

Cantilever shaft with two spherical ball bearings on one end and a pulley/belt on the other. The belt creates a downward force on the end of the shaft. The shaft has a “shoulder” to position the bearings against. This shoulder cannot have a large fillet – otherwise it would interfere with the bearing. Unfortunately, being a cantilever structure, there is large bending moment at the bearing location.

TASK: without increasing the shaft’s fillet radius or diameter, develop 3 concepts (revise the shaft) that may reduce the stress concentration at the fillet. If time allows, discuss pros and cons of each of the concepts.

