50. A uniform load of $w \sim N(200, \ 20^2)$ lbf/in is applied to a rod OC as shown in the figure. The yield strength of rod OD is $S_y \sim N(30, 3^2)$ kips. Assume the maximum probability of failure to be $p_f = 10^{-5}$, determine the minimum diameter of rod OD using the First Order Second Moment Method and then select a preferred one. Note that w and S_y are independent.

Answer: $d_{min} = 0.45$ in, $d_{preferred} = 0.5$ in