



NEW MILLENNIUM
BUILDING SYSTEMS
Building a better steel experience.



DESIGN IDEAS
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Building Components as Design Features

In downtown Vancouver, a steel and glass tower expresses its structural frame in a dramatic cantilever over Richards Street. Telus Garden unabashedly celebrates its building components as design features. The vocabulary continues inside as well. Exposed structure serves as finished ceilings. The limited palette of materials is meticulously detailed to create a minimalist design that appears effortless.



Upon the announcement of the 2010 Olympic Games, the city of Vancouver studied the expansion of a casino in the entertainment district, surrounding the stadium, BC Place. The concept was to help fund its renovation required for the Olympics. Local structural engineering firm, Glotman-Simpson, was introduced to the long-span composite deck system, Versa-Floor™, for this project. The system-based approach is ideal for large-scale, column-free spaces.

The community ultimately nixed the casino, but the Versa-Floor™ system left an impression with Glotman-Simpson. With a new project on the horizon for Canada's largest telecom, they brought Versa-Floor™ to the attention of the architecture firm, Henriquez Partners.

The design of the unique office building presented a number of structural challenges. While wanting an open floor plan, acoustics and floor vibration were obstacles to overcome. There were additional considerations for how to maximize the floor-to-ceiling height without compromising mechanical and electrical distribution.

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A major design concern of the Telus Garden building was floor-to-ceiling height, as the design called for towering, open spaces, which also require quite a bit of MEP integration.

New Millennium Building System's Versa-Floor™ design development team coordinated with the architect and engineer to meet their project goals. Through the iterative process, New Millennium provided custom solutions to address the challenges of the project with extensive in-house expertise. The end result is a tailored Versa-Floor™ solution featuring Deep-Dek® Composite 6.0.

Hiding connections is key

A key innovation of Versa-Floor™ is its sidelap tool, Dek-Lok®. This proprietary connection allows for the rapid installation of Deep-Dek® panels, eliminating the use of unsightly screws.



The factory closed ends of the Versa-Floor™ system featuring Deep-Dek® allow for concrete to be poured continuously, increasing its capacity to withstand large reactions at the bearing point.



The innovative Dek-Lok® sidelap tool allows for the elimination of unsightly screw connections to provide a smoother aesthetic.

Another critical fabrication component is the closed ends of Deep-Dek®. This allows for the concrete to be poured continuously, as these tapered ends terminate at the supporting structure, and increase its capacity to withstand large reactions at the bearing point. The steel complements the concrete in a UL-rated assembly. The Deep-Dek® steel decking with a 5-inch normal weight topping slab equals an 11-1/8-inch total slab depth that has an unprotected 2-hour Fire Rating. Intumescent paint is required at the structural members only. Beams have upturned angles as ledgers to receive the Deep-Dek® steel decking in the web of the wide flange, as opposed to sitting on top.

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The open floor plan and towering open spaces made the Versa-Floor™ system featuring Deep-Dek® a natural choice for the Telus Garden office structure.



The aesthetically pleasing deep-fluted appearance of exposed Deep-Dek® steel flooring saves space and project cost by eliminating the need for dropped ceiling panels.

Open floor plans

To meet the challenge of the open floor plan, the deck slab assembly cleared a remarkable span of 32-feet and is 30 to 35 percent lighter than an equal thin plate concrete slab. The Versa-Floor™ team provided vibration analysis and certified slab analysis that, unlike other composite designs, accounts for long-term deflection.

Initially, the design team selected Deep-Dek® Cellular Acoustical. This profile has a flat liner panel that is shop-welded to the “deck hat.” The cavity alternates between a chaseway and acoustical treatment. Where access panels were required, a piano hinge-like door with discrete lock was designed by New Millennium. The cellular acoustical option was abandoned in the late design stage, but most of the unique qualities of the project remain.

During production, New Millennium pre-cut holes in the deck to accommodate junction boxes for electrical distribution. Mechanical piping and most ducts did maintain their location of fitting in the flutes of the Deep-Dek®, without the liner panel. This further maximized the floor-to-ceiling heights, as typical high-rise construction has to compromise ceiling heights by as much as five feet with dropped ceilings to conceal massive ducts.

Cost savings part of the design

The Versa-Floor™ system featuring Deep-Dek® Composite creates cost savings in multiple ways. As a long-span deck, it eliminates interstitial structural beams, reducing material costs, and subsequent labor to fabricate and install. Additional labor savings are found with the speed of deck installation. New Millennium worked with the deck erector, KWH Constructors, who quickly embraced the Dek-Lok® tool. Once familiar with the installation process, the team was able to complete their role in short order. The install goes more efficiently relative to standard composite deck and two-to-three times faster than cast-in-place concrete projects.



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