Qx = beban Q untuk satu jalur tanpa k kejut.

Qx = q' + Q

q' =12 . 5,5/2,75 = 24 ton

Qx = 24 + 135,25 = 152,25 ton

HR = 5% . 152,25 = 7,3625 ton

$$VR = \frac{HR(1,8+0,05+1,38)}{L}$$

$$= \frac{5,92(1,8+0,05+1,38)}{20}$$

= 0,9951 ton

3. Gaya Gempa Bumi

K = E . G

dimana :

K = Gaya horizontal

E = Koefisien gempa bumi yang ditentukan menurut daftar

G = Muatan mati dari konstruksi

G = Vabt + V jem

= 662,175 + 148, 104 = 881,55

K = E . G

= 0,032 . 881,55 = 20,032 ton

Maka Beban P = 4,204 + 0,99510 + 20,032

= 25,03 ton

Jadi muatan W = 1000 ton

dan P = 25 ton = 250 kN

$$M_{L1} = \frac{179}{2}\left(\frac{1}{3,6^2} + \frac{015}{1,6^2}\right)\frac{3,6^4 1,6^4}{3.3,6^4 + 2.3,6^2.1,6^2 + 3.1,6^4} = 22,672\,kNm/m$$

$$M_{L2} = \frac{q}{2}\left(\frac{\mu}{a^2} + \frac{1}{b^2}\right)\frac{a^4 b^4}{3a^4 + 2a^2b^2 + 3b^4}$$

$$M_{L2} = \frac{179}{2}\left(\frac{0,15}{3,6^2} + \frac{1}{1,6^2}\right)\frac{3,6^4 1,6^4}{3.3,6^4 + 2.3,6^2.1,6^2 + 3.1,6^4} = 67,170\,kNm/m$$

$$M_{t1} = \frac{q}{a^2}.\frac{a^4 b^4}{3a^4 + 2a^2b^2 + 3b^4} = \frac{179}{3,6^2}.\frac{3,6^4.1,6^4}{3.3,6^4 + 2.3,6^2.1,6^2 + 3.1,6^4}$$

$M_{t1} = 25,773\,kNm/m$

$$M_{t2} = \frac{q}{b^2}.\frac{a^4 b^4}{3a^4 + 2a^2b^2 + 3b^4} = \frac{179}{1,6^2}.\frac{3,6^4.1,6^4}{3.3,6^4 + 2.3,6^2.1,6^2 + 3.1,6^4}$$

$M_{t2} = 130,464\,kNm/m$

Momen yang terjadi :

$M_{L1} = M_{L1}.2b = 22,672.3,2 = 72,5504$ kNm,

$M_{L2} = M_{L2}.2a = 67,170.7,2 = 483,624$ kNm,

$M_{t1} = M_{t1}.2b = 25,773.3,2 = 82,474$ kNm,

$M_{t2} = M_{t2}.2a = 130,464.7,2 = 939,341$ kNm,

Berdasarkan persamaan (3.50) diperoleh :

$$t = \sqrt{\frac{6M}{l.\sigma}}$$

searah sumbu x diperoleh $t = \sqrt{\frac{6.82,474}{3,6.0,45.30000}} = 0,101m$,

searah sumbu y diperoleh $t = \sqrt{\frac{6.939,341}{7,2.0.45.30000}} = 0,241m$

diambil t = 0,25 m

Berdasarkan persamaan (3.29) diperoleh :

$$\frac{\sum M_{lawan}}{\sum M_{dorong}} \geq SF \Rightarrow SF = 1{,}5$$

$$\frac{P_1 + P_2 + F}{P} = \frac{1921{,}683 + 1088{,}238 + 529{,}162}{300} = 11{,}797 > 1{,}5$$

2) Kontrol stabilitas guling

Berdasarkan persamaan (3.28) diperoleh :

$$\frac{\sum M_{lawan}}{\sum M_{guling}} \geq SF \Rightarrow SF = 1{,}5$$

$$\frac{M_{E1} - M_{E2} + v_1 . B_o / 2(P_1 - P_2)}{P(H + D)}$$

$$\frac{15402{,}293 - 717{,}675 + 0{,}384 . 2{,}749 / 2(1921{,}68 - 1088{,}238)}{300(10 + 14)}$$

$2{,}101 > 1{,}5$

3) Kontrol kapasitas dukung tanah

Eksentrisitas (e)

$$e = \frac{M}{R} = \frac{7924{,}517}{10844{,}190} = 0{,}731 m > \frac{L}{6} = \frac{3{,}5}{6} = 0{,}583 m$$

Karena eksentrisitas berada di luar inti, maka ada sebagian tanah yang mengalami tarik. Secara teoritis tanah tidak dapat menahan tarik, sehingga tekanan tanah tarik diabaikan.