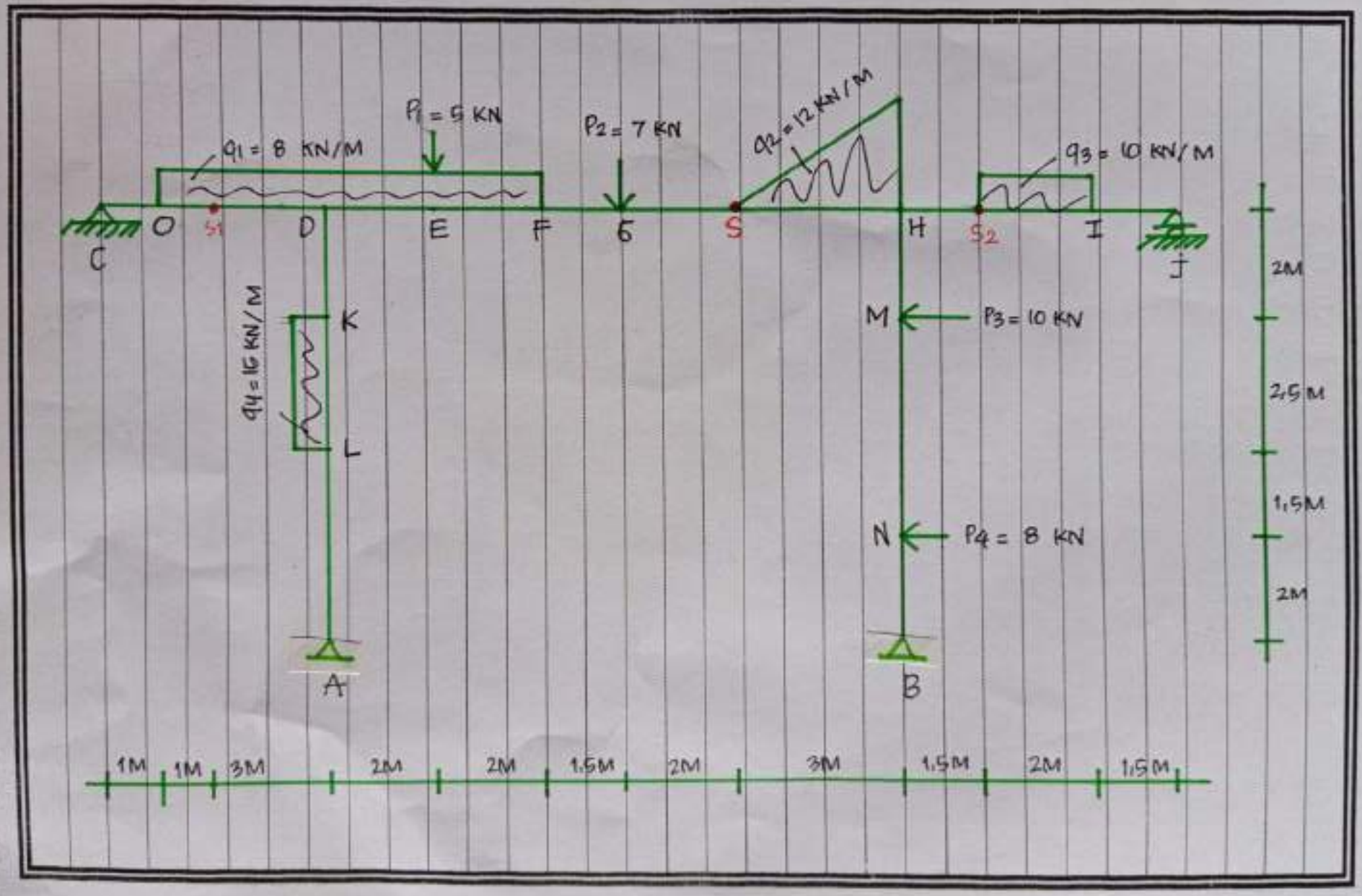

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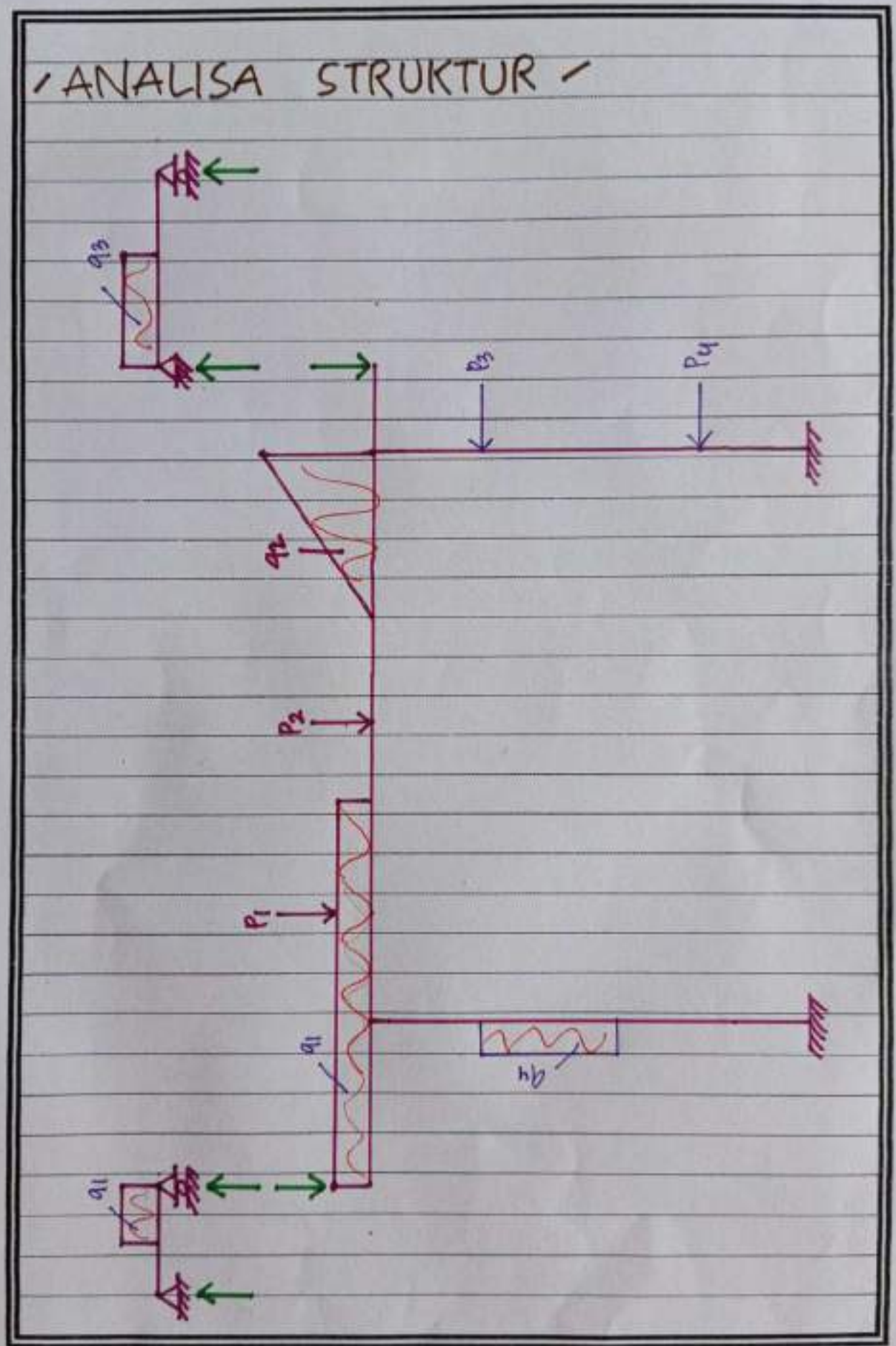
ANALISA STRUKTUR



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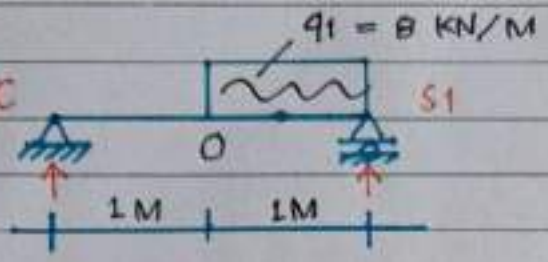
— REAKSI PERLETAKAN —

BATANG C – S1



$\Sigma MS1 = 0$

$RCV \cdot CS1 - q1 \cdot OS1 \left(\frac{1}{2} \cdot OS1\right) = 0$

$RCV \cdot 2 - 8 \cdot 1 \left(\frac{1}{2} \cdot 1\right) = 0$

$RCV = 2\ KN\ (\uparrow)$

$\Sigma MC = 0$

$-RS1V \cdot S1C + q1 \cdot S1O \left(\frac{1}{2} \cdot S1O\right) = 0$

$-RS1V \cdot 2 + 8 \cdot 1 \left(\frac{1}{2} \cdot 1 + 1\right) = 0$

$RS1V = 6\ KN\ (\uparrow)$

CHECKING :

$\Sigma V = 0$

$RCV + RS1V = Q1$

$2\ KN + 6\ KN = 8 \cdot 1$

$8\ KN = 8\ KN \cdots$ OKE !!

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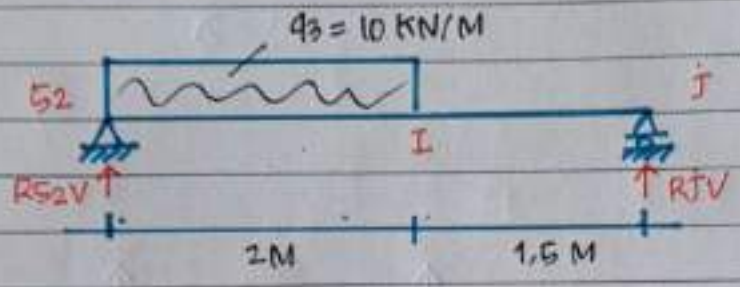
BATANG S2 - J



$\Sigma MJ = 0$

$RS2V \cdot S2J - q3 \cdot S2I \left(\frac{1}{2} S2I + IJ \right) = 0$

$RS2V \cdot 3,5 - 10 \cdot 2 \left(\frac{1}{2} \cdot 2 + 1,5 \right) = 0$

$RS2V = 14,2857 \text{ KN } (\uparrow)$

$\Sigma MS2 = 0$

$-RJV \cdot JS2 + q3 \cdot IS2 \left(\frac{1}{2} \cdot IS2 \right) = 0$

$-RJV \cdot 3,5 + 10 \cdot 2 \left(\frac{1}{2} \cdot 2 \right) = 0$

$RJV = 5,7143 \text{ KN } (\uparrow)$

CHECKING :

$\Sigma V = 0$

$RS2V + RJV = Q3$

$14,2857 + 5,7143 = 10 \cdot 2$

$20 \text{ KN} = 20 \text{ KN} \ldots$ OKE !

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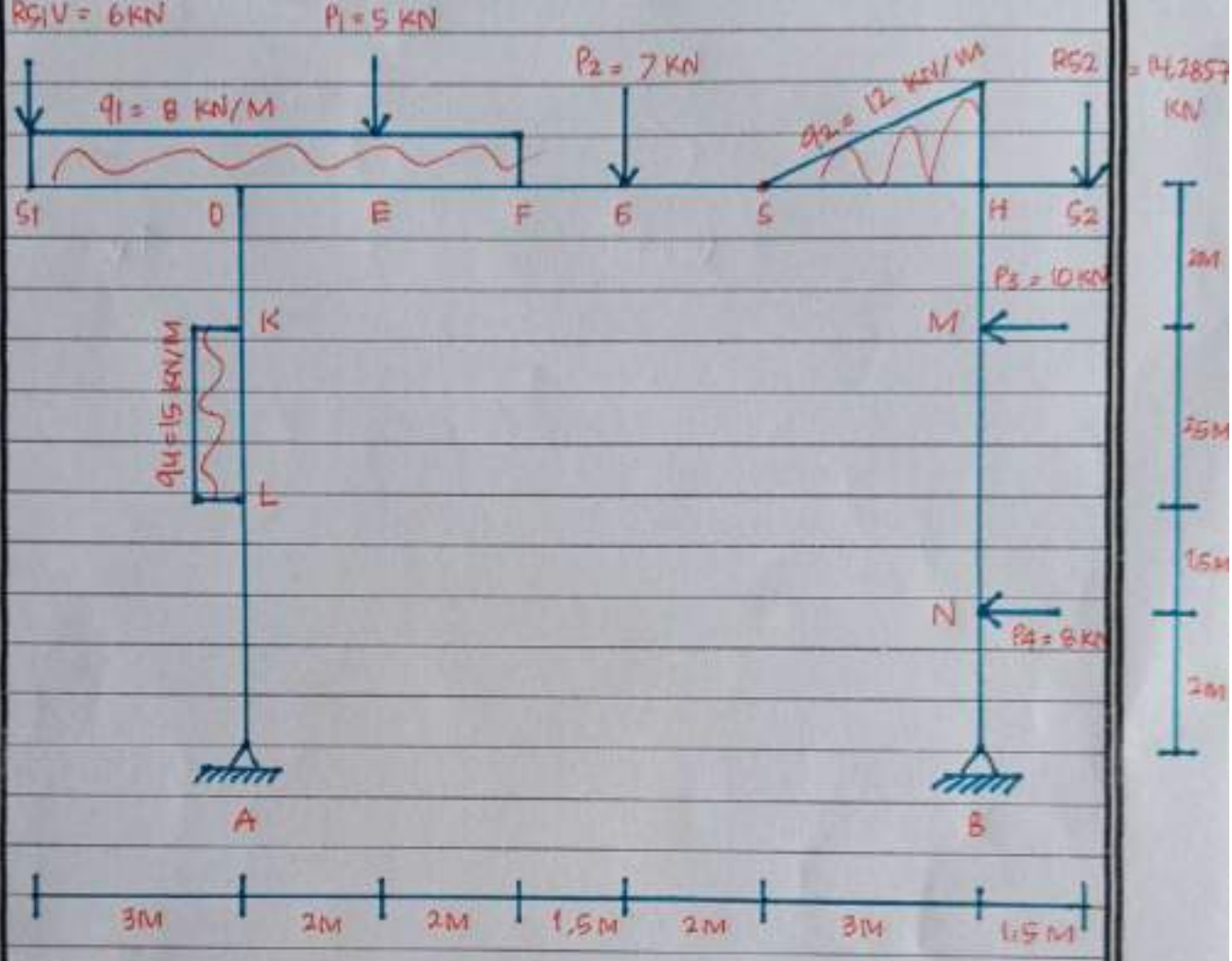
BATANG S1 - S2



$\Sigma MB = 0$

$RAV.AB + q4.KL\,(\frac{1}{2}KL + LA) - RS1V.S1H - q1.S1F\,(\frac{1}{2}S1F + FH) - P1.EH - P2.GH - \frac{1}{2}.q2.SH\,(\frac{1}{3}SH) + RS2V.S_2H - P3.MB - P4.NB = 0$

$RAV.10,5 + 15[2,5\,(\frac{1}{2}.2,5 + 3,5) - 6.13,5 - 8.7\,(\frac{1}{2}.7 + 6,5) - 7,5 - \frac{1}{2}.12.3\,(\frac{1}{3}.3) + 14,2857.1,5 - 10.6 - 8.2] - 6.8,5 = 0$

$RAV = 58,3758\ KN\ (\uparrow)$

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$\Sigma MA = 0$

$-RBV.BA - P4.NB - P3.MB + RS2V.52D + \frac{1}{2}.92.5H(\frac{1}{3}.5H + 5D) + P2.5D + 91.DF(\frac{1}{2}DF) + P1.ED - 91.5,1D(\frac{1}{2}.5,1D) - RS1V.5,1D + 94.KL(\frac{1}{2}.KL + LA) = 0$

$-RBV.10,5 - 8.2 - 10.6 + 14,2857.12 + \frac{1}{2}.12.3(\frac{2}{3}.3 + 7,5) + 7.5,5 + 8.4(\frac{1}{2}.4) + 5.2 - 8.3(\frac{1}{2}.3) - 6.3 + 15.2,5(\frac{1}{2}.2,5 + 3,5) = 0$

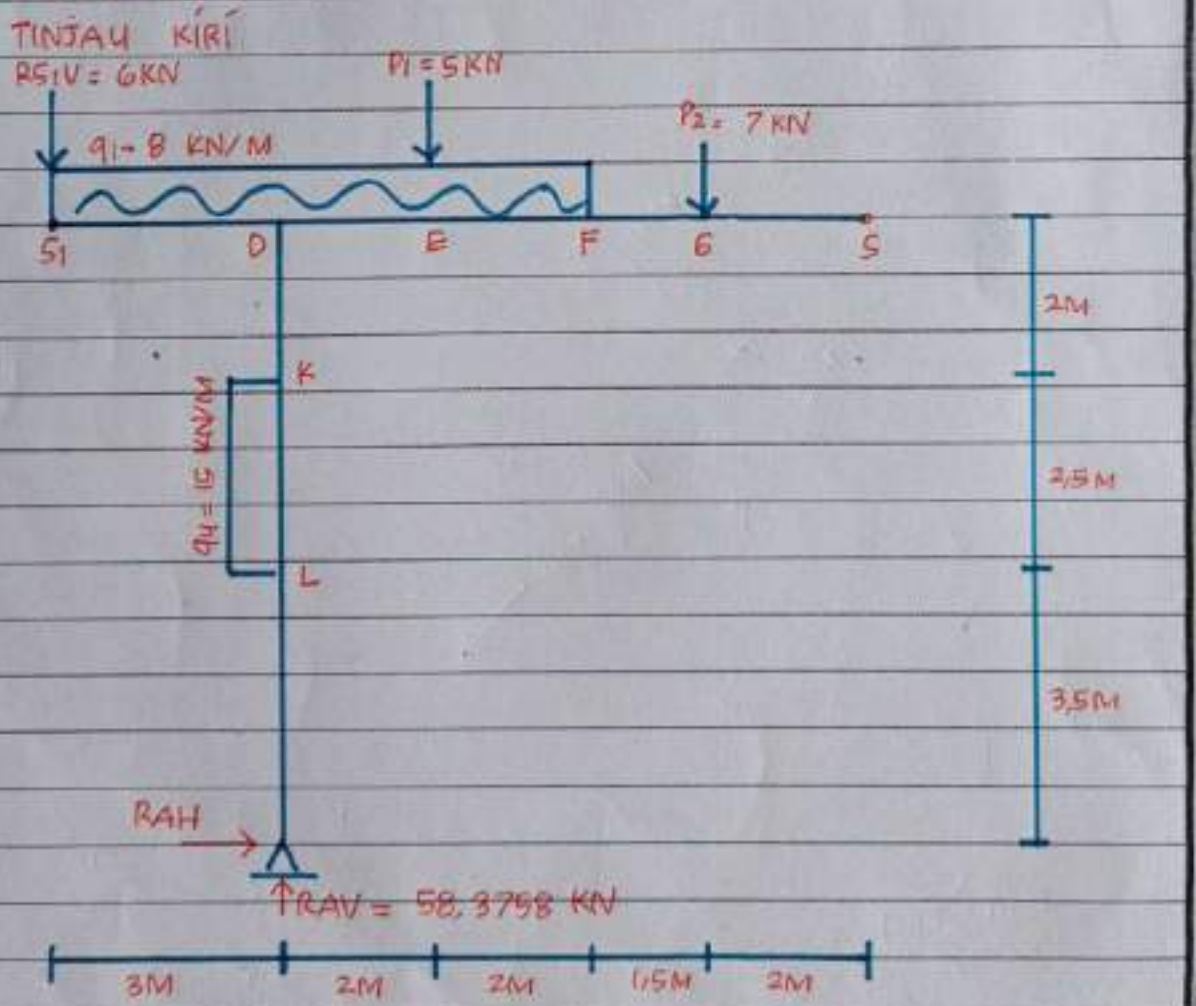
$RBV = 47,9099$ KN (↑)

CHECKING : $\Sigma V = 0$

$RAV + RBV = RS1V + 91.S1F + P1 + P2 + \frac{1}{2}.92.5H + RS2V$

$58,3758 + 47,9099 = 6 + 8.7 + 5 + 7 + \frac{1}{2}.12.3 + 14,2857$

$106,2857$ KN = $106,2857$ KN ··· OKE!!



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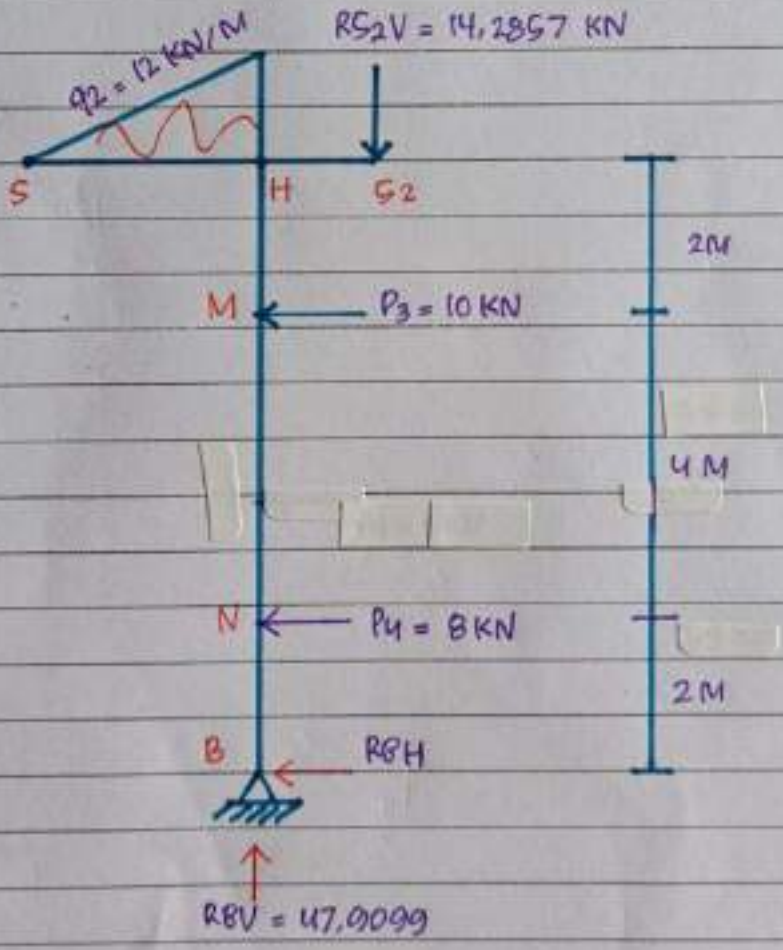
$\Sigma MS = 0$

$RAV.AS - RAH.AD - q4.KL\left(\frac{1}{2}KL + KD\right) - RS_1V.S_1S - q_1.S_1F.\left(\frac{1}{2}.S_1F + FS\right) - P_1.ES - P_2.6S = 0$

$58,3758.7,5 - RAH.8 - 15.2,5\left(\frac{1}{2}.2,5+2\right) - 6.10,5 - 8.7\left(\frac{1}{2}.7 + 3,5\right) - 5.5,5 - 7.2 = 0$

$RAH = -22,5696 \text{ KN} (\leftarrow)$

TINJAU KANAN



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$\Sigma M_5 = 0$

$-R_{BV} . B_5 + R_{BH} . B_H + P_4 . N_H + P_3 . M_H + R_{S_2V} . S_{25} + \frac{1}{2} . q_2 . S_H \left(\frac{2}{3} S_H\right) = 0$

$-47,9099.3 + R_{BH}.8 + 8.6 + 10.2 + 14,2857 . 4,5 + \frac{1}{2} . 12 . 3 \left(\frac{2}{3} . 3\right) = 0$

$R_{BH} = -3,0696$ KN ($\rightarrow$)

CHECKING :

$-R_{AH} + 94 . KL - P_3 - P_4 + R_{BH} = 0$

$-22,5696 + 15 . 2,5 - 10 - 8 + 3,0696 = 0$

$0 = 0$ ... OKE

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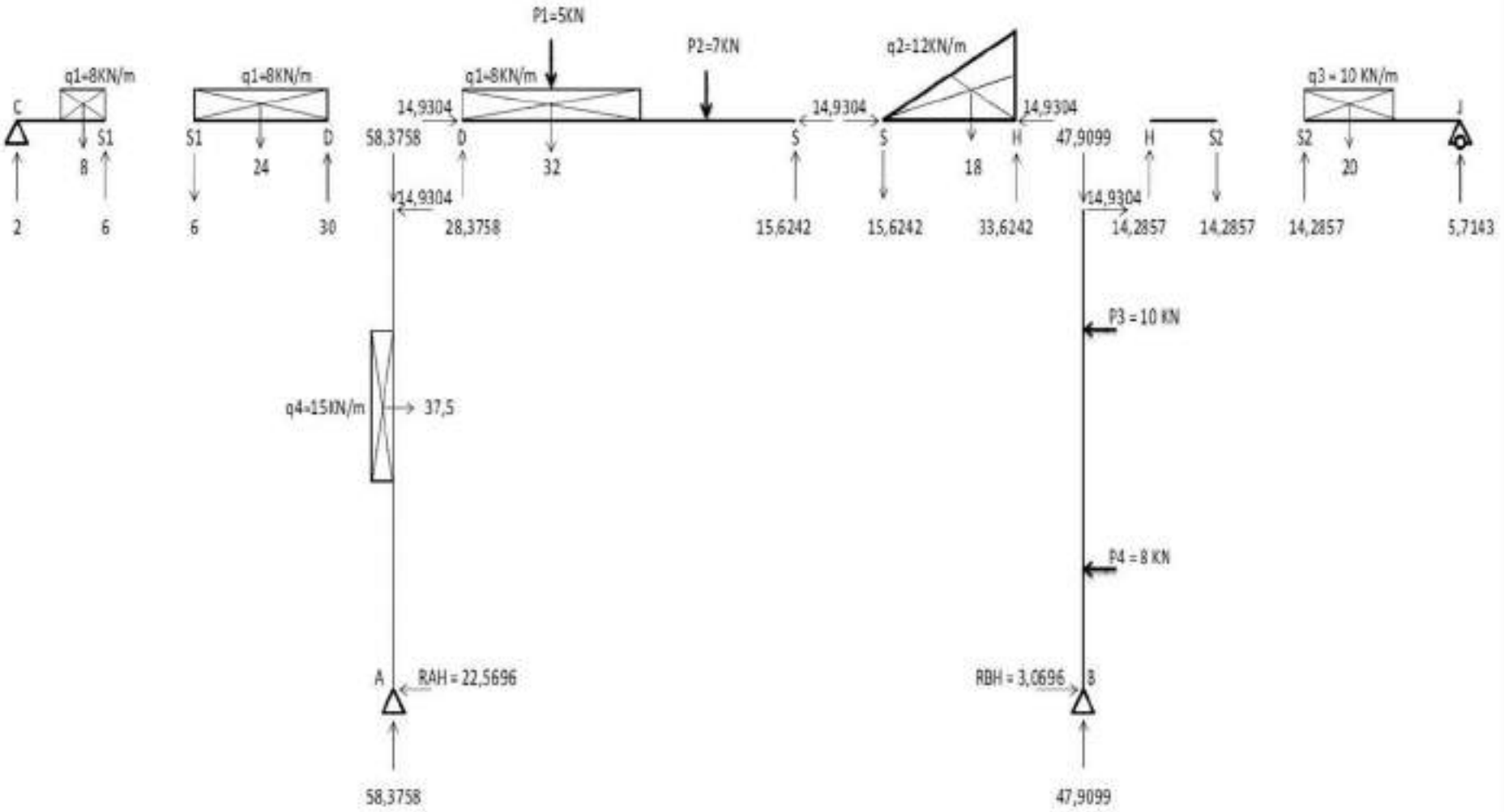
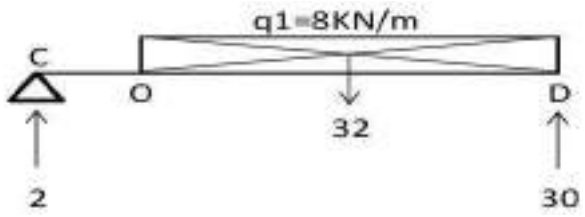
FREEBODY GAYA-GAYA BATANG



PERHITUNGAN GAYA - GAYA DALAM

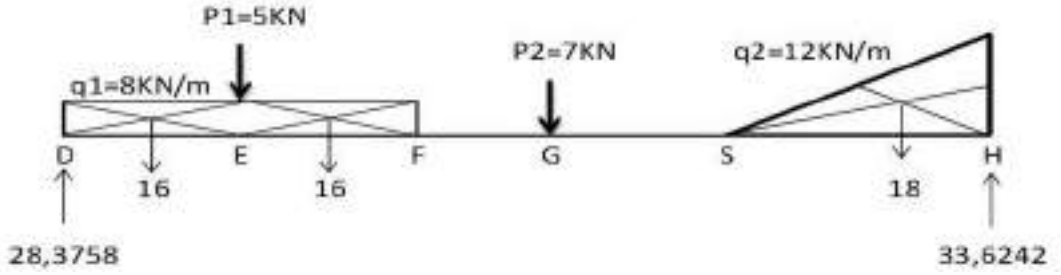
1. GAYA LINTANG

- **Batang A - D**



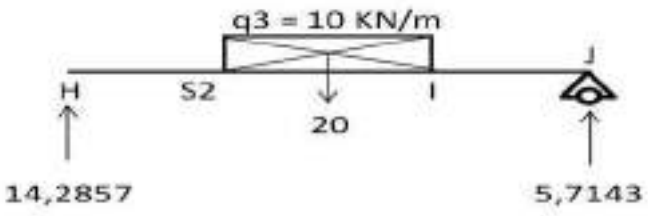
DC = RCV = 2 KN
DO = DC = 2 KN
DDkiri = DO - q1.OD = 2 – (18 . 4) = - 30 KN
DD = DDkiri + 30 = - 30 + 30 = 0

- **Batang D - H**



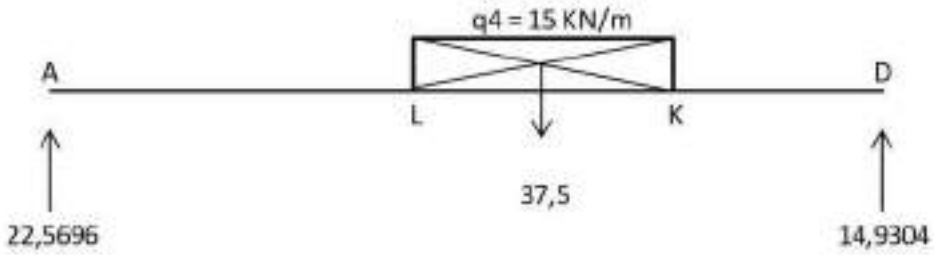
DD = 28,3758 KN
DEkiri = DD – q1.DE = 28,3758 – (8.2) = 12,3758 KN
DE = DEkiri – P1 = 12,3758 – 5 = 7,3758 KN
DF = DE - q1.EF = 7,3758 – (8.2) = -8,6242 KN
DGkiri = DF = -8,6242 KN
DG = DGkiri – P2 = -8,6242 – 7 = -15,6242 KN
DS = DG = -15,6242 KN
DHkiri = DS – ½.q2.SH = -15,6242 – ½.12.3 = -33,6242 KN
DH = DHkiri + 33,6242 = -33,6242 + 33,6242 = 0

- **Batang D - H**



DH = 14,2857 KN
DS2 = DH = 14,2857 KN
DI = DS2 – q3.S2I = 14,2857 – 20 = -5,7143 KN
DJkiri = DI = -5,7143 KN
DJ = DJkiri + 5,7143 = -5,7143 + 5,7143 = 0

- Batang D - H



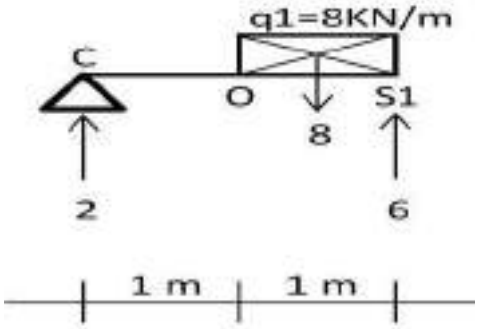
DA = RAH = 22,5696 KN
DL = DA = 22,5696 KN
DK = DL – q4.LK = 22,5696 – 15.2,5 = -14,9304 KN
DDkiri = DK = -14,9304 KN
DD = DDkiri + 14,9304 = -14,9304 + 14,9304 = 0

- Batang D - H

DH = 14,93 KN
DMkiri = DH = 14,93 KN
DM = DMkiri – P3 = 14,93 – 10 = 4,93 KN
DNkiri = 4,93 KN
DN = DNkiri – P4 = 4,93 – 8 = -3,0696 KN
DB kiri = DN = -3,0696 KN
DB = DBkiri + 3,0696 = -3,0696 + 3,0696 = 0

2. GAYA MOMEN

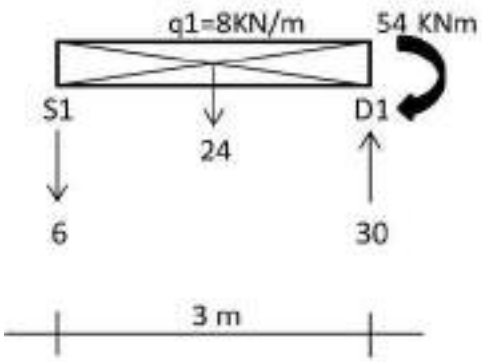
- Batang C – S1



MC = 0
MO = 2 .1 = 2 KNm
MS1 = 2 . 2 – 8 . 1 (½ . 1) = 0

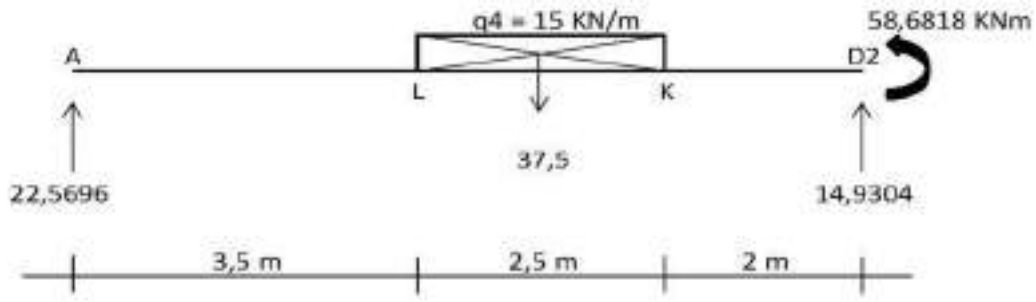
x = DO = 2 = 0,25 dari titik O
q1 8
Mmaksimum = 2 . 1,25 – 8 . 0,25 (½.0,25) = 2,25 KNm

- Batang S1 – D1



MS1 = 0
MD1 = - 6 . 3 – 24 (½.3) = - 54 KNm

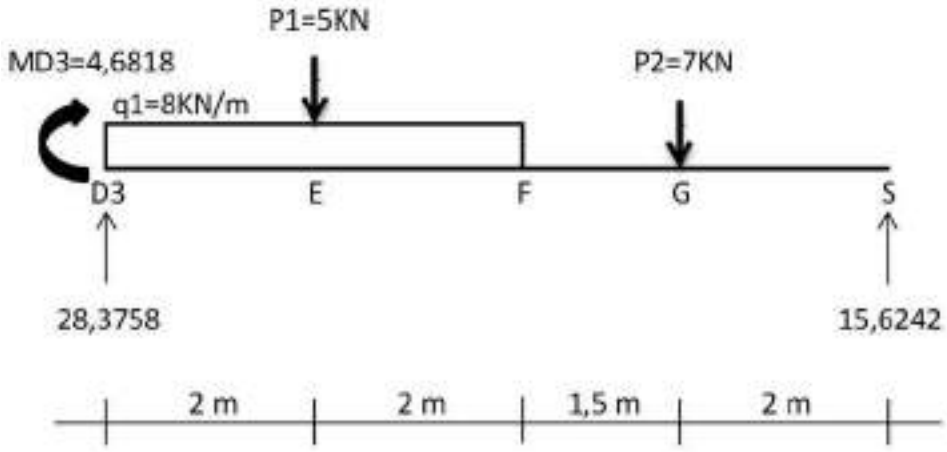
- Batang A – D2



MA = 0
ML = 22,5696 . 3,5 = 78,9936 KNm
MK = 22,5696 . 6 – 15 . 2,5 (½.2,5) = 88,5426 KNm
MD2 = 22,5696 . 8 – 15 . 2,5 (½.2,5 + 2) = 58,6818 KNm

x = DL / q4 = 22,5696 / 15 = 1,5 dari titik L
Mmaksimum = 22,5696 . 5 – 15 . 1,5 (½.1,5) = 95,973 KNm

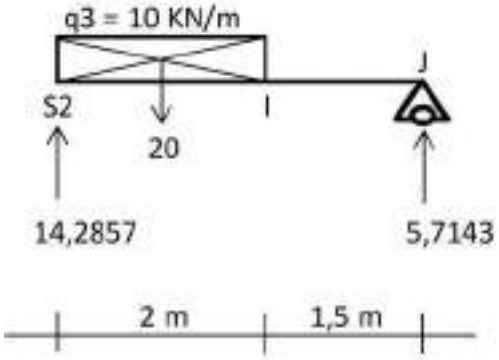
- Batang D3 – S



MD3 = MD1 + MD3 = - 54 + 58,6818 = 4,6818 KNm
ME = 28,3758 . 2 – 8 . 2 (½.2) + 4,6818 = 45,4334 KNm
MF = 28,3758 . 4 – 8 . 4 (½.4) – 5 . 2 + 4,6818= 44,185 KNm
MG = 28,3758 . 5,5 – 8 . 4 (½.4 + 1,5) – 5 . 3,5 + 4,6818= 31,2487 KNm
MS = 28,3758 . 7,5 – 8 . 4 (½.4 + 3,5) – 5 . 5,5 + 4,6818= 0

x = DE / q = 7,3758 / 8 = 0,9 m dari titik E
Mmaksimum = 28,3758 . 2,9 – 8 . 2,9 (½.2,9) – 5 . 0,9 + 4,4818 = 48,8316 KNm

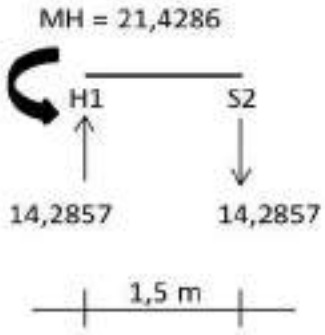
- **Batang S2 – J**



MJ = 0
MI = 5,7143 . 1,5 = 8,5715 KNm
MS2 = 5,7143 . 3,5 – 20 (½.2) = 0

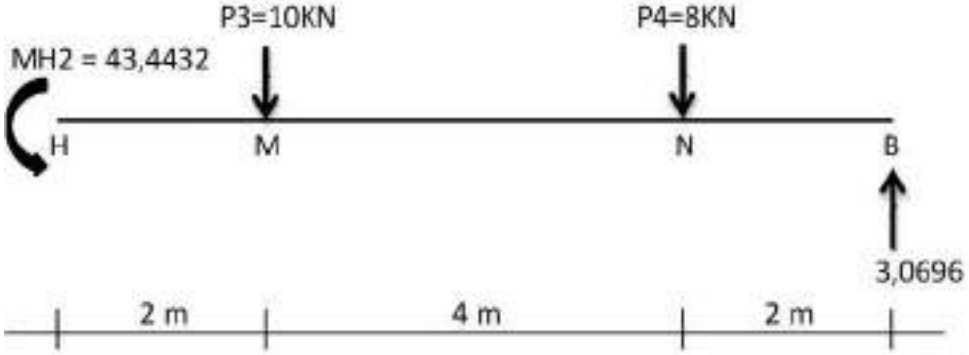
x = $\frac{DS2}{q}$ = $\frac{14,2857}{10}$ = 1,4 m dari titik S2
Mmaksimum = 14,2857 . 1,4 – 10. 1,4 (½.1,4) = 10,2 KNm

- **Batang H1 – S2**



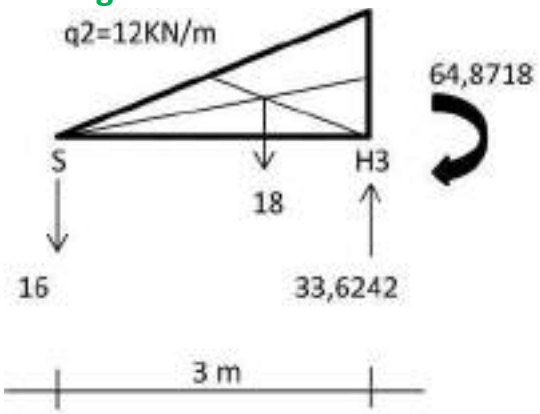
MS2 = 0
MH1 = - 14,2857 . 1,5 = - 21,4286 KNm

- **Batang H2 – B**



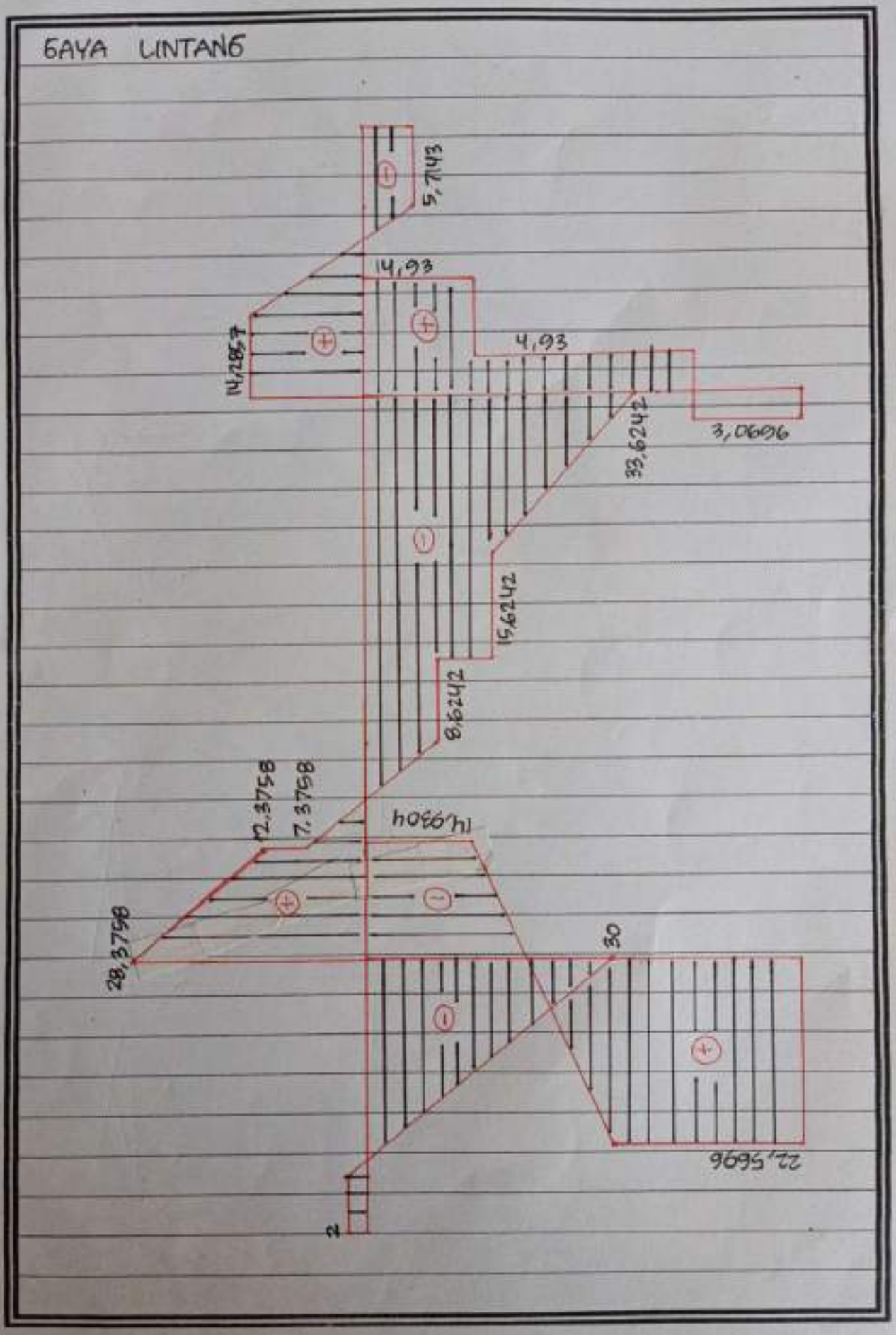
MB = 0
MN = 3,0696 . 2 = 6,1392 KNm
MM = 3,0696 . 6 – 8 . 2 = 2,4176 KNm
MH2 = 3,0696 . 8 – 8 . 6 – 10 . 2 = - 43,4432 KNm

- **Batang S – H3**



MH3 = MH1 + MH2 = - 21,4286 – 43,4432 = - 64,8718 KNm
MS = 33,6242 . 3 – ½.12.3 (2/3.3) – 64,8718 = 0

GAYA LINTANG



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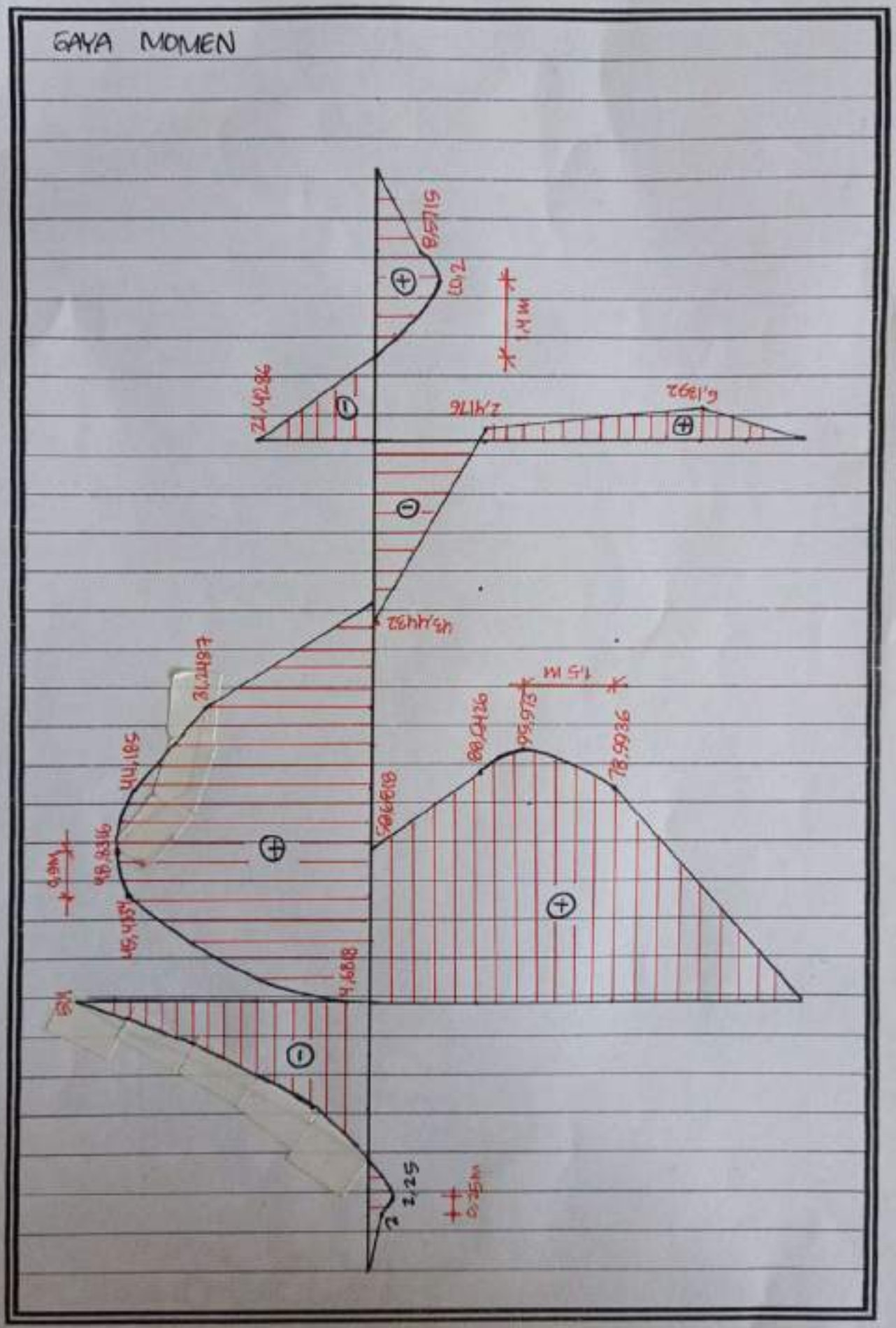
GAYA MOMEN



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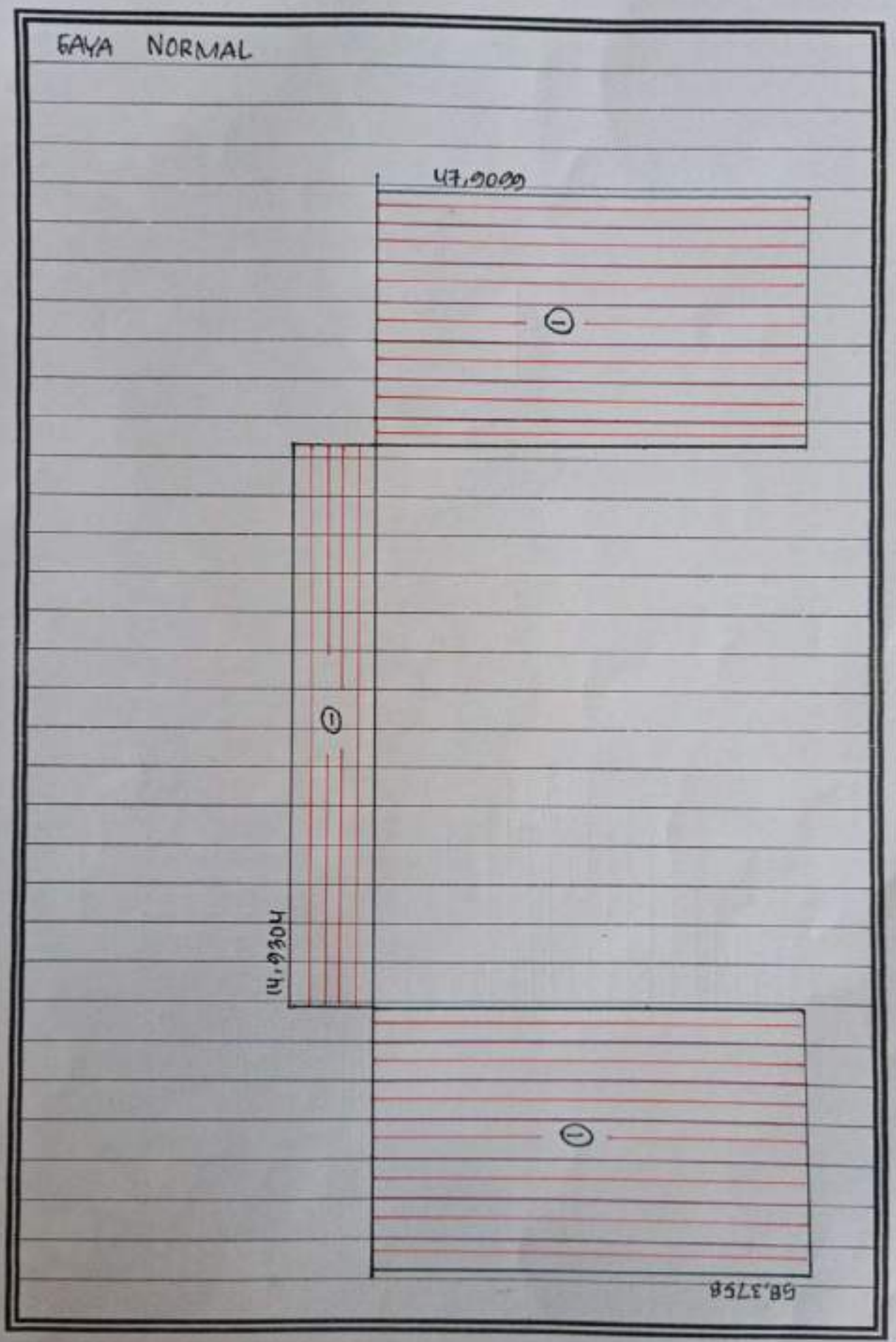
GAYA NORMAL



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