



Air Handling



Fan Array

DePaul University • Chicago

# Project Highlights

DePaul University's current "Many Dreams. One Mission" campaign, includes a new theatre school for its students. The University wanted their new theatre facilities to widen artistic horizons, add vitality to the community, and welcome generations of new artists, performers, and audiences. To accomplish this vision, the theatre worked with world-renowned architect Cesar Pelli, Senior Principal at Pelli Clarke Pelli and the former dean of Yale University School of Architecture. The \$72 Million project includes a 165,000 sq. ft. theatre school building, featuring a 250 seat thrust "Shakespearean" style theatre, a 100 seat black box theatre, a rehearsal room for all theaters, design studios and labs, elevators, computer labs, box office, faculty and staff offices, school script library, and even lockers and bathrooms.



## Challenge

DePaul's new construction was targeted LEED Silver Certification, and focused on creating positive impacts by increasing energy efficiency, reducing the carbon footprint, and mitigating resource depletion, such as water usage, among many others benefits. The massive white facade protrudes out above the street allowing many of the inner workings to be visible to pedestrians. While pedestrians may have clear views to the "behind the scenes" inner workings that make every theatrical performance tick, what the neighborhood and students won't hear is the 140,000 CFM TMI Climate Solutions air handling equipment on the roof. Noise pollution is a common problem in poor urban planning, and the threat of noise pollution could undermine the creative planning taken to design a visually stunning new construction in the heart of a campus environment. The goal was to maintain the quality of life with student/residential housing nearby, and also mitigate any potential interference to the acoustics when actual performances were taking place, so sound attenuation was a very important issue.

The sound from Fan Array and boiler has been summarized. The accumulated sound from Fan Array superseded the sound from boiler and pumps. No effect from the boiler and pumps. SP indicates the casing across the supply plenum.

| Sound Levels       | Frequency, HZ |     |     |     |      |      |      |      |
|--------------------|---------------|-----|-----|-----|------|------|------|------|
|                    | 63            | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| Supply Air Opening | 59            | 67  | 66  | 70  | 65   | 70   | 72   | 73   |
| Return Air Opening | 40            | 51  | 56  | 56  | 55   | 60   | 60   | 67   |
| Casing Radiated    | 27            | 48  | 66  | 62  | 59   | 53   | 42   | 31   |



## Solution

Our unit incorporated both return inlet sound attenuators and supply air outlet attenuators. Also, TMI's Fan Array format provides quiet and energy efficient fans in a sound-attenuated module. In addition to sound attenuation in the enclosure, to ensure the piping and equipment didn't cause noise, piping was hung from the ceiling with spring isolators and equipment was mounted to inertia bases on the floor.

Efficiency was enhanced by utilizing our VFD controlled Fan Array™ module, containing premium efficiency motors that allow for the ramping up and down of CFMs. The unit also includes an integrated closed loop boiler system that provides hot water to the dual purpose coils, and a special mixing section was incorporated to better blend return air with outside air.

Chicago deservedly is nicknamed, "The Windy City", and the TMI Climate Solutions' air handling unit would be set on the top of the five-story building. Wind and snow were a question as to how our unit would perform. TMI solicited a structural engineer to calculate the snow and wind loads, distribution loads to the building structural steel/curbs and recommendations for intermediate supports under penthouse.

Naturally, building aesthetics were of major importance. Therefore, TMI Climate Solutions worked hand in hand with the development team to provide custom siding on our air handling unit, blending the 3 visible sides of the unit with the building exterior by using the same Eclad exterior stone cladding system as was utilized on the building. This siding provides a fully sealed system with high-performance thermal breaks and insulation. The result is an aesthetically pleasing grand appearance, with the energy-efficient performance and environmental benefits desired by the University and Its development team.



If you are interested in learning more about TMI Climate Solutions **Fan Array** options please contact your local TMI Rep or contact us directly at:

### TMI Climate Solutions

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