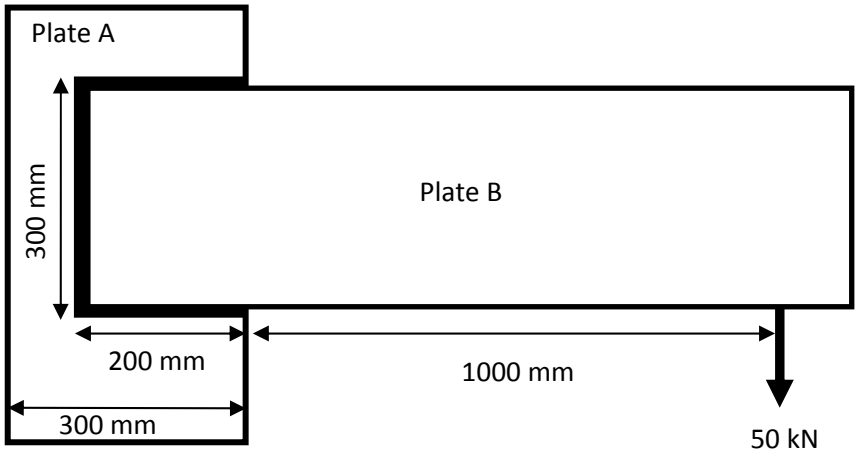
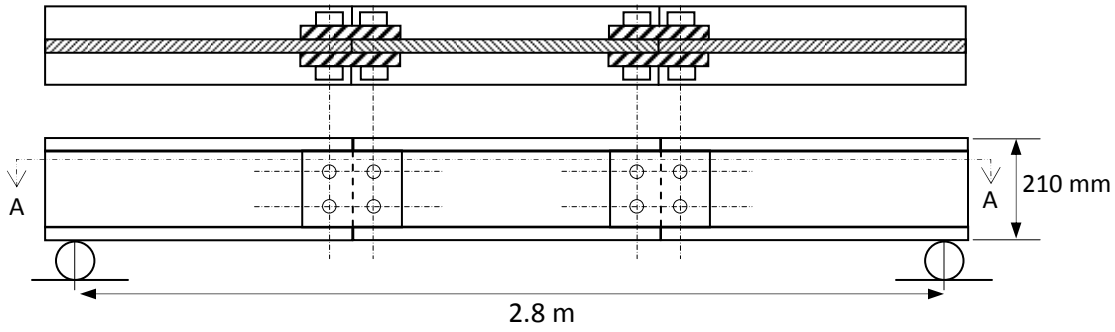
March 22, 2018

ME-351A
Design Tutorial- 5

1. A steel construction comprises of two plates each of 10 mm thickness made of AISI 1030 CD steel. The two plates are joined together by a fillet weld as shown in figure. The welding electrode used is ** series. Determine the weld leg size for a factor of safety of 1.5.



2. A beam is made by joining 3 pieces of 1 m long I-sections as shown in Figure. The web and flanges of the I-section are 5 mm thick. The flange is 125 mm wide and the depth of the I-section is 210 mm as shown in figure. The assembly is placed symmetrically on two supports as shown and is subjected to a uniformly distributed load of ** kN/m between the two supports. Determine the bolt size required assuming a bolt grade of 4.8 considering failure of bolts in shear. The distance between the bolt center lines is 120 mm in either direction. A factor of safety of around 2 is required.



3. A deep-groove ball bearing is subjected to a radial of 6000 N and a thrust load of ** N. Select the bearing for an expected life of 1000 hours at a speed of 400 rpm. Assume a load factor of 1.2.

** - Data will be given in Lab

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