Check Fatigue and Deflection due to Live Load

$M_{LL(transverse)}$= 9.34 ft kips/ft (Use Eq. 1 or Eq. 3 for all span lengths respective of main bar direction.)

Fatigue in Negative Bending:

SM top of welds in negative bending = 7.78 in^3

$M_F = M_{strength}$ / 3 = 3.113658

Factor to reduce moment due to flexibility of supports (not yet in code) = 1

Negative M_F adjusted for flexibility of supports = 3.113658

Check liveload stress = 3.113658 x 12 / SM = 4.80105 ksi at top of welds in negative bending

check against f/2 cat C= 5 ksi: O.K. ◄ CHECK

Fatigue in Positive Bending:

SM bottom of punchout in positive bending = 9.47 in^3

$M_F = M_{strength}$ / 3 = 3.113658

Factor to reduce moment due to flexibility of supports (not yet yet in code) = 1

Positive M_F adjusted for flexibility of supports = 3.113658

Check liveload stress = 3.113658 x 12 / SM = 3.945262 ksi at bottom of welds in positive bending

check against f/2 cat C= 5 ksi: O.K. ◄ CHECK

Deflection:

$\Delta_{transverse} = \frac{0.0052\ P^{in}\ L^3}{D_x}$ * 0.0319836 in. = L / 2261

$\Delta_{parallel} = \frac{0.0072\ P^{in}\ L^3}{D_y}$ * 0.0400471 in. = L / 1798

Deflection = Δtransverse = 0.0319836 in. = L / 2251

But this is for a simple span. Reduce by continuity factor if continuous:

Deflection = 0.025587 in. = L / 2814 O.K. ◄ CHECK