

Q3 [XG to MG connection]  
 ↳ shear connection.

$P_{y_{max}} = 74 \text{ t}$

1) Friction type:

assume using M22 (10.9)

tables  $\rightarrow P_s = 4.77 \text{ t}$

G1: # bolts =  $\frac{74}{4.77} \div 2 \approx 8 \text{ bolts}$

G2: # bolts =  $\frac{74}{4.77} \approx 16 \text{ bolts} \Rightarrow 8 \text{ bolts / side}$

2) Beaming type:

using bolts M22 (10.9)

$R_{sh} = (0.2 F_{ub}) * A_b * m = (0.2 * 10) * \left( \frac{\pi (2.2)^2}{4} * 0.8 \right) * 2 = 12.16 \text{ t}$  } G1

$R_b = \alpha F_{up} * D * \min \leq t = 0.8 * 3.6 * 2.2 * 2 = 12.67 \text{ t}$

assumed  $\leftarrow$  min of  
th. of 2 \* 1cm 100x10 2cm th. of XG web

$R = 12.16 \text{ t}$

# bolts =  $\frac{74}{12.16} \approx 7 \text{ bolts}$

$R_{sh} = (0.2 * 10) * \left( \frac{\pi (2.2)^2}{4} * 0.8 \right) = 6.08 \text{ t}$  } G2

$R_b = 0.8 * 3.6 * 2.2 * 1 = 6.34 \text{ t}$

min of th. of MG web  
1cm th. of 100x10

$R = 6.08 \text{ t}$

# bolts =  $\frac{74}{6.08} = 12.2 \rightarrow \text{use 14 bolts} \rightarrow 7 \text{ per side}$

∴ e is taken = 2d  
 ∴ e = 4.4 cm

