

①  $M_s = (0.31 \cdot 2.8 \cdot 1.8 \cdot 5.9 + 4.0 \cdot 3.7 + 2.0 \cdot 12.6 + 1.5 \cdot 20.2 + 2.5 \cdot 4.5 + 0.31 \cdot 12.0 \cdot 1.8 \cdot 7.4 + 0.20 \cdot 1.8 \cdot 4.5 \cdot 8.3) 27.8 = 1536 \cdot 27.8 = 4270$

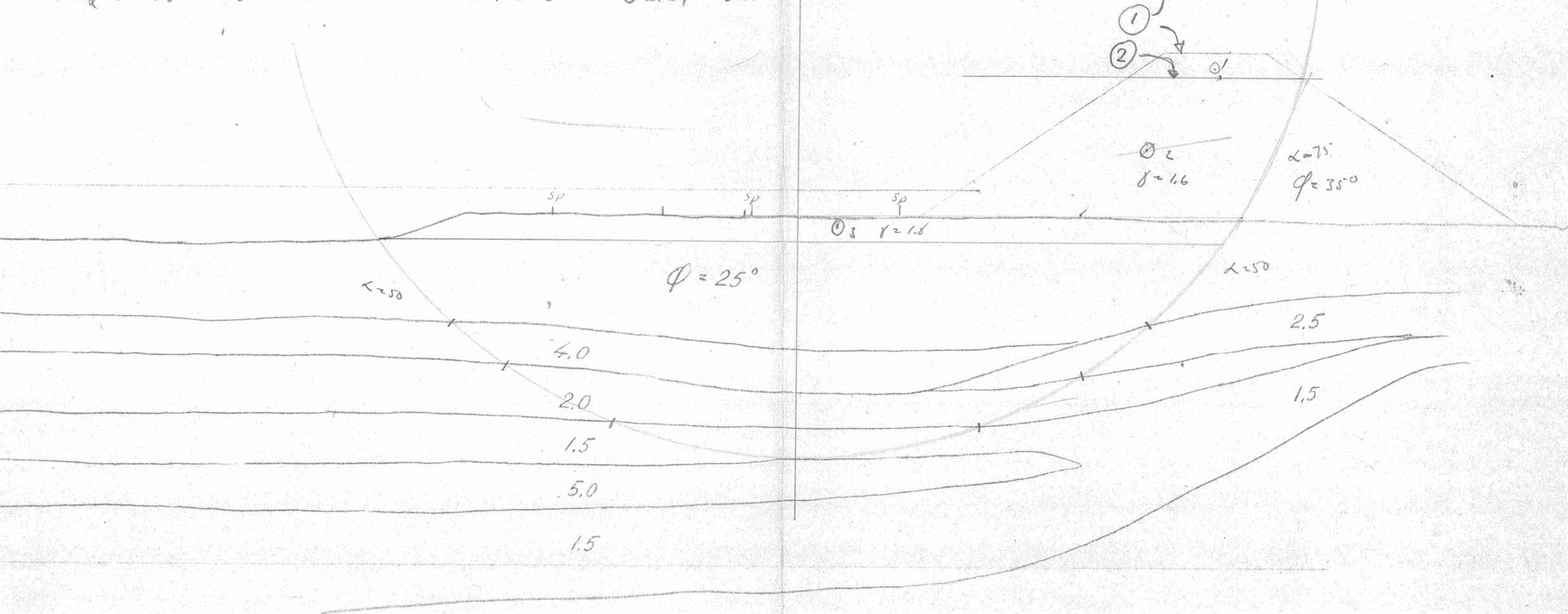
$M_R: (7.5 \cdot 1.3 \cdot 22.2 + 13.4 \cdot 7.5 \cdot 18.6) 1.6 + 427 \cdot 1.4 \cdot 2.1 \cdot 1.8 = 2086 \cdot 1.6 + 226 = 3340 + 226 = 3566$

$F_s = 1.20$

②  $M_s = 27.8(9.2 + 14.8 + 25.2 + 30.3 + 11.2 + 49.5 + 0.20 \cdot 1.8 \cdot 3.6 \cdot 8.3) = 1515 \cdot 27.8 = 4210$

$M_R = 1870 \cdot 1.6 + 226 = 2990 + 226 = 3216$

$F_s = 1.31$



Heggedal st  
Pukkopp lag  
BLI

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16/9-00  
Krk



$$M_s = 23,2 \left( 0,28 \cdot 1,8 \cdot 1,9 \cdot 4,7 + 0,32 \cdot 1,8 \cdot 5,4 \cdot 4,7 + 4,0 \cdot 4,4 + 2,0 \cdot 6,9 + 1,5 \cdot 21,0 + 2,5 \cdot 3,7 + 0,28 \cdot 1,8 \cdot 6,0 \cdot 4,6 + 0,23 \cdot 1,4 \cdot 1,6 \cdot 2,8 \right) = 23,2 \cdot 106,5 = 2470$$

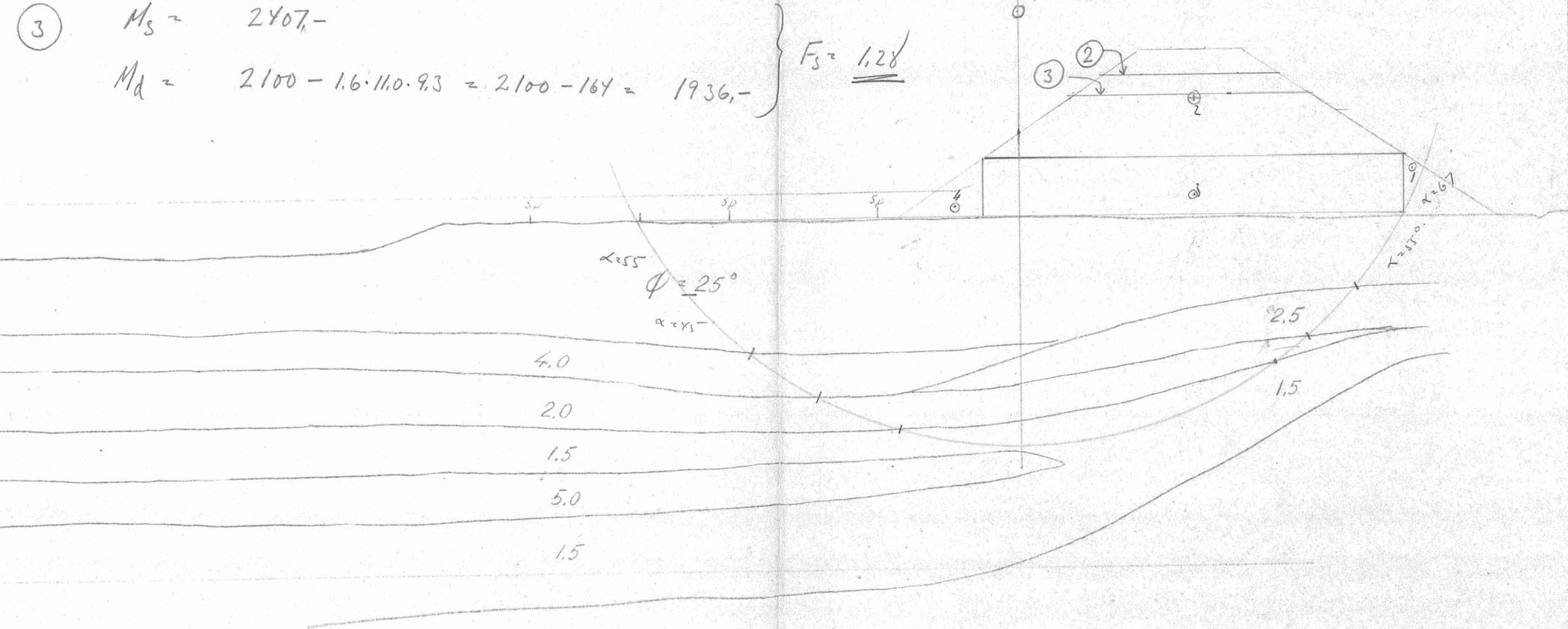
$$M_d = \left( 1,2 \cdot 1,6 \cdot 21,0 + 1,5 \cdot 15,9 \cdot 4,4 \cdot 9,3 + 1,5 \cdot 22,4 \cdot 3,1 \cdot 9,3 + 4,5 \cdot 1,6 \cdot 3,5 \right) 1,6 = 1312,1 \cdot 1,6 = 2100, - \text{tm.}$$

$$F_s = 1,18$$

$$M_s = 2407, -$$

$$M_d = 2100 - 1,6 \cdot 11,0 \cdot 9,3 = 2100 - 164 = 1936, -$$

$$F_s = 1,28$$



Heggedal st  
Pukkopplag-  
BI 2

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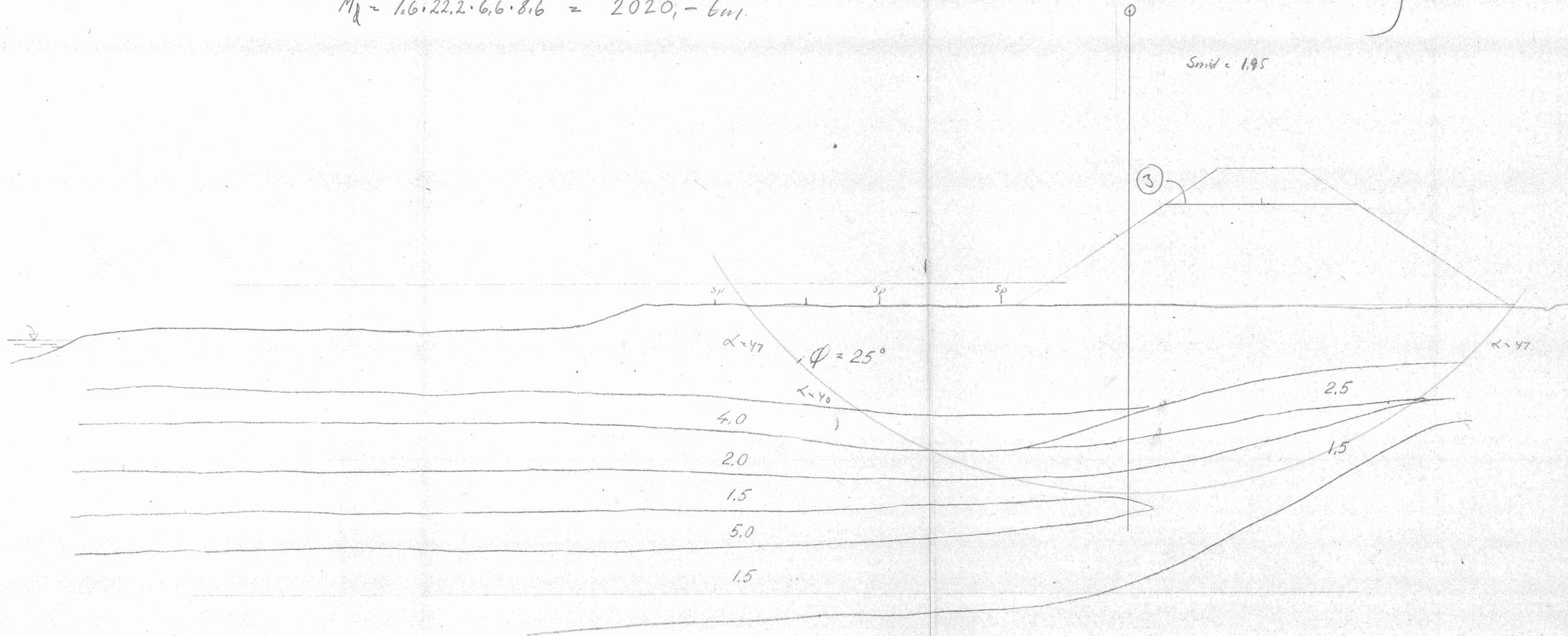
16/9-60  
K.K



③  $M_s = (0,31 \cdot 1,8 \cdot 1,8 \cdot 4,9 + 0,33 \cdot 5,2 \cdot 1,8 \cdot 5,0 + 4,0 \cdot 5,3 + 2,0 \cdot 5,4 + 1,5 \cdot 27,2 + 2,5 \cdot 3,7 + 0,31 \cdot 1,8 \cdot 2,8 \cdot 4,8) 31,3 = 109,9 \cdot 31,3 = 3440$

$M_d = 1,6 \cdot 22,2 \cdot 6,6 \cdot 8,6 = 2020, - \text{tun.}$

}  $F_s = 1,7$



Heggedal st.  
Pukk opplag.  
Blad 3

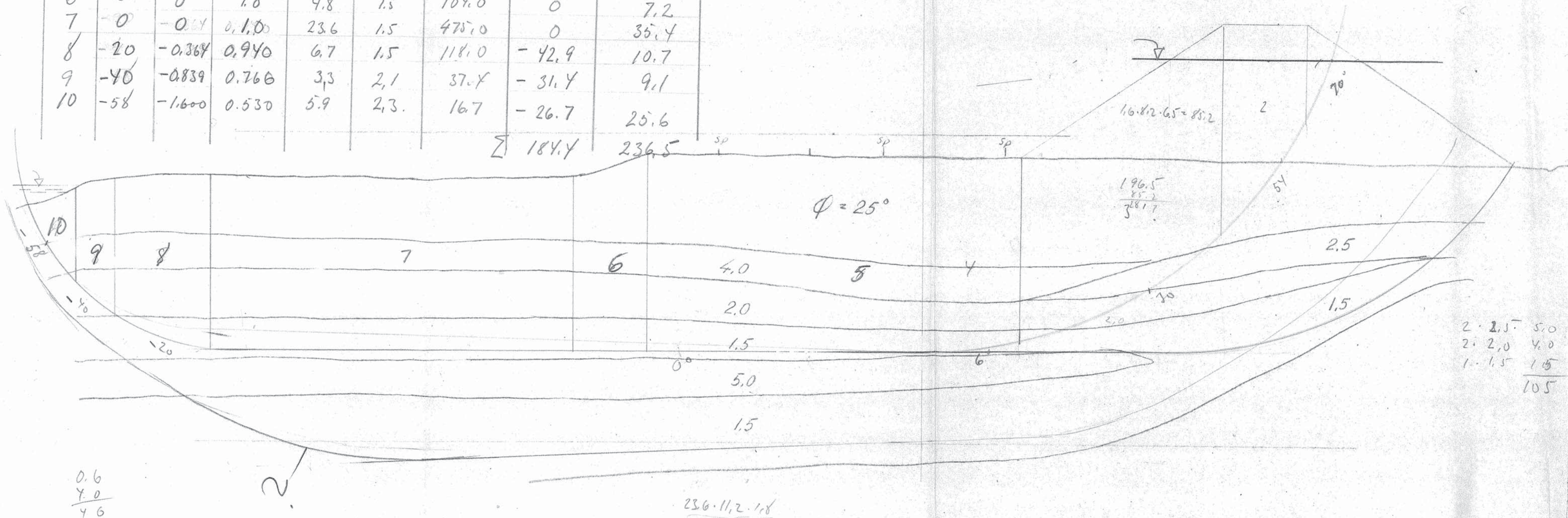
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17/9-60



| Verdier fra profil. |          |              |               |            |     |                |                       |                                  |
|---------------------|----------|--------------|---------------|------------|-----|----------------|-----------------------|----------------------------------|
| Lam.                | $\alpha$ | $\lg \alpha$ | $\cos \alpha$ | $\Delta l$ | $S$ | $4W$           | $4W \cdot \lg \alpha$ | $\frac{\Delta l S}{\cos \alpha}$ |
| 1                   | 70       | 2,747        | 0,342         | 4,4        | 0,9 | 5,1            | 14,0                  | 11,5                             |
| 2                   | 54       | 1,376        | 0,588         | 9,2        | 4,1 | 68,2           | 93,9                  | 64,1                             |
| 3                   | 30       | -0,577       | 0,866         | 15,1       | 2,1 | 281,7          | 162,4                 | 36,6                             |
| 4                   | 6°       | 0,105        | 0,995         | 6,4        | 1,5 | 144,0          | 15,1                  | 9,6                              |
| 5                   | 0        | 0            | 1,0           | 17,8       | 1,5 | 410,0          | 0                     | 26,7                             |
| 6                   | 0        | 0            | 1,0           | 4,8        | 1,5 | 104,0          | 0                     | 7,2                              |
| 7                   | 0        | -0,4         | 0,1,0         | 23,6       | 1,5 | 475,0          | 0                     | 35,4                             |
| 8                   | -20      | -0,364       | 0,940         | 6,7        | 1,5 | 118,0          | -42,9                 | 10,7                             |
| 9                   | -40      | -0,839       | 0,766         | 3,3        | 2,1 | 37,4           | -31,4                 | 9,1                              |
| 10                  | -58      | -1,600       | 0,530         | 5,9        | 2,3 | 16,7           | -26,7                 | 25,6                             |
|                     |          |              |               |            |     | $\Sigma$ 184,4 | 236,5                 |                                  |

$$F_s = 1,07 \cdot \frac{236,5}{184,4} = \underline{\underline{1,37}}$$



Heggedal st.  
Pukk opplag.  
Bl. 4

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17/6-60  
KIK



| Verdier fra profil. |     |        |       |      |     | Beregning. |                   |                           |
|---------------------|-----|--------|-------|------|-----|------------|-------------------|---------------------------|
| Lam.                | x   | tgx    | cosx  | dl   | s   | ΔW         | ΔW <sub>tgx</sub> | $\frac{\Delta W}{\cos x}$ |
| 1                   | 43  | 0.933  | 0.731 | 13.8 | 1.8 | 105.7      | 98.5              | 34.0                      |
| 2                   | 29  | 0.555  | 0.875 | 14.2 | 1.5 | 281.0      | 156.0             | 24.4                      |
| 3                   | 12  | 0.213  | 0.978 | 10.0 | 1.5 | 204.2      | 43.5              | 15.3                      |
| 4                   | 3   | 0.052  | 0.999 | 24.3 | 1.5 | 412.0      | 21.4              | 36.4                      |
| 5                   | 3   | 0.052  | 0.999 | 4.9  | 1.5 | 78.6       | 4.1               | 7.3                       |
| 6                   | 3   | 0.052  | 0.999 | 8.6  | 1.5 | 129.2      | 6.7               | 12.9                      |
| 7                   | -7  | -0.123 | 0.993 | 7.0  | 1.5 | 104.9      | -12.9             | 10.6                      |
| 8                   | -21 | -0.384 | 0.933 | 8.5  | 1.5 | 110.6      | -42.4             | 13.7                      |
| 9                   | -37 | -0.754 | 0.799 | 8.8  | 3.3 | 72.3       | -54.5             | 36.4                      |
| 10                  | -53 | -1.327 | 0.602 | 8.9  | 2.2 | 19.0       | -25.2             | 32.5                      |
|                     |     |        |       |      |     | Σ          | 195.2             | 223.5                     |

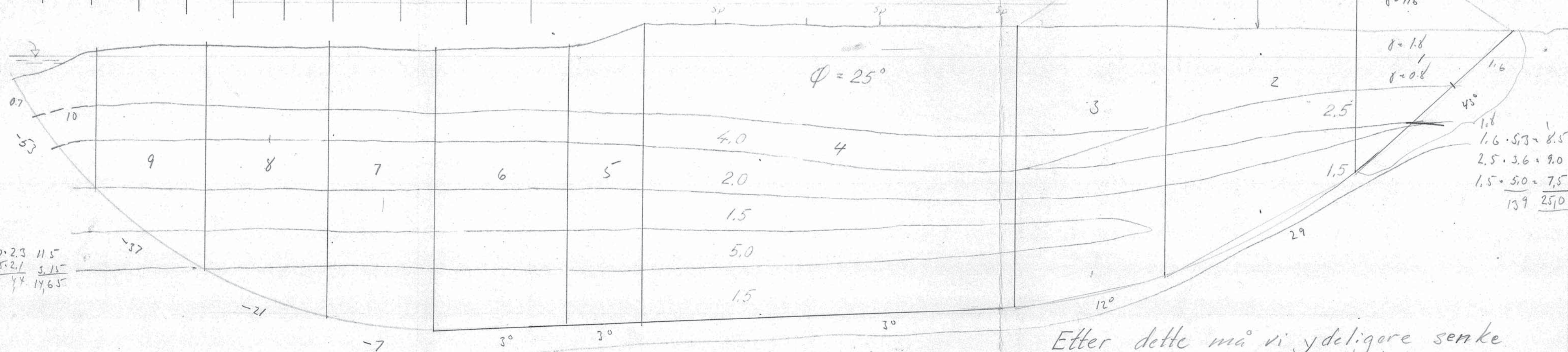
$$\frac{d}{L} = \frac{8.6}{48.4} = 0.18$$

$$F_s = 1.08 \cdot \frac{223.5}{195.2} = 1.24$$

Tillatt fyllingsh.  $\nabla$  Kote 104

ΔW: 53.6

- 1)  $1.6 \cdot 5.0 \cdot 6.7 + 1.8 \cdot 9.1 \cdot 1.7 + 0.8 \cdot 3.7 \cdot 8.2 = 105.7$
- 2)  $1.6 \cdot 12.3 \cdot 6.7 + 1.8 \cdot 1.9 \cdot 12.3 + 0.8 \cdot 10.9 \cdot 12.3 = 281.0$
- 3)  $1.6 \cdot 9.7 \cdot 3.3 + 1.8 \cdot 9.7 \cdot 2.0 + 0.8 \cdot 15.2 \cdot 9.7 = 204.2$
- 4)  $1.8 \cdot 24.2 \cdot 2.0 + 1.6 \cdot 8 \cdot 24.2 \cdot 0.8 = 412.0$
- 5)  $1.8 \cdot 12 \cdot 4.9 + 0.8 \cdot 17.4 \cdot 4.9 = 78.6$
- 6)  $1.8 \cdot 0.5 \cdot 8.6 + 0.8 \cdot 17.7 \cdot 8.6 = 129.2$
- 7)  $1.8 \cdot 7.0 \cdot 0.5 + 0.8 \cdot 17.6 \cdot 7.0 = 104.9$
- 8)  $1.8 \cdot 8.0 \cdot 0.6 + 0.8 \cdot 15.9 \cdot 8.0 = 110.6$
- 9)  $1.8 \cdot 7.2 \cdot 0.6 + 0.8 \cdot 11.2 \cdot 7.2 = 72.3$
- 10)  $0.8 \cdot 5.4 \cdot 4.4 = 19.0$



Med trafikklast på alle spor (10 t/m².)

$$\Delta L_6 \cdot t_{gx} = 3 \cdot 10 \cdot 0.052 = 1.55$$

$$F_s = \frac{223.5 \cdot 1.08}{195.2 + 1.55} = \frac{223.5 \cdot 1.08}{196.75} = 1.22$$

Etter dette må vi ydeligere senke tillatt fyllingshøyde

Forsöker med 1m reduksjon.

$$\Delta L_3 \cdot t_{gx} = 1.6 \cdot 0.7 \cdot 10 \cdot 0.213 = 0.24$$

$$\Delta L_2 \cdot t_{gx} = 1.6 \cdot 12.2 \cdot 10 \cdot 0.055 = 10.80$$

$$\Delta L_1 \cdot t_{gx} = 1.6 \cdot 0.7 \cdot 10 \cdot 0.933 = 1.06$$

$$\sum \Delta L \cdot t_{gx} = 12.10$$

$$F_s = 1.08 \cdot \frac{223.5}{196.75 - 12.10} = 1.08 \cdot \frac{223.5}{184.65} = 1.3$$

cf. H.H.H.  
23/9-60

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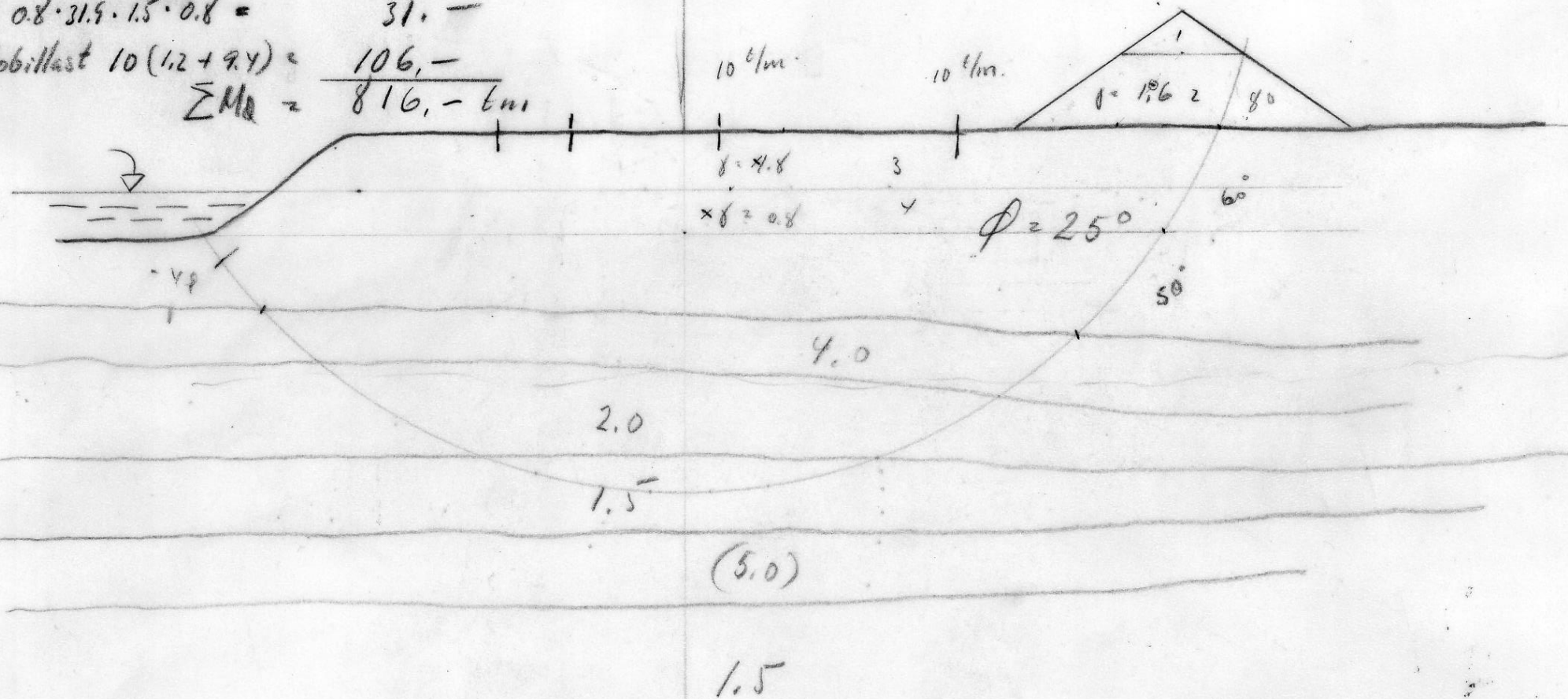
20/9-60  
KJ



$M_d =$

- 1)  $1.6 \cdot 2.1 \cdot 1.4 \cdot 17.1 = 81. -$
- 2)  $1.6 \cdot 5.7 \cdot 2.3 \cdot 16.0 = 336. -$
- 3)  $1.8 \cdot 30.6 \cdot 1.9 \cdot 2.5 = 262. -$
- 4)  $0.8 \cdot 31.9 \cdot 1.5 \cdot 0.8 = 31. -$

Mobilast  $10(1.2 + 9.4) = 106. -$   
 $\Sigma M_d = 816. - \text{ tmi}$



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$$M_s = (0.31 \cdot 1.7 \cdot 0.8 \cdot 2.0 + 0.14 \cdot 1.6 \cdot 1.6 \cdot 2.6 + 0.27 \cdot 5.5 \cdot 1.7 \cdot 4.0 + 0.31 \cdot 7.5 \cdot 1.5 \cdot 4.6 + 4.0 \cdot 6.0 + 2.0 \cdot 11.2 + 1.5 \cdot 13.9) 20.0 =$$

$$(0.84 + 0.93 + 1.0 + 1.6 + 24. - 22.4 + 20.8) 20.0 =$$

$$F_s = \frac{1430}{816} = 1.75$$

$$71.57 \cdot 20 = 1430. - \text{ tmi}$$