

Assignment 2

Darina Ponomarenko

$$(g-g_0)_{\text{floor},k} = 1,4 \text{ kN/m}^2$$

$$(g-g_0)_{\text{roof},k} = 1,4 \text{ kN/m}^2$$

$$q_{\text{floor},k} = 4,9 \text{ kN/m}^2$$

$$q_{\text{roof},k} = 0,75 \text{ kN/m}^2$$

Beam loading:

$$g_{k,t} = 20,6 \text{ kN/m}$$

$$q_{k,t} = 19,6 \text{ kN/m}$$

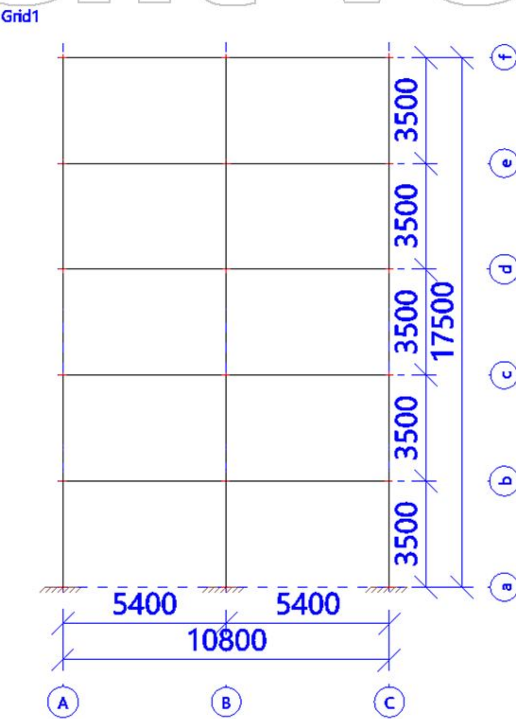
$$g_{k,r} = 20,6 \text{ kN/m}$$

$$q_{k,r} = 3 \text{ kN/m}$$

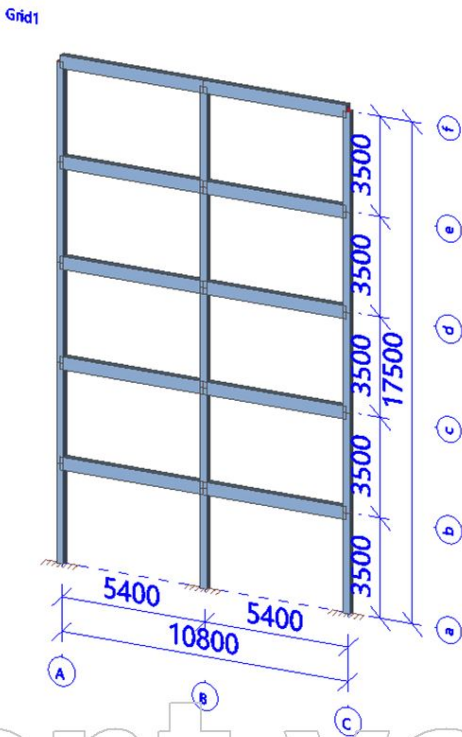
Floor beam load						
Load type	Load name	$f_{a,k}$	tributing width	$f_{lin,k}$	γ	$f_{lin,d}$
-	-	kN/m ²	m	kN/m	-	kN/m
Dead (G)	slab dead load	5,15	4	20,6	1,35	27,81
	beam self weight			0		0
	Σ			20,6		27,81
Live (Q)	slab live load	4,9	4	19,6	1,5	29,4
	Σ			19,6		29,4
SUM				$f_k =$	40,2	$f_d =$ 57,21

Roof beam load						
Load type	Load name	$f_{a,k}$	tributing width	$f_{lin,k}$	γ	$f_{lin,d}$
-	-	kN/m ²	m	kN/m	-	kN/m
Dead (G)	slab dead load	5,15	4	20,6	1,35	27,81
	beam self weight			0		0
	Σ			20,6		27,81
Live (Q)	slab live load	0,75	4	3	1,5	4,5
	Σ			3		4,5
SUM				$f_k =$	23,6	$f_d =$ 32,31

1. Analysis model



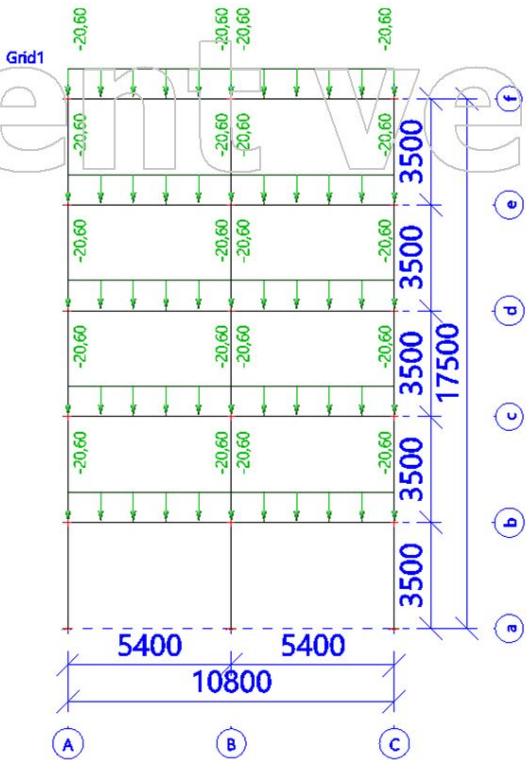
2. Analysis model



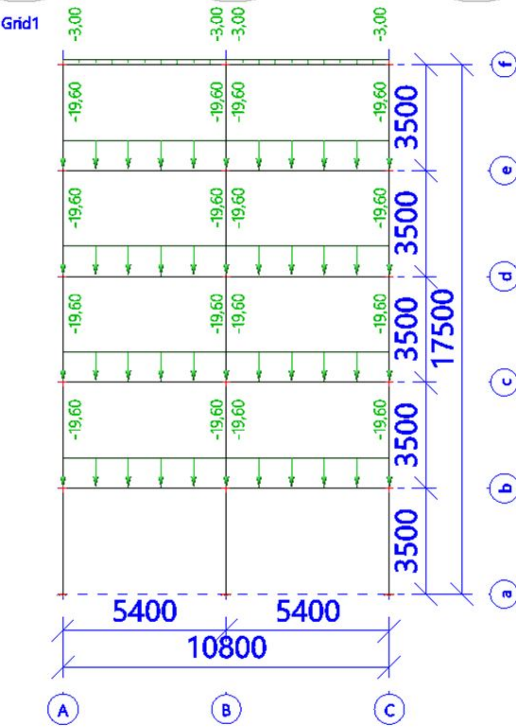
3. Members

Name	Cross-section	Material	Length [m]	Beg. node	End node	Type
B1	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N1	N2	column (100)
B2	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N3	N4	column (100)
B3	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N5	N6	column (100)
B4	CS-beam - Rectangle (450,00; 250,00)	C25/30	5,400	N2	N4	beam (80)
B5	CS-beam - Rectangle (450,00; 250,00)	C25/30	5,400	N4	N6	beam (80)
B6	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N2	N7	column (100)
B7	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N4	N8	column (100)
B8	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N6	N9	column (100)
B9	CS-beam - Rectangle (450,00; 250,00)	C25/30	5,400	N7	N8	beam (80)
B10	CS-beam - Rectangle (450,00; 250,00)	C25/30	5,400	N8	N9	beam (80)
B11	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N7	N10	column (100)
B12	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N8	N11	column (100)
B13	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N9	N12	column (100)
B14	CS-beam - Rectangle (450,00; 250,00)	C25/30	5,400	N10	N11	beam (80)
B15	CS-beam - Rectangle (450,00; 250,00)	C25/30	5,400	N11	N12	beam (80)
B16	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N10	N13	column (100)
B17	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N11	N14	column (100)
B18	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N12	N15	column (100)
B19	CS-beam - Rectangle (450,00; 250,00)	C25/30	5,400	N13	N14	beam (80)
B20	CS-beam - Rectangle (450,00; 250,00)	C25/30	5,400	N14	N15	beam (80)
B21	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N13	N16	column (100)
B22	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N14	N17	column (100)
B23	CS-column - Rectangle (250,00; 250,00)	C25/30	3,500	N15	N18	column (100)
B24	CS-beam - Rectangle (450,00; 250,00)	C25/30	5,400	N16	N17	beam (80)
B25	CS-beam - Rectangle (450,00; 250,00)	C25/30	5,400	N17	N18	beam (80)

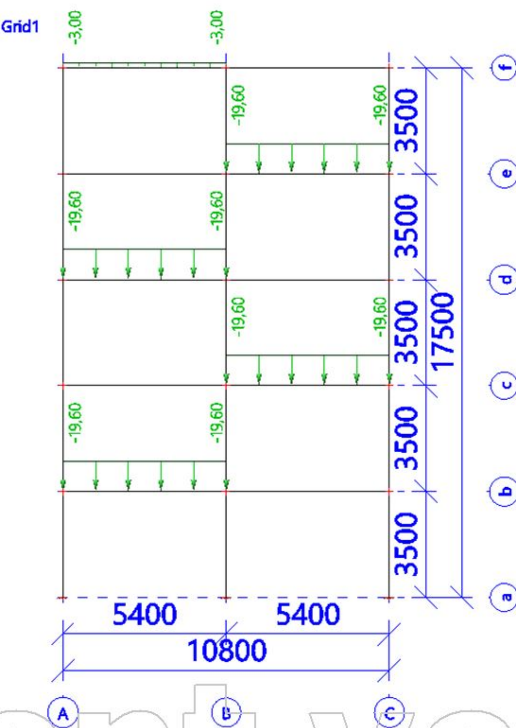
4. LC2 / Tot. value / Value



5. LC3 / Tot. value / Value



6. LC4 / Tot. value / Value

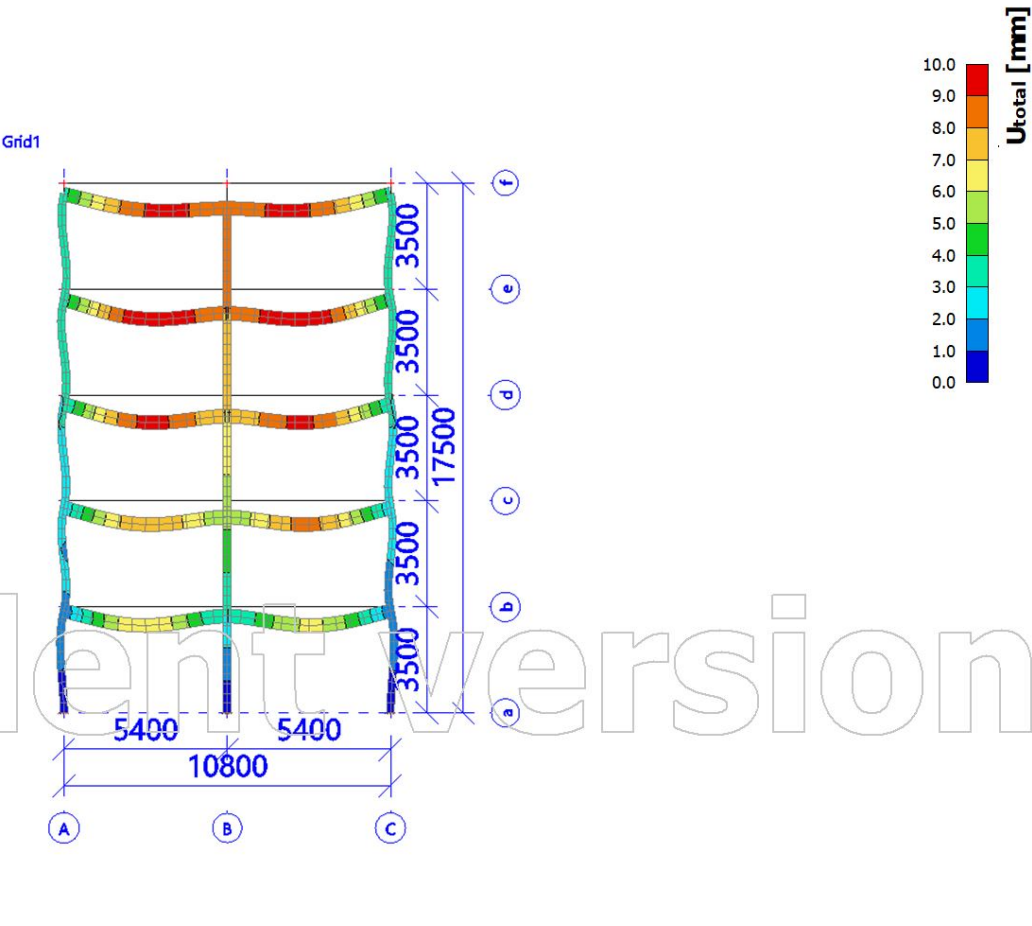


7. Combinations

Name	Description	Type	Load cases	Coeff.
CO1-full		Linear - ultimate	LC1 - Self weight	1,350
			LC2 - Other dead loads	1,350
			LC3 - Live loads full	1,500
CO2-checkerboard		Linear - ultimate	LC1 - Self weight	1,350
			LC2 - Other dead loads	1,350
			LC4 - Live loads checkerboard	1,500

8. 3D displacement; U_total

Values: U_{total}
Linear calculation
Class: RC1
Selection: All
Location: In nodes avg. on macro.
System: LCS mesh element



9. RC1 - N

Values: N
 Linear calculation
 Class: RC1
 Coordinate system: Member
 Extreme 1D: Local
 Selection: B1..B3, B6..B8, B11..B13,
 B16..B18, B21..B23

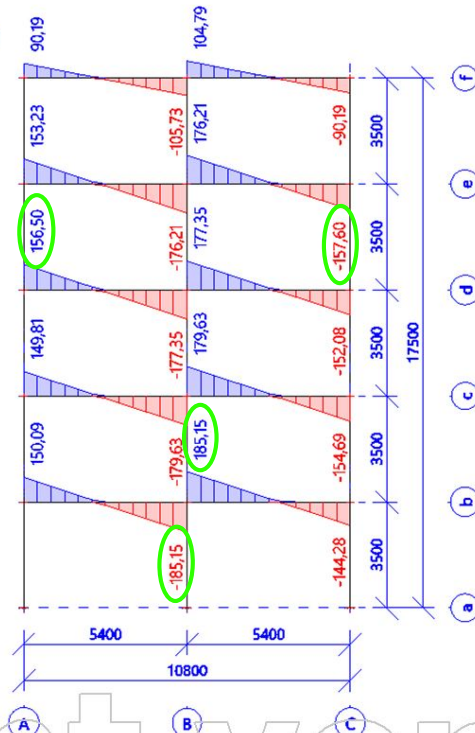
Grid1



10. RC1 - V

Values: V_z
 Linear calculation
 Class: RC1
 Coordinate system: Member
 Extreme 1D: Local
 Selection: B4, B5, B9, B10, B14, B15,
 B19, B20, B24, B25

Grid1



11. RC1 - M (beam)

Values: M_y

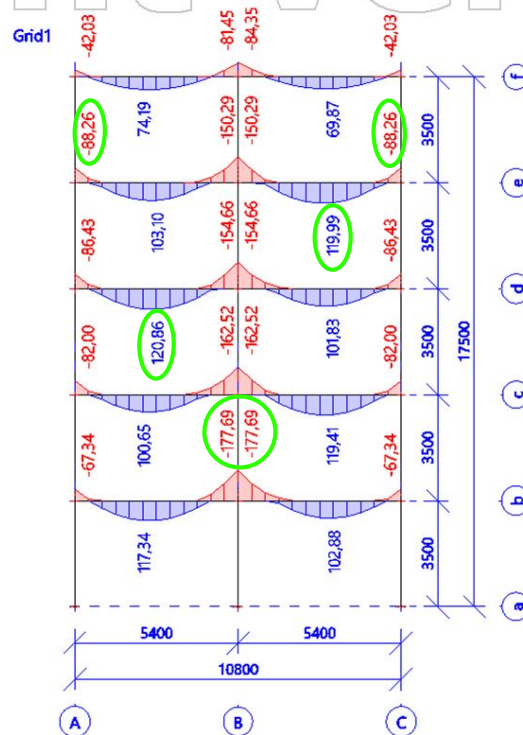
Linear calculation

Class: RC1

Coordinate system: Member

Extreme 1D: Local

Selection: B4, B5, B9, B10, B14, B15,
B19, B20, B24, B25



12. RC1 - M (column)

Values: M_y

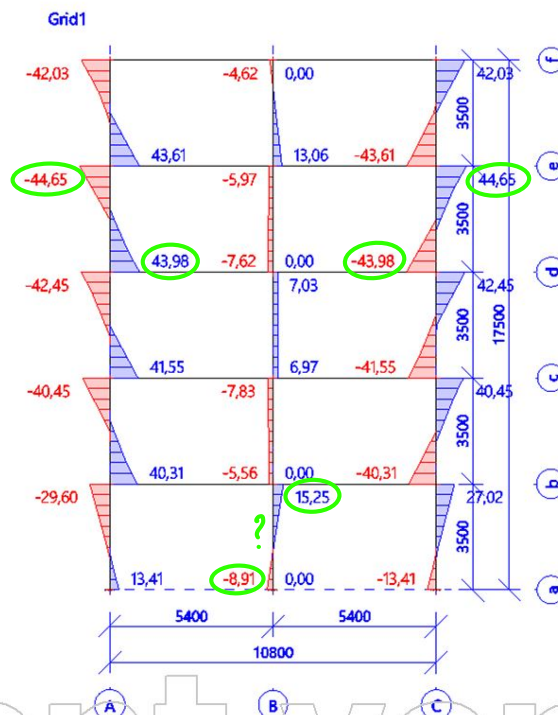
Linear calculation

Class: RC1

Coordinate system: Member

Extreme 1D: Local

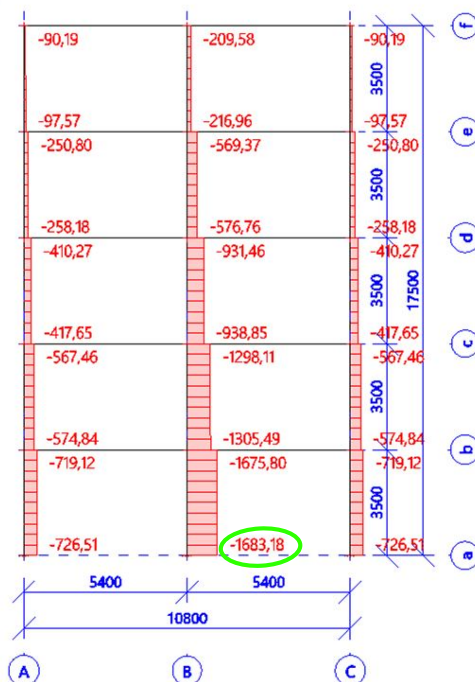
Selection: B1..B3, B6..B8, B11..B13,
B16..B18, B21..B23



13. CO1 - N

Values: N
 Linear calculation
 Combination: CO1-full
 Coordinate system: Member
 Extreme 1D: Local
 Selection: B1..B3, B6..B8, B11..B13,
 B16..B18, B21..B23

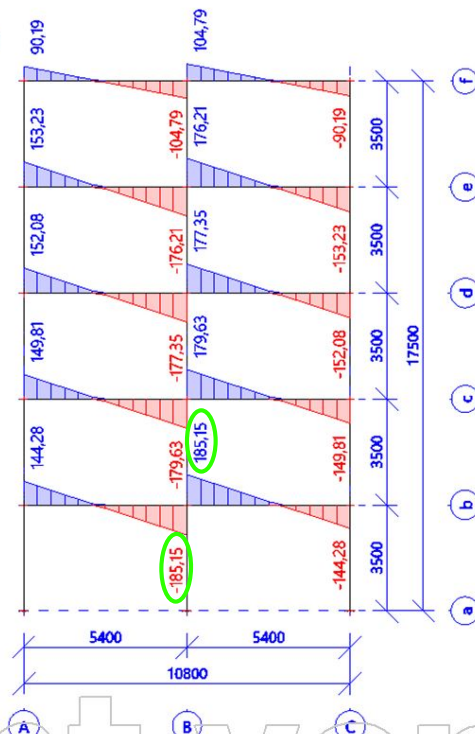
Grid1



14. CO1 - V

Values: V_z
 Linear calculation
 Combination: CO1-full
 Coordinate system: Member
 Extreme 1D: Local
 Selection: B4, B5, B9, B10, B14, B15,
 B19, B20, B24, B25

Grid1



15. CO1 - M (beam)

Values: M_y

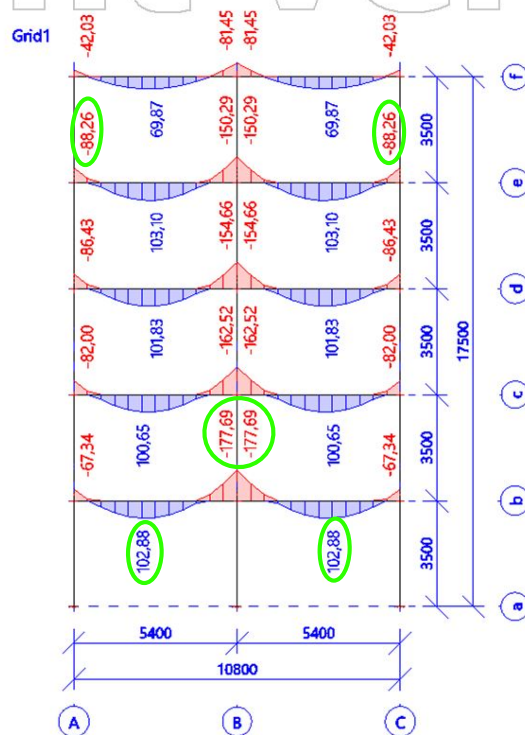
Linear calculation

Combination: CO1-full

Coordinate system: Member

Extreme 1D: Local

Selection: B4, B5, B9, B10, B14, B15,
B19, B20, B24, B25



16. CO1 - M (column)

Values: M_y

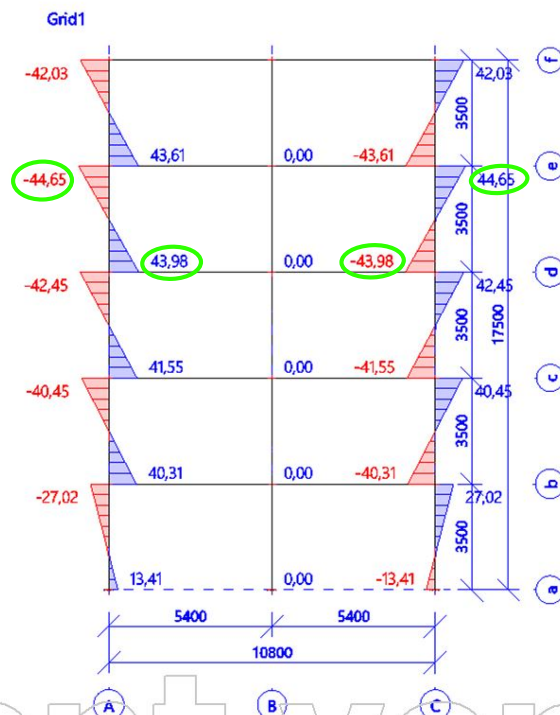
Linear calculation

Combination: CO1-full

Coordinate system: Member

Extreme 1D: Local

Selection: B1..B3, B6..B8, B11..B13,
B16..B18, B21..B23



17. CO2 - N

Values: N

Linear calculation

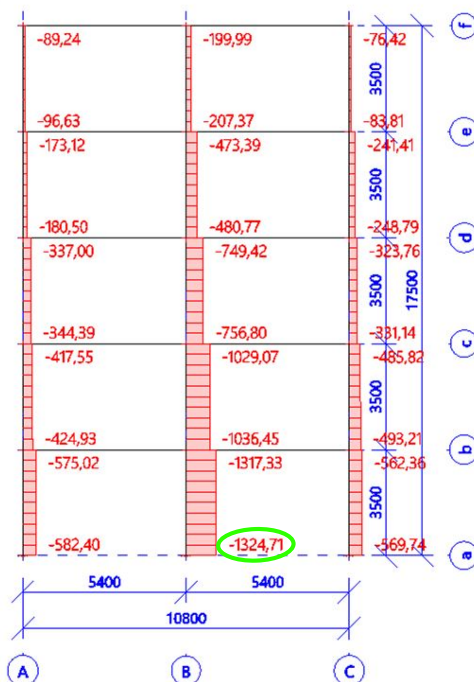
Combination: CO2-checkerboard

Coordinate system: Member

Extreme 1D: Local

Selection: B1..B3, B6..B8, B11..B13,
B16..B18, B21..B23

Grid1



18. CO2 - V

Values: V_z

Linear calculation

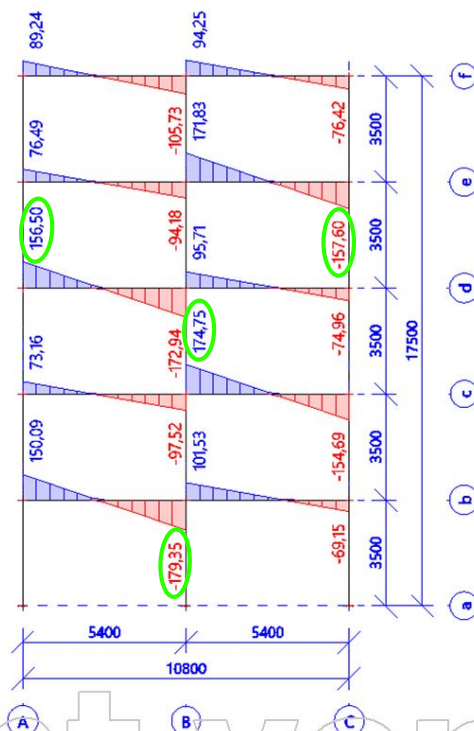
Combination: CO2-checkerboard

Coordinate system: Member

Extreme 1D: Local

Selection: B4, B5, B9, B10, B14, B15,
B19, B20, B24, B25

Grid1



19. CO2 - M (beam)

Values: M_y

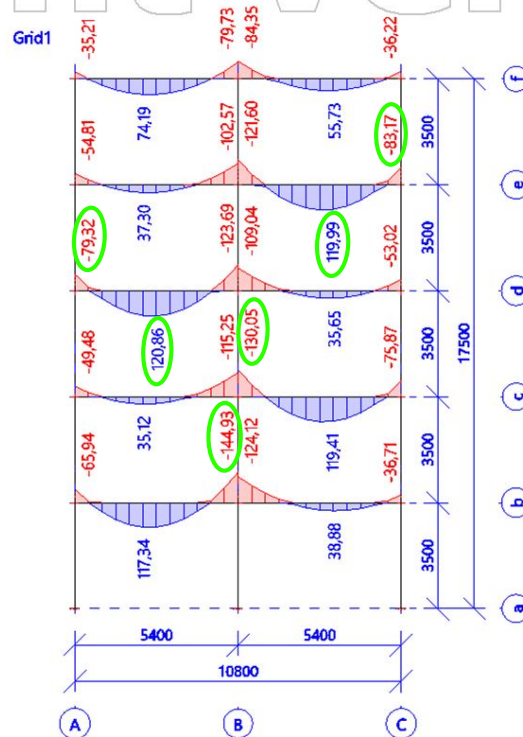
Linear calculation

Combination: CO2-checkerboard

Coordinate system: Member

Extreme 1D: Local

Selection: B4, B5, B9, B10, B14, B15,
B19, B20, B24, B25



20. CO2 - M (column)

Values: M_y

Linear calculation

Combination: CO2-checkerboard

Coordinate system: Member

Extreme 1D: Local

Selection: B1..B3, B6..B8, B11..B13,
B16..B18, B21..B23

