Southwest
New Brunswick
Service Commission

Building beams

Beams have long been a part of modern construction, and are a vital part of any home. However there are a few principles worth noting to help you build a top-quality load-bearing system, whether you're a weekend warrior tackling that deck project or a long-time pro.

Beam support

Beams must be supported, either by foundation walls, or columns (posts.) When supported by a wooden post, the width of the column must be at least the width of the beam and in any event, must be at least 5-1/2" square. (Also called a 6x6 post.) This can be a single piece of lumber, or a laminated section. If laminated, it is important that all vertical members are continuous from the bottom support to the underside of the beam.

If the beam is supported by a steel column, the metal plate the beam rests on must be the width of the beam, and no portion of the metal plate can be less than 10 cm wide.

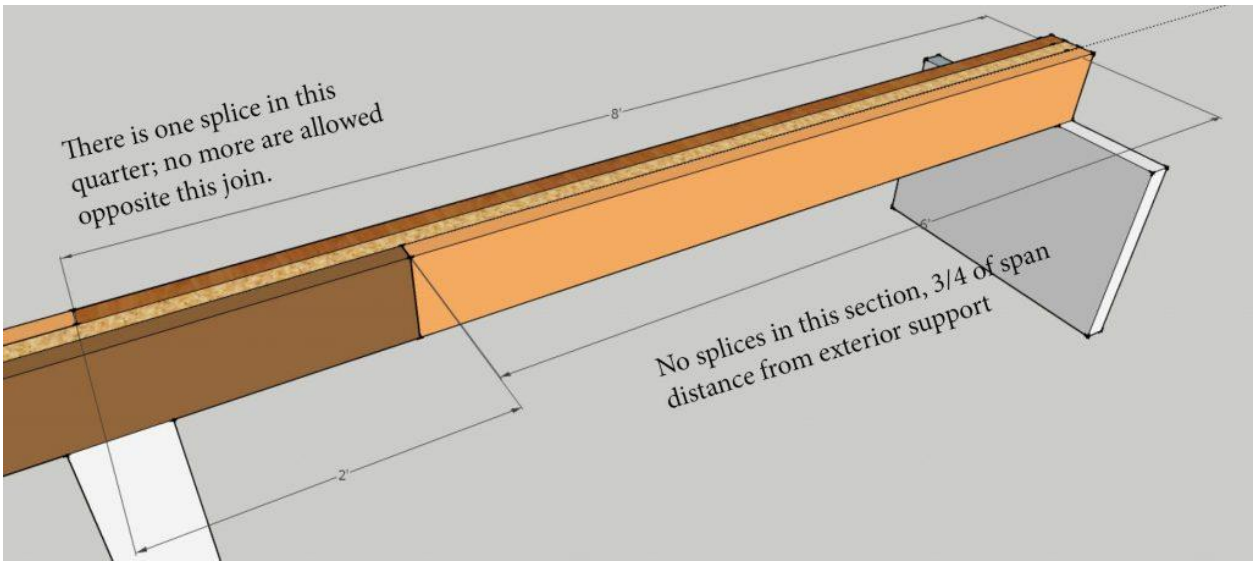
Beam construction:

The critical thing to note is that the best and strongest system does not have any splices (joins) in any part of the beam. Sometimes, that's not feasible: try spanning anything more than 16 feet without a splice!

The key to retaining strength is to put splices in the right spots. Ideally, joins should only be made right over a supporting post.

Joins can be made elsewhere, but with some limitations. If, as in the example below, there's an eight-foot span between the outside of a beam and a post, then splices can only take place in a space up to one-quarter of the span width distance from the post.

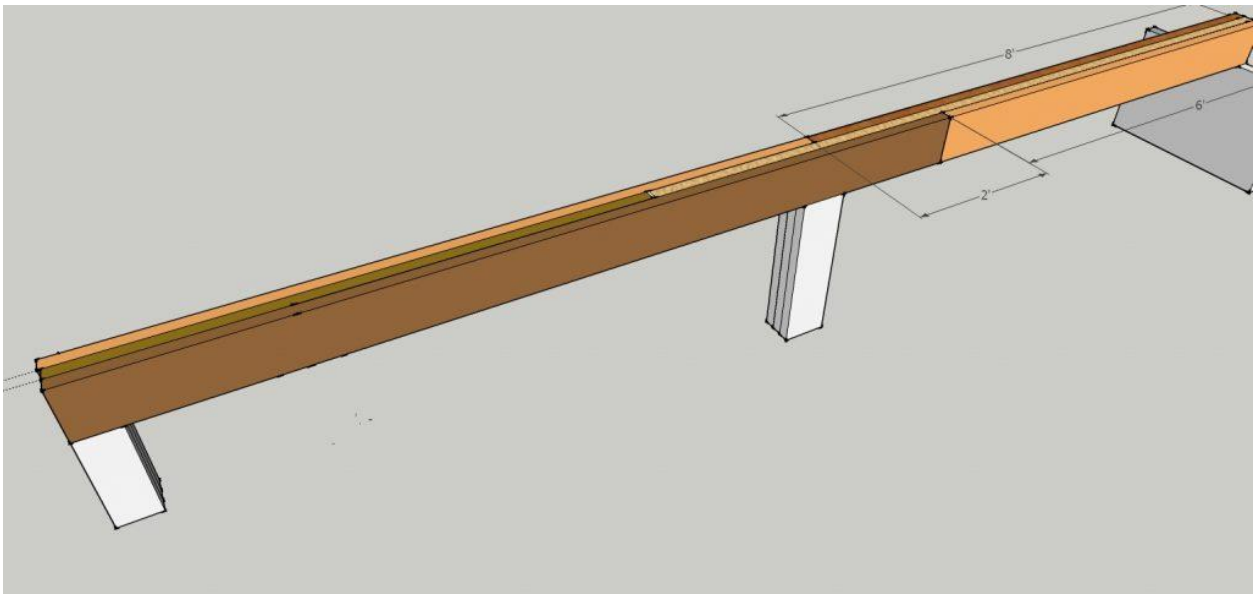
Or, in other words, if you've got an eight-foot span, splices can only be made in the two-foot section nearest to the posts, as in the image below.



Splices must be over post supports OR within 1/4 total span from post supports. No splices within the 3/4 span of the exterior support. In this illustration, a beam runs across eight feet, so no splices are allowed six feet from the wall at right).

Splices are NOT allowed in the remaining 3/4 span between the post and the wall - that's the orange-hued section in the illustration shown here.

Also, if there is a splice on one section of a beam, the piece of lumber on the other side of the butt splice has to span the distance to the next support.



If there is a butt-joint splice that does not rest on a post support, the other side of the board - front side shown here - must be continuous to the next support, as with the brown-coloured section at front and the two middle boards in this illustration.

Nailing/bolting beams:

Beams must be nailed together using 89 mm nails (3-1/4") paired at distances no greater than 17", in a manner that all members are securely penetrated fully by nails. Alternately, beams may be bolted with 1/2 bolts spaced no more than 1.2 metres (four feet) apart.

Code reference 9.23.8.3. Built-up Wood Beams

1) Where a beam is made up of individual pieces of lumber that are nailed together, the individual members shall be 38 mm or greater in thickness and installed on edge.
2) Except as permitted in Sentence (3), where individual members of a built-up beam are butted together to form a joint, the joint shall occur over a support.
3) Where a beam is continuous over more than one span, individual members are permitted to be butted together to form a joint at or within 150 mm of the end quarter points of the clear spans, provided the quarter points are not those closest to the ends of the beam.
4) Members joined at quarter points shall be continuous over adjacent supports.
5) Joints in individual members of a beam that are located at or near the end quarter points shall not occur in adjacent members at the same quarter point and shall not reduce the effective beam width by more than half.
6) Not more than one butt joint shall occur in any individual member of a built-up beam within any one span.
7) Except as provided in Sentence (8), where 38 mm members are laid on edge to form a built-up beam, individual members shall be nailed together with a double row of nails not less than 89 mm in length, spaced not more than 450 mm apart in each row with the end nails located 100 mm to 150 mm from the end of each piece.
8) Where 38 mm members in built-up wood beams are not nailed together as provided in Sentence (7), they shall be bolted together with not less than 12.7 mm diam bolts equipped with washers and spaced not more than 1.2 m o.c., with the end bolts located not more than 600 mm from the ends of the members.