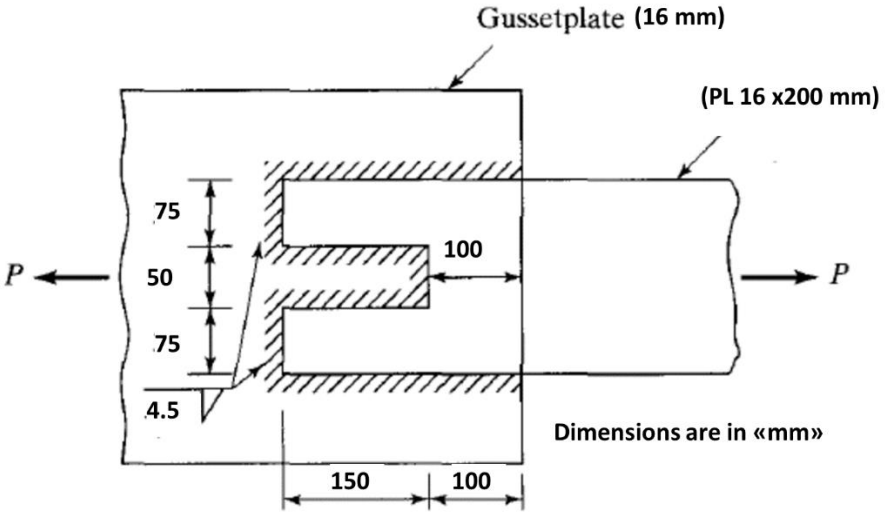
STEEL STRUCTURES (CE483) III. Homework

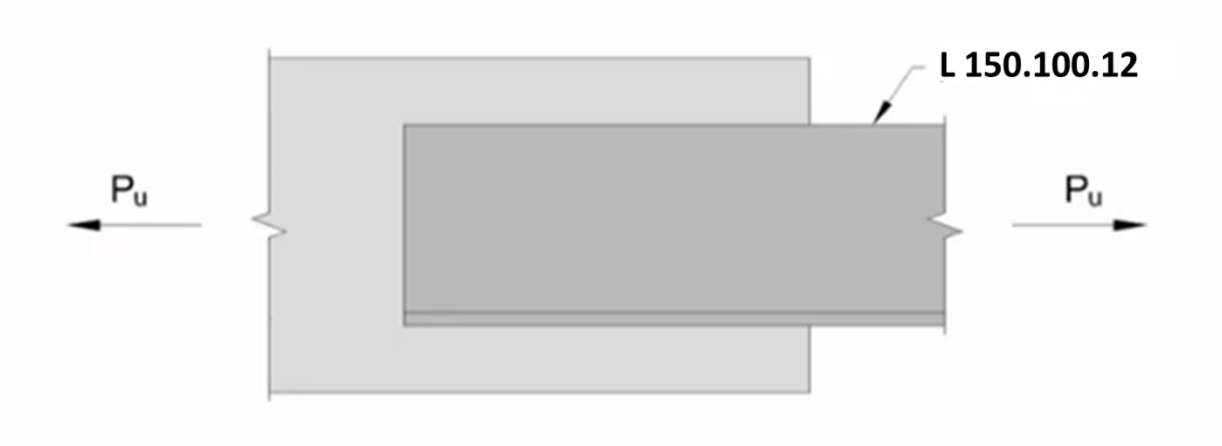
Due on Friday, 17 January 2020, 2:00 pm. (110/100 points)

Note: You can assume if you think some data is missing. Plagiarism will not be tolerated.

1) The 16x200 mm plate (PL) shown in the accompanying illustration is to be connected to a gusset plate with 4.5 mm thick (a) SMAW fillet welds. Determine ΦR_n of the bar if S235 steel and E70 (480 MPa) electrodes and are used? (35 points)



2) Design by LRFD and <u>maximum size longitudinal</u> SMAW fillet welds required to develop the loads P_{Dead} = 310 kN and P_{Live} = 270 kN for an L150.100.12, using E70 (480 MPa) electrodes and S355 steel? (15 points)



3) Rework the 2. Problem, using both longitudinal and transverse welds at the end of the angle? (10 points)

4) Rework the 2. Problem, using both longitudinal and transverse welds at the end of the angle and E80 (550 MPa) electrodes? (10 points)

5) Member L_2 L_3 is to consist of a pair of angles with a 12 mm thick gusset plate between the angles at each joint. Steel is S235. Each P is consisting of P_{Dead} = 270 kN and P_{Live} = 210 kN for the truss shown in Fig. below. (40 points)

a) Design the member L_2 L_3 with the lightest shape available?

b) Design the connection L_2 by welds using E70 (480 MPa) electrodes and L_3 by welds using M20-8.8 (N) bolts.

c) Design the member B_2 B_1 with the lightest IPN shape available?