

Collateral Dead Loads for Hotels, Apartments, and Dormitories

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When designing **NiCore™ Planks** by Nitterhouse Concrete Products, Inc. (NCP) for a multitude of structures such as **hotels, apartments, and dormitories** in Residential Group R-2 it is important not to overlook commonly encountered collateral dead loads. Such loads are not included in the IBC-prescribed minimum live loads for these types of occupancy. A typical 40 psf live load essentially includes the occupants and furniture for non-public areas, but these aren't the only loads present.

For example, Section 3.1.1 of *Minimum Design Loads for Buildings and Other Structures* (ASCE/SEI 7-10) defines dead loads as consisting of "... the weight of all materials of construction incorporated into the building including, but not limited to, walls, floors, roofs, ceilings stairways, built-in partitions, finishes, cladding, and other similarly incorporated architectural and structural items, and fixed service equipment including the weight of cranes."

A similar definition is found in Chapter 2 of the *International Building Code* (IBC 2015). Its definition of dead load is "The weight of materials of construction incorporated into the building, including but not limited to finishes, cladding and other similarly incorporated architectural and structural items, and the weight of fixed service equipment, such as cranes, plumbing stacks and risers, electrical feeders, heating, ventilating and air conditioning systems and automated sprinkler systems."

When we speak of collateral dead loads we mean those items included within these definitions that are exclusive of the actual structural system itself such as **columns, beams**, load-bearing walls, NiCore™ Planks, cast-in-place composite toppings, etc. So, what might be the composition and magnitude of these loads?

The weight of interior stud walls is approximately...

2x4 Studs @ 16" o.c.: 2 psf

5/8" Gypsum board each side: 5 psf

7 psf

If the "average" room is 8' high x 12' wide x 13' long then the average weight allowance for interior partition walls is $(12 \times 13) / 7 \text{ psf} / (12) / (13) = 9 \text{ psf}$.

Other components could include...

Hardwood flooring or ceramic tile or porcelain tile: 4 psf

Carpet: 1 psf

½" Gypsum board ceiling: 2 psf

Mechanical allowance: 4 psf

11 psf

When taken in combination the collateral dead loads are on the order of 9 psf + 11 psf = 20 psf.

The above example is only intended as a guide for informational purposes. It is incumbent on the Structural Engineer of Record (SER) as the licensed design professional in responsible charge of the building design to establish the magnitude of loads when designing each building project.

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