The beam to girder web connection should be designed to deliver the beam reaction to the center of the joist girder and to minimize the amount of beam end rotation induced into the girder. If practical, the end seat type of connection should be used in place of framing the beam into the web of the girder. The end seat connection requires less material and no special erection considerations. The beam end can be reinforced to act as a shallow seat as long as the unreinforced web section of the member can transfer the shear load. If this capacity is exceeded, a heavier beam should be used or the beam will have to be connected to the web of the joist girder. End seat reinforcement is usually required to resist the bending in the coped section of the beam. The design of a 2.5 inch end seat is illustrated in the following example.

Example 5.2.2 Beam Seat Design

Design a 2.5″ deep seat for the given beam and loading.

Given:

W16x31

Reaction , R = 9 kips.

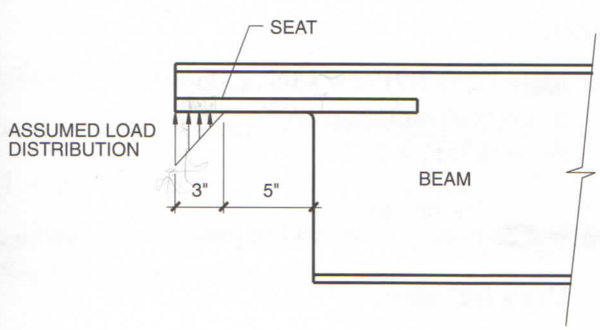

Fig. 5.2.7 Example 5.1.2

Solution:

1. Check the shear capacity of 2–1/2″ deep section:
   The maximum shear capacity = $V_R = F_v t_w h$
   $F_v = 0.4F_y = 14.4$ ksi
   $t_w = 0.275$ inches; $h = 2.5$ inches
   $V_R = (14.4)(.275)(2.5) = 9.9$ kips
   9 kips < 9.9 kips **o.k.**

2. Reinforce the section for bending:
   $M = RL$

Based on the triangular stress distribution shown in Fig. 5.2.7 the reaction is located one inch from the end of the seat, thus L = 7 inches.