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Supplying Weights of Materials Critical for Accuracy

When Nucor Building Systems provides the wall panel, roof panel, and liner panel for a building, the design engineer can accurately determine the dead loads being applied to the building based on the known weights of these materials. This weight is in terms of pounds per square foot of surface area and is required for the design of nearly all components of a steel building.

There are many instances, however, when these materials are not provided by NBS per customer request. In these cases, it is just as critical that the weights are known so that the building can be accurately designed and so that it meets the customer's needs and expectations. These weights should be supplied to NBS in the quoting stage so that their impacts can be determined and properly accounted for.

Coverings by Others

Some examples of wall and roof coverings by others include insulated panel, steel stud framing with stucco, brick, block, tilt-up concrete walls, plywood with shingles, deck with clay tile, etc. There have been many instances when the design engineer has had to make conservative estimates on the weights of these materials. This can add unneeded weight and cost to the building. At the quote stage, there is often an assumed weight called out on the contract. This weight should be verified by the customer, and modified as applicable, so that the building is not needlessly under or over engineered.

Additions

Another situation that arises is the addition of wall or ceiling liner in the field that was not considered in design. These unexpected additions will likely cause over-stresses in purlins, frames, and possibly bracing. One other situation that we come across is the addition of a wall system where there was never one considered in design. These wall systems can include both exterior surfaces and interior partition walls. In addition to adding dead weight, this can also drastically increase wind pressures, leading to the likely failure of building components.

Moderate/High Seismic Area

When a building is going to be in a moderate or high seismic area, knowing the weights of the wall and roof cladding, and any interior partition walls that are supported by the building becomes even more important because of the impacts it can have on the seismic weight of the building. For example, for an average 80 ft x 120 ft building with a 20 ft eave height located in a high seismic area, even a change in roof and wall weight of only one pound per square foot can change the seismic load, referred to as base shear, by about 15 %. This will directly impact the loads, weights, and cost of bracing, frames, and spandrel beams.

These tips concerning weights of materials will help you get the most accurate quote. The NBS team takes pride in offering our customers the most economical building that will meet their needs and budget.