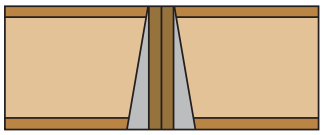
PLF LOAD DEVELOPMENT

CASE ONE: **FLUSH BEAM**

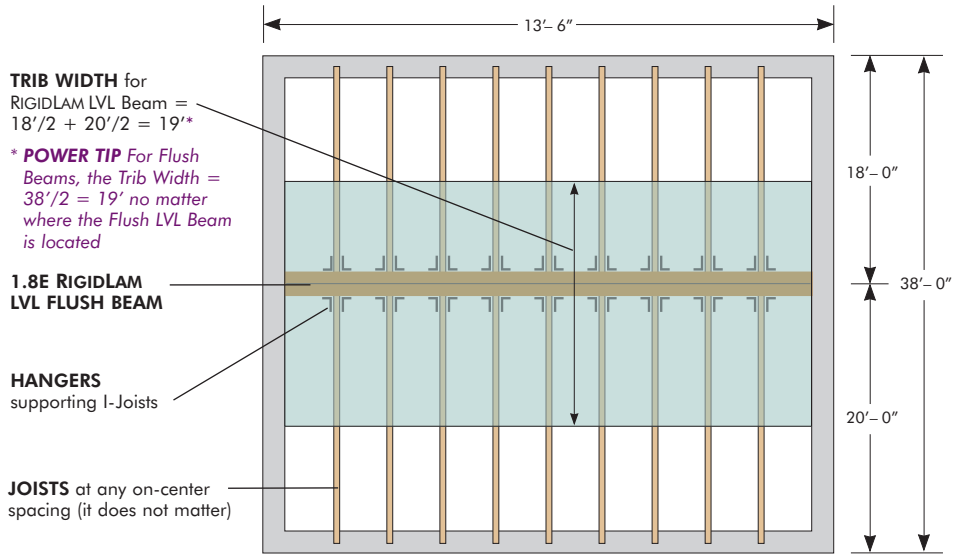


Typical **FLUSH BEAM** Framing

STEP 1 Determine the Trib Width (expressed in units of feet). In the example above, the Trib Width = 19′.

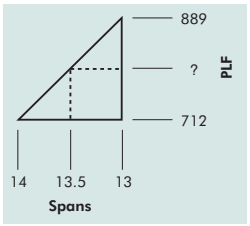
STEP 2 Determine the Live Load PLF and Total Load PLF on the Beam:
PLF_{LL} = (PSF_{LL}) x (Trib Width). Here,
PLF_{LL} = 40PSF x 19′ = 760 PLF_{LL}
PLF_{TL} = (PSF_{TL}) x (Trib Width). Here,
PLF_{TL} = 50PSF x 19′ = 950 PLF_{TL}

STEP 3 Use the appropriate PLF Table, (pages 48 – 59) and match the span of the LVL beam with the left "Span" column of the table. Always round the beam span up to the next whole foot. In this example use the Floor Table on page 48 with a span of 14′.



STEP 4 Going from left to right, find a beam that supports a LL equal to or greater than 760 plf and a TL equal to or greater than 950 plf. Both checks must be made to properly size the beam.

STEP 5 A 2 ply 14″ RIGIDLAM LVL will work (778>760 and 980>950) but a 3 ply 11⅞″ comes close. To check if the 3 ply 11⅞ LVL works at the actual span of 13′– 6″, interpolate the table between 13′ and 14′. If you are not familiar with this, use a triangle as shown to the right to set up the proportion as follows:

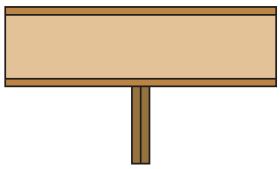


FOR LL (?–712) / (14–13.5) = (889–712) / (14–13) or (?–712) / 0.5 = 177 / 1 or ? = 800 plf LL > 760 plf OK

The PLF value for TL at 14′ is 1052 plf and since this is greater than the required 950 plf, interpolation is not required for total load.

An alternative solution would be a 3 ply 11⅞″ RIGIDLAM LVL (800>760 and 1052>950)

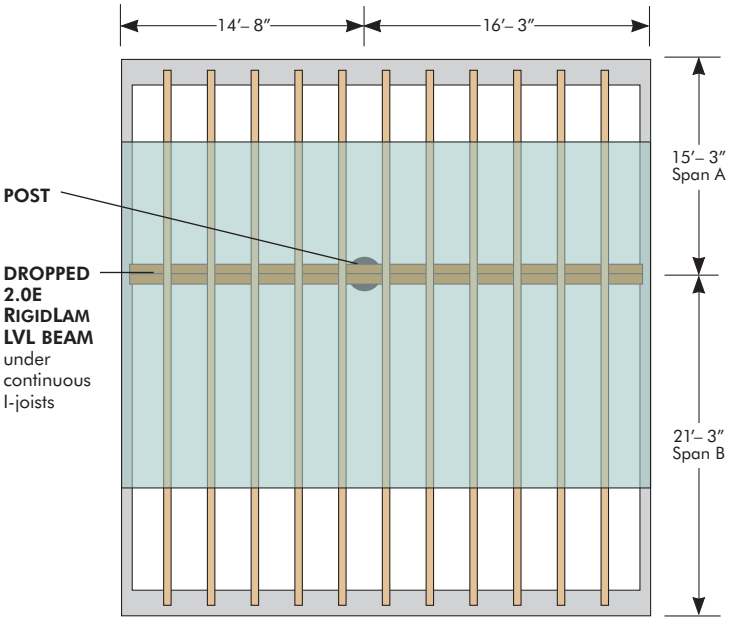
CASE TWO: **DROPPED BEAM**



Typical **DROPPED BEAM** Framing

When the LVL beam is dropped and the I-joists are continuous over the beam, there is more load transferred to the beam. This is because the continuous I-joist increase the trib width of the beam (green shaded area).

If both spans of the I-joist are equal, there is 25% more load put into the LVL beam. If both spans are not equal, like shown in the diagram to the right (Span B > Span A), there is even more load placed into the LVL beam. The exact formula is complicated but fortunately there is a simple and safe way to size the LVL beam:



STEP 1 Assume both spans of the I-joist to be the longest span. In the example to the left, this would be Span B (21.25 ft).

STEP 2 Calculate the PLF on the LVL beam as if it were flush and increase by 25%:
PLF_{LL}= 40PSF x 21.25′ x 1.25 = 1063 PLF_{LL}
PLF_{TL}= 50PSF x 21.25′ x 1.25 = 1329 PLF_{TL}

STEP 3 Use the longest span of the LVL beam (round up to the next whole foot) and use the appropriate PLF table. In this example, use a span of 17′ and the table on page 50. Use a 3 ply 2.0E 16″ RIGIDLAM LVL beam (1081>1063 & 1425>1329).

This method will always be safe provided the long span of the I-joist (Span B) is not more than 5 times longer than the shorter span (Span A). When possible, RFP-KeyBeam™ sizing software should be used.