

# Rigging Report

June 30, 2025

## 1 Pipe Weight Calculation

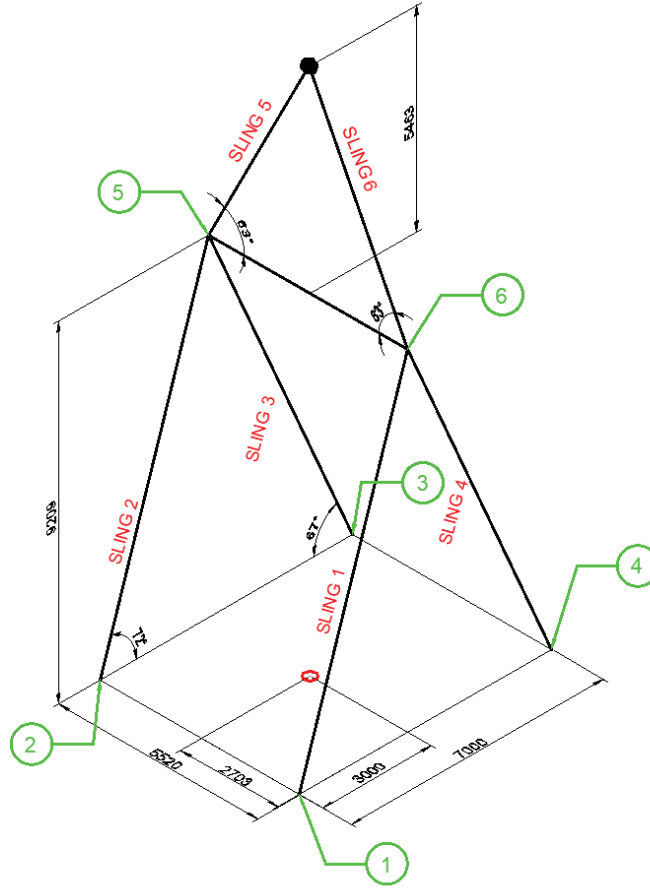
The weight of the spreader bar pipe is calculated as:

$$\text{Weight per Meter} = \text{Outer Diameter} \times \pi \times \text{Thickness} \times 7.85$$

$$\text{Weight} = \text{Weight per Meter} \times \text{Length}$$

The calculated weight of the spreader bar pipe is **2.28 T**.

## 2 Position of Center of Gravity (C.O.G)



The position of the C.O.G is essential for stability. The distances from the C.O.G to each lifting point are used in the load calculations.

## 3 Calculation for Each Lifting Point

The load at each lifting point is calculated using (e.g., lifting point 1 and 2):

$$L = W \times \left( \frac{d_{t1}}{od_{t1}} \right) \times \left( \frac{d_{t2}}{od_{t2}} \right)$$

$$L_1 = 150 \times \left( \frac{5520 - 2703}{5520} \right) \times \left( \frac{7000 - 3000}{7000} \right)$$

$$L_2 = 150 \times \left( \frac{2703}{5520} \right) \times \left( \frac{7000 - 3000}{7000} \right)$$

- Lifting Point 1: 43.74 T

- Lifting Point 2: 41.97 T
- Lifting Point 3: 31.48 T
- Lifting Point 4: 32.81 T
- Lifting Point 5: 76.55 T
- Lifting Point 6: 73.45 T

## 4 Tension Calculation

The tension in each sling is:

$$\text{Tension} = \frac{\text{Load}}{\sin(\theta)}$$

- Sling 1: 45.99 T (72°)
- Sling 2: 44.13 T (72°)
- Sling 3: 34.20 T (67°)
- Sling 4: 35.64 T (67°)
- Sling 5: 82.44 T (63°)
- Sling 6: 85.91 T (63°)

## 5 Compressive Force Calculation from Sling 5 and 6

The compressive force on the spreader bar is generated by the horizontal components of the tensions in sling 5 and 6. For each sling:

$$\text{Compressive Force (per sling)} = \text{Tension} \times \cos(\theta)$$

For sling 5:

$$C_5 = 82.44 \times \cos(63^\circ) = 82.44 \times 0.4540 = 37.43 \text{ T}$$

For sling 6:

$$C_6 = 85.91 \times \cos(63^\circ) = 85.91 \times 0.4540 = 38.99 \text{ T}$$

Total compressive force:

$$C_{\text{total}} = C_5 + C_6 = 37.43 + 38.99 = 76.42 \text{ T}$$

## 6 Compressive Stress on the Spreader Bar

The compressive stress is the combination of sling 5 and 6 pulling at two ends of the spreader bar:

$$\text{Longitudinal Load} = \text{Load} \times \cos(\theta)$$

The total compressive stress on the spreader bar is **75.01 T**.

## 7 Summary Tables

### Lifting Load at 4 Lifting Points and Padeye

Lifting Point	Load (T)
1	43.74
2	41.97
3	31.48
4	32.81
5	73.45
6	76.55

### Tension of the Slings

Sling No.	Tension (T)	Angle (°)
1	45.99	72
2	44.13	72
3	34.20	67
4	35.64	67
5	82.44	63
6	85.91	63

### Compressive Stress on Spreader Bar

Component	Stress (T)
Total Compressive Stress	75.01