



Project Number :

Project Name : **Seven Sisters Market**

245-253 High Rd, South Tottenham, London N15 5BT

Subject : **CALCULATION of LOADS and
ANALYSIS REPORT**

Project Date : **05.06.2026**

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This report presents the engineering calculations for the structure, with its location and properties as specified.

Think before you print—small actions make a big difference!

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INTRODUCTION

This structural engineering report details the analysis and design of a aluminium and/or steel structure conducted in accordance with the Standards implementation of the British Standards Eurocodes (European Norms - BS EN). The structure was modeled and analyzed using the Finite Element Method (FEM), allowing for a precise evaluation of structural behavior under various loading scenarios. The design adheres to the principles of safety, serviceability, and durability as outlined in the relevant BS EN Eurocode standards. The following standards were applied (if applicable) throughout the analysis and design process:

BS EN 1990: Eurocode 0 – Basis of structural design

BS EN 1991: Eurocode 1 – Actions on structures

BS EN 1992: Eurocode 2 – Design of concrete structures

(if applicable)

BS EN 1993: Eurocode 3 – Design of steel structures

(if applicable)

BS EN 1997: Eurocode 7 – Geotechnical design

(if applicable)

BS EN 1998: Eurocode 8 – Design of structures for earthquake resistance

(if applicable)

BS EN 1999: Eurocode 9 – Design of aluminium structures

(if applicable)

This report provides an overview of the modelling techniques, structural analysis, load combinations, and design checks performed, ensuring the structure meets all necessary regulatory and performance criteria.

1 - LOCATION DEFINITION

Location : 245-253 High Rd, South Tottenham N15 5BT
Altitude : 11m
Country : United Kingdom

Region : Greater London
City : London

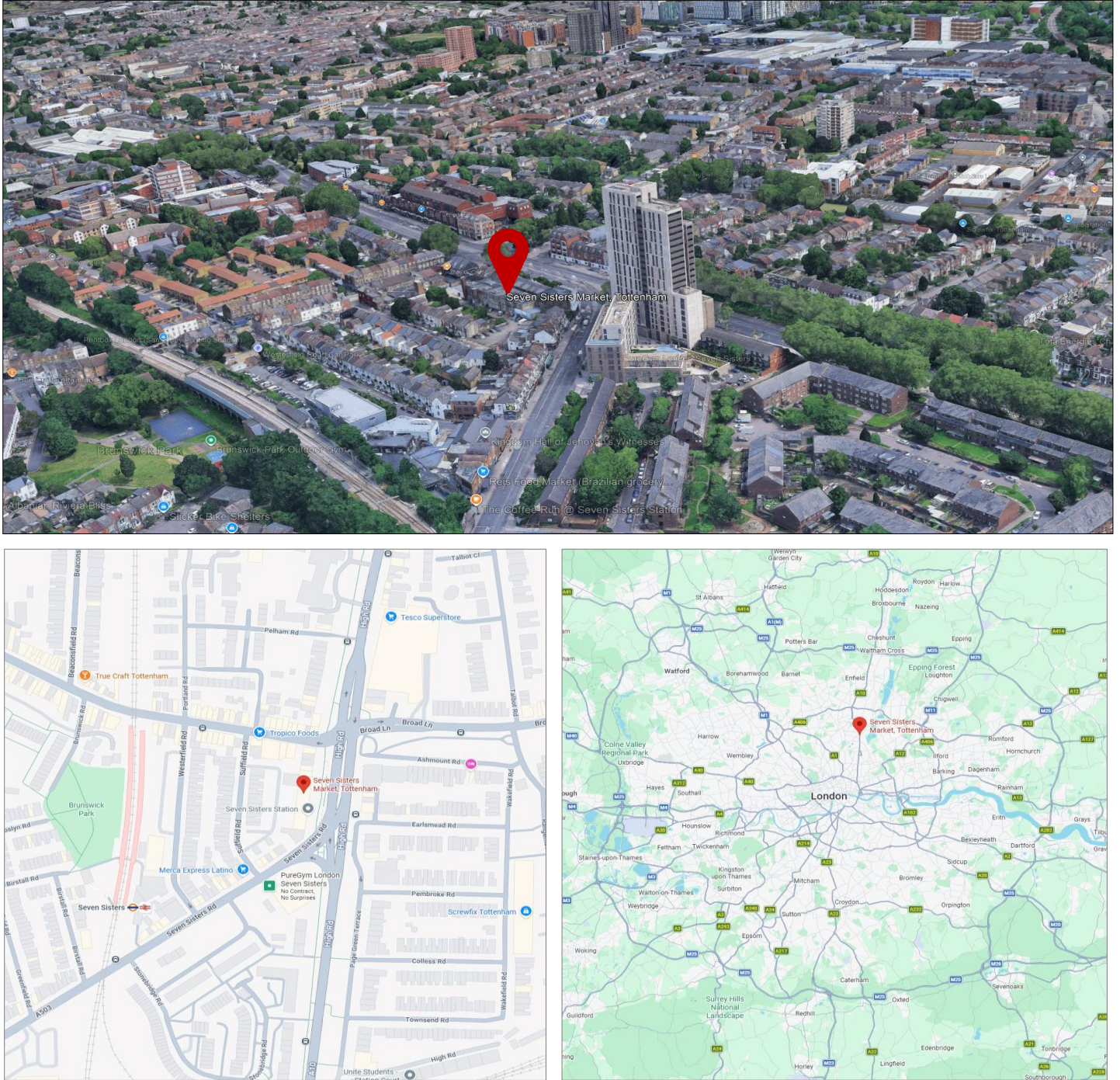


Figure 1.1 Location

2 - GEOMETRY DEFINITION

2.1 DRAWINGS

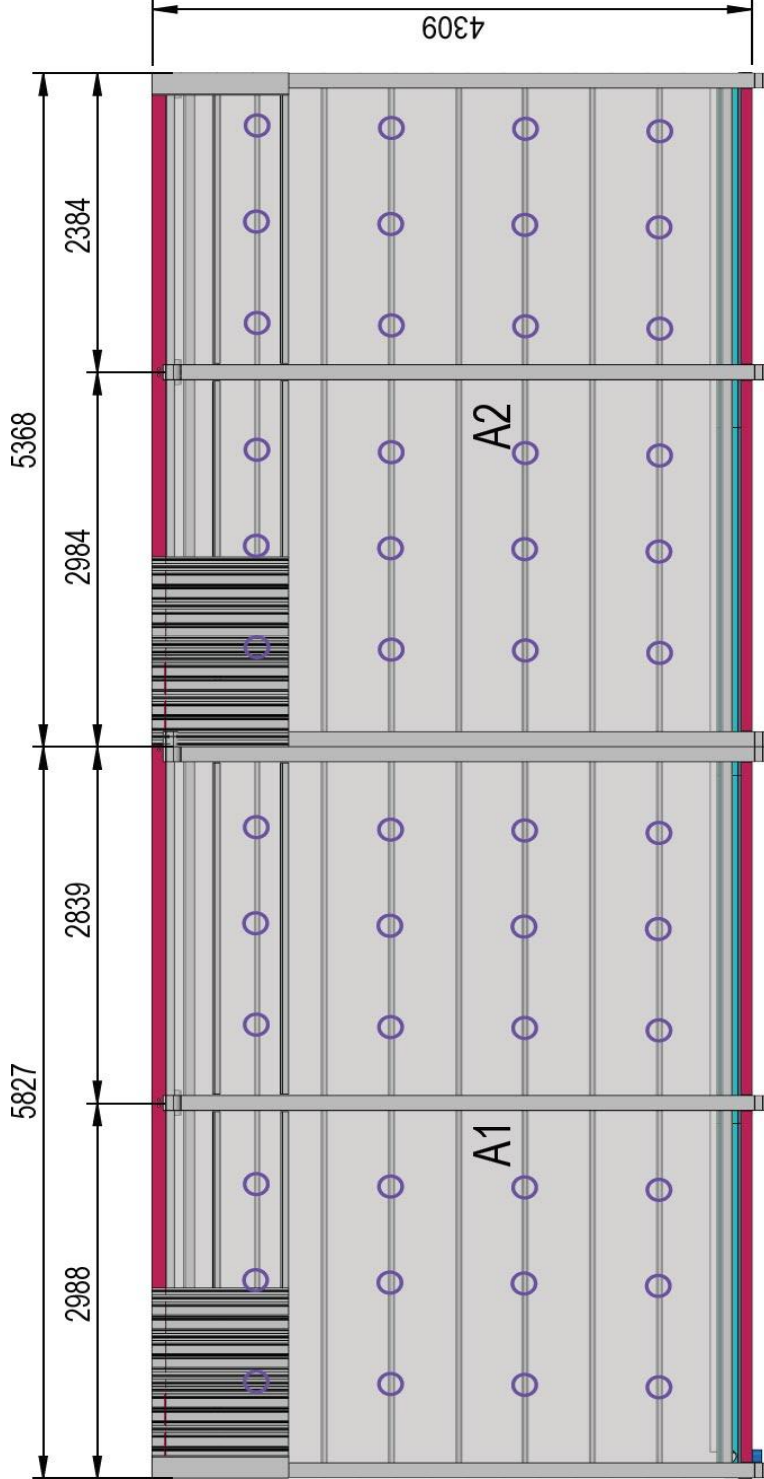


Figure 2.1 Plan View

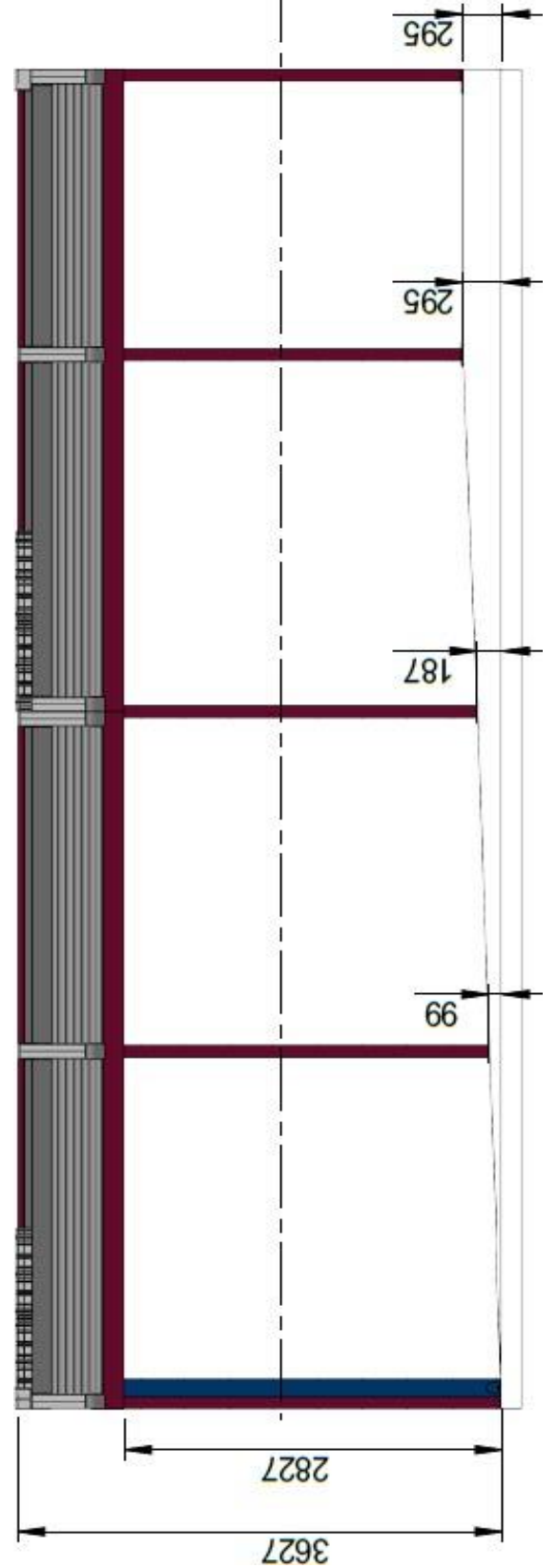


Figure 2.2 Front View

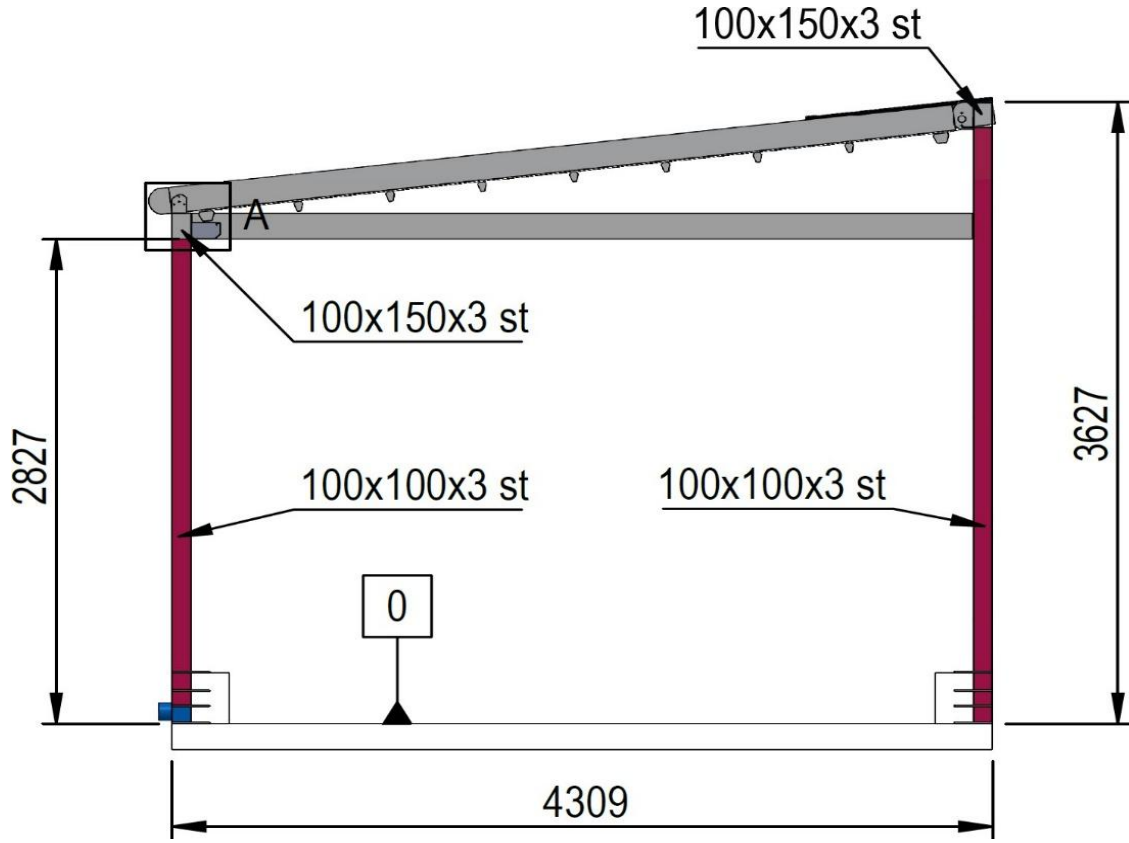


Figure 2.3 Side View

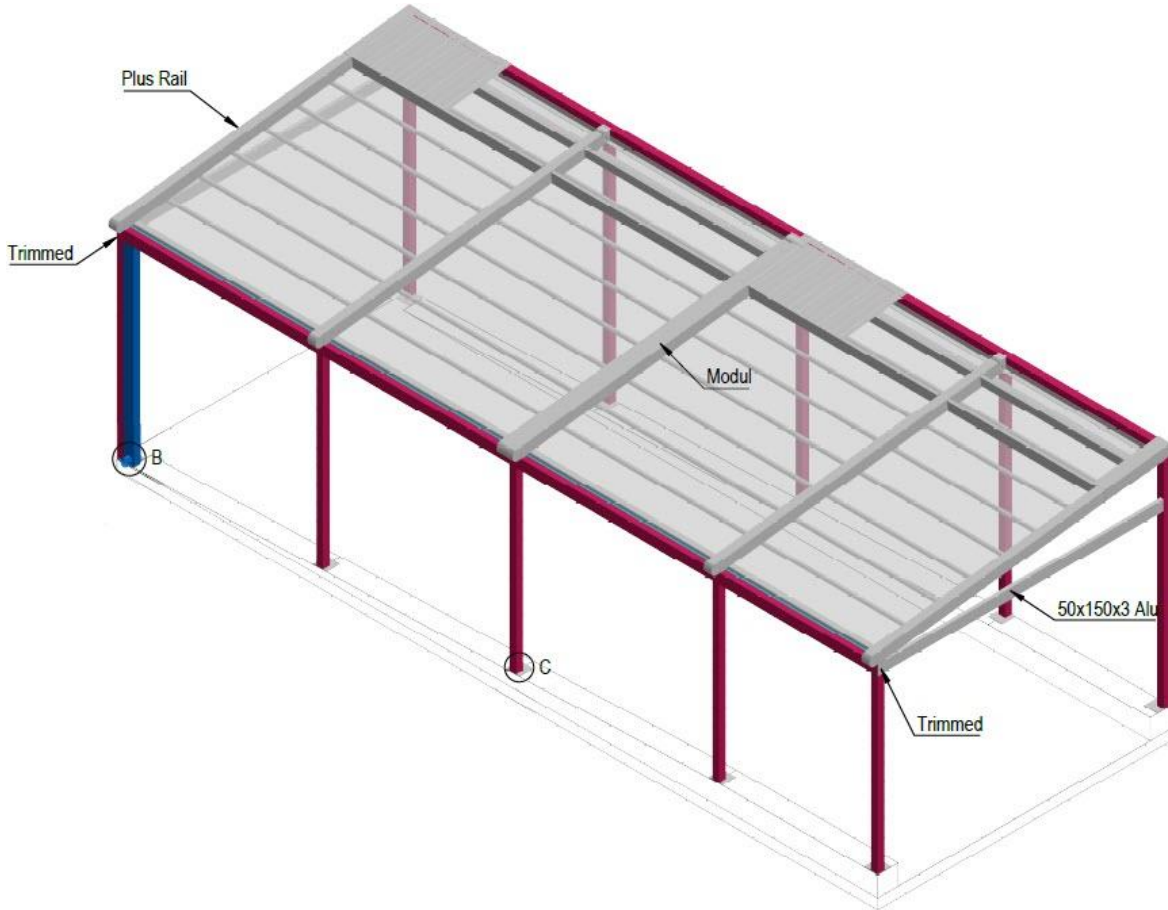


Figure 2.4 3D View

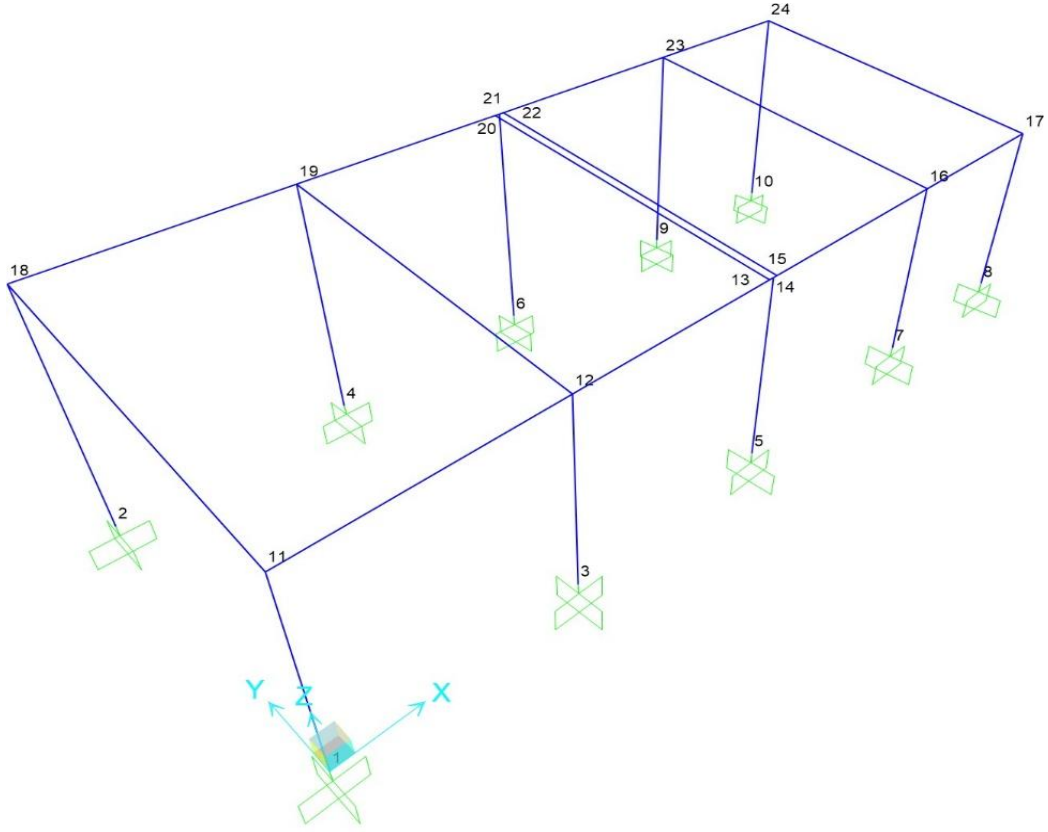


Figure 2.5 Joint Labels

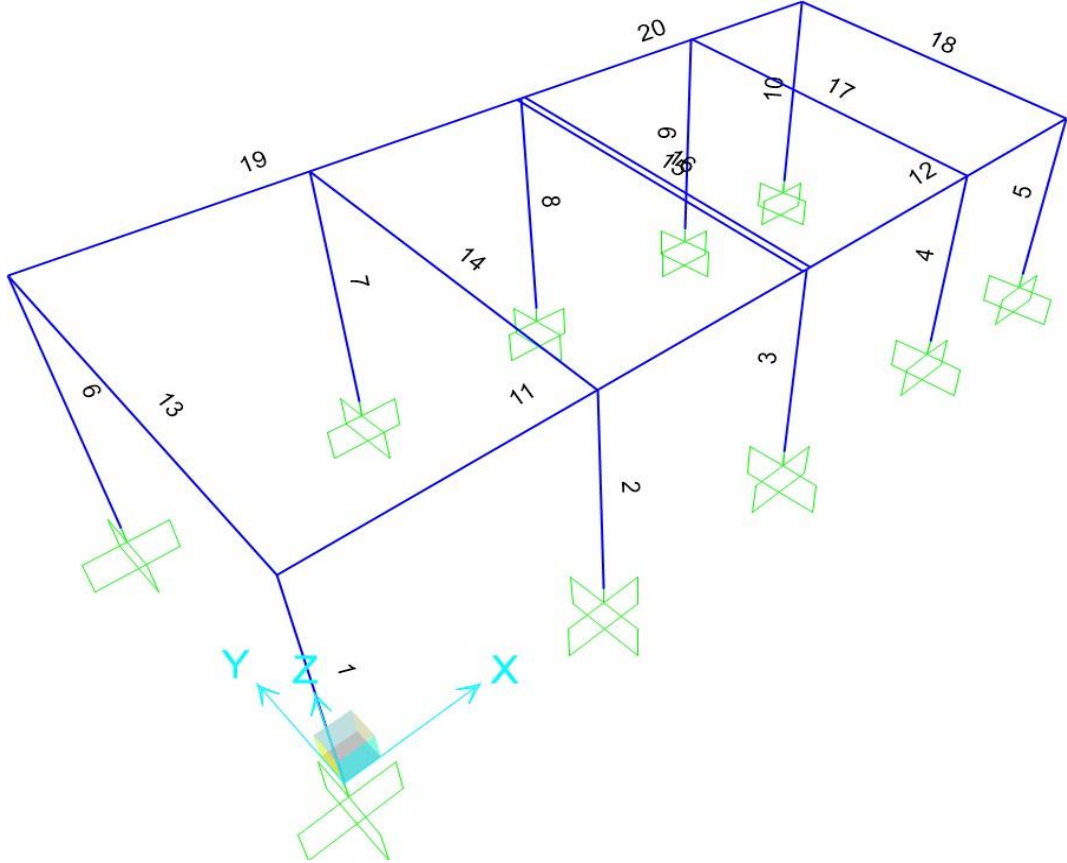


Figure 2.6 Frame Labels

2.2 JOINT COORDINATES

TABLE: Joint Coordinates					
Joint	CoordSys	CoordType	GlobalX	GlobalY	GlobalZ
1	GLOBAL	Cartesian	0.00	0.00	0.00
2	GLOBAL	Cartesian	0.00	4.31	0.00
3	GLOBAL	Cartesian	2.99	0.00	0.10
4	GLOBAL	Cartesian	2.99	4.31	0.10
5	GLOBAL	Cartesian	5.83	0.00	0.19
6	GLOBAL	Cartesian	5.83	4.31	0.19
7	GLOBAL	Cartesian	8.81	0.00	0.30
8	GLOBAL	Cartesian	11.20	0.00	0.30
9	GLOBAL	Cartesian	8.81	4.31	0.30
10	GLOBAL	Cartesian	11.20	4.31	0.30
11	GLOBAL	Cartesian	0.00	0.00	2.98
12	GLOBAL	Cartesian	2.99	0.00	2.98
13	GLOBAL	Cartesian	5.77	0.00	2.98
14	GLOBAL	Cartesian	5.83	0.00	2.98
15	GLOBAL	Cartesian	5.89	0.00	2.98
16	GLOBAL	Cartesian	8.81	0.00	2.98
17	GLOBAL	Cartesian	11.20	0.00	2.98
18	GLOBAL	Cartesian	0.00	4.31	3.63
19	GLOBAL	Cartesian	2.99	4.31	3.63
20	GLOBAL	Cartesian	5.77	4.31	3.63
21	GLOBAL	Cartesian	5.83	4.31	3.63
22	GLOBAL	Cartesian	5.89	4.31	3.63
23	GLOBAL	Cartesian	8.81	4.31	3.63
24	GLOBAL	Cartesian	11.20	4.31	3.63

2.3 JOINT RESTRAINT ASSIGNMENTS

TABLE: Joint Restraints						
Joint	U1	U2	U3	R1	R2	R3
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes
6	Yes	Yes	Yes	Yes	Yes	Yes
7	Yes	Yes	Yes	Yes	Yes	Yes
8	Yes	Yes	Yes	Yes	Yes	Yes
9	Yes	Yes	Yes	Yes	Yes	Yes
10	Yes	Yes	Yes	Yes	Yes	Yes

2.4 ELEMENT CONNECTIVITY

[illegible]

2.5 FRAME SECTION ASSIGNMENTS

[illegible]

5 - DETERMINATION OF LOADS

5.1 WIND LOAD

Basic values

Determination of basic wind velocity:

$$V_b = C_{dir} \times C_{season} \times V_{b,0}$$

Where ;
 V_b basic wind velocity
 C_{dir} direction factor
 C_{season} seasonal factor
 $V_{b,0}$ fundamental value of the basic wind velocity

Fundamental value of the basic wind velocity;

$$V_{b,0} = 28.33 \text{ m/s}$$

For simplification the directional factor C_{dir} and the seasonal factor C_{season} are in general equal to 1.

$$V_b = C_{dir} \times C_{season} \times V_{b,0} = 28.33 \text{ m/s}$$

Basic Velocity Pressure

$$q_b = 0,5 \times \rho_{air} \times V_b^2$$

Where ;
 $q_b = 1,25 \text{ kg/m}^3$ (air density)

$$q_b = 0,5 \times 1,25 \times 28,3^2 = 502 \text{ N/m}^2 = 0.50 \text{ kN/m}^2$$

Peak Pressure

$$q_p(z) = c_e(z) \times q_b$$

Where ;
 $c_e(z)$ is the exposure factor taken from EN 1991.1.4 Figure 4.1

Terrain Category IV

Area in which at least 15 % of the surface is covered with buildings and their average height exceeds 15 m

$$\text{Say } z = 3.63 \text{ m} \rightarrow c_e(z) \approx 1.20$$

$$q_p(z) = 0.50 \times 1.20 \rightarrow q_p(z) = 0.602 \text{ kN/m}^2$$

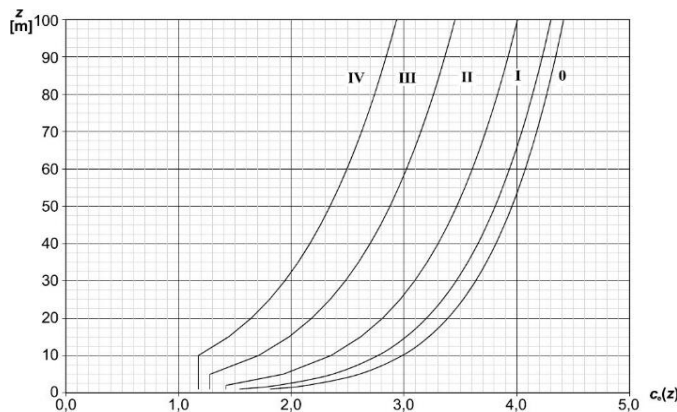


Figure 3.1
 Illustrations of the
 exposure factor $c_e(z)$
 for $c_0=1,0$, $k_t=1,0$

Wind pressure on surfaces

For both external and internal wind action, a positive wind load stands for pressure whereas a negative wind load indicates suction on the surface.

A - External pressure coefficient**- Monopitch Canopy**

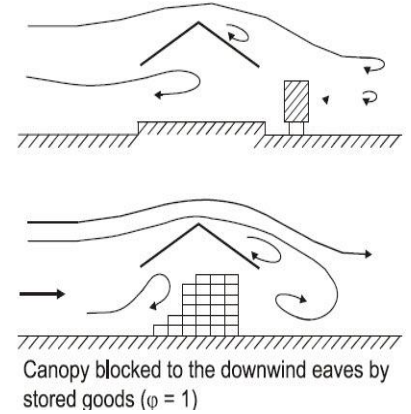
(EN 1991 – 2005)

Zone A using $C_{p,net}$ ($\alpha \approx 8.58^\circ$, $\varphi = 1$)

$$C_{p,net} = -1.96 \quad (\text{negative})$$

$$C_{p,net} = 1.11 \quad (\text{positive})$$

Where ; α pitch angle
 φ airflow factor



The wind loadings per unit length w (in kN/m) for a frame are calculated using the influence width (spacing) $s =$
 2.988 m., 2.839 m. 2.984 m. and 2.385 m.

Load Calculation

$$W_{e,B} = C_{p,net} \times q_p \times s$$

B1	► (Beams)	►	-1.96	×	0.602	×	2.988	=	-3.53 kN/m	*a
B2	► (Beams)	►	1.11	×	0.602	×	2.988	=	2.00 kN/m	**b
B3	► (Beams)	►	-1.96	×	0.602	×	2.839	=	-3.35 kN/m	*a
B4	► (Beams)	►	1.11	×	0.602	×	2.839	=	1.90 kN/m	**b
B5	► (Beams)	►	-1.96	×	0.602	×	2.984	=	-3.52 kN/m	*a
B6	► (Beams)	►	1.11	×	0.602	×	2.984	=	1.99 kN/m	**b
B7	► (Beams)	►	-1.96	×	0.602	×	2.385	=	-2.81 kN/m	*a
B8	► (Beams)	►	1.11	×	0.602	×	2.385	=	1.59 kN/m	**b

*a negative values : suction - uplift force

**b positive values : compression - downwards force

5.2 DEAD LOAD

Fabrics, Panel Covers and Other Weights (Pins, motor etc.)

G1	► (Beams)	►	0.05	kN/m ²	×	2.99	=	0.149 kN/m
G2	► (Beams)	►	0.05	kN/m ²	×	2.84	=	0.142 kN/m
G3	► (Beams)	►	0.05	kN/m ²	×	2.98	=	0.149 kN/m
G4	► (Beams)	►	0.05	kN/m ²	×	2.38	=	0.119 kN/m

Roof Dead Load ► Calculated by software

Beam Dead Load ► Calculated by software

5.3 LOAD COMBINATIONS

a) Ultimate Limit States

$$\sum_{j \geq 1} \gamma_{G,j} G_{k,j} + \gamma_{Q,1} \psi_{0,1} Q_{k,1} + \sum_{i > 1} \gamma_{Q,i} \psi_{0,i} Q_{k,i}$$

Equation 6.10a

$$\sum_{j \geq 1} \xi_j \gamma_{G,j} G_{k,j} + \gamma_{Q,1} Q_{k,1} + \sum_{i > 1} \gamma_{Q,i} \psi_{0,i} Q_{k,i}$$

Equation 6.10b

b) Serviceability Limit States

b.1 - Characteristic Combination

$$\sum_{j \geq 1} G_{k,j} + Q_{k,1} + \sum_{i > 1} \psi_{0,i} Q_{k,i}$$

Equation 6.14b

b.2 - Frequent Combination

$$\sum_{j \geq 1} G_{k,j} + \psi_{1,1} Q_{k,1} + \sum_{i > 1} \psi_{2,i} Q_{k,i}$$

Equation 6.15b

b.3 - Quasi-permanent Combination

$$\sum_{j \geq 1} G_{k,j} + \sum_{i > 1} \psi_{2,i} Q_{k,i}$$

Equation 6.16a

where; "+" implies "to be combined with"
Σ implies "the combined effect of"
ξ is a reduction factor for unfavourable permanent actions G
G_{k,j} Characteristic value of permanent action j
Q_{k,1} Characteristic value of the leading variable action 1
Q_{k,i} Characteristic value of the accompanying variable action i
γ_{G,j} Partial factor for permanent action j
γ_{Q,i} Partial factor for variable action i
ψ₀ Factor for combination value of a variable action
ψ₁ Factor for frequent value of a variable action
ψ₂ Factor for quasi-permanent value of a variable action
G_{kj,sup} / G_{kj,inf} Upper/lower characteristic value of permanent action j
γ_{Gj,sup} / γ_{Gj,inf} Partial factor for permanent action j in calculating upper/lower design values

STR : Internal failure or excessive deformation of the structure or structural members, including footings, piles, basement walls, etc., where the strength of construction materials of the structure governs.

Table A1.1 - Recommended values of factors for buildings

Action	ψ_0	ψ_1	ψ_2
Imposed loads in buildings, category (see EN 1991-1-1)			
Category A : domestic, residential areas	0.70	0.50	0.30
Category B : office areas	0.70	0.50	0.30
Category C : congregation areas	0.70	0.70	0.60
Category D : shopping areas	0.70	0.70	0.60
Category E : storage areas	1.00	0.90	0.80
Category F : traffic area,	0.00	0.00	0.00
vehicle weight $\leq 30\text{kN}$	0.70	0.70	0.60
Category G : traffic area,	0.00	0.00	0.00
$30\text{kN} < \text{vehicle weight} \leq 160\text{kN}$	0.70	0.50	0.30
Category H : roofs	0.00	0.00	0.00
	0.70	0.50	0.20
Snow loads on buildings (see EN 1991-1-3)* Finland, Iceland, Norway, Sweden			
Remainder of CEN Member States, for sites located at altitude $H > 1000\text{ m}$ a.s.l.	0.70	0.50	0.20
Remainder of CEN Member States, for sites located at altitude $H \leq 1000\text{ m}$ a.s.l.	0.50	0.20	0.00
Wind loads on buildings (see EN 1991-1-4)	0.60	0.20	0.00
Temperature (non-fire) in buildings (see EN 1991-1-5)	0.60	0.50	0.00
NOTE The values may be set by the National annex.			
* For countries not mentioned below, see relevant local conditions.			

Table A1.2(B) - Design values of actions (STR/GEO) (Set B)

Persistent and transient design	Permanent actions		Leading variable action (*)	Accompanying	
	Unfavourable	Favourable		Main (if any)	Others
(Eq. 6.10a)	$\gamma_{Gj,sup} G_{kj,sup}$	$\gamma_{Gj,inf} G_{kj,inf}$		$\gamma_{Q,1} \psi_{0,i} Q_{k,1}$	$\gamma_{Q,i} \psi_{0,i} Q_{k,i}$
(Eq. 6.10b)	$\xi \gamma_{Gj,sup} G_{kj,sup}$	$\gamma_{Gj,inf} G_{kj,inf}$	$\gamma_{Q,1} Q_{k,1}$		$\gamma_{Q,i} \psi_{0,i} Q_{k,i}$

(*) Variable actions are those considered in Table A1.1

NOTE 1 The choice between 6.10, or 6.10a and 6.10b will be in the National annex. In case of 6.10a and 6.10b, the National annex may in addition modify 6.10a to include permanent actions only.

NOTE 2 The γ and ξ values may be set by the National annex. The following values for γ and ξ are recommended when using expressions 6.10, or 6.10a and 6.10b.

$$\gamma_{Gj,sup} = 1,35$$

$$\gamma_{Gj,inf} = 1,00$$

$$\gamma_{Q,1} = 1,50 \text{ where unfavourable (0 where favourable)}$$

$$\gamma_{Q,i} = 1,50 \text{ where unfavourable (0 where favourable)}$$

$$\xi = 0,85 \text{ (so that } \xi \gamma_{Gj,sup} = 0,85 \times 1,35 \approx 1,15 \text{)}.$$

See also EN 1991 to EN 1999 for γ values to be used for imposed deformations.

NOTE 3 The characteristic values of all permanent actions from one source are multiplied by $\gamma_{G,sup}$ if the total resulting action effect is unfavourable and $\gamma_{G,inf}$ if the total resulting action effect is favourable. For example, all actions originating from the self weight of the structure may be considered as coming from one source ; this also applies if different materials are involved.

NOTE 4 For particular verifications, the values for γ_G and γ_Q may be subdivided into γ_g and γ_q and the model uncertainty factor γ_{sd} . A value of γ_{sd} in the range 1,05 to 1,15 can be used in most common cases and can be modified in the National annex.

Load Combinations Table								
		NO	NAME	MULTIPLIER				
				D	W	W_x^*	W_y^*	S^*
				VERT.	VERT.	HORZ.	HORZ.	VERT.
Ultimate Limit States	Equatation 6.10a	COMB1	(1.35)G+(1.5x0.6)WX+(1.5x0.5)S(+)	1.35	0.90	0.90		0.75
		COMB2	(1.35)G+(1.5x0.6)WX+(1.5x0.5)S(-)	1.35	-0.90	-0.90		0.75
		COMB3	(1.35)G+(1.5x0.6)WY+(1.5x0.5)S(+)	1.35	0.90		0.90	0.75
		COMB4	(1.35)G+(1.5x0.6)WY+(1.5x0.5)S(-)	1.35	-0.90		-0.90	0.75
	Equatation 6.10b	COMB5	(0.85x1.35)G+(1.5)WX+(1.5x0.5)S(+)	1.15	1.50	1.50		0.75
		COMB6	(0.85x1.35)G+(1.5)WX+(1.5x0.5)S(-)	1.15	-1.50	-1.50		0.75
		COMB7	(0.85x1.35)G+(1.5)WY+(1.5x0.5)S(+)	1.15	1.50		1.50	0.75
		COMB8	(0.85x1.35)G+(1.5)WY+(1.5x0.5)S(-)	1.15	-1.50		-1.50	0.75
		COMB9	(0.85x1.35)G+(1.5)S+(1.5x0.6)WX(+)	1.15	0.90	0.90		1.50
		COMB10	(0.85x1.35)G+(1.5)S+(1.5x0.6)WX(-)	1.15	-0.90	-0.90		1.50
		COMB11	(0.85x1.35)G+(1.5)S+(1.5x0.6)WY(+)	1.15	0.90		0.90	1.50
		COMB12	(0.85x1.35)G+(1.5)S+(1.5x0.6)WY(-)	1.15	-0.90		-0.90	1.50
Serviceability Limit States	Equatation 6.14b	COMB13	G+WX+(0.5)S(+)	1.00	1.00	1.00		0.50
		COMB14	G+WX+(0.5)S(-)	1.00	-1.00	-1.00		0.50
		COMB15	G+WY+(0.5)S(+)	1.00	1.00		1.00	0.50
		COMB16	G+WY+(0.5)S(-)	1.00	-1.00		-1.00	0.50
		COMB17	G+S+(0.6)WX(+)	1.00	0.60	0.60		1.00
		COMB18	G+S+(0.6)WX(-)	1.00	-0.60	-0.60		1.00
		COMB19	G+S+(0.6)WY(+)	1.00	0.60		0.60	1.00
		COMB20	G+S+(0.6)WY(-)	1.00	-0.60		-0.60	1.00

* if appreciable

ENV_DISP is the envelope combination of Equatation 6.14b (unfavourable combination)

ENV_SECTION_DESIGN is the envelope combination of Equatation 6.10a or Equatation 6.10b (unfavourable

6 - MODELLING

6.1 NUMERICAL MODEL

Model Name : Seven Sisters Market - 05.06.2026

License #0X1EDB7

05.06.2026

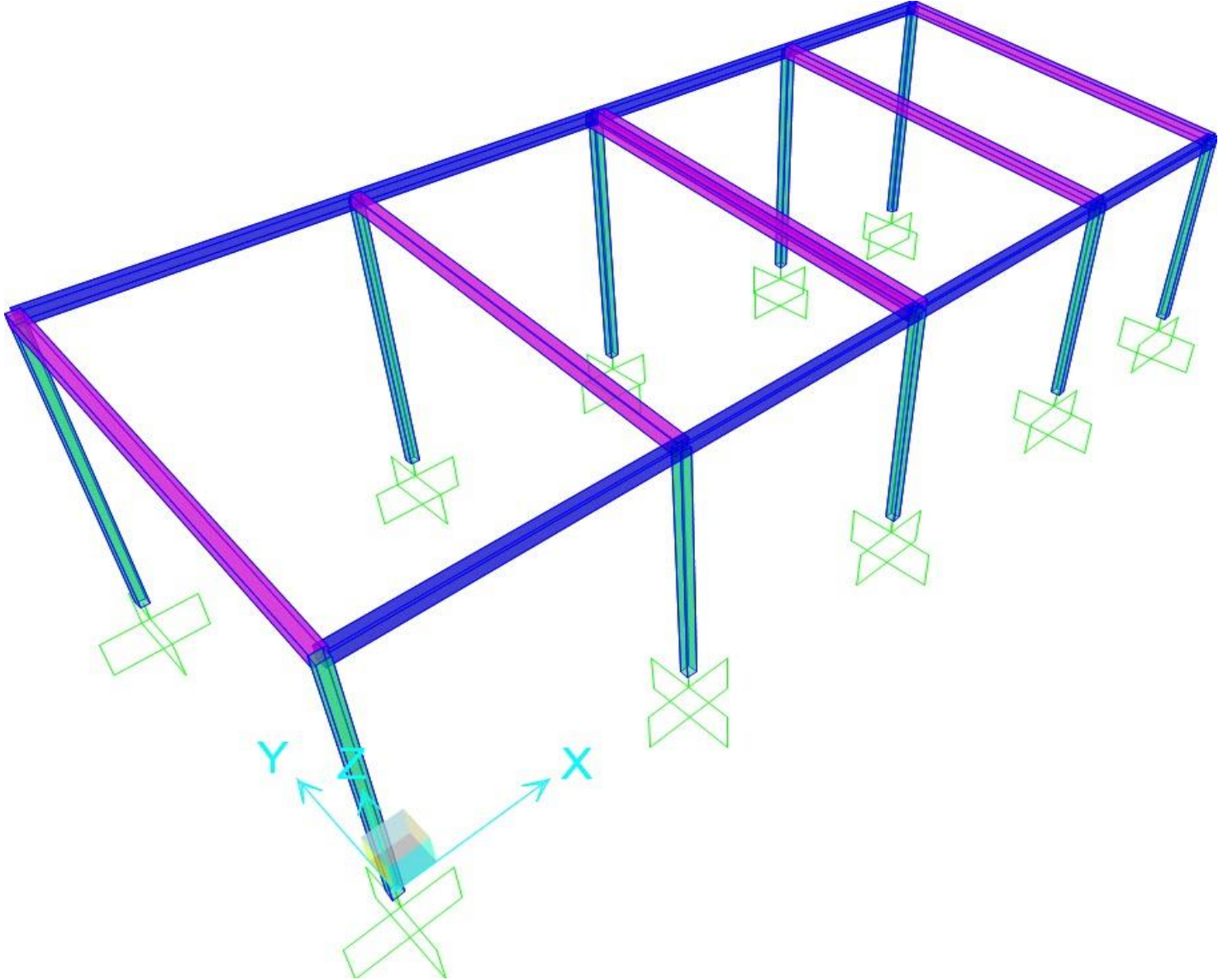


Figure 6.1 Finite Element Model

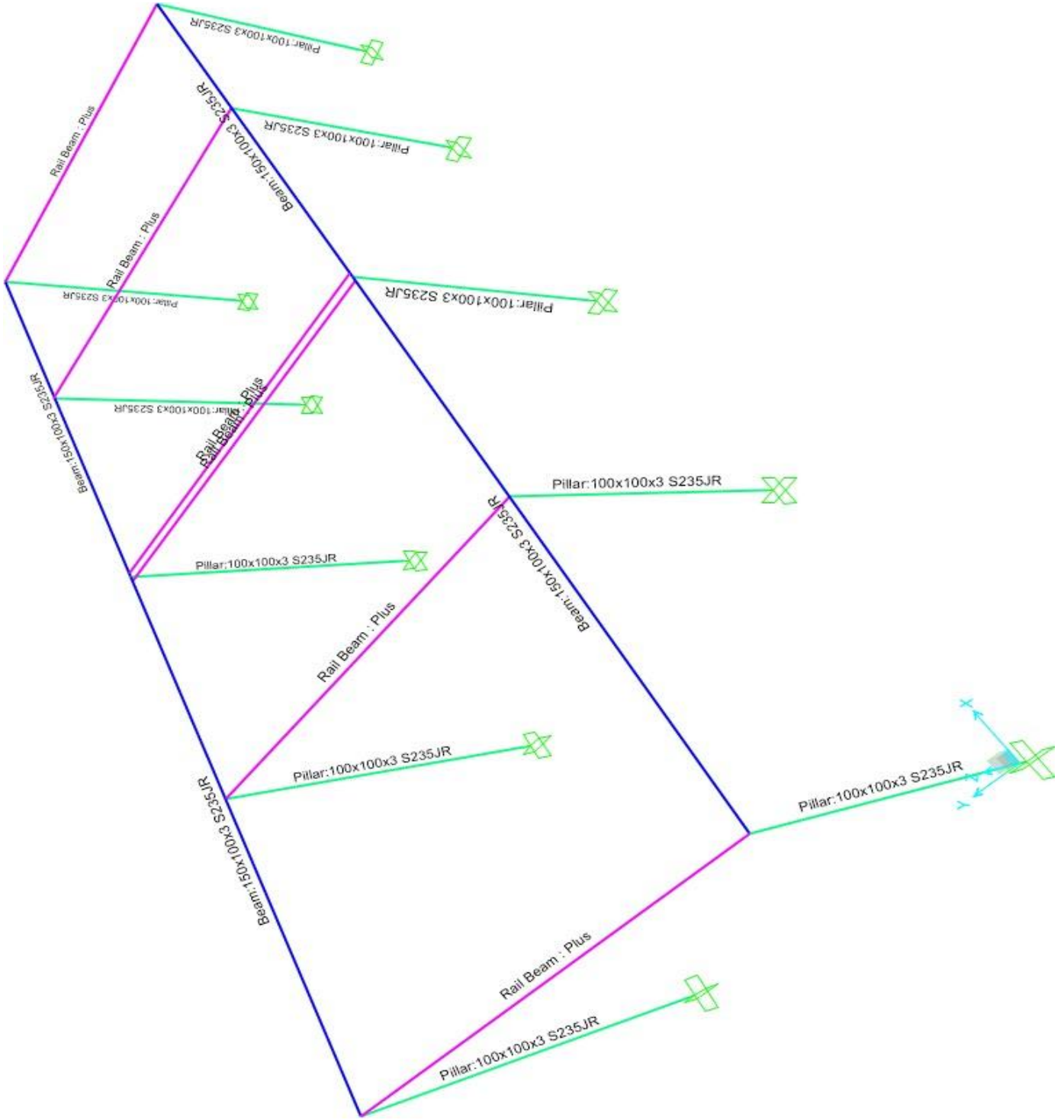


Figure 6.2 Frame Sections

6.2 LOADING

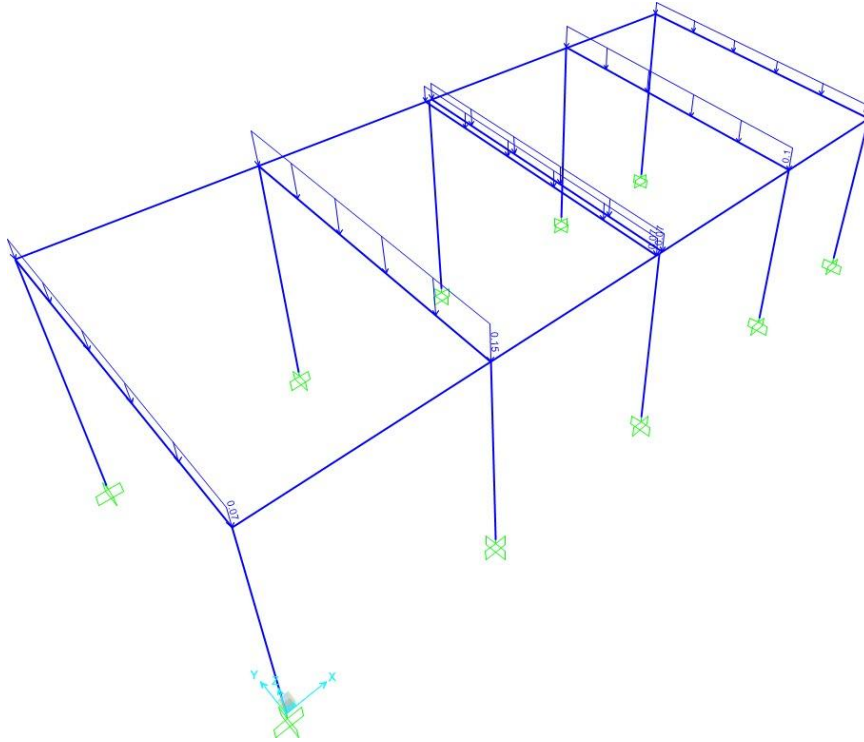


Figure 6.3 Additional Dead Load (kN,m)

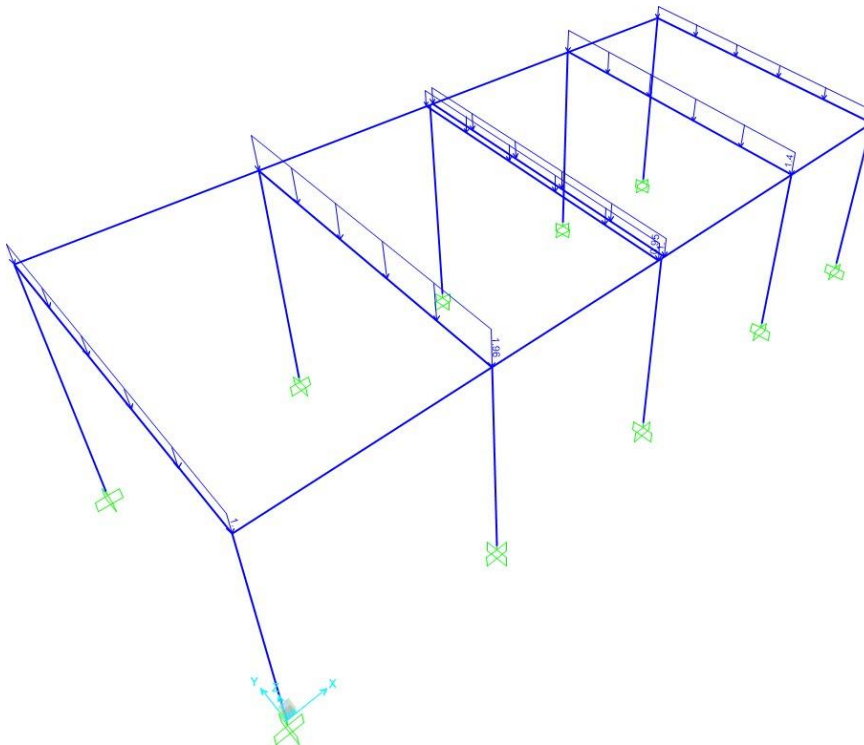


Figure 6.4 Wind Load (Vertical - Z-axis) (kN,m) - Positive

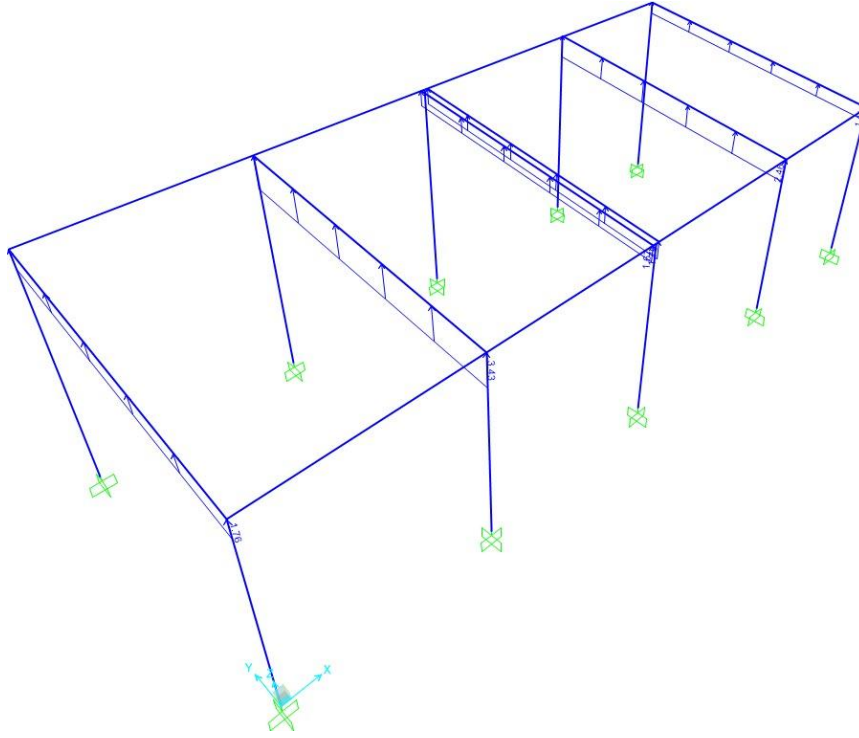


Figure 6.5 Wind Load (Vertical - Z-axis) (kN,m) - Negative

7 - ANALYSIS RESULTS

7.1 FORCE DIAGRAMS

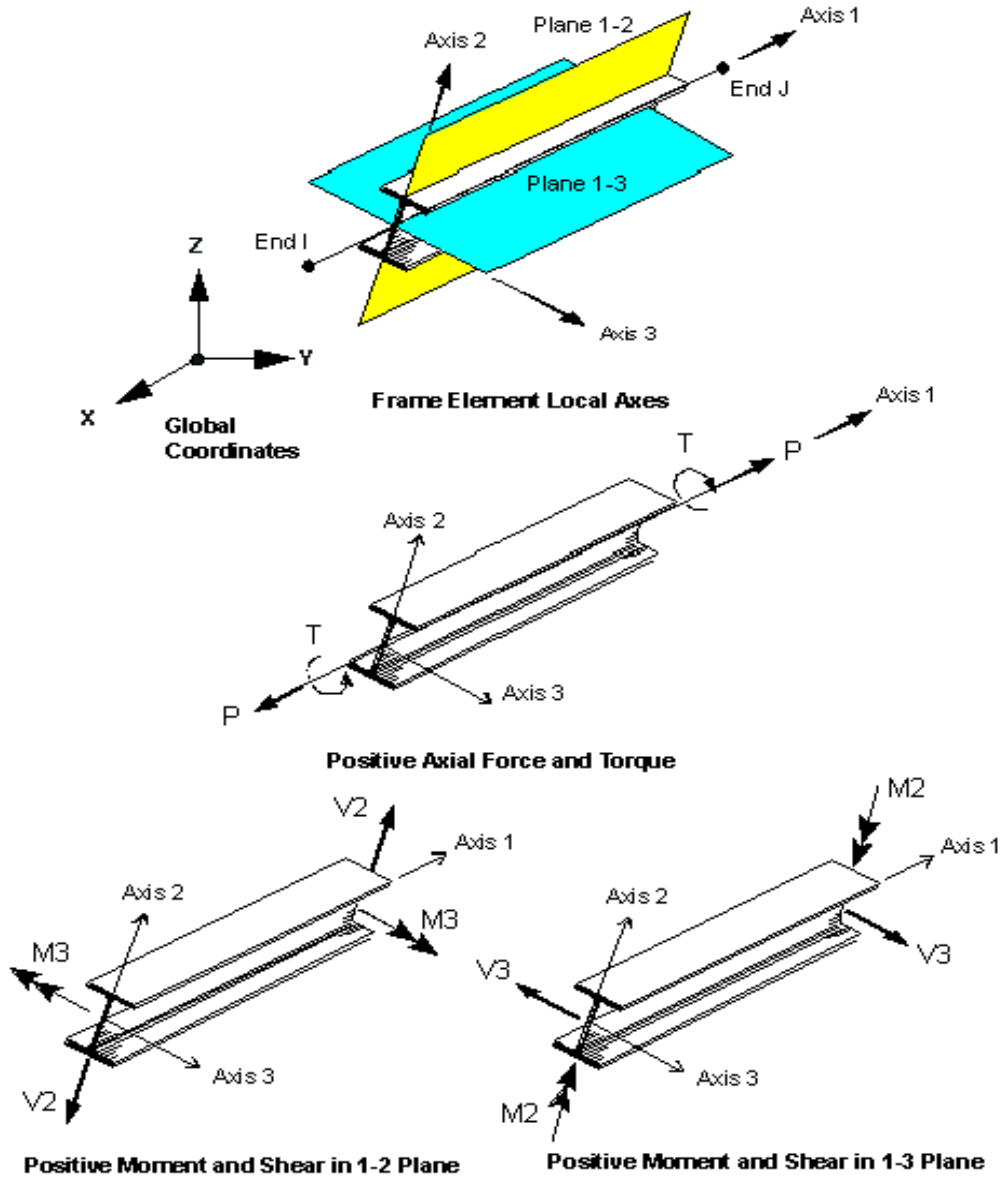


Figure 7.1 Frame Element Internal Forces - Directions

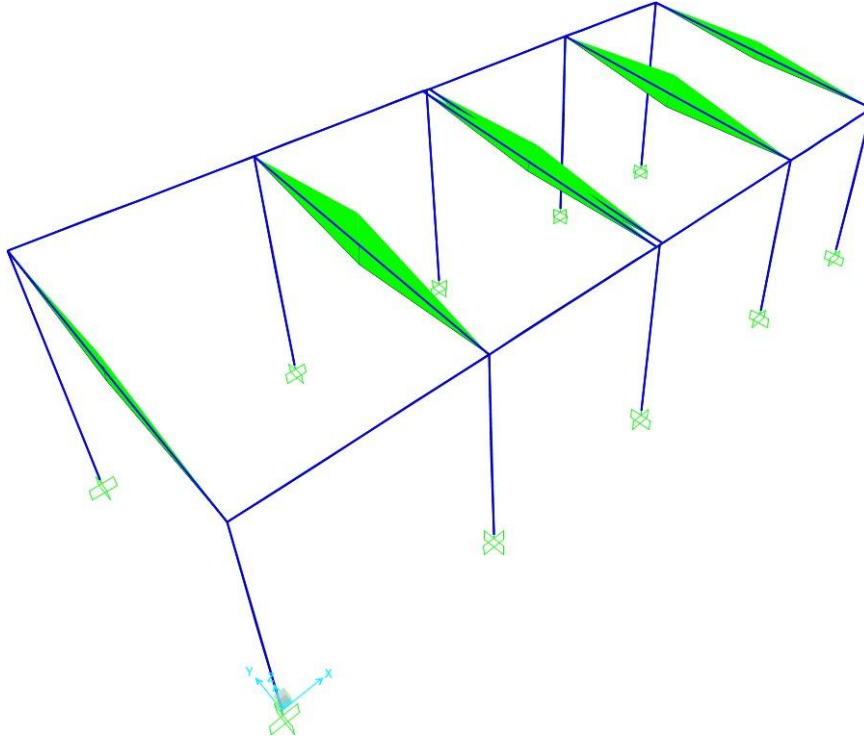


Figure 7.2 Moment 3-3 (kNm,m)

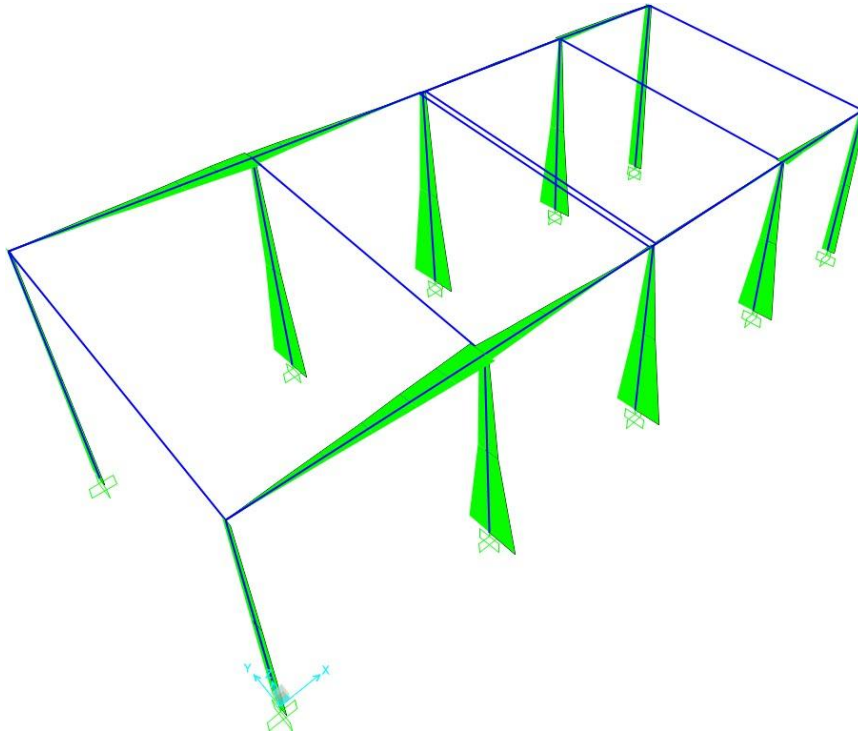


Figure 7.3 Moment 2-2 (kNm,m)

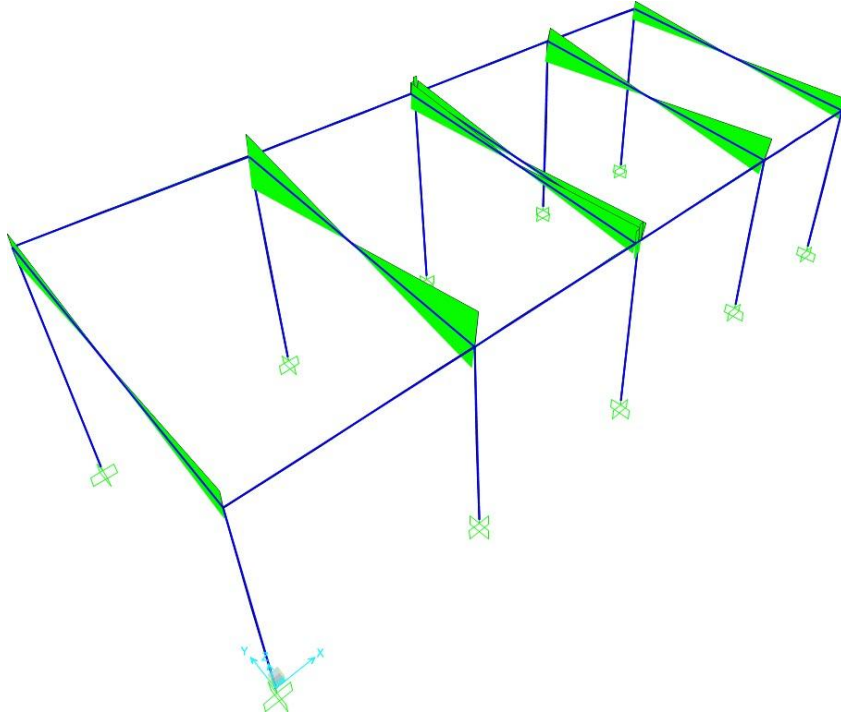


Figure 7.4 Shear Force 2-2 (kN,m)

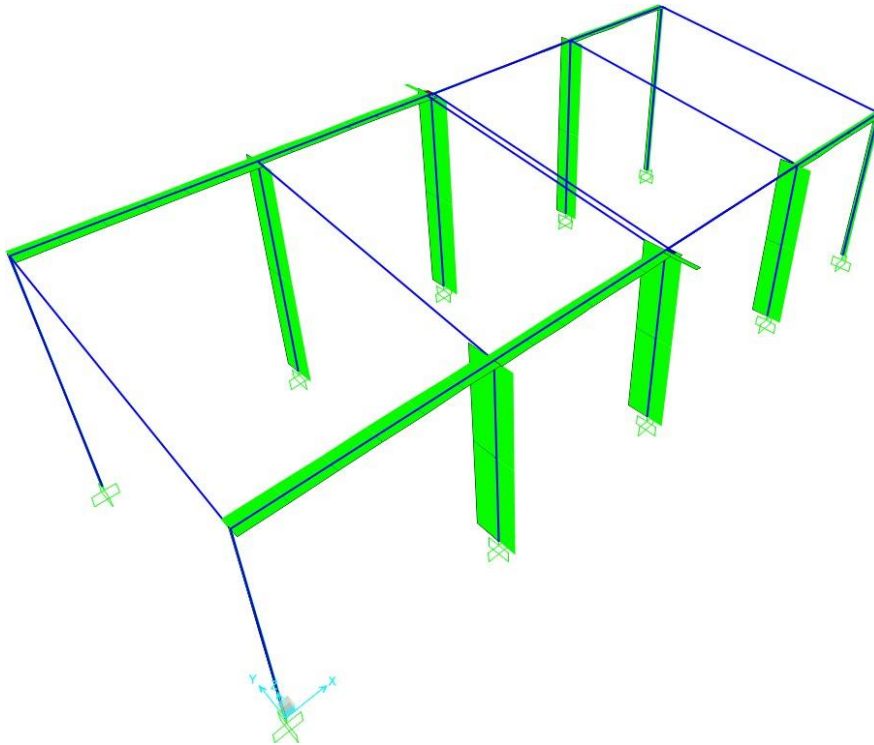


Figure 7.5 Shear Force 3-3 (kN,m)

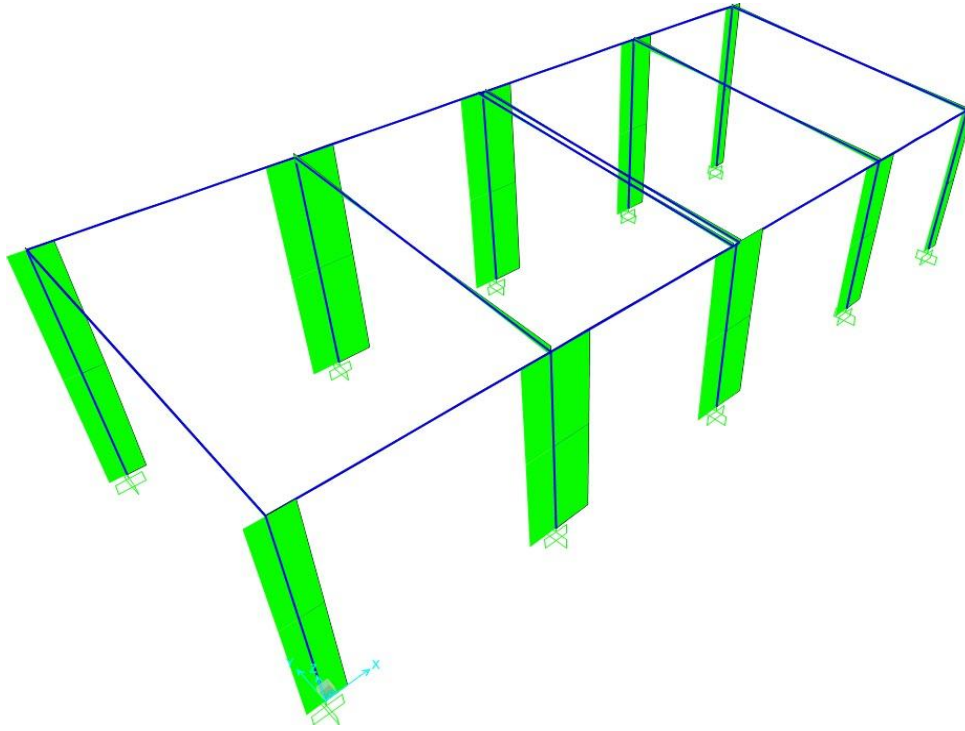


Figure 7.6 Axial Force (kN, m)

7.2 BASE REACTIONS

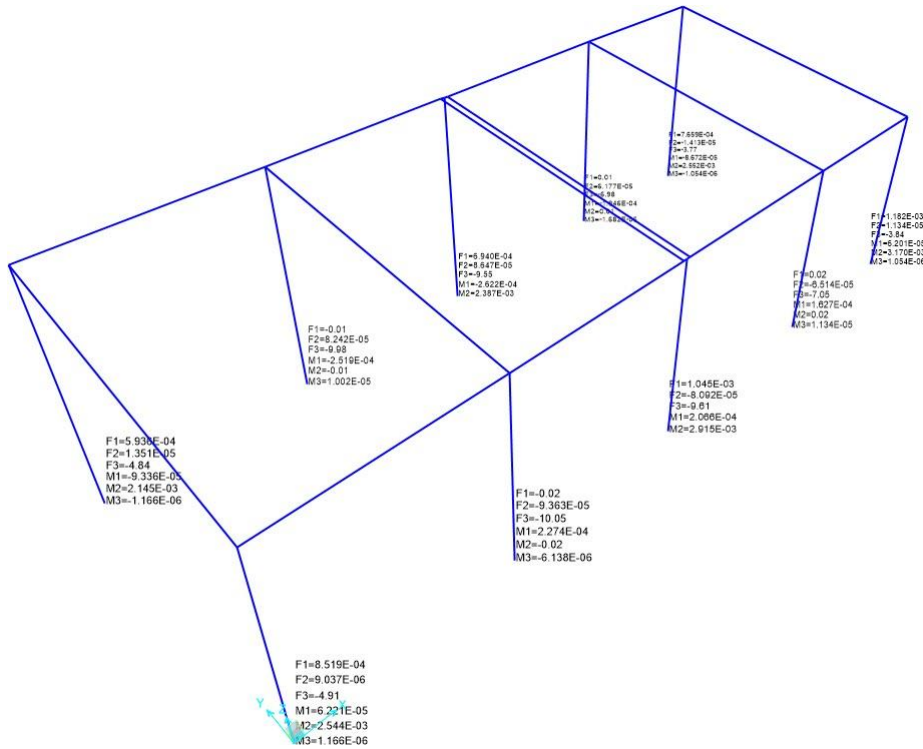


Figure 7.7 Base Reactions (kN, kNm, m) (Ultimate Loading)

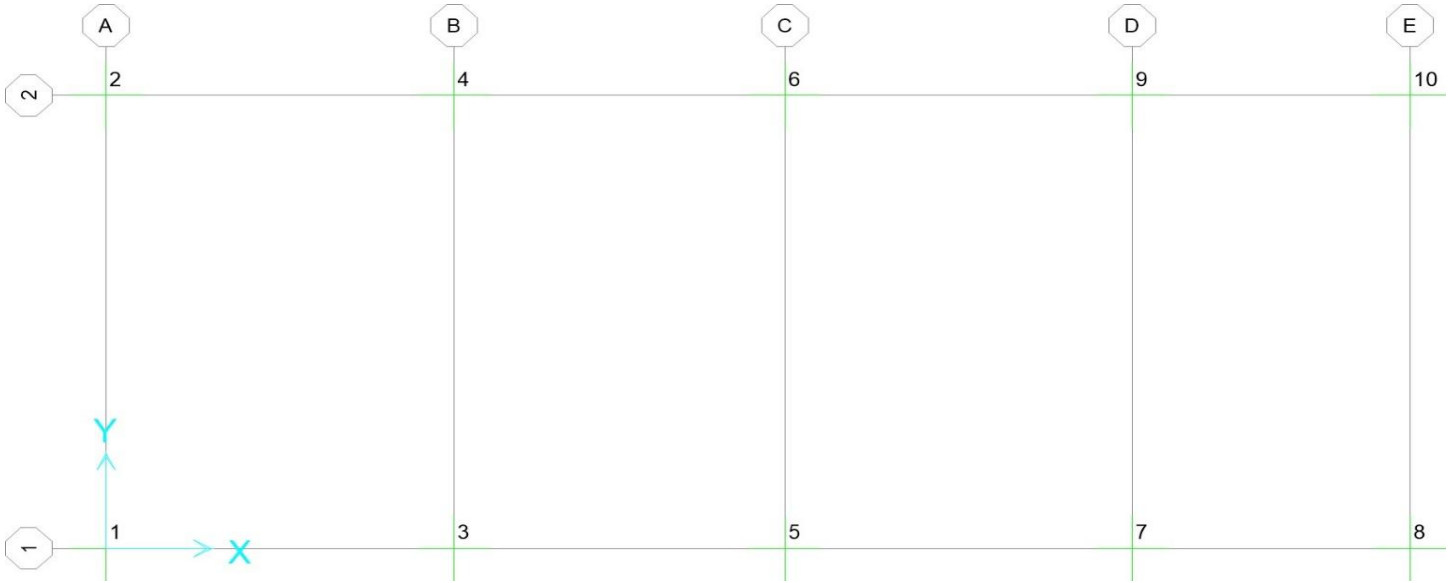


Figure 7.8 Joint Labels

TABLE: Joint Reactions									
Joint	OutputCase	CaseType	StepType	F1	F2	F3	M1	M2	M3
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
1	DEAD	LinStatic	-	0.00	0.00	0.72	0.00	0.00	0.00
1	WIND-VER(+)	LinStatic	-	0.00	0.00	2.18	0.00	0.00	0.00
1	WIND-VER(-)	LinStatic	-	0.00	0.00	-3.83	0.00	0.00	0.00
1	ENV_DISP	Combination	Max	0.00	0.00	2.90	0.00	0.00	0.00
1	ENV_DISP	Combination	Min	0.00	0.00	-3.10	0.00	0.00	0.00
1	ENV_SECTION_DESIGN	Combination	Max	0.00	0.00	4.10	0.00	0.00	0.00
1	ENV_SECTION_DESIGN	Combination	Min	0.00	0.00	-4.91	0.00	0.00	0.00
2	DEAD	LinStatic	-	0.00	0.00	0.78	0.00	0.00	0.00
2	WIND-VER(+)	LinStatic	-	0.00	0.00	2.18	0.00	0.00	0.00
2	WIND-VER(-)	LinStatic	-	0.00	0.00	-3.83	0.00	0.00	0.00
2	ENV_DISP	Combination	Max	0.00	0.00	2.96	0.00	0.00	0.00
2	ENV_DISP	Combination	Min	0.00	0.00	-3.04	0.00	0.00	0.00
2	ENV_SECTION_DESIGN	Combination	Max	0.00	0.00	4.17	0.00	0.00	0.00
2	ENV_SECTION_DESIGN	Combination	Min	0.00	0.00	-4.84	0.00	0.00	0.00
3	DEAD	LinStatic	-	0.00	0.00	1.16	0.00	0.00	0.00
3	WIND-VER(+)	LinStatic	-	0.01	0.00	4.32	0.00	0.01	0.00
3	WIND-VER(-)	LinStatic	-	-0.01	0.00	-7.59	0.00	-0.01	0.00
3	ENV_DISP	Combination	Max	0.01	0.00	5.48	0.00	0.01	0.00
3	ENV_DISP	Combination	Min	-0.01	0.00	-6.43	0.00	-0.01	0.00
3	ENV_SECTION_DESIGN	Combination	Max	0.01	0.00	7.82	0.00	0.02	0.00
3	ENV_SECTION_DESIGN	Combination	Min	-0.02	0.00	-10.05	0.00	-0.02	0.00
4	DEAD	LinStatic	-	0.00	0.00	1.22	0.00	0.00	0.00
4	WIND-VER(+)	LinStatic	-	0.01	0.00	4.32	0.00	0.01	0.00
4	WIND-VER(-)	LinStatic	-	-0.01	0.00	-7.59	0.00	-0.01	0.00
4	ENV_DISP	Combination	Max	0.01	0.00	5.54	0.00	0.01	0.00
4	ENV_DISP	Combination	Min	-0.01	0.00	-6.37	0.00	-0.01	0.00

TABLE: Joint Reactions									
Joint	OutputCase	CaseType	StepType	F1	F2	F3	M1	M2	M3
Text	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
4	ENV_SECTION_DESIGN	Combination	Max	0.01	0.00	7.89	0.00	0.01	0.00
4	ENV_SECTION_DESIGN	Combination	Min	-0.01	0.00	-9.98	0.00	-0.01	0.00
5	DEAD	LinStatic	-	0.00	0.00	1.14	0.00	0.00	0.00
5	WIND-VER(+)	LinStatic	-	0.00	0.00	4.14	0.00	0.00	0.00
5	WIND-VER(-)	LinStatic	-	0.00	0.00	-7.28	0.00	0.00	0.00
5	ENV_DISP	Combination	Max	0.00	0.00	5.28	0.00	0.00	0.00
5	ENV_DISP	Combination	Min	0.00	0.00	-6.14	0.00	0.00	0.00
5	ENV_SECTION_DESIGN	Combination	Max	0.00	0.00	7.52	0.00	0.00	0.00
5	ENV_SECTION_DESIGN	Combination	Min	0.00	0.00	-9.61	0.00	0.00	0.00
6	DEAD	LinStatic	-	0.00	0.00	1.19	0.00	0.00	0.00
6	WIND-VER(+)	LinStatic	-	0.00	0.00	4.15	0.00	0.00	0.00
6	WIND-VER(-)	LinStatic	-	0.00	0.00	-7.28	0.00	0.00	0.00
6	ENV_DISP	Combination	Max	0.00	0.00	5.34	0.00	0.00	0.00
6	ENV_DISP	Combination	Min	0.00	0.00	-6.09	0.00	0.00	0.00
6	ENV_SECTION_DESIGN	Combination	Max	0.00	0.00	7.59	0.00	0.00	0.00
6	ENV_SECTION_DESIGN	Combination	Min	0.00	0.00	-9.55	0.00	0.00	0.00
7	DEAD	LinStatic	-	0.00	0.00	1.03	0.00	0.00	0.00
7	WIND-VER(+)	LinStatic	-	-0.01	0.00	3.12	0.00	-0.01	0.00
7	WIND-VER(-)	LinStatic	-	0.01	0.00	-5.48	0.00	0.01	0.00
7	ENV_DISP	Combination	Max	0.01	0.00	4.15	0.00	0.01	0.00
7	ENV_DISP	Combination	Min	-0.01	0.00	-4.46	0.00	-0.01	0.00
7	ENV_SECTION_DESIGN	Combination	Max	0.02	0.00	5.86	0.00	0.02	0.00
7	ENV_SECTION_DESIGN	Combination	Min	-0.02	0.00	-7.05	0.00	-0.01	0.00
8	DEAD	LinStatic	-	0.00	0.00	0.63	0.00	0.00	0.00
8	WIND-VER(+)	LinStatic	-	0.00	0.00	1.73	0.00	0.00	0.00
8	WIND-VER(-)	LinStatic	-	0.00	0.00	-3.04	0.00	0.00	0.00
8	ENV_DISP	Combination	Max	0.00	0.00	2.36	0.00	0.00	0.00
8	ENV_DISP	Combination	Min	0.00	0.00	-2.41	0.00	0.00	0.00
8	ENV_SECTION_DESIGN	Combination	Max	0.00	0.00	3.32	0.00	0.00	0.00
8	ENV_SECTION_DESIGN	Combination	Min	0.00	0.00	-3.84	0.00	0.00	0.00
9	DEAD	LinStatic	-	0.00	0.00	1.08	0.00	0.00	0.00
9	WIND-VER(+)	LinStatic	-	-0.01	0.00	3.12	0.00	-0.01	0.00
9	WIND-VER(-)	LinStatic	-	0.01	0.00	-5.48	0.00	0.01	0.00
9	ENV_DISP	Combination	Max	0.01	0.00	4.21	0.00	0.01	0.00
9	ENV_DISP	Combination	Min	-0.01	0.00	-4.40	0.00	-0.01	0.00
9	ENV_SECTION_DESIGN	Combination	Max	0.01	0.00	5.93	0.00	0.01	0.00
9	ENV_SECTION_DESIGN	Combination	Min	-0.01	0.00	-6.98	0.00	-0.01	0.00
10	DEAD	LinStatic	-	0.00	0.00	0.69	0.00	0.00	0.00
10	WIND-VER(+)	LinStatic	-	0.00	0.00	1.73	0.00	0.00	0.00
10	WIND-VER(-)	LinStatic	-	0.00	0.00	-3.04	0.00	0.00	0.00
10	ENV_DISP	Combination	Max	0.00	0.00	2.42	0.00	0.00	0.00
10	ENV_DISP	Combination	Min	0.00	0.00	-2.36	0.00	0.00	0.00
10	ENV_SECTION_DESIGN	Combination	Max	0.00	0.00	3.39	0.00	0.00	0.00
10	ENV_SECTION_DESIGN	Combination	Min	0.00	0.00	-3.77	0.00	0.00	0.00

7.3 FRAME FORCES

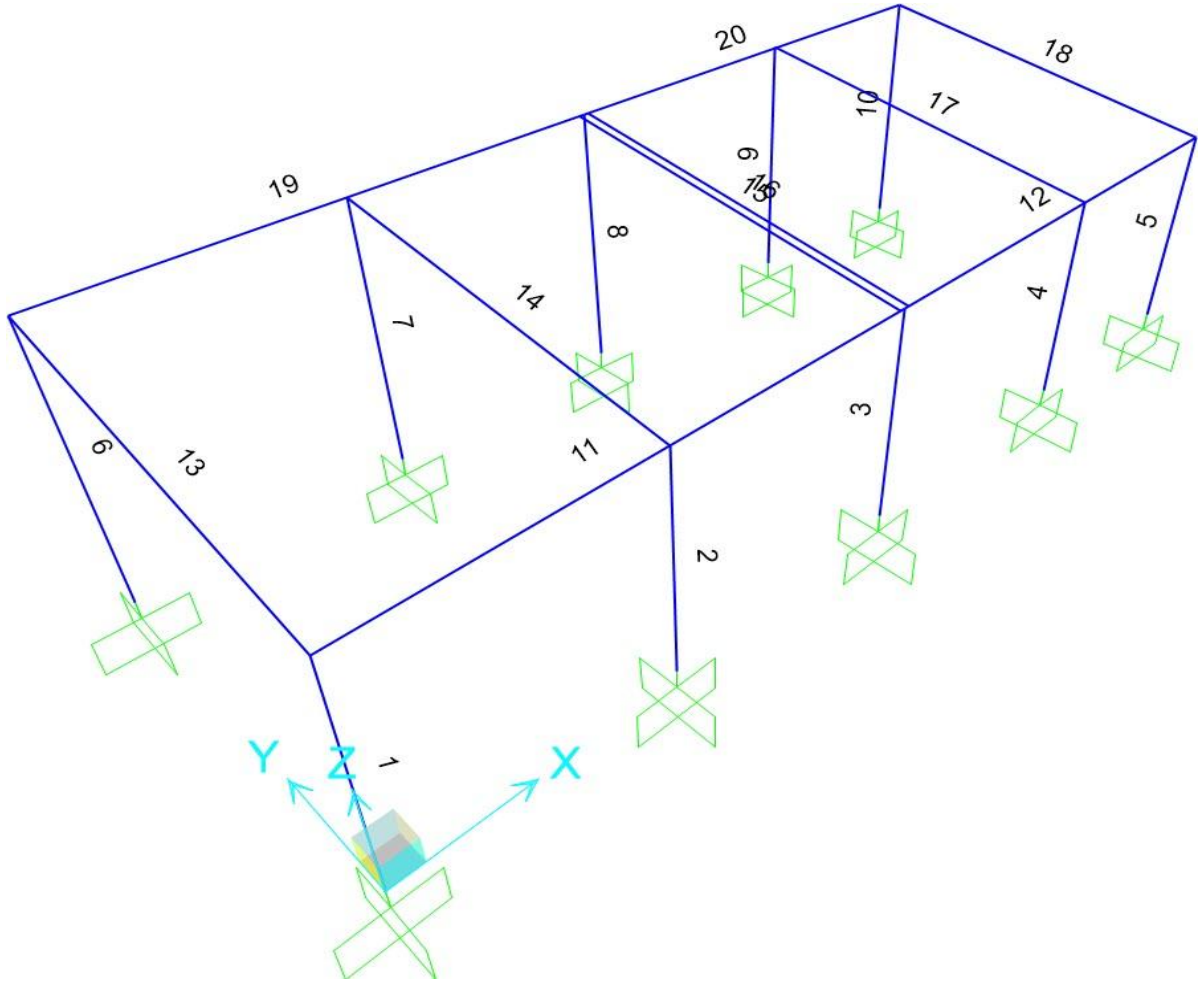


Figure 7.9 Frame Numbers

TABLE: Frame Forces									
Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	M2	M3
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m
1	0.00	DEAD	LinStatic	-	-0.72	0.00	0.00	0.00	0.00
1	1.49	DEAD	LinStatic	-	-0.59	0.00	0.00	0.00	0.00
1	2.98	DEAD	LinStatic	-	-0.46	0.00	0.00	0.00	0.00
1	0.00	WIND-VER(+)	LinStatic	-	-2.18	0.00	0.00	0.00	0.00
1	1.49	WIND-VER(+)	LinStatic	-	-2.18	0.00	0.00	0.00	0.00
1	2.98	WIND-VER(+)	LinStatic	-	-2.18	0.00	0.00	0.00	0.00
1	0.00	WIND-VER(-)	LinStatic	-	3.83	0.00	0.00	0.00	0.00
1	1.49	WIND-VER(-)	LinStatic	-	3.83	0.00	0.00	0.00	0.00
1	2.98	WIND-VER(-)	LinStatic	-	3.83	0.00	0.00	0.00	0.00
1	0.00	ENV_DISP	Combination	Max	3.10	0.00	0.00	0.00	0.00

TABLE: Frame Forces									
Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	M2	M3
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m
1	1.49	ENV_DISP	Combination	Max	3.24	0.00	0.00	0.00	0.00
1	2.98	ENV_DISP	Combination	Max	3.37	0.00	0.00	0.00	0.00
1	0.00	ENV_DISP	Combination	Min	-2.90	0.00	0.00	0.00	0.00
1	1.49	ENV_DISP	Combination	Min	-2.77	0.00	0.00	0.00	0.00
1	2.98	ENV_DISP	Combination	Min	-2.64	0.00	0.00	0.00	0.00
1	0.00	ENV_SECTION_DESIGN	Combination	Max	4.91	0.00	0.00	0.00	0.00
1	1.49	ENV_SECTION_DESIGN	Combination	Max	5.06	0.00	0.00	0.00	0.00
1	2.98	ENV_SECTION_DESIGN	Combination	Max	5.21	0.00	0.00	0.00	0.00
1	0.00	ENV_SECTION_DESIGN	Combination	Min	-4.10	0.00	0.00	0.00	0.00
1	1.49	ENV_SECTION_DESIGN	Combination	Min	-3.95	0.00	0.00	0.00	0.00
1	2.98	ENV_SECTION_DESIGN	Combination	Min	-3.79	0.00	0.00	0.00	0.00
2	0.00	DEAD	LinStatic	-	-1.16	0.00	0.00	0.00	0.00
2	1.44	DEAD	LinStatic	-	-1.03	0.00	0.00	0.00	0.00
2	2.88	DEAD	LinStatic	-	-0.91	0.00	0.00	0.00	0.00
2	0.00	WIND-VER(+)	LinStatic	-	-4.32	-0.01	0.00	0.00	-0.01
2	1.44	WIND-VER(+)	LinStatic	-	-4.32	-0.01	0.00	0.00	0.00
2	2.88	WIND-VER(+)	LinStatic	-	-4.32	-0.01	0.00	0.00	0.01
2	0.00	WIND-VER(-)	LinStatic	-	7.59	0.01	0.00	0.00	0.01
2	1.44	WIND-VER(-)	LinStatic	-	7.59	0.01	0.00	0.00	-0.01
2	2.88	WIND-VER(-)	LinStatic	-	7.59	0.01	0.00	0.00	-0.03
2	0.00	ENV_DISP	Combination	Max	6.43	0.01	0.00	0.00	0.01
2	1.44	ENV_DISP	Combination	Max	6.56	0.01	0.00	0.00	0.00
2	2.88	ENV_DISP	Combination	Max	6.69	0.01	0.00	0.00	0.02
2	0.00	ENV_DISP	Combination	Min	-5.48	-0.01	0.00	0.00	-0.01
2	1.44	ENV_DISP	Combination	Min	-5.36	-0.01	0.00	0.00	-0.01
2	2.88	ENV_DISP	Combination	Min	-5.23	-0.01	0.00	0.00	-0.02
2	0.00	ENV_SECTION_DESIGN	Combination	Max	10.05	0.02	0.00	0.00	0.02
2	1.44	ENV_SECTION_DESIGN	Combination	Max	10.20	0.02	0.00	0.00	0.01
2	2.88	ENV_SECTION_DESIGN	Combination	Max	10.35	0.02	0.00	0.00	0.03
2	0.00	ENV_SECTION_DESIGN	Combination	Min	-7.82	-0.01	0.00	0.00	-0.02
2	1.44	ENV_SECTION_DESIGN	Combination	Min	-7.67	-0.01	0.00	0.00	-0.01
2	2.88	ENV_SECTION_DESIGN	Combination	Min	-7.52	-0.01	0.00	0.00	-0.04
3	0.00	DEAD	LinStatic	-	-1.14	0.00	0.00	0.00	0.00
3	1.40	DEAD	LinStatic	-	-1.01	0.00	0.00	0.00	0.00
3	2.79	DEAD	LinStatic	-	-0.89	0.00	0.00	0.00	0.00
3	0.00	WIND-VER(+)	LinStatic	-	-4.14	0.00	0.00	0.00	0.00
3	1.40	WIND-VER(+)	LinStatic	-	-4.14	0.00	0.00	0.00	0.00
3	2.79	WIND-VER(+)	LinStatic	-	-4.14	0.00	0.00	0.00	0.00
3	0.00	WIND-VER(-)	LinStatic	-	7.28	0.00	0.00	0.00	0.00
3	1.40	WIND-VER(-)	LinStatic	-	7.28	0.00	0.00	0.00	0.00
3	2.79	WIND-VER(-)	LinStatic	-	7.28	0.00	0.00	0.00	0.00
3	0.00	ENV_DISP	Combination	Max	6.14	0.00	0.00	0.00	0.00

TABLE: Frame Forces

Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	M2	M3
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m
3	1.40	ENV_DISP	Combination	Max	6.27	0.00	0.00	0.00	0.00
3	2.79	ENV_DISP	Combination	Max	6.39	0.00	0.00	0.00	0.00
3	0.00	ENV_DISP	Combination	Min	-5.28	0.00	0.00	0.00	0.00
3	1.40	ENV_DISP	Combination	Min	-5.15	0.00	0.00	0.00	0.00
3	2.79	ENV_DISP	Combination	Min	-5.03	0.00	0.00	0.00	0.00
3	0.00	ENV_SECTION_DESIGN	Combination	Max	9.61	0.00	0.00	0.00	0.00
3	1.40	ENV_SECTION_DESIGN	Combination	Max	9.76	0.00	0.00	0.00	0.00
3	2.79	ENV_SECTION_DESIGN	Combination	Max	9.90	0.00	0.00	0.00	0.00
3	0.00	ENV_SECTION_DESIGN	Combination	Min	-7.52	0.00	0.00	0.00	0.00
3	1.40	ENV_SECTION_DESIGN	Combination	Min	-7.38	0.00	0.00	0.00	0.00
3	2.79	ENV_SECTION_DESIGN	Combination	Min	-7.23	0.00	0.00	0.00	0.00
4	0.00	DEAD	LinStatic	-	-1.03	0.00	0.00	0.00	0.00
4	1.34	DEAD	LinStatic	-	-0.91	0.00	0.00	0.00	0.00
4	2.68	DEAD	LinStatic	-	-0.79	0.00	0.00	0.00	-0.01
4	0.00	WIND-VER(+)	LinStatic	-	-3.12	0.01	0.00	0.00	0.01
4	1.34	WIND-VER(+)	LinStatic	-	-3.12	0.01	0.00	0.00	0.00
4	2.68	WIND-VER(+)	LinStatic	-	-3.12	0.01	0.00	0.00	-0.02
4	0.00	WIND-VER(-)	LinStatic	-	5.48	-0.01	0.00	0.00	-0.01
4	1.34	WIND-VER(-)	LinStatic	-	5.48	-0.01	0.00	0.00	0.01
4	2.68	WIND-VER(-)	LinStatic	-	5.48	-0.01	0.00	0.00	0.03
4	0.00	ENV_DISP	Combination	Max	4.46	0.01	0.00	0.00	0.01
4	1.34	ENV_DISP	Combination	Max	4.58	0.01	0.00	0.00	0.00
4	2.68	ENV_DISP	Combination	Max	4.70	0.01	0.00	0.00	0.02
4	0.00	ENV_DISP	Combination	Min	-4.15	-0.01	0.00	0.00	-0.01
4	1.34	ENV_DISP	Combination	Min	-4.03	-0.01	0.00	0.00	-0.01
4	2.68	ENV_DISP	Combination	Min	-3.91	-0.01	0.00	0.00	-0.02
4	0.00	ENV_SECTION_DESIGN	Combination	Max	7.05	0.02	0.00	0.00	0.01
4	1.34	ENV_SECTION_DESIGN	Combination	Max	7.18	0.02	0.00	0.00	0.01
4	2.68	ENV_SECTION_DESIGN	Combination	Max	7.32	0.02	0.00	0.00	0.03
4	0.00	ENV_SECTION_DESIGN	Combination	Min	-5.86	-0.02	0.00	0.00	-0.02
4	1.34	ENV_SECTION_DESIGN	Combination	Min	-5.72	-0.02	0.00	0.00	-0.01
4	2.68	ENV_SECTION_DESIGN	Combination	Min	-5.59	-0.02	0.00	0.00	-0.03
5	0.00	DEAD	LinStatic	-	-0.63	0.00	0.00	0.00	0.00
5	1.34	DEAD	LinStatic	-	-0.51	0.00	0.00	0.00	0.00
5	2.68	DEAD	LinStatic	-	-0.39	0.00	0.00	0.00	0.00
5	0.00	WIND-VER(+)	LinStatic	-	-1.73	0.00	0.00	0.00	0.00
5	1.34	WIND-VER(+)	LinStatic	-	-1.73	0.00	0.00	0.00	0.00
5	2.68	WIND-VER(+)	LinStatic	-	-1.73	0.00	0.00	0.00	0.00
5	0.00	WIND-VER(-)	LinStatic	-	3.04	0.00	0.00	0.00	0.00
5	1.34	WIND-VER(-)	LinStatic	-	3.04	0.00	0.00	0.00	0.00
5	2.68	WIND-VER(-)	LinStatic	-	3.04	0.00	0.00	0.00	0.00
5	0.00	ENV_DISP	Combination	Max	2.41	0.00	0.00	0.00	0.00

TABLE: Frame Forces									
Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	M2	M3
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m
5	1.34	ENV_DISP	Combination	Max	2.53	0.00	0.00	0.00	0.00
5	2.68	ENV_DISP	Combination	Max	2.65	0.00	0.00	0.00	0.00
5	0.00	ENV_DISP	Combination	Min	-2.36	0.00	0.00	0.00	0.00
5	1.34	ENV_DISP	Combination	Min	-2.24	0.00	0.00	0.00	0.00
5	2.68	ENV_DISP	Combination	Min	-2.12	0.00	0.00	0.00	0.00
5	0.00	ENV_SECTION_DESIGN	Combination	Max	3.84	0.00	0.00	0.00	0.00
5	1.34	ENV_SECTION_DESIGN	Combination	Max	3.98	0.00	0.00	0.00	0.00
5	2.68	ENV_SECTION_DESIGN	Combination	Max	4.12	0.00	0.00	0.00	0.00
5	0.00	ENV_SECTION_DESIGN	Combination	Min	-3.32	0.00	0.00	0.00	0.00
5	1.34	ENV_SECTION_DESIGN	Combination	Min	-3.18	0.00	0.00	0.00	0.00
5	2.68	ENV_SECTION_DESIGN	Combination	Min	-3.04	0.00	0.00	0.00	0.00
6	0.00	DEAD	LinStatic	-	-0.78	0.00	0.00	0.00	0.00
6	1.81	DEAD	LinStatic	-	-0.62	0.00	0.00	0.00	0.00
6	3.63	DEAD	LinStatic	-	-0.46	0.00	0.00	0.00	0.00
6	0.00	WIND-VER(+)	LinStatic	-	-2.18	0.00	0.00	0.00	0.00
6	1.81	WIND-VER(+)	LinStatic	-	-2.18	0.00	0.00	0.00	0.00
6	3.63	WIND-VER(+)	LinStatic	-	-2.18	0.00	0.00	0.00	0.00
6	0.00	WIND-VER(-)	LinStatic	-	3.83	0.00	0.00	0.00	0.00
6	1.81	WIND-VER(-)	LinStatic	-	3.83	0.00	0.00	0.00	0.00
6	3.63	WIND-VER(-)	LinStatic	-	3.83	0.00	0.00	0.00	0.00
6	0.00	ENV_DISP	Combination	Max	3.04	0.00	0.00	0.00	0.00
6	1.81	ENV_DISP	Combination	Max	3.21	0.00	0.00	0.00	0.00
6	3.63	ENV_DISP	Combination	Max	3.37	0.00	0.00	0.00	0.00
6	0.00	ENV_DISP	Combination	Min	-2.96	0.00	0.00	0.00	0.00
6	1.81	ENV_DISP	Combination	Min	-2.80	0.00	0.00	0.00	0.00
6	3.63	ENV_DISP	Combination	Min	-2.64	0.00	0.00	0.00	0.00
6	0.00	ENV_SECTION_DESIGN	Combination	Max	4.84	0.00	0.00	0.00	0.00
6	1.81	ENV_SECTION_DESIGN	Combination	Max	5.03	0.00	0.00	0.00	0.00
6	3.63	ENV_SECTION_DESIGN	Combination	Max	5.21	0.00	0.00	0.00	0.00
6	0.00	ENV_SECTION_DESIGN	Combination	Min	-4.17	0.00	0.00	0.00	0.00
6	1.81	ENV_SECTION_DESIGN	Combination	Min	-3.98	0.00	0.00	0.00	0.00
6	3.63	ENV_SECTION_DESIGN	Combination	Min	-3.79	0.00	0.00	0.00	0.00
7	0.00	DEAD	LinStatic	-	-1.22	0.00	0.00	0.00	0.00
7	1.76	DEAD	LinStatic	-	-1.06	0.00	0.00	0.00	0.00
7	3.53	DEAD	LinStatic	-	-0.91	0.00	0.00	0.00	0.00
7	0.00	WIND-VER(+)	LinStatic	-	-4.32	-0.01	0.00	0.00	-0.01
7	1.76	WIND-VER(+)	LinStatic	-	-4.32	-0.01	0.00	0.00	0.00
7	3.53	WIND-VER(+)	LinStatic	-	-4.32	-0.01	0.00	0.00	0.01
7	0.00	WIND-VER(-)	LinStatic	-	7.59	0.01	0.00	0.00	0.01
7	1.76	WIND-VER(-)	LinStatic	-	7.59	0.01	0.00	0.00	-0.01
7	3.53	WIND-VER(-)	LinStatic	-	7.59	0.01	0.00	0.00	-0.02
7	0.00	ENV_DISP	Combination	Max	6.37	0.01	0.00	0.00	0.01

TABLE: Frame Forces									
Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	M2	M3
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m
7	1.76	ENV_DISP	Combination	Max	6.53	0.01	0.00	0.00	0.00
7	3.53	ENV_DISP	Combination	Max	6.68	0.01	0.00	0.00	0.02
7	0.00	ENV_DISP	Combination	Min	-5.54	-0.01	0.00	0.00	-0.01
7	1.76	ENV_DISP	Combination	Min	-5.38	-0.01	0.00	0.00	-0.01
7	3.53	ENV_DISP	Combination	Min	-5.23	-0.01	0.00	0.00	-0.02
7	0.00	ENV_SECTION_DESIGN	Combination	Max	9.98	0.01	0.00	0.00	0.01
7	1.76	ENV_SECTION_DESIGN	Combination	Max	10.16	0.01	0.00	0.00	0.00
7	3.53	ENV_SECTION_DESIGN	Combination	Max	10.34	0.01	0.00	0.00	0.02
7	0.00	ENV_SECTION_DESIGN	Combination	Min	-7.89	-0.01	0.00	0.00	-0.01
7	1.76	ENV_SECTION_DESIGN	Combination	Min	-7.70	-0.01	0.00	0.00	-0.01
7	3.53	ENV_SECTION_DESIGN	Combination	Min	-7.52	-0.01	0.00	0.00	-0.03
8	0.00	DEAD	LinStatic	-	-1.19	0.00	0.00	0.00	0.00
8	1.72	DEAD	LinStatic	-	-1.04	0.00	0.00	0.00	0.00
8	3.44	DEAD	LinStatic	-	-0.89	0.00	0.00	0.00	0.00
8	0.00	WIND-VER(+)	LinStatic	-	-4.15	0.00	0.00	0.00	0.00
8	1.72	WIND-VER(+)	LinStatic	-	-4.15	0.00	0.00	0.00	0.00
8	3.44	WIND-VER(+)	LinStatic	-	-4.15	0.00	0.00	0.00	0.00
8	0.00	WIND-VER(-)	LinStatic	-	7.28	0.00	0.00	0.00	0.00
8	1.72	WIND-VER(-)	LinStatic	-	7.28	0.00	0.00	0.00	0.00
8	3.44	WIND-VER(-)	LinStatic	-	7.28	0.00	0.00	0.00	0.00
8	0.00	ENV_DISP	Combination	Max	6.09	0.00	0.00	0.00	0.00
8	1.72	ENV_DISP	Combination	Max	6.24	0.00	0.00	0.00	0.00
8	3.44	ENV_DISP	Combination	Max	6.40	0.00	0.00	0.00	0.00
8	0.00	ENV_DISP	Combination	Min	-5.34	0.00	0.00	0.00	0.00
8	1.72	ENV_DISP	Combination	Min	-5.19	0.00	0.00	0.00	0.00
8	3.44	ENV_DISP	Combination	Min	-5.03	0.00	0.00	0.00	0.00
8	0.00	ENV_SECTION_DESIGN	Combination	Max	9.55	0.00	0.00	0.00	0.00
8	1.72	ENV_SECTION_DESIGN	Combination	Max	9.73	0.00	0.00	0.00	0.00
8	3.44	ENV_SECTION_DESIGN	Combination	Max	9.90	0.00	0.00	0.00	0.00
8	0.00	ENV_SECTION_DESIGN	Combination	Min	-7.59	0.00	0.00	0.00	0.00
8	1.72	ENV_SECTION_DESIGN	Combination	Min	-7.41	0.00	0.00	0.00	0.00
8	3.44	ENV_SECTION_DESIGN	Combination	Min	-7.24	0.00	0.00	0.00	0.00
9	0.00	DEAD	LinStatic	-	-1.08	0.00	0.00	0.00	0.00
9	1.67	DEAD	LinStatic	-	-0.93	0.00	0.00	0.00	0.00
9	3.33	DEAD	LinStatic	-	-0.79	0.00	0.00	0.00	-0.01
9	0.00	WIND-VER(+)	LinStatic	-	-3.12	0.01	0.00	0.00	0.01
9	1.67	WIND-VER(+)	LinStatic	-	-3.12	0.01	0.00	0.00	0.00
9	3.33	WIND-VER(+)	LinStatic	-	-3.12	0.01	0.00	0.00	-0.01
9	0.00	WIND-VER(-)	LinStatic	-	5.48	-0.01	0.00	0.00	-0.01
9	1.67	WIND-VER(-)	LinStatic	-	5.48	-0.01	0.00	0.00	0.01
9	3.33	WIND-VER(-)	LinStatic	-	5.48	-0.01	0.00	0.00	0.02
9	0.00	ENV_DISP	Combination	Max	4.40	0.01	0.00	0.00	0.01

TABLE: Frame Forces									
Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	M2	M3
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m
9	1.67	ENV_DISP	Combination	Max	4.55	0.01	0.00	0.00	0.00
9	3.33	ENV_DISP	Combination	Max	4.70	0.01	0.00	0.00	0.02
9	0.00	ENV_DISP	Combination	Min	-4.21	-0.01	0.00	0.00	-0.01
9	1.67	ENV_DISP	Combination	Min	-4.06	-0.01	0.00	0.00	-0.01
9	3.33	ENV_DISP	Combination	Min	-3.91	-0.01	0.00	0.00	-0.02
9	0.00	ENV_SECTION_DESIGN	Combination	Max	6.98	0.01	0.00	0.00	0.01
9	1.67	ENV_SECTION_DESIGN	Combination	Max	7.15	0.01	0.00	0.00	0.01
9	3.33	ENV_SECTION_DESIGN	Combination	Max	7.32	0.01	0.00	0.00	0.03
9	0.00	ENV_SECTION_DESIGN	Combination	Min	-5.93	-0.01	0.00	0.00	-0.01
9	1.67	ENV_SECTION_DESIGN	Combination	Min	-5.76	-0.01	0.00	0.00	-0.01
9	3.33	ENV_SECTION_DESIGN	Combination	Min	-5.59	-0.01	0.00	0.00	-0.03
10	0.00	DEAD	LinStatic	-	-0.69	0.00	0.00	0.00	0.00
10	1.67	DEAD	LinStatic	-	-0.54	0.00	0.00	0.00	0.00
10	3.33	DEAD	LinStatic	-	-0.39	0.00	0.00	0.00	0.00
10	0.00	WIND-VER(+)	LinStatic	-	-1.73	0.00	0.00	0.00	0.00
10	1.67	WIND-VER(+)	LinStatic	-	-1.73	0.00	0.00	0.00	0.00
10	3.33	WIND-VER(+)	LinStatic	-	-1.73	0.00	0.00	0.00	0.00
10	0.00	WIND-VER(-)	LinStatic	-	3.04	0.00	0.00	0.00	0.00
10	1.67	WIND-VER(-)	LinStatic	-	3.04	0.00	0.00	0.00	0.00
10	3.33	WIND-VER(-)	LinStatic	-	3.04	0.00	0.00	0.00	0.00
10	0.00	ENV_DISP	Combination	Max	2.36	0.00	0.00	0.00	0.00
10	1.67	ENV_DISP	Combination	Max	2.51	0.00	0.00	0.00	0.00
10	3.33	ENV_DISP	Combination	Max	2.65	0.00	0.00	0.00	0.00
10	0.00	ENV_DISP	Combination	Min	-2.42	0.00	0.00	0.00	0.00
10	1.67	ENV_DISP	Combination	Min	-2.27	0.00	0.00	0.00	0.00
10	3.33	ENV_DISP	Combination	Min	-2.12	0.00	0.00	0.00	0.00
10	0.00	ENV_SECTION_DESIGN	Combination	Max	3.77	0.00	0.00	0.00	0.00
10	1.67	ENV_SECTION_DESIGN	Combination	Max	3.95	0.00	0.00	0.00	0.00
10	3.33	ENV_SECTION_DESIGN	Combination	Max	4.12	0.00	0.00	0.00	0.00
10	0.00	ENV_SECTION_DESIGN	Combination	Min	-3.39	0.00	0.00	0.00	0.00
10	1.67	ENV_SECTION_DESIGN	Combination	Min	-3.22	0.00	0.00	0.00	0.00
10	3.33	ENV_SECTION_DESIGN	Combination	Min	-3.04	0.00	0.00	0.00	0.00
11	0.00	DEAD	LinStatic	-	0.00	-0.13	0.00	0.00	0.00
11	2.91	DEAD	LinStatic	-	0.00	0.20	0.00	0.00	-0.11
11	5.83	DEAD	LinStatic	-	0.00	0.43	0.00	0.00	0.00
11	0.00	WIND-VER(+)	LinStatic	-	0.00	0.01	0.00	0.00	0.00
11	2.91	WIND-VER(+)	LinStatic	-	0.00	0.01	0.00	0.00	-0.02
11	5.83	WIND-VER(+)	LinStatic	-	-0.01	2.02	0.00	0.00	0.00
11	0.00	WIND-VER(-)	LinStatic	-	0.00	-0.01	0.00	0.00	0.00
11	2.91	WIND-VER(-)	LinStatic	-	0.00	-0.01	0.00	0.00	0.03
11	5.83	WIND-VER(-)	LinStatic	-	0.01	-3.55	0.00	0.00	0.00
11	0.00	ENV_DISP	Combination	Max	0.00	-0.12	0.00	0.00	0.00

TABLE: Frame Forces									
Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	M2	M3
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m
11	2.91	ENV_DISP	Combination	Max	0.00	0.21	0.00	0.00	-0.08
11	5.83	ENV_DISP	Combination	Max	0.01	2.45	0.00	0.00	0.00
11	0.00	ENV_DISP	Combination	Min	0.00	-0.14	0.00	0.00	0.00
11	2.91	ENV_DISP	Combination	Min	0.00	0.19	0.00	0.00	-0.12
11	5.83	ENV_DISP	Combination	Min	-0.01	-3.12	0.00	0.00	0.00
11	0.00	ENV_SECTION_DESIGN	Combination	Max	0.00	-0.14	0.00	0.00	0.00
11	2.91	ENV_SECTION_DESIGN	Combination	Max	0.00	0.28	0.00	0.00	-0.08
11	5.83	ENV_SECTION_DESIGN	Combination	Max	0.02	3.53	0.00	0.00	0.00
11	0.00	ENV_SECTION_DESIGN	Combination	Min	0.00	-0.18	0.00	0.00	0.00
11	2.91	ENV_SECTION_DESIGN	Combination	Min	0.00	0.22	0.00	0.00	-0.16
11	5.83	ENV_SECTION_DESIGN	Combination	Min	-0.02	-4.83	0.00	0.00	0.00
12	0.00	DEAD	LinStatic	-	0.00	-0.45	0.00	0.00	0.00
12	2.68	DEAD	LinStatic	-	0.00	0.18	0.00	0.00	-0.05
12	5.37	DEAD	LinStatic	-	0.00	0.09	0.00	0.00	0.00
12	0.00	WIND-VER(+)	LinStatic	-	-0.01	-2.12	0.00	0.00	0.00
12	2.68	WIND-VER(+)	LinStatic	-	-0.01	0.06	0.00	0.00	-0.02
12	5.37	WIND-VER(+)	LinStatic	-	0.00	-0.01	0.00	0.00	0.00
12	0.00	WIND-VER(-)	LinStatic	-	0.01	3.73	0.00	0.00	0.00
12	2.68	WIND-VER(-)	LinStatic	-	0.01	-0.10	0.00	0.00	0.04
12	5.37	WIND-VER(-)	LinStatic	-	0.00	0.02	0.00	0.00	0.00
12	0.00	ENV_DISP	Combination	Max	0.01	3.28	0.00	0.00	0.00
12	2.68	ENV_DISP	Combination	Max	0.01	0.24	0.00	0.00	-0.01
12	5.37	ENV_DISP	Combination	Max	0.00	0.11	0.00	0.00	0.00
12	0.00	ENV_DISP	Combination	Min	-0.01	-2.58	0.00	0.00	0.00
12	2.68	ENV_DISP	Combination	Min	-0.01	0.08	0.00	0.00	-0.08
12	5.37	ENV_DISP	Combination	Min	0.00	0.08	0.00	0.00	0.00
12	0.00	ENV_SECTION_DESIGN	Combination	Max	0.02	5.07	0.00	0.00	0.00
12	2.68	ENV_SECTION_DESIGN	Combination	Max	0.02	0.29	0.00	0.00	0.00
12	5.37	ENV_SECTION_DESIGN	Combination	Max	0.00	0.14	0.00	0.00	0.00
12	0.00	ENV_SECTION_DESIGN	Combination	Min	-0.02	-3.71	0.00	0.00	0.00
12	2.68	ENV_SECTION_DESIGN	Combination	Min	-0.02	0.05	0.00	0.00	-0.10
12	5.37	ENV_SECTION_DESIGN	Combination	Min	0.00	0.09	0.00	0.00	0.00
13	0.00	DEAD	LinStatic	-	-0.05	-0.33	0.00	0.00	0.00
13	2.18	DEAD	LinStatic	-	0.00	0.00	0.00	0.00	0.36
13	4.36	DEAD	LinStatic	-	0.05	0.33	0.00	0.00	0.00
13	0.00	WIND-VER(+)	LinStatic	-	-0.33	-2.16	0.00	0.00	0.00
13	2.18	WIND-VER(+)	LinStatic	-	0.00	0.00	0.00	0.00	2.35
13	4.36	WIND-VER(+)	LinStatic	-	0.33	2.16	0.00	0.00	0.00
13	0.00	WIND-VER(-)	LinStatic	-	0.57	3.79	0.00	0.00	0.00
13	2.18	WIND-VER(-)	LinStatic	-	0.00	0.00	0.00	0.00	-4.13
13	4.36	WIND-VER(-)	LinStatic	-	-0.57	-3.79	0.00	0.00	0.00
13	0.00	ENV_DISP	Combination	Max	0.52	3.47	0.00	0.00	0.00

TABLE: Frame Forces									
Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	M2	M3
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m
13	2.18	ENV_DISP	Combination	Max	0.00	0.00	0.00	0.00	2.71
13	4.36	ENV_DISP	Combination	Max	0.38	2.49	0.00	0.00	0.00
13	0.00	ENV_DISP	Combination	Min	-0.38	-2.49	0.00	0.00	0.00
13	2.18	ENV_DISP	Combination	Min	0.00	0.00	0.00	0.00	-3.78
13	4.36	ENV_DISP	Combination	Min	-0.52	-3.47	0.00	0.00	0.00
13	0.00	ENV_SECTION_DESIGN	Combination	Max	0.80	5.32	0.00	0.00	0.00
13	2.18	ENV_SECTION_DESIGN	Combination	Max	0.00	0.00	0.00	0.00	3.94
13	4.36	ENV_SECTION_DESIGN	Combination	Max	0.55	3.62	0.00	0.00	0.00
13	0.00	ENV_SECTION_DESIGN	Combination	Min	-0.55	-3.62	0.00	0.00	0.00
13	2.18	ENV_SECTION_DESIGN	Combination	Min	0.00	0.00	0.00	0.00	-5.79
13	4.36	ENV_SECTION_DESIGN	Combination	Min	-0.80	-5.32	0.00	0.00	0.00
14	0.00	DEAD	LinStatic	-	-0.07	-0.48	0.00	0.00	0.00
14	2.18	DEAD	LinStatic	-	0.00	0.00	0.00	0.00	0.52
14	4.36	DEAD	LinStatic	-	0.07	0.48	0.00	0.00	0.00
14	0.00	WIND-VER(+)	LinStatic	-	-0.64	-4.21	0.00	0.00	0.00
14	2.18	WIND-VER(+)	LinStatic	-	0.00	0.00	0.00	0.00	4.59
14	4.36	WIND-VER(+)	LinStatic	-	0.64	4.21	0.00	0.00	0.00
14	0.00	WIND-VER(-)	LinStatic	-	1.12	7.40	0.00	0.00	0.00
14	2.18	WIND-VER(-)	LinStatic	-	0.00	0.00	0.00	0.00	-8.06
14	4.36	WIND-VER(-)	LinStatic	-	-1.12	-7.40	0.00	0.00	0.00
14	0.00	ENV_DISP	Combination	Max	1.04	6.92	0.00	0.00	0.00
14	2.18	ENV_DISP	Combination	Max	0.00	0.00	0.00	0.00	5.11
14	4.36	ENV_DISP	Combination	Max	0.71	4.69	0.00	0.00	0.00
14	0.00	ENV_DISP	Combination	Min	-0.71	-4.69	0.00	0.00	0.00
14	2.18	ENV_DISP	Combination	Min	0.00	0.00	0.00	0.00	-7.54
14	4.36	ENV_DISP	Combination	Min	-1.04	-6.92	0.00	0.00	0.00
14	0.00	ENV_SECTION_DESIGN	Combination	Max	1.59	10.55	0.00	0.00	0.00
14	2.18	ENV_SECTION_DESIGN	Combination	Max	0.00	0.00	0.00	0.00	7.48
14	4.36	ENV_SECTION_DESIGN	Combination	Max	1.04	6.87	0.00	0.00	0.00
14	0.00	ENV_SECTION_DESIGN	Combination	Min	-1.04	-6.87	0.00	0.00	0.00
14	2.18	ENV_SECTION_DESIGN	Combination	Min	0.00	0.00	0.00	0.00	-11.49
14	4.36	ENV_SECTION_DESIGN	Combination	Min	-1.59	-10.55	0.00	0.00	0.00
15	0.00	DEAD	LinStatic	-	-0.05	-0.32	0.00	0.00	0.00
15	2.18	DEAD	LinStatic	-	0.00	0.00	0.00	0.00	0.35
15	4.36	DEAD	LinStatic	-	0.05	0.32	0.00	0.00	0.00
15	0.00	WIND-VER(+)	LinStatic	-	-0.31	-2.05	0.00	0.00	0.00
15	2.18	WIND-VER(+)	LinStatic	-	0.00	0.00	0.00	0.00	2.24
15	4.36	WIND-VER(+)	LinStatic	-	0.31	2.05	0.00	0.00	0.00
15	0.00	WIND-VER(-)	LinStatic	-	0.54	3.61	0.00	0.00	0.00
15	2.18	WIND-VER(-)	LinStatic	-	0.00	0.00	0.00	0.00	-3.93
15	4.36	WIND-VER(-)	LinStatic	-	-0.54	-3.61	0.00	0.00	0.00
15	0.00	ENV_DISP	Combination	Max	0.50	3.29	0.00	0.00	0.00

TABLE: Frame Forces									
Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	M2	M3
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m
15	2.18	ENV_DISP	Combination	Max	0.00	0.00	0.00	0.00	2.58
15	4.36	ENV_DISP	Combination	Max	0.36	2.37	0.00	0.00	0.00
15	0.00	ENV_DISP	Combination	Min	-0.36	-2.37	0.00	0.00	0.00
15	2.18	ENV_DISP	Combination	Min	0.00	0.00	0.00	0.00	-3.58
15	4.36	ENV_DISP	Combination	Min	-0.50	-3.29	0.00	0.00	0.00
15	0.00	ENV_SECTION_DESIGN	Combination	Max	0.76	5.04	0.00	0.00	0.00
15	2.18	ENV_SECTION_DESIGN	Combination	Max	0.00	0.00	0.00	0.00	3.75
15	4.36	ENV_SECTION_DESIGN	Combination	Max	0.52	3.45	0.00	0.00	0.00
15	0.00	ENV_SECTION_DESIGN	Combination	Min	-0.52	-3.45	0.00	0.00	0.00
15	2.18	ENV_SECTION_DESIGN	Combination	Min	0.00	0.00	0.00	0.00	-5.49
15	4.36	ENV_SECTION_DESIGN	Combination	Min	-0.76	-5.04	0.00	0.00	0.00
16	0.00	DEAD	LinStatic	-	-0.05	-0.33	0.00	0.00	0.00
16	2.18	DEAD	LinStatic	-	0.00	0.00	0.00	0.00	0.36
16	4.36	DEAD	LinStatic	-	0.05	0.33	0.00	0.00	0.00
16	0.00	WIND-VER(+)	LinStatic	-	-0.33	-2.16	0.00	0.00	0.00
16	2.18	WIND-VER(+)	LinStatic	-	0.00	0.00	0.00	0.00	2.35
16	4.36	WIND-VER(+)	LinStatic	-	0.33	2.16	0.00	0.00	0.00
16	0.00	WIND-VER(-)	LinStatic	-	0.57	3.79	0.00	0.00	0.00
16	2.18	WIND-VER(-)	LinStatic	-	0.00	0.00	0.00	0.00	-4.13
16	4.36	WIND-VER(-)	LinStatic	-	-0.57	-3.79	0.00	0.00	0.00
16	0.00	ENV_DISP	Combination	Max	0.52	3.46	0.00	0.00	0.00
16	2.18	ENV_DISP	Combination	Max	0.00	0.00	0.00	0.00	2.71
16	4.36	ENV_DISP	Combination	Max	0.38	2.48	0.00	0.00	0.00
16	0.00	ENV_DISP	Combination	Min	-0.38	-2.48	0.00	0.00	0.00
16	2.18	ENV_DISP	Combination	Min	0.00	0.00	0.00	0.00	-3.77
16	4.36	ENV_DISP	Combination	Min	-0.52	-3.46	0.00	0.00	0.00
16	0.00	ENV_SECTION_DESIGN	Combination	Max	0.80	5.31	0.00	0.00	0.00
16	2.18	ENV_SECTION_DESIGN	Combination	Max	0.00	0.00	0.00	0.00	3.93
16	4.36	ENV_SECTION_DESIGN	Combination	Max	0.55	3.61	0.00	0.00	0.00
16	0.00	ENV_SECTION_DESIGN	Combination	Min	-0.55	-3.61	0.00	0.00	0.00
16	2.18	ENV_SECTION_DESIGN	Combination	Min	0.00	0.00	0.00	0.00	-5.78
16	4.36	ENV_SECTION_DESIGN	Combination	Min	-0.80	-5.31	0.00	0.00	0.00
17	0.00	DEAD	LinStatic	-	-0.06	-0.39	0.00	0.00	0.00
17	2.18	DEAD	LinStatic	-	0.00	0.00	0.00	0.00	0.42
17	4.36	DEAD	LinStatic	-	0.06	0.39	0.00	0.00	0.00
17	0.00	WIND-VER(+)	LinStatic	-	-0.46	-3.02	0.00	0.00	0.00
17	2.18	WIND-VER(+)	LinStatic	-	0.00	0.00	0.00	0.00	3.29
17	4.36	WIND-VER(+)	LinStatic	-	0.46	3.02	0.00	0.00	0.00
17	0.00	WIND-VER(-)	LinStatic	-	0.80	5.30	0.00	0.00	0.00
17	2.18	WIND-VER(-)	LinStatic	-	0.00	0.00	0.00	0.00	-5.78
17	4.36	WIND-VER(-)	LinStatic	-	-0.80	-5.30	0.00	0.00	0.00
17	0.00	ENV_DISP	Combination	Max	0.74	4.91	0.00	0.00	0.00

TABLE: Frame Forces

Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	M2	M3
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m
17	2.18	ENV_DISP	Combination	Max	0.00	0.00	0.00	0.00	3.71
17	4.36	ENV_DISP	Combination	Max	0.51	3.41	0.00	0.00	0.00
17	0.00	ENV_DISP	Combination	Min	-0.51	-3.41	0.00	0.00	0.00
17	2.18	ENV_DISP	Combination	Min	0.00	0.00	0.00	0.00	-5.35
17	4.36	ENV_DISP	Combination	Min	-0.74	-4.91	0.00	0.00	0.00
17	0.00	ENV_SECTION_DESIGN	Combination	Max	1.13	7.51	0.00	0.00	0.00
17	2.18	ENV_SECTION_DESIGN	Combination	Max	0.00	0.00	0.00	0.00	5.42
17	4.36	ENV_SECTION_DESIGN	Combination	Max	0.75	4.98	0.00	0.00	0.00
17	0.00	ENV_SECTION_DESIGN	Combination	Min	-0.75	-4.98	0.00	0.00	0.00
17	2.18	ENV_SECTION_DESIGN	Combination	Min	0.00	0.00	0.00	0.00	-8.18
17	4.36	ENV_SECTION_DESIGN	Combination	Min	-1.13	-7.51	0.00	0.00	0.00
18	0.00	DEAD	LinStatic	-	-0.04	-0.29	0.00	0.00	0.00
18	2.18	DEAD	LinStatic	-	0.00	0.00	0.00	0.00	0.32
18	4.36	DEAD	LinStatic	-	0.04	0.29	0.00	0.00	0.00
18	0.00	WIND-VER(+)	LinStatic	-	-0.26	-1.72	0.00	0.00	0.00
18	2.18	WIND-VER(+)	LinStatic	-	0.00	0.00	0.00	0.00	1.88
18	4.36	WIND-VER(+)	LinStatic	-	0.26	1.72	0.00	0.00	0.00
18	0.00	WIND-VER(-)	LinStatic	-	0.46	3.03	0.00	0.00	0.00
18	2.18	WIND-VER(-)	LinStatic	-	0.00	0.00	0.00	0.00	-3.30
18	4.36	WIND-VER(-)	LinStatic	-	-0.46	-3.03	0.00	0.00	0.00
18	0.00	ENV_DISP	Combination	Max	0.41	2.73	0.00	0.00	0.00
18	2.18	ENV_DISP	Combination	Max	0.00	0.00	0.00	0.00	2.20
18	4.36	ENV_DISP	Combination	Max	0.30	2.02	0.00	0.00	0.00
18	0.00	ENV_DISP	Combination	Min	-0.30	-2.02	0.00	0.00	0.00
18	2.18	ENV_DISP	Combination	Min	0.00	0.00	0.00	0.00	-2.98
18	4.36	ENV_DISP	Combination	Min	-0.41	-2.73	0.00	0.00	0.00
18	0.00	ENV_SECTION_DESIGN	Combination	Max	0.63	4.20	0.00	0.00	0.00
18	2.18	ENV_SECTION_DESIGN	Combination	Max	0.00	0.00	0.00	0.00	3.18
18	4.36	ENV_SECTION_DESIGN	Combination	Max	0.44	2.92	0.00	0.00	0.00
18	0.00	ENV_SECTION_DESIGN	Combination	Min	-0.44	-2.92	0.00	0.00	0.00
18	2.18	ENV_SECTION_DESIGN	Combination	Min	0.00	0.00	0.00	0.00	-4.58
18	4.36	ENV_SECTION_DESIGN	Combination	Min	-0.63	-4.20	0.00	0.00	0.00
19	0.00	DEAD	LinStatic	-	0.00	-0.13	0.00	0.00	0.00
19	2.91	DEAD	LinStatic	-	0.00	0.20	0.00	0.00	-0.11
19	5.83	DEAD	LinStatic	-	0.00	0.43	0.00	0.00	0.00
19	0.00	WIND-VER(+)	LinStatic	-	0.00	0.01	0.00	0.00	0.00
19	2.91	WIND-VER(+)	LinStatic	-	0.00	0.01	0.00	0.00	-0.02
19	5.83	WIND-VER(+)	LinStatic	-	-0.01	2.02	0.00	0.00	0.00
19	0.00	WIND-VER(-)	LinStatic	-	0.00	-0.01	0.00	0.00	0.00
19	2.91	WIND-VER(-)	LinStatic	-	0.00	-0.01	0.00	0.00	0.03
19	5.83	WIND-VER(-)	LinStatic	-	0.01	-3.55	0.00	0.00	0.00
19	0.00	ENV_DISP	Combination	Max	0.00	-0.12	0.00	0.00	0.00

TABLE: Frame Forces									
Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	M2	M3
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m
19	2.91	ENV_DISP	Combination	Max	0.00	0.21	0.00	0.00	-0.08
19	5.83	ENV_DISP	Combination	Max	0.01	2.45	0.00	0.00	0.00
19	0.00	ENV_DISP	Combination	Min	0.00	-0.14	0.00	0.00	0.00
19	2.91	ENV_DISP	Combination	Min	0.00	0.19	0.00	0.00	-0.12
19	5.83	ENV_DISP	Combination	Min	-0.01	-3.12	0.00	0.00	0.00
19	0.00	ENV_SECTION_DESIGN	Combination	Max	0.00	-0.14	0.00	0.00	0.00
19	2.91	ENV_SECTION_DESIGN	Combination	Max	0.00	0.28	0.00	0.00	-0.08
19	5.83	ENV_SECTION_DESIGN	Combination	Max	0.01	3.53	0.00	0.00	0.00
19	0.00	ENV_SECTION_DESIGN	Combination	Min	0.00	-0.18	0.00	0.00	0.00
19	2.91	ENV_SECTION_DESIGN	Combination	Min	0.00	0.22	0.00	0.00	-0.16
19	5.83	ENV_SECTION_DESIGN	Combination	Min	-0.01	-4.83	0.00	0.00	0.00
20	0.00	DEAD	LinStatic	-	0.00	-0.45	0.00	0.00	0.00
20	2.68	DEAD	LinStatic	-	0.00	0.18	0.00	0.00	-0.05
20	5.37	DEAD	LinStatic	-	0.00	0.09	0.00	0.00	0.00
20	0.00	WIND-VER(+)	LinStatic	-	-0.01	-2.13	0.00	0.00	0.00
20	2.68	WIND-VER(+)	LinStatic	-	-0.01	0.06	0.00	0.00	-0.02
20	5.37	WIND-VER(+)	LinStatic	-	0.00	-0.01	0.00	0.00	0.00
20	0.00	WIND-VER(-)	LinStatic	-	0.01	3.73	0.00	0.00	0.00
20	2.68	WIND-VER(-)	LinStatic	-	0.01	-0.10	0.00	0.00	0.04
20	5.37	WIND-VER(-)	LinStatic	-	0.00	0.02	0.00	0.00	0.00
20	0.00	ENV_DISP	Combination	Max	0.01	3.28	0.00	0.00	0.00
20	2.68	ENV_DISP	Combination	Max	0.01	0.24	0.00	0.00	-0.01
20	5.37	ENV_DISP	Combination	Max	0.00	0.11	0.00	0.00	0.00
20	0.00	ENV_DISP	Combination	Min	-0.01	-2.58	0.00	0.00	0.00
20	2.68	ENV_DISP	Combination	Min	-0.01	0.08	0.00	0.00	-0.08
20	5.37	ENV_DISP	Combination	Min	0.00	0.08	0.00	0.00	0.00
20	0.00	ENV_SECTION_DESIGN	Combination	Max	0.01	5.07	0.00	0.00	0.00
20	2.68	ENV_SECTION_DESIGN	Combination	Max	0.01	0.29	0.00	0.00	0.00
20	5.37	ENV_SECTION_DESIGN	Combination	Max	0.00	0.14	0.00	0.00	0.00
20	0.00	ENV_SECTION_DESIGN	Combination	Min	-0.01	-3.71	0.00	0.00	0.00
20	2.68	ENV_SECTION_DESIGN	Combination	Min	-0.01	0.05	0.00	0.00	-0.10
20	5.37	ENV_SECTION_DESIGN	Combination	Min	0.00	0.09	0.00	0.00	0.00

8 - DESIGN

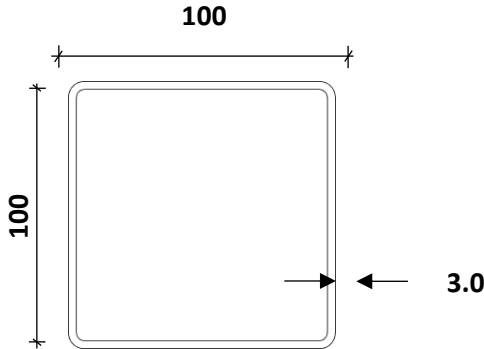
8.1 FRAME DESIGN

1) Pillars (Frame Number:7)

L = 3.528 m

Material : Steel S235JR

- Strong Direction



Section Properties		
A_{axial}	=	1.16E-03 m ²
A_{shear}	=	6.00E-04 m ²
I_{y-y}	=	1.83E-06 m ⁴
Centroid	x	= 5.00E-02 m
	y	= 5.00E-02 m
	z	= m
W_{el}	=	3.65E-05 m ³

Loads (Demands)		
N_{ed}	=	9.98 kN
M_{ed}	=	1.00 kNm
V_{ed}	=	2.00 kN

(approx.)

Material Properties		
E	=	210000000 kN/m ²
f_u	=	360000 kN/m ²
f_y	=	235000 kN/m ²
γ_{M0}	=	1.0

Capacities

$N_{C,Rd} = A_{axial} \times f_y / \gamma_{M0} =$	273.5	kN
$M_{C,Rd} = W_{el} \times f_y / \gamma_{M0} =$	8.6	kNm
$V_{C,Rd} = A_{shear} \times f_y / \sqrt{3} \cdot \gamma_{M0} =$	81.4	kN

$$\frac{M_{Ed}}{M_{C,Rd}} + \frac{N_{Ed}}{N_{C,Rd}} < 1 \text{ and } \frac{V_{Ed}}{V_{C,Rd}} < 1$$

$M_{ed} / M_{C,Rd} =$	0.116	=	0.134	<	1.000
$N_{ed} / N_{C,Rd} =$	0.018	=			
$V_{ed} / V_{C,Rd} =$	0.025	=	0.025	<	1.000

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- Weak Direction

Section Properties		
A_{axial}	=	1.16E-03 m ²
A_{shear}	=	6.00E-04 m ²
I_{x-x}	=	1.83E-06 m ⁴
Centroid	x	= 5.00E-02 m
	y	= 5.00E-02 m
	z	= m
W_{el}	=	3.65E-05 m ³

Loads (Demands)		
N_{ed}	=	9.98 kN
M_{ed}	=	0.01 kNm
V_{ed}	=	0.01 kN

Capacities		
$N_{C,Rd} = A_{axial} \times f_y / \gamma_{M0} =$	273.5	kN
$M_{C,Rd} = W_{el} \times f_y / \gamma_{M0} =$	8.6	kNm
$V_{C,Rd} = A_{shear} \times f_y / \sqrt{3} \cdot \gamma_{M0} =$	81.4	kN

$M_{ed} / M_{C,Rd} =$	0.001	=	0.019	<	1.000
$N_{ed} / N_{C,Rd} =$	0.018	=			
$V_{ed} / V_{C,Rd} =$	0.000	=	0.000	<	1.000

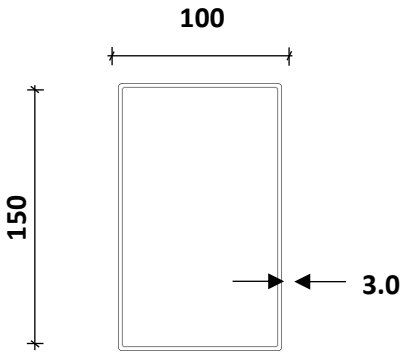
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2) Beams (Frame Number:19)

L = 5.827 m

Material : Steel S235JR

- Strong Direction

Section Properties			
A_{axial}	=	1.46E-03	m ²
A_{shear}	=	9.00E-04	m ²
I_{y-y}	=	4.73E-06	m ⁴
Centroid	x	=	5.00E-02 m
	y	=	7.50E-02 m
	z	=	m
W_{el}	=	6.31E-05	m ³

Loads (Demands)			
N_{ed}	=	0.01	kN
M_{ed}	=	0.16	kNm
V_{ed}	=	4.83	kN

Material Properties			
E	=	210000000	kN/m ²
f_u	=	360000	kN/m ²
f_y	=	235000	kN/m ²
γ_{M0}	=	1.0	

Capacities

$N_{C,Rd} = A_{axial} \times f_y / \gamma_{M0} =$	344.0	kN
$M_{C,Rd} = W_{el} \times f_y / \gamma_{M0} =$	14.8	kNm
$V_{C,Rd} = A_{shear} \times f_y / \sqrt{3} \cdot \gamma_{M0} =$	122.1	kN

$$\frac{M_{ed}}{M_{C,Rd}} + \frac{N_{ed}}{N_{C,Rd}} < 1 \text{ and } \frac{V_{ed}}{V_{C,Rd}} < 1$$

$M_{ed} / M_{C,Rd} =$	0.011	=	0.011	<	1.000
$N_{ed} / N_{C,Rd} =$	0.000	=			
$V_{ed} / V_{C,Rd} =$	0.040	=	0.040	<	1.000

SAFE**SAFE****- Weak Direction**

Section Properties			
A_{axial}	=	1.46E-03	m ²
A_{shear}	=	6.00E-04	m ²
I_{x-x}	=	2.53E-06	m ⁴
Centroid	x	=	5.00E-02 m
	y	=	7.50E-02 m
	z	=	m
W_{el}	=	5.07E-05	m ³

Loads (Demands)			
N_{ed}	=	0.01	kN
M_{ed}	=	0.01	kNm
V_{ed}	=	0.01	kN

Capacities			
$N_{C,Rd} = A_{axial} \times f_y / \gamma_{M0} =$	344.0	kN	
$M_{C,Rd} = W_{el} \times f_y / \gamma_{M0} =$	11.9	kNm	
$V_{C,Rd} = A_{shear} \times f_y / \sqrt{3} \cdot \gamma_{M0} =$	81.4	kN	

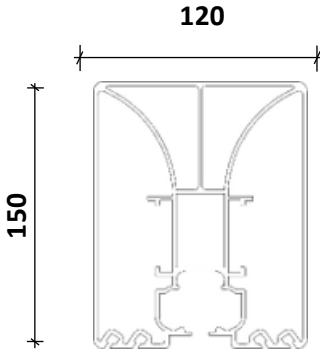
$M_{ed} / M_{C,Rd} =$	0.001	=	0.001	<	1.000
$N_{ed} / N_{C,Rd} =$	0.000	=			
$V_{ed} / V_{C,Rd} =$	0.000	=	0.000	<	1.000

SAFE**SAFE**

3) Rail Beams (Frame Number:14)

L ≈ 4.358 m

Material : Aluminium 6063T6

- Strong Direction

Section Properties

A_{axial}	=	2.60E-03	m ²
A_{shear}	=	1.30E-03	m ²
I_{y-y}	=	7.05E-06	m ⁴
Centroid	x	=	6.00E-02 m
	y	=	7.26E-02 m
	z	=	m
W_{el}	=	9.72E-05	m ³

Loads (Demands)

N_{ed}	=	1.59	kN
M_{ed}	=	11.49	kNm
V_{ed}	=	10.55	kN

Material Properties

E	=	69637055	kN/m ²
f_u	=	195000	kN/m ²
f_y	=	160000	kN/m ²
γ_{M1}	=	1.1	

Capacities

$N_{c,Rd}$	=	$A_{axial} \times f_y / \gamma_{M1}$	=	378.3	kN
$M_{c,Rd}$	=	$W_{el} \times f_y / \gamma_{M1}$	=	14.1	kNm
$V_{c,Rd}$	=	$A_{shear} \times f_y / \sqrt{3} \cdot \gamma_{M1}$	=	109.2	kN

$$\frac{M_{ed}}{M_{c,Rd}} + \frac{N_{ed}}{N_{c,Rd}} < 1 \text{ and } \frac{V_{ed}}{V_{c,Rd}} < 1$$

$M_{ed} / M_{c,Rd}$	=	0.813	=	0.815	<	1.000
$N_{ed} / N_{c,Rd}$	=	0.002	=			
$V_{ed} / V_{c,Rd}$	=	0.097	=	0.097	<	1.000

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- Weak Direction

Section Properties

A_{axial}	=	2.60E-03	m ²
A_{shear}	=	1.30E-03	m ²
I_{x-x}	=	4.21E-06	m ⁴
Centroid	x	=	6.00E-02 m
	y	=	7.50E-02 m
	z	=	m
W_{el}	=	7.02E-05	m ³

Loads (Demands)

N_{ed}	=	1.59	kN
M_{ed}	=	0.00	kNm
V_{ed}	=	0.00	kN

Capacities

$N_{c,Rd}$	=	$A_{axial} \times f_y / \gamma_{M1}$	=	378.3	kN
$M_{c,Rd}$	=	$W_{el} \times f_y / \gamma_{M1}$	=	10.2	kNm
$V_{c,Rd}$	=	$A_{shear} \times f_y / \sqrt{3} \cdot \gamma_{M1}$	=	109.2	kN

$M_{ed} / M_{c,Rd}$	=	0.000	=	0.002	<	1.000
$N_{ed} / N_{c,Rd}$	=	0.002	=			
$V_{ed} / V_{c,Rd}$	=	0.000	=	0.000	<	1.000

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8.2 CONNECTION DESIGN

a - Back Beam - Rail Beam Connection

$$\gamma_{M2} = 1.25 \quad (\text{EN 1993.1.1-6.1 Note 2B})$$

$$f_{ub} = 400 \text{ N/mm}^2 \quad (\text{EN 1993.1.1-Table 3.1})$$

$$A = 18.1 \text{ mm}^2 \quad (\text{Stress Area of Bolts and Nuts})$$

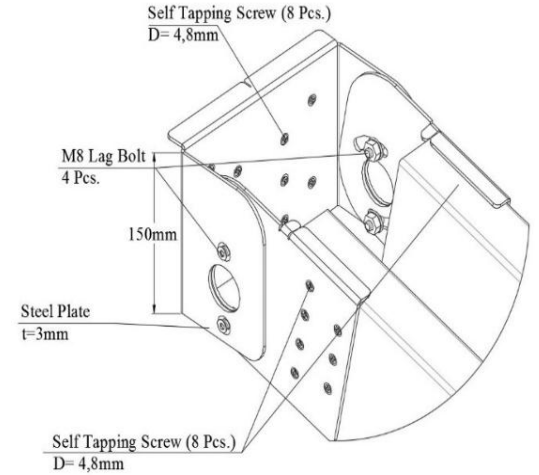
$$F_{v,Rd} = \frac{0,6 f_{ub} A}{\gamma_{M2}} = \frac{0,6 \times 400 \times 18.1}{1.25} = 3474.4 \text{ N}$$

For 8 pieces of screws; $\Rightarrow F_{v,Rd} = 8 \times 3.474 \text{ kN}$

$$F_{v,Rd} = 27.8 \text{ kN} \quad \Rightarrow \quad \frac{F_{v,Ed}}{F_{v,Rd}} = 0.38 < 1$$

$$F_{v,Ed} = 10.5 \text{ kN}$$

SAFE



(representative)

b - Back Beam - Rail Beam Connection

$$\gamma_{M2} = 1.25 \quad (\text{EN 1993.1.1-6.1 Note 2B})$$

$$f_{ub} = 400 \text{ N/mm}^2 \quad (\text{EN 1993.1.1-Table 3.1})$$

$$A = 50.27 \text{ mm}^2$$

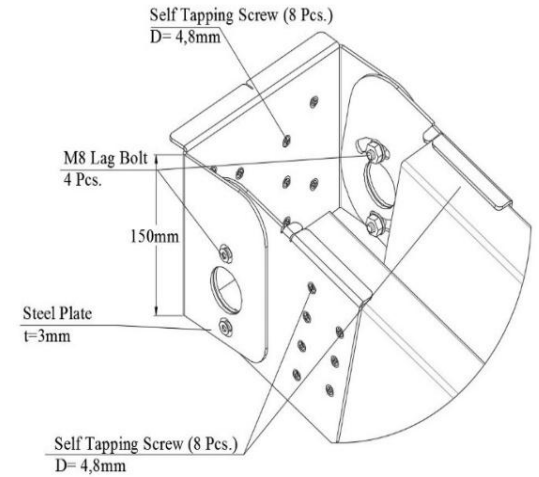
$$F_{v,Rd} = \frac{0,6 f_{ub} A}{\gamma_{M2}} = \frac{0,6 \times 400 \times 50.27}{1.25} = 9651 \text{ N}$$

For 4 pieces of bolts; $\Rightarrow F_{v,Rd} = 4 \times 9.651 \text{ kN}$

$$F_{v,Rd} = 38.6 \text{ kN} \quad \Rightarrow \quad \frac{F_{v,Ed}}{F_{v,Rd}} = 0.27 < 1$$

$$F_{v,Ed} = 10.5 \text{ kN}$$

SAFE



(representative)

c - Rail Beam - Front Pillar Connection

$$\gamma_{M2} = 1.25 \quad (\text{EN 1993.1.1-6.1 Note 2B})$$

$$f_{ub} = 400 \text{ N/mm}^2 \quad (\text{EN 1993.1.1-Table 3.1})$$

$$A = 18.1 \text{ mm}^2 \quad (\text{Stress Area of Bolts and Nuts})$$

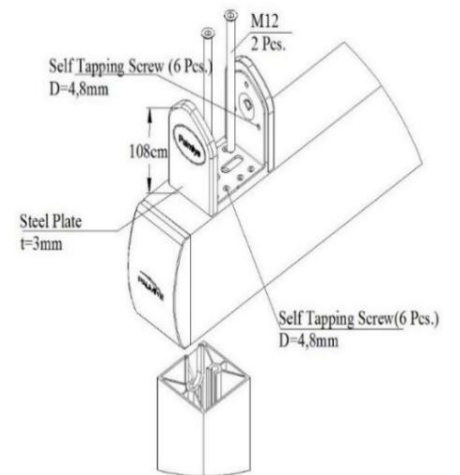
$$F_{v,Rd} = \frac{0,6 f_{ub} A}{\gamma_{M2}} = \frac{0,6 \times 400 \times 18.1}{1.25} = 3474.4 \text{ N}$$

For 6 pieces of screws; $\Rightarrow F_{v,Rd} = 6 \times 3.474 \text{ kN}$

$$F_{v,Rd} = 20.8 \text{ kN} \quad \Rightarrow \quad \frac{F_{v,Ed}}{F_{v,Rd}} = 0.51 < 1$$

$$F_{v,Ed} = 10.5 \text{ kN}$$

SAFE



(representative)

8.3 BASE PLATE DESIGN

□ 100.100.3 Steel Pillars

LOADS

$$N_{sd} = 9.98 \text{ kN}$$

$$M_{sd} = 1.00 \text{ kNm}$$

PROFILES

$$t_s = 3 \text{ mm}$$

$$Y_{M0} = 1.15$$

$$a_s = 100 \text{ mm}$$

$$f_{yb} = 235 \text{ Mpa}$$

$$b_s = 100 \text{ mm}$$

BOLTS

$$\text{Pieces} = 2 \text{ pc. (Total bolts in bending direction)}$$

$$\text{Distance} = 35 \text{ mm}$$

$$Y_{Mb} = 1.45$$

$$\text{Cross Sect.} = 113.1 \text{ mm}^2 \text{ (M12)}$$

$$f_{yb} = 235 \text{ Mpa}$$

$$\text{Min. Length} = 14.4 \text{ cm}$$

BASE PLATE

$$t = 10 \text{ mm} \quad Y_{M0} = 1.15$$

$$a = 200 \text{ mm} \quad f_{yb} = 235 \text{ Mpa}$$

$$b = 200 \text{ mm}$$

ANALYSIS**1 - Tension Part :**

$$F_{2s,Rd} = F_{2s,Rd} = 2 \frac{F_{yb} \times A_s}{Y_{Mb}}$$

$$F_{2s,Rd} = 36.7 \text{ kN}$$

2 - Base Plate Resistance

$$F_{p,Rd} = \frac{w_{e,l} \times f_y}{Y_{Mb}} = \frac{b \times t^2 \times f_y}{6 \times m \times Y_{Mb}}$$

$$F_{p,Rd} = 19.5 \text{ kN}$$

3 - Compression Part

$$a_1 = \min \left[\begin{array}{l} a + 2a_r = 250 \\ 5a = 1000 \\ a + h = 500 \\ 5b_1 = 1500 \end{array} \right] = 250 \text{ mm}$$

$$\text{As symmetry } b_1 = 250 \text{ mm}$$

4 - The Stress Concentration Factor

$$k_j = \sqrt{\frac{a_1 \times b_1}{a \times b}}$$

$$k_j = 1.25$$

5 - The Bearing Strength of the Concrete Under Base Plate

$$f_j = \frac{0.67 \times k_j \times f_{ck}}{Y_c}$$

$$f_j = 8.4 \text{ Mpa}$$

6 - The Effective Area of the Concrete in Compression

$$F_{sd} = A_{eff} \times f_j - F_{2s,Rd}$$

$$A_{eff} = 5569 \text{ mm}^2$$

7 - The Rigit Plate Effective Width

$$c = t \sqrt{\frac{f_y}{3 \times f_j \times Y_{M0}}}$$

$$c = 31.0 \text{ mm}$$

8 - The Width Effective Area

$$b_{eff}$$

$$b_{eff} = 34 \text{ mm}$$

9 - The Concrete Lever Arm

$$d_c = \frac{h_c}{2} + c - \frac{b_{eff}}{2}$$

$$d_c = 63.8 \text{ mm}$$

10 - The Base Plate Bending Resistance

$$M_{Rd} = F_{2s,Rd} \times d_b + A_{eff} \times f_j \times d_c$$

$$M_{Rd} = 6.1 \text{ kNm}$$

$$M_{sd} = 1.00 \text{ kNm} <$$

$$M_{Rd} = 6.1 \text{ kNm}$$

SAFE

Base plate is resistant to 9.979 kN axial force 6.1 kNm moment.

9 CONCLUSION & NOTES

- Based on structural analysis performed in accordance with Eurocode Standards, the system is considered safe under wind loads corresponding up to Force **10** on the Beaufort Scale.