Simplification of the bungee cord equation

$$v^2 = -\frac{gk}{W}s^2 + 2g\left(1 + \frac{lk}{W}\right)s - \frac{gk}{W}l^2$$

when the jumper first stops, v^2=0 we calculate the maximum length (s_{max}) as,

$$-\frac{gk}{W}s_{max}{}^2 + 2g\left(1 + \frac{lk}{W}\right)s_{max} - \frac{gk}{W}l^2 = 0$$

$$s_{max}{}^2 - 2\left(l + \frac{W}{k}\right)s_{max} + l^2 = 0$$

$$s_{max}{}^2 = \sqrt{\left(\frac{W}{k}\right)^2 + 2\frac{Wl}{k}} + \frac{W}{k} + l$$

since the minimum distance to the bottom is $h_{min} = H - s_{max}$

$$h_{min} = H - \sqrt{\left(\frac{W}{k}\right)^2 + 2\frac{Wl}{k}} + \frac{W}{k} + l = (H - l) - \frac{W}{k}\left(1 + \sqrt{1 + 2\frac{kl}{W}}\right)$$

For simplification, if l=0 and if we have number of bungee cord strands = σ, we obtain,

$$h_{min} = H - \frac{2W}{\sigma k} = H - \frac{2Mg}{\sigma k}$$

which is the equation used in Saltelli's exercise.