



Case Study



Property Owner

Fairmont Hotels & Resorts



Main Contractor

PCL Constructors Canada, Inc.



Acoustic Consultant

Thornton Thomasetti



Architect

Hariri Pontarini



Structural Engineer

RJC Consulting Engineers

Stravifloor Deck

Stravifloor Deck is a low-profile floating floor system customized with engineered spring isolators to meet the project's acoustic specifications. The fail-safe springs automatically limit deflection under higher loads and are color-coded for easy onsite placement. The system provides excellent structure-borne and airborne noise isolation, installed with 100 mm (4") lightweight reinforced concrete, and complies with non-combustible code requirements.

OVERVIEW

As part of an ongoing renovation, the historic Fairmont Royal York Hotel in Toronto converted a former administrative wing into a new fitness center. The new fitness center space, a retrofitted amenity on the hotel's early 20th-century construction, sits directly above the facility's main conference room, making perceptible noise and vibration isolation a top priority.

SOLUTION

The building's age introduced a host of structural constraints. The fitness center floor was constructed over a ribbed slab (Flortyle slab), limiting both the placement and capacity of any added acoustic systems. Meanwhile, the project demanded high acoustic performance criteria that would typically require spring-based, concrete floating floor system to isolate impact noise from free weights drops and cardio equipment.

The original design defined the use of a jack-up floor, but with the structural constraints, a jack-up solution was not economically feasible, due to the tight spacing required between jackup boxes.

Since a jackup system was out of the budget scope, the design team needed to find a solution that provided the required acoustic performance, but that would also fit within the project's budget constraints.

CDM Stravitec was challenged to deliver adequate isolation while respecting the resonance frequency limits, load restrictions, and tight placement tolerances, all with a non-combustible system.

To meet these demands, CDM Stravitec supplied a **Stravifloor Deck** floating floor system customized with engineered spring isolators (pictured below) designed for precise control of isolator resonance frequency as per project acoustic specifications.

The CDM Stravitec team produced customized springs and integrated tailored support cups to control spring deflection. Two spring configurations with different load capacities were used to respond to varying structural demands: 4 kN (899 lbs)/4 Hz (red) springs were installed where load conditions were more demanding, around the column zones, while 1 kN (225lbs)/4 Hz (green) springs were applied across the general floor area. CDM Stravitec color-codes springs by load capacity for easy placement and identification onsite for every project.

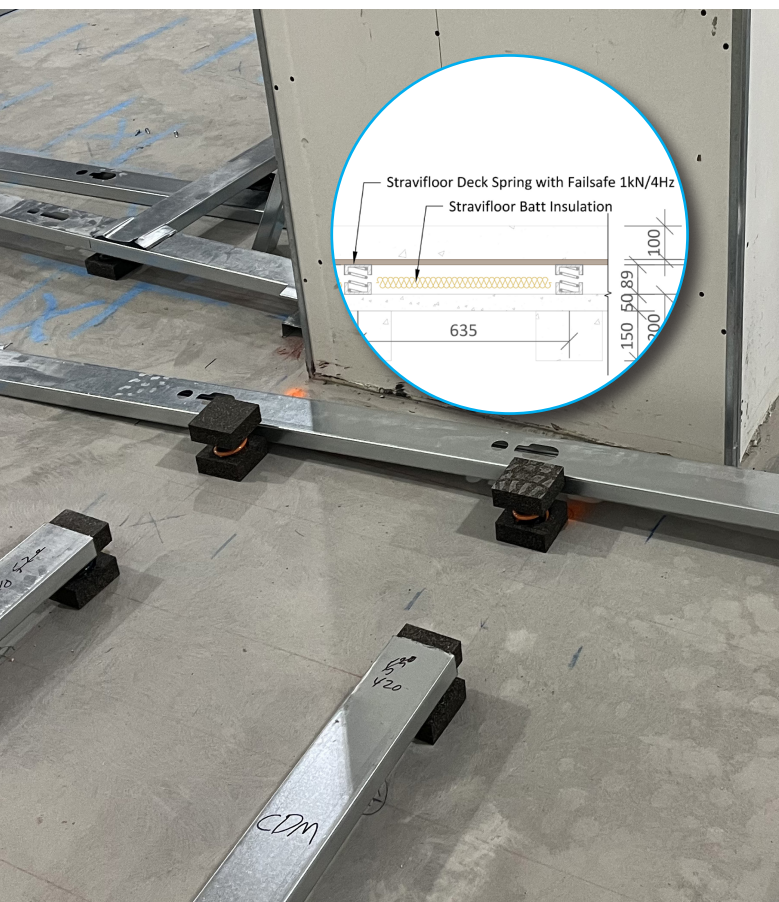


Stravifloor Deck provides excellent structure-borne and airborne noise isolation while minimizing impact on the available floor-ceiling height by requiring only lightweight, 100 mm-thick (4") reinforced concrete pours for installation, and also meets non-combustible code requirements.

CDM Stravitec collaborated closely with the contractor and engineering team to adapt the system to site-specific constraints while maintaining full acoustic functionality.

The Stravifloor Deck's proprietary dovetailed metal deck layout enabled isolators to be positioned precisely along the existing slab ribs. This flexibility allowed the design team to optimize isolator placement and reduce the overall structural load, while the lightweight concrete topping slab minimized mass without compromising floor stiffness or acoustic performance.

By using Stravifloor Deck, the project team achieved the required performance with greater flexibility and lower structural impact.



185.8 m²
(2,000 ft²)
Stravifloor
Deck

AT A GLANCE

CHALLENGES

- Code requirements dictated a non-combustible system.
- Structural limits due to historic construction and structural slab constrains.
- The structural slab load limitations and incapacity to take high ponctual loads made a jackup system out of project budget.
- Spring deflection had to be limited to a resonance frequency of 4 Hz under ADL.

BENEFITS

- Solution allowed for custom-engineered springs with deflection limiters
- Stravifloor Deck solution enabled flexible layout that met code requirements and accomodated slab rib posiitioning.
- Dovetailed metal system met non-compustible requirements.
- Lightweight concrete topping reduced dead load.
- Acoustic isolation achieved without compromising structural integrity.
- Springs were color-coded by load capacity for easy placement and identification onsite.
- CDM Stravitec offers EFM Analysis for gauranteed performance.



Photo Courtesy of Fairmount Royal York Hotel