Southwest
New Brunswick
Service Commission

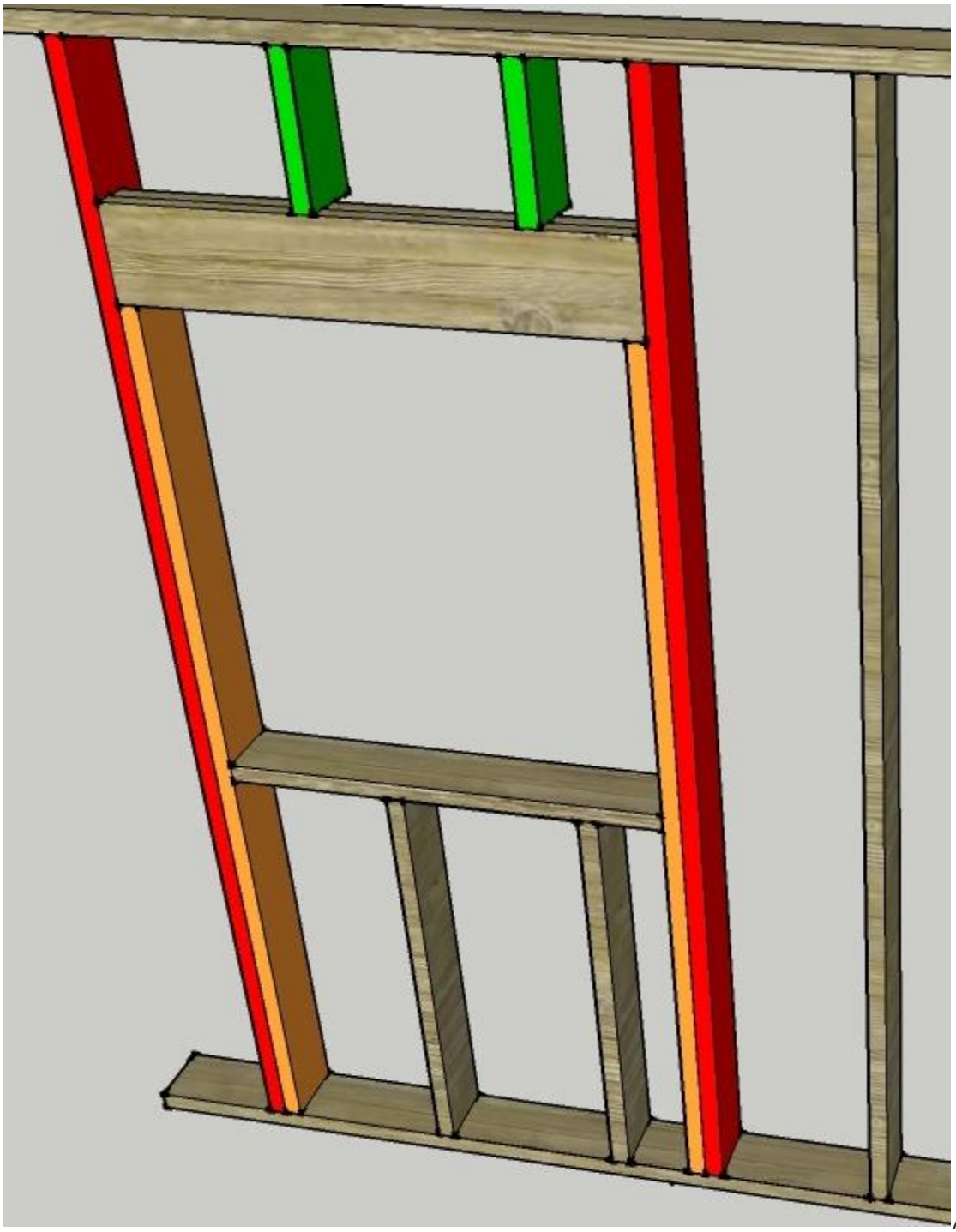
Lintel construction

Lintels (often incorrectly called "headers") are the built-up horizontal elements above openings in load-bearing walls, usually framed over spaces that will later be occupied by windows or doors. They are thus almost always located at the exterior of a building.

Lintels are essentially two (or three) pieces of lumber nailed together, laying sideways. They are designed to carry loads from the middle of the span to the outside.

There are two types of lintels: two-ply and three ply. With 2x6 framing now common, many contractors now choose to install three-ply lintels, even when they aren't necessary to carry the loads from above. While the concepts are the same, there is one minor Code-required difference when framing the two.

Two-ply lintel framing:



A diagram showing the framing for a 3'3" H by 3'W rough window opening and a two-ply lintel.

The illustration above shows a two-ply lintel framed over a 3' wide, 3'3" rough opening in a 2x6 walls. The joists are drawn at 16 inches on centre - in other words, a very typical layout. The **red studs** are "king" studs. They serve the role of transferring loads from the sill plate above as well as some of the load from the lintell.

The **orange studs** are "jack" studs.They carry the bulk of the load from the **green** "cripple" studs resting atop the lintel. It's important to note that the cripple studs must meet Code for separation and distance in the stud wall. In other words, if the design is crafted on requiring 16" OC studs, then the cripples must also be 16" OC, and no more. They do not have to align to the studs below the windowsill, which are essentially only present to provide support to the sill, exterior sheathing and drywall.

Critical note: jack studs *must be continuous from the underside of the lintel to the bottom plate.*

Sizing two-ply lintels:

The required construction of a lintel depends on two factors: the width of the opening, and the length of the truss or floor joist being supported. These tables are sufficient for the snow loads in our region (Southwest New Brunswick.) Caution should be used for those who may be viewing these tables from a different climactic zone.

What is supported length?

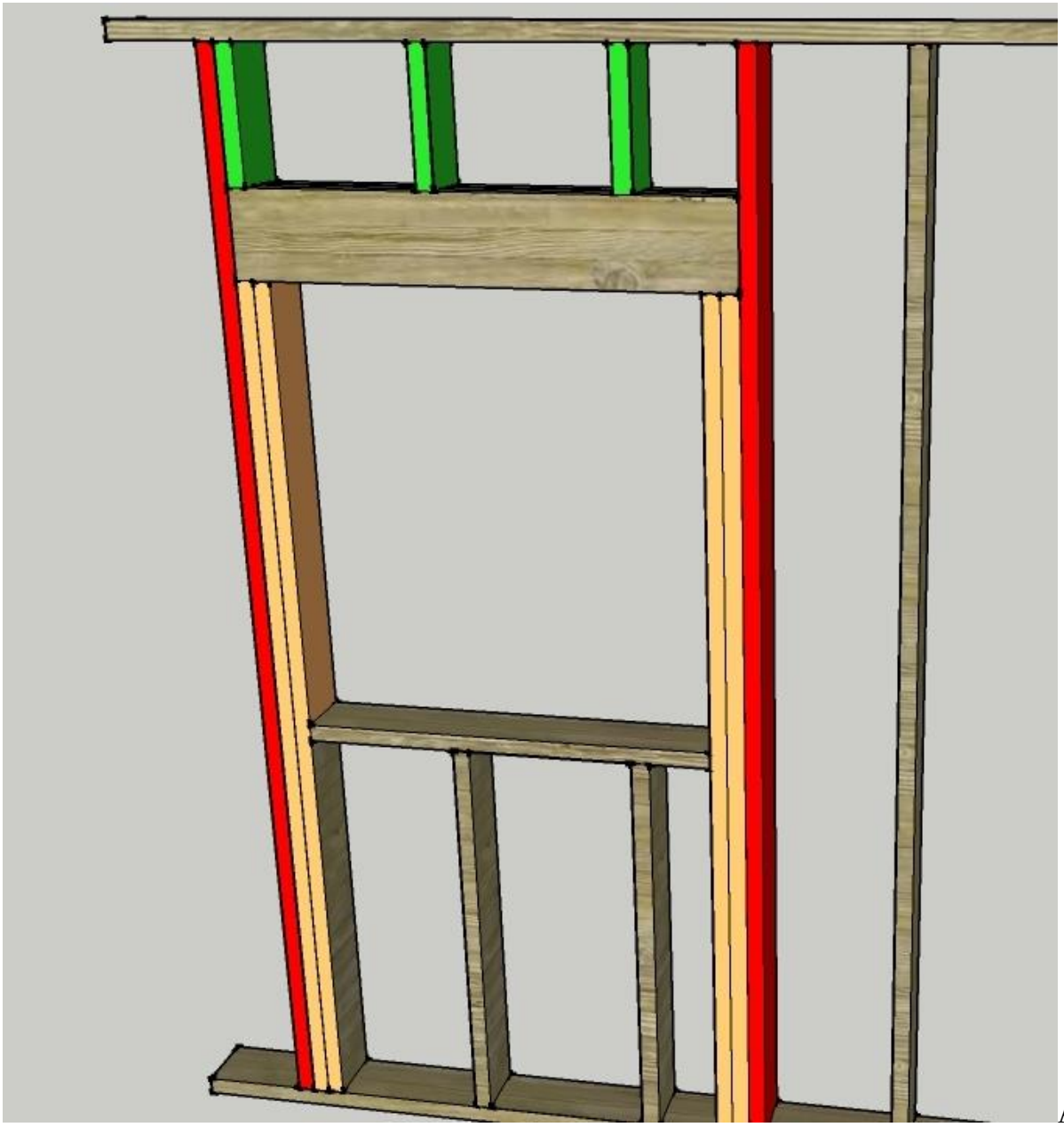
In the tables below, the supported length is one half the distance of the total truss span. If the truss has a mid-range support, then the supported length is half the distance between the wall containing the lintel and that supporting system.

Two ply lintels 52 psf snow load				
Supporting roof only; max width				
Supported length	2x6	2x8	2x10	2x12
8	6'1"	7'8"	9'4"	10'10" *
10	5'7"	6'10"	8'4"	9'8"
12	5'1"	6'3"	7'7"	8'10"
14	4'9"	5'9"	7'1"	8'2"
16	4'5"	5'5"	6'7"	7'8"
18	4'2"	5'1"	6'3"	7'1"
20	4'	4'10"	5'9"	6'7"
Supporting roof + one storey; max width				
Supported length	2x6	2x8	2x10	2x12
8	5'7"	6'9"	8'3"	9'7"
10	5'0"	6'0"	7'5"	8'7"
12	4'6"	5'6"	6'9"	7'10"
14	4'2"	5'1"	6'3"	7'1"
16	3'11"	4'9"	5'8"	6'6"
18	3'8"	4'4"	5'3"	5'11"
20	3'5"	4'0"	4'10"	5'7"
Supporting roof + two storeys; max width				
Supported length	2x6	2x8	2x10	2x12
8	5'3"	6'5"	7'10"	9'1"
10	4'8"	5'9"	7'	8'1"
12	4'3"	5'3"	6'5"	7'4"
14	4'0"	4'10"	5'10"	6'7"
16	3'9"	4'5"	5'3"	6'
18	3'5"	4'	4'10"	5'6"
20	3'2"	3'9"	4'6"	

Lintels that span more than 3 metres (9'9" require double jack studs: see below for construction.)

Three-ply lintel framing

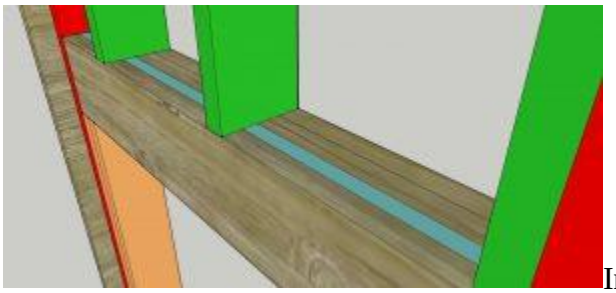
These tables are sufficient for the snow loads throughout our region (Southwest New Brunswick.) Caution should be used for those who may be viewing these tables from a different climactic zone.

A key requirement of any three-ply lintel is that it is supported by two jack studs. This also is a 3'-wide by 3'3" tall opening, as shown above.

On the surface, there is little difference between construction for three-ply lintels when compared to framing a two-ply opening. The one critical difference is that a three-ply lintel must have two jacks studs, regardless of the size of the opening.

(Two-ply lintels only needs a double-jack if the opening is 3m or more.) In the image above, the king studs are in **red**, the jack studs in **orange**, and the cripple studs in **green**.

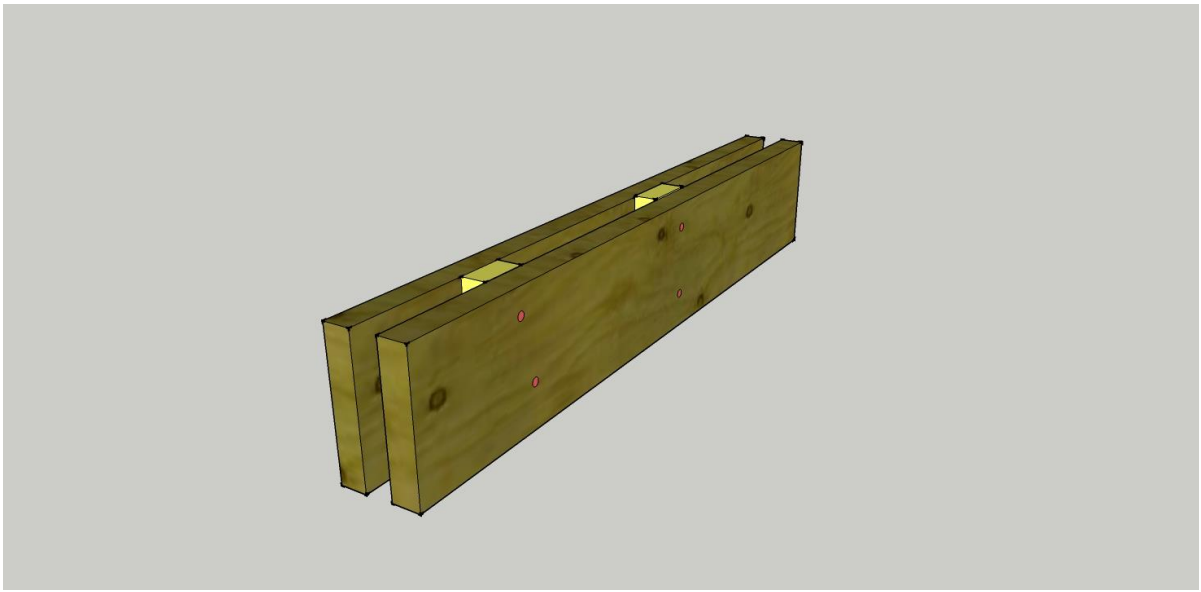
Three-ply lintels in standard 2x6 stud walls present an interesting challenge: three layers of standard lumber measure 4 1/2" wide, which leaves a one-inch gap (a 2x6 is actually 11/2" x 5 1/2") to fill. Options include

In this illustration, a three-ply lintel has been "filled out: with an interior piece of foam. This allows the contractor a surface to attach sheathing and, later, lumber to attach fasteners for a standard nailing-flange window. In order to be code-compliant, the outer element must be attached to the inner element with filler pieces (wood, plywood, or OSB) at spacing no greater than 18". Generally, this means a piece of dimensional lumber or plywood at the same spacing as the studs.

- Doing nothing - leaving the gap on the outside and covering it with exterior sheathing later on. This will not give much material for fastening the upper edge of a window, later on.
- Inserting a 1" piece of foam insulation (which helps reduce thermal bridging). If this is done, "filler" pieces of wood must be used to bind the two elements of the lintel together.
- Inserting two pieces of 1/2" plywood or OSB.

Filler pieces

Filler pieces are allowed under Code. However, these elements must be spaced no more than 45 cm (18") apart, and both sides of the lintel must be nailed to the filler piece in order to create the rigidity required to give the lintel its strength.



Filler pieces (shown in yellow) are permitted, but cannot be more than 45 cm (18") apart.

Three-ply lintels 52 psf snow load			
Supported length	2X8	2x10	2X12
8	8'11"	11'4"	13'10"
10	8'3"	10'7"	12'10"
12	7'9"	9'11"	11'10"
14	7'5"	9'4"	10'8"
16	7'0"	8'4"	9'5"
18	6'4"	7'7"	8'7"
20	5'10"	7'10"	7'11"

Nailing of lintels:

Lintels shall be fastened together with not less than 82 mm nails in a double row, with nails not more than 450 mm apart in each row. [9.23.12.2(2)]. This means that nails must be used on *both* sides of a lintel. (If constructing a three-ply lintel, the first two layers must be nailed to each other, and then the third nailed to the second pair.)
They must also be nailed with a pair of 89 mm (3 1/4") nails at each end - this means that a three-ply lintel will have to be nailed to the king stud with six nails.