

Wood I-Joists and APA Performance Rated Rim Board®

Prefabricated wood I-joists are typically manufactured to depths that are slightly different from that of sawn lumber. This is intended to discourage mixing engineered wood I-joists and APA Performance Rated Rim Boards® with sawn lumber joists and rim boards.

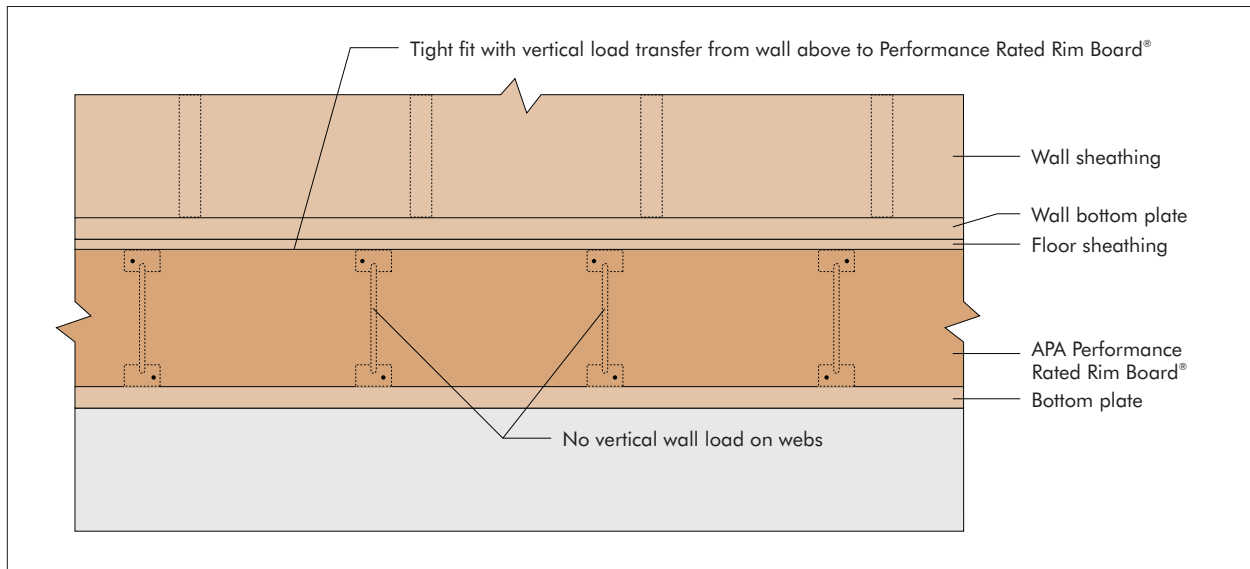
The reason is that wood changes dimensions when its moisture content changes. Sawn lumber typically has a higher moisture content than engineered wood products do. The sawn lumber is very likely to shrink, sometimes considerably, as the building begins to dry. Even lumber that is specified as “Dry” can shrink. A sawn lumber rim board may shrink as much as 1/2 inch in height. The resulting gap can have serious structural consequences.

In a floor, the wood I-joists carry the structural bending loads on the floor and the Rim Boards carry the axial and lateral loads from the exterior walls. The axial loads (those from the roof or floors above) may be considerable. The Rim Boards are intended to prevent an axial/compressive load on the I-joists by transferring the load around them to the wall below. The wood I-joists, with their relatively thin webs, are not as capable of safely transferring as much axial load as the much thicker Rim Boards.

Another important structural function of the Rim Boards is to resist the lateral shear loads that come from the floor sheathing and walls. They do this through the nail connections between the walls and floor sheathing to the Rim Boards.

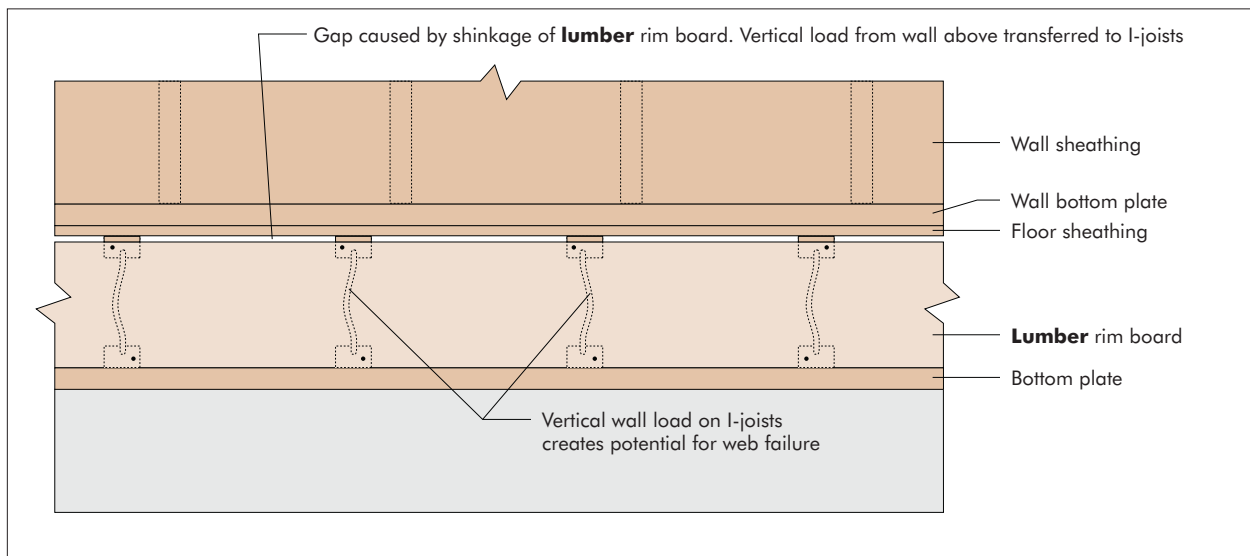
When engineered Rim Boards are used with wood I-joists, the physical contact between the floor sheathing and walls remains tight because any moisture-related dimensional changes are nearly equal. This direct-contact connection permits full transfer of the design axial and lateral loads.

Figure 1. Correct Fit Between APA Performance Rated Rim Board® and Floor Sheathing.



If lumber rim boards are used in place of the engineered Performance Rated Rim Boards, lumber shrinkage can cause a gap between the lumber rim boards and the floor sheathing. This gap causes the nails to bridge between the floor sheathing and the rim board, reducing their ability to transfer the necessary lateral loads. The lumber shrinkage also causes the wood I-joists to protrude above the top of the now-shrunken lumber rim board, transferring the axial/compressive load into the webs of the wood I-joists.

Figure 2. Incorrect Fit Between Lumber Rim Board and Floor Sheathing after Lumber Dries.



In summary, there is no structural advantage to using lumber rim board in place of engineered rim board. There is, however, a high potential for structural problems when lumber rim boards are used in place of engineered Rim Boards with wood I-joists. For this reason, APA strongly recommends that only APA Performance Rated Rim Board be used with wood I-Joists.

Rim Board is a registered trademark of APA – The Engineered Wood Association.

We have field representatives in many major U.S. cities and in Canada who can help answer questions involving APA trademarked products. For additional assistance in specifying engineered wood products, contact us:

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