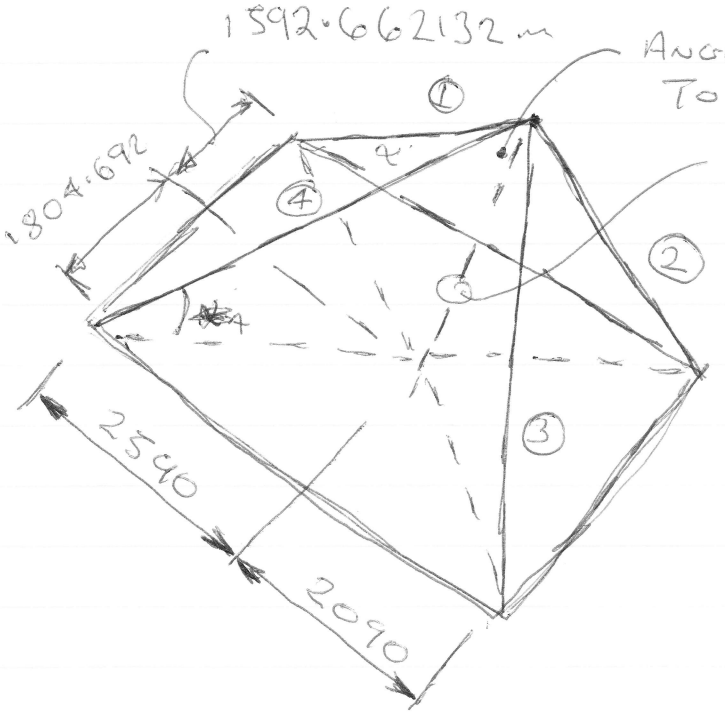


ANGLE OF EACH CABLE TO VERTIX

VERTIX = 5554.272924 mm

TOTAL LENGTH OF CABLE ① $\sqrt{3041.829265^2 + 5554.27294}$

① = 6332.667131 mm

② = 6144.478854 mm

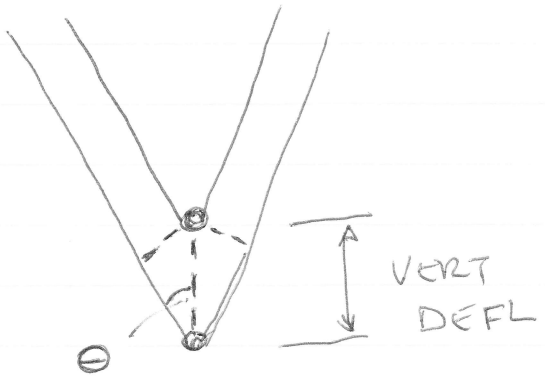
③ = 6202.818984 mm

④ = 6388.658963 mm

ANGLE OF EACH CABLE AT THE TOP OF THE APEX

		Cos θ =
①	= 28.70756°	0.8770827219
②	= 25.31839167°	0.9039453833
③	= 26.43456818°	0.8954433361
④	= 29.61150298°	0.8693957458

NOW COMPONENT BEING LIFTED STAYS HORIZONTAL, THEREFORE THE VERTICAL DEFLECTION OF EACH CABLE MUST BE THE SAME CONSIDER :-



FOR SMALL DISPLACEMENTS WE CAN ASSUME THE ANGLE OF THE CABLES DOESN'T CHANGE.

FROM THE FORMULA $\Delta x = \frac{FL}{AE}$

ASSUME A & E CONSTANT FOR EACH CABLE

$\therefore \Delta x_1 = F_1 L_1$

$\Delta x_2 = F_2 L_2$

$\Delta x_3 = F_3 L_3$

$\Delta x_4 = F_4 L_4$

VERTICAL DEFLECTION $\therefore \frac{FL}{\cos\theta}$

IF VERTICAL DEFL OF ALL CABLES ARE EQUAL THEN :-

$$\frac{F_1 L_1}{\cos\theta_1} = \frac{F_2 L_2}{\cos\theta_2} = \frac{F_3 L_3}{\cos\theta_3} = \frac{F_4 L_4}{\cos\theta_4} \quad (1)$$

IN ADDITION

(2) $F_1 \cos\theta_1 + F_2 \cos\theta_2 + F_3 \cos\theta_3 + F_4 \cos\theta_4 = 75\,Te$

USING EQUATION (1) ON PREVIOUS PAGE SUBSTITUTE F_2, F_3, F_4 INTO TERMS OF F_1 & POT IN EQUATION (2) ABOVE.

$$\therefore\ F_1 \cos\theta_1 + \frac{F_1 l_1 \cos^2(2)}{l_2 \cos(1)} + \frac{F_1 l_1 \cos^2(3)}{l_3 \cos(1)} + \frac{F_1 l_1 \cos^2(4)}{l_4 \cos(1)}$$

$$0.8771 F_1 + 0.9316 F_1 + 0.9332 F_1 + 0.8542 F_1 = 75\,Te$$

$$F_1 = 20.8559\,Te$$

$$F_2 = 22.15297\,Te$$

$$F_3 = 21.7367\,Te$$

$$F_4 = 20.4915\,Te.$$