development length, as is shown below.

Welds

First, the welds needed to develop each end of the WT section in tension will be considered. To keep material preparation simple, fillet welds will be used. Keeping in mind that the minimum size fillet weld for this WT section (stem thickness = 0.22 inches) is ⅛-in., and assuming F_w = 60 ksi (the nominal strength of the weld metal), the following can be written:

$$\text{Length of Weld} = T_r / [2 \times \phi \times 0.60 \times F_w \times A_w]$$

where

A_w = Effective area of the weld

$$\text{Length of Weld} = 36 \times 2.02/[2 \times 0.75 \times 0.60 \times 60 \times 0.707 \times 0.125] = 15.23 \text{ inches}$$

For practical purposes, a development length of 2 feet on each end will be used. Therefore, the length of the reinforcing WT6 will be 4.8 ft + 2 × 2 ft., or say 9 ft-0 in. long, centered in the 40 ft. span. ⅛-in. fillet welds 24-in. long between the WT stem and the bottom of the beam on both sides of the stem at each end will be used. Also, to stitch the stem to the bottom of the beam between the ends of the WT, ⅛-in. fillet welds 2-in. long at 12-in. o.c. both sides, staggered will be specified. This will result in a 2-in. weld every 6 inches, which will satisfy the minimum requirements. See Figure 3 for a design sketch.

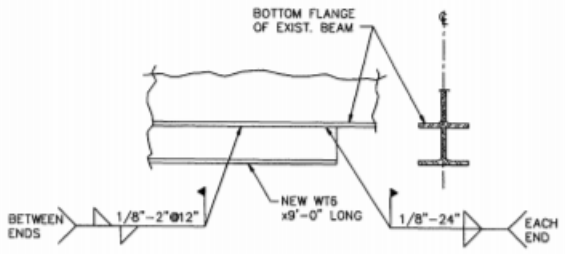

Fig. 3. Design sketch.