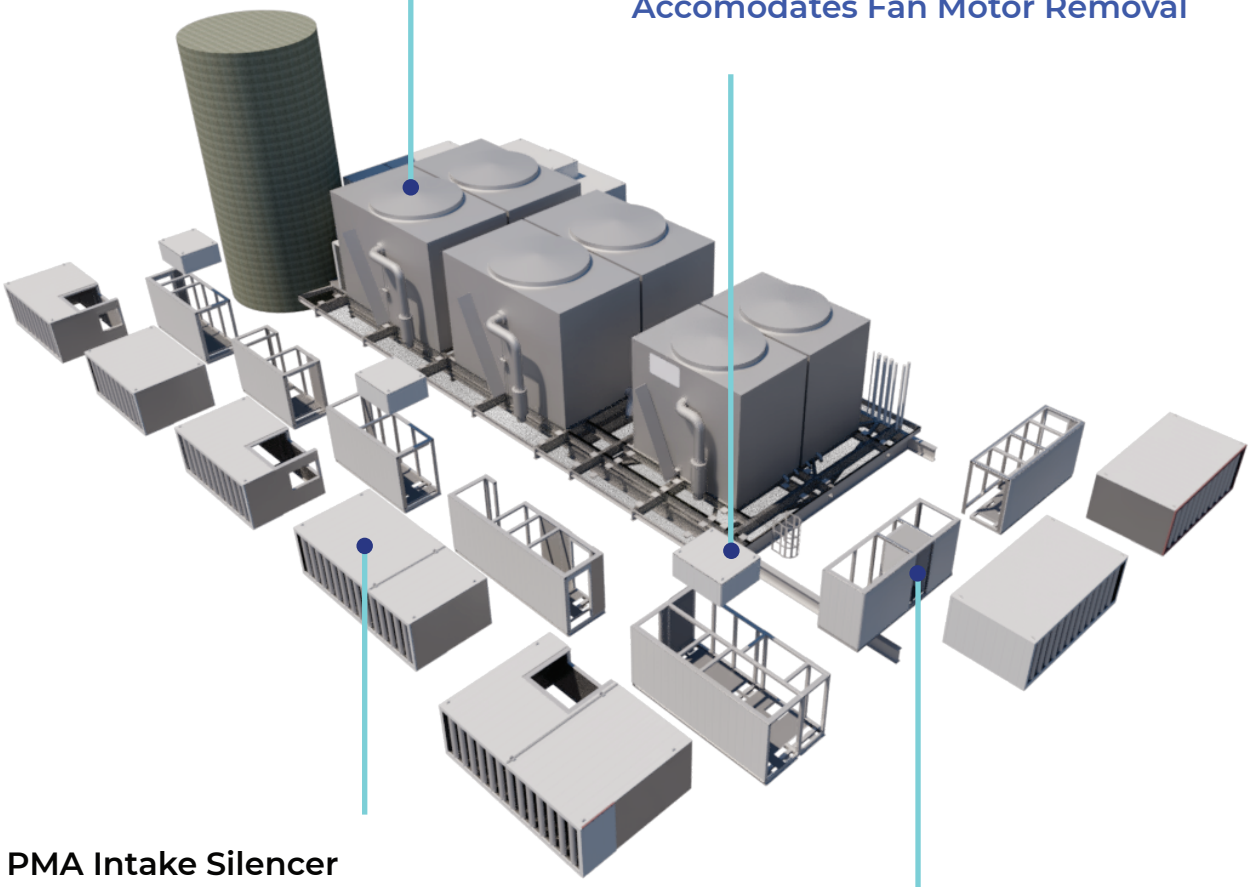
Existing Induced Draft
Cooling Towers

Acoustic Dog House
Accomodates Fan Motor Removal



PMA Intake Silencer
Attentuates Intake Noise

Modular Acoustic Plenum
Provides complete access
for maintenance staff

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# The Result

Our team successfully addressed the primary design constraints of sound attenuation, ventilation and equipment access, while our innovative site-integrated approach delivered a cost-effective, timely solution for a challenging, site-constrained project.

## Designed Performance

PMA Intake Plenum Silencer

| Frequency (Hz) | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|---|---|---|---|---|---|---|---|---|
| Insertion Loss (dB) | 14 | 19 | 24 | 33 | 37 | 27 | 22 | 19 |
| Required Level (dB) | 7 | 9 | 14 | 22 | 25 | 15 | 11 | 7 |
| Pressure Drop (in.wg) | **0.038** | | | | | | | |

# 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.

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