Handout for Clab 2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Design | Max bending stress | Deflection in each beam | | | Load multiplier | Overall sway |
| Beam 1 | Beam 2 | Beam 3 |
| ASME 8” SCH.20 | 3.09e8Pa | 8.87e-4m | 5.3e-4m | 9.23e-4m | 36.7 | 0.0282m |
| ASME 8” SCH.40 | 1.61e8Pa | 6.86e-4m | 4.16e-4m | 7.12e-4m | 48.59 | 0.0217m |
| ASME 8” XS | 1.08e8Pa | 4.63e-4m | 2.82e-4m | 4.80e-4m | 70.8 | 0.01459m |
| Requirement | 170MPa | 1/360 of each beam span | | |  | 12.5mm |

170MPa = 1.7e8Pa

Beam 1 = 8.3e-3

Beam 2 = 1.25e-2

Beam 3 = 1.25e-2

1)-

2)All 3 beams meet the design requirements in all 3 designs for deflection by beam.

3)-

4)-

5)Both design 2 & 3 meet the same number of requirements, they both meet requirements 1,2,3 but not 4. Design 3 is closest to meeting design requirement 4.

6)Most of the member are not loaded so using smaller cross sections for these would save money and vice versa.