Note: never make sling length shorter than the distance between two anchors

APPLICATION:

A STEEL SECTION OF 2m x 2m – 14 Mtrs Long Weighing around 50,000 Kgs to be lifted with help of 2 Slings.

It is considered that the load of the beam is evenly distributed (i.e 50,000 kgs ÷ 14 Mtrs = 3572 Kgs / Mtr), hence we can plan a lift at 4 mtrs from centre each side, so load between slings shall be 28 Tons, and load outside slings shall be 22 Tons, which seems to be balanced load to keep the minimum deflections in the beam being lifted.

Below are the Loads and Risk Factor associated with this lift. It will all depend upon the Head Room available to carry out the safest possible Lift. As indicated by the users 4.5 m head room is available for the slings (Total available 8.5 mtrs, minus 2 Mtrs of

beam, and 2 Mtrs for lifting and turning etc.), which confirms that angle used shall be between 90 to 120 degrees, which is between safe to Moderate risk profile.

INCLUDED ANGLE BETWEEN TWO LEGS	RISK FACTOR	LOAD PER LEG (KGS)	SLING LENGTH (M)	HEAD ROOM (M)
30°	SAFEST LIFT	25,881.90	15.45	14.93
60°	SAFER LIFT	28,867.51	8.00	6.93
90°	SAFE LIFT	35,355.34	5.66	4.00
120°	MODERATE RISK LIFT	50,000.00	4.62	2.31
150°	HIGH RISK LIFT	96,592.58	4.14	1.07
170°	RISKY LIFT	2,86,842.83	4.02	0.35

Hence we would like to use a 5 Mtrs. Sling;

Using a 5 Mtr Sling the other data would change as follows:

Included angle – 106°
Risk Profile - Moderate Risk Lift
Load Per Leg - 41,541 kgs
Sling Length - 5.00 Mtrs
Head Room - 3.00 Mtrs.

SELECTION OF TYPE OF SLING :

We shall need 2 Slings, Each Sling shall be able to lift 40 Tons individually.

If we consider a basket lift for this application, a single sling will be 16 mtrs. Long and in straight lift, capable of lifting 25 Tons. (As Basket lift double its capacity, and angle between two basket legs will again reduce the capacity of the sling to 47 tons – A 20 Tons sling would lift 37.5 Tons in this configuration).

We need 2 Nos. of 25 ton x 16 Mtrs (Straight lift cap: 25 Tons)

TO DECIDE, WHICH SLING TO USED:

1. **For 25 Tons Straight Lift, a wire rope of 6 x 37 IWRC, RHOL, (1770 N/mm Sq.) of minimum 56 to 60mm is recommended.**

2. **Wire rope: assuming section edge are 90 degrees, the wire rope should not be Point loaded and must be in contact with object being lifted for at least 1 lay length (approx. 6 times the Dia of wire rope), and a protection must be provided so the wire is in contact for 1 lay length (i.e. around 360mm minimum), proper D/d ratio is Must for full strength of the sling.**

3. **G80 chain of 32mm has also a WLL of 25 Tons, But again, the corners must be R = 64mm or such protection has to be provided.**

4. **Polyester Round Sling can also be used, and as that is very soft, proper protection against damage at corner lifting has to be considered.**

Being a Moderate Risk Lift, The riggers must take utmost care to inspect the Sling before each lift, maintain proper distance between slings, & maintain proper balance between two legs.

As if this may be a regular job, _SAFER_ or _SAFEST_ lifts must be considered to avoid any chances of mishaps during lifting.

NOTE : Although every care has been taken while making calculations above, we suggest users to cross check (double check) in case there might have been any oversight in calculations. Also these all are theoretical calculations, and proper over-protection margins should be taken into due consideration after checking the operating environment and risk profile of applications involved.