

## POINT LOAD CONDITIONS ON PANEL WALLS

Premier Building System's panel products are being used in many types of structures as a structural wall. In this application, it is essential to understand the axial capacities of the panel wall and how the load is transferred into a wall panel. In structures where a panel roof system is transferring the roof load to the wall panel, the load transfer is continuous over the length of the wall. Axial capacities found in our load design charts can be utilized as the maximum design loads. However, there are many applications where the load being transferred into a wall panel from the roof or a floor is accomplished through a structural component such as a truss or a beam, which places a point load on the wall panel. Premier Building Systems has conducted full-scale destructive tests at an independent code recognized laboratory to determine the point load capacities for our panel products.

When conducting the tests, it was determined by the engineers that one of the worst case scenarios in which wall panels are subjected to are typical 2x trusses transferring loads through the narrow edge of the 2x chord onto a 3.5" core panel. Following our typical detail for wall panel installation, a series of tests were conducted to determine the point load capacity of a standard panel: this data is shown in the chart below. Once values were determined for a standard panel a second series of tests were conducted by the independent laboratory on a standard 3.5" wall that had an additional plate fastened to the top of the panels. This plate can be either standard 2x SPF lumber, 1-1/8" OSB(Oriented Strand Board) or 1-1/8" OSL(Oriented Strand Lumber) i.e. Rimboard, which has been ripped to the overall width of the wall panel so that the OSB skins of the panel are covered by the ripped material. Placement of this additional top plate substantially increases the point load capacity of a panel and is shown below.

To calculate the point load that a member will be placing on a panel, it is necessary to take into account the intended live and dead loads and the tributary area that the member is designed to carry. An example would be the placement of roof trusses 2' o.c. which is spanning 60' with only the exterior panel walls as support and the trusses extending 2' beyond the wall for the overhang. For this example, let's assume that the live load for the roof is 35 psf and the dead load is 10 psf. In this situation, each truss is placing a point load on the panel wall of 2880 pounds which is in excess of the design point load allowed for standard detailed panels. However, this is allowed for panels with the additional top plate, as shown below. Another example would be the same roof with a bearing wall running down the center of the structure; therefore, providing an additional bearing point for the trusses. In this scenario the panel walls are subjected to a point load of 1530 pounds which falls within the design recommendations for a standard detailed panel wall.

<b>Point Load Design Values</b>		
	1 ½" Minimum Bearing	3" Minimum Bearing
Standard Detail	2040 lbs	2450 lbs
Additional Top Plate	4030 lbs	4678 lbs
<i>Design loads reflect ultimate load divided by a safety factor of three (3).</i>		
<i>Loads in excess of the above require posts under the point load</i>		
<i>Posts to be designed by an engineer</i>		