**ANALISA STRUKTUR 2**

Mencari Bidang Momen, Lintang dan Normal Tahap 2 Continuous Beam

Dosen Pengampu:

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X = 3 m q3 = 3 t/m L3 = 3 m

Y = 4 m q4 = 6 t/m L4 = 4 m

P2 = 4 Ton RBV = 21,9 Ton PRBV = -21,9 Ton

**NOMOR 1**

∑**MC** = **0**

RBV’ . LTOTAL – PRBV . LTOTAL – P2 . L4 – (q3 .LTOTAL) .. LTOTAL – ( . q4 . L4) .. L4 = 0

RBV’ . 7 – (-21,9) . 7 – 4 .4 – (3.7) .. 7 – ( . 6 .4) . = 0

RBV’ . 7 – (-153,3) – 16 – 73,5 – 16 = 0

RBV’ . 7 + 153,3 – 16 – 73,5 – 16 = 0

RBV’ . 7 + 47,8 = 0

RBV’ . 7 = -51,8

RBV’ = –

**RBV’** = -**6,8 Ton**

∑**MB** = **0**

– RCV . LTOTAL + (. q4 . L4) ( . L4 + L3) + P2 . L3 + (q3 . LTOTAL ) . . LTOTAL = 0

–RCV . 7 + ( . 6 . 4) . ( . 4 + 3) + 4 . 3 + (3 . 7) . . 7 = 0

– RCV . 7 + 68 + 12 + 73,5 = 0

– RCV . 7 + 153,5 = 0

– RCV . 7 = -153,5

RCV =

**RCV** = **21,9 ton**

**KONTROL**

**∑V = 0**

RBV’ – PRBV – q1 . LTOTAL – . q2 . L2 – P1 + RCV = 0

-6,8 – (-21,9) – (3 .7) – ( . 6 . 4) – 4 + 21,9 = 0

-6,8 + 21,9 – 21 – 12 – 4 + 21,9 = 0

**0 = 0**

**BIDANG MOMEN (M)**

**Interval 0 ≤ X0 ≤ 0**

MXX – X0 = RBV’ . X0

= -6,8 . 0 = **0 tm1**

**Interval 0 ≤ X1 ≤ L3 (3)**

MXX – X1 = RBV’ . X1 – PRBV . X1 – (q3 . X1) . . X­­1

X1 = 3 = -6,8 . 3 – (-21,9) . 3 – (3 . 3) . 3

= -20,4 + 65,7 – 13,5

= **31,8 tm1**

**Interval 0 ≤ X2 ≤ 7**

MXX – X2 = RBV’ . X2 – PRBV . X2 – (q3 . X2) . . X2 – P2 . L4 – ( . q2 . L4) . L4

X2 = 7 = -6,8 . 7 – (-21,9) . 7 – (3 . 7) . 7 – 4 . 4 – (. 6 . 4) . 4

= -47,6 + 153,3 – 73,5 – 16 – 16

= 105,7 – 73,5 – 16 – 6 0

= **0,2 tm1**

**BIDANG LINTANG (D)**

**Interval 0 ≤ X0 ≤ 0**

X0 = 0

DXX – X0 = RBV’ – PRBV

= -6,8 – (-21,9)

= -6,8 + 21,9

= **15,1 Ton**

**Interval 0 ≤ X1 ≤ L3 (3)**

DXX – X1 = RBV’ – PRBV – q3. X1

**X1 = 3** = -6,8 – (-21,9) – 3 . 3

= -6,8 + 21,9 – 9

= **6,1 Ton**

**Interval 0 ≤ X1 ≤ 7**

DXX – X2 = RBV’ – PRBV – (q3 . X2) – P1– ( . q4 . L4)

**X2 = 7** = -6,8 – (-21,9) – (3 . 7) – 4 – ( . 6 . 4)

= -6,8 + 21,9 – 21 – 4 – 12

= 15,1 – 21 – 4 – 12

= **– 21,9 ton**

**BIDANG NORMAL (N)**

N = 0

X = 3 m q3 = 4 t/m L3 = 4 m

Y = 4 m q4 = 3 t/m L4 = 3 m

P2 = 4 Ton RBV = 9 Ton PRBV = -9 Ton

**NOMOR 3**

∑**MC** = **0**

RBV’ . LTOTAL – (PRBV) . LTOTAL – (. q4 . L3) ( . L3 + L4) – (q3 .L4) .. L4 + P2 L4 = 0

RBV’ . 7– (-9) . 7 – (. 3 . 4) . ( . 4 + 3) – (4.3) .. 3 + 4 3 = 0

RBV’ . 7 – (-63) – 34 – 18 + 8,5 = 0

RBV’ . 7 + 63 – 34 – 18 + 8,5 = 0

RBV’ . 7 + 19,5 = 0

RBV’. 7 = -19,5

RBV’ =

RBV’ = **-2,8 ton**

∑**MB** = **0**

– RCV . LTOTAL + (q3. L4) ( . L4 + L3) + ( . q4 . L3 ) ( . L3 ) – P2 L3 = 0

– RCV . 7 + (4 . 3) ( . 3 + 4) + ( . 3. 4) ( . 4) – 4 4 = 0

– RCV . 7 + 66 + 8 – 11,3 = 0

– RCV . 7 + 62,7 = 0

– RCV . 7 = –62,7

RCV =

RCV = **9 ton**

**KONTROL**

**∑V = 0**

RBV’ – PRBV – (q3 . L4) – ( . q4 . L3) + P2  + RCV = 0

-2,8 – (-9) – (4 . 3) – ( . 3 . 4) + 4. + 9 = 0

-2,8 + 9 – 12 – 6 + 2,8 + 9 = 0

**0 = 0**

**BIDANG MOMEN (M)**

**Interval 0 ≤ X0 ≤ 0**

X0 = 0

MXX – X0 = RBV’ . X0

= -2,8 . 0 = **0 tm1**

**Interval 0 ≤ X1 ≤ L3 (4)**

MXX – X1 = RBV’.X1 – PRBV .X1 – ( . q4 . L3) + P2 . 4 – q4 .L3

**X1 = 4**  = -2,8 . 4 – (-9) . 4 – (( . 3. 4) + 4 . 4 – 4 . 4

= -11,2 + 36 – 6 + 11,3 – 16

= **14,1 tm1**

**Interval 0 ≤ X2 ≤ 7**

MXX – X2 = RBV . X2 – PRBV .X2 – ( . q4 . L3) . . L4 + P2 . L4 – (q3 . L4) . . L4

**X2 = 7**  = -2,8 . 7 – (-9) . 7 – ( . 3. 4) . . 3 + 4 . 3 – (4 . 3) . . 3

= -19,6 + 63 – 12 + 8,5 – 18

**= 21,9 tm1**

**BIDANG LINTANG (D)**

**Interval 0 ≤ X0 ≤ 0**

X0 = 0

DXX – X0 = RBV’ – PRBV

= -2,8 – (-9)

= **6,2 Ton**

**Interval 0 ≤ X1 ≤ L3 (4)**

DXX – X1 = RBV’ – PRBV – ( . q2 . L3) + P1 –

**X1 = 3,5** = -2,8 – (-9) – ( . 3. 4) + 4

= -2,8 + 9 – 6 + 2,8

= **3 Ton**

**Interval 0 ≤ X2 ≤ 7**

DXX – X1 = RBV’ – PRBV – ( . q2 . L1) + P1 – (q1 . L2)

**X2 = 7** = -2,8 – (-9) – ( . 3. 4) + 4 – (4 . 3)

= -2,8 + 9 – 6 + 2,8 – 12

= **– 9 Ton**

**BIDANG NORMAL (N)**

N = 0

X = 3 m q3 = 4 t/m L4 = 3 m RBV = 21,9 Ton

Y = 4 m q4 = 3 t/m L5 = 4 m PRBV = -21,9 Ton

P2 = 4 Ton L6 = 3 m

**NOMOR 5**

∑**MC** = **0**

RBV’. LTOTAL – (PRBV) . LTOTAL – (q4 . L4) ( . L4 + L5 + L6) – P2 . L6 – (q3 (L5+ L6)) . (L5+ L6) = 0

RBV’. 10 – (-21,9) . 10 – (. 3 . 3) . ( . 3 + 4+ 3) – 4 . 3– (4(4+ 3)) . (4 + 3) = 0

RBV’. 10 – (-219) – 36 – 12 – 98 = 0

RBV’. 10 + 219 – 36 – 12 – 98 = 0

RBV’. 10 + 73 = 0

RBV’. 10 = -73

RBV’ = –

**RBV’**  = -**7,3 ton**

∑**MB** = **0**

– RCV . LTOTAL + (q3 (L5+ L6)) . (L5+ L6)+ L4 ) + P2 ((L5+ L4 ) +(. q4 . L4) . .L4 = 0

– RCV . 10 + (4(4 + 3)) . (4 + 3)+ 3 ) + 4 ((4+ 3) +(. 3 . 3). .3 = 0

– RCV . 10 + 182 + 28 + 9 = 0

– RCV . 10 + 219 = 0

– RCV . 10 = – 219

RCV =

**RCV** = **21,9 ton**

**KONTROL**

**∑V = 0**

RBV’ – PRBV – q3(L5 + L6 ) – ( . q4 . L4) – P2 + RCV = 0

-7,3 – (-21,9) – (4.(4 + 3 ) – ( . 3 . 3) – 4 + 21,9 = 0

-7,3 + 21,9 – 28 – 4,5 – 4 + 21,9 = 0

**0 = 0**

**BIDANG MOMEN (M)**

**Interval 0 ≤ X0 ≤ 0**

MXX – X0 = RBV’ . X0

= -7,3 . 0 = **0 tm1**

**Interval 0 ≤ X1 ≤ L (5)**

MXX – X1 = RBV’ . X1 – PRBV . X1 – ( . q4 . L6) . . L6 + 2 – (q3 . 2) . . 2

**X1 = 5** = -7,3 . 5 – (-21,9) . 5 – ( . 3. 3) . . 3 + 2 – (4 . 2) . . 2

= -36,5 + 109,5 – 13,5 - 8

= **51,5 tm1**

**Interval 0 ≤ X2 ≤ 10**

MXX – X2 = RBV’ . X2 – PRBV . X1 – ( . q4 . L4) . . L4 + 11 – P2 . L6 – (q3 . 11) . . 11

= -7,3 . 10 – (-21,9) . 10– ( . 3. 3) . . 3 + 7 – 4 . 3 – (4 . 7) . . 7

= -73 + 219 – 36 – 12 – 98

= **0 tm1**

**BIDANG LINTANG (L)**

**Interval 0 ≤ X0 ≤ 0**

X0 = 0

DXX – X0 = RBV’ **–** PRBV

= -7,3 – (-21,9)

= **14,6 Ton**

**Interval 0 ≤ X1 ≤ L (5)**

DXX – X1 = RBV’ **–** PRBV – ( . q4 . L4) – (q3 . 2)

**X1 = 5** = -7,3 – (-21,9) – ( . 3. 3) – (4 . 2)

= -7,3 + 21,9– 4,5 – 8

= **2,1 ton**

**Interval 0 ≤ X2 ≤ 10**

DXX – X1 = RBV’ **–** PRBV – ( . q4 . L4) – P2 – (q3 . 7)

**X2 = 10** = -7,3 – (-21,9) **–** ( . 3. 3) – 4– (4 . 7)

= -7,3 + 21,9 – 4,5 – 4 – 28

= **– 21,9 ton**

**BIDANG NORMAL (N)**

N = 0