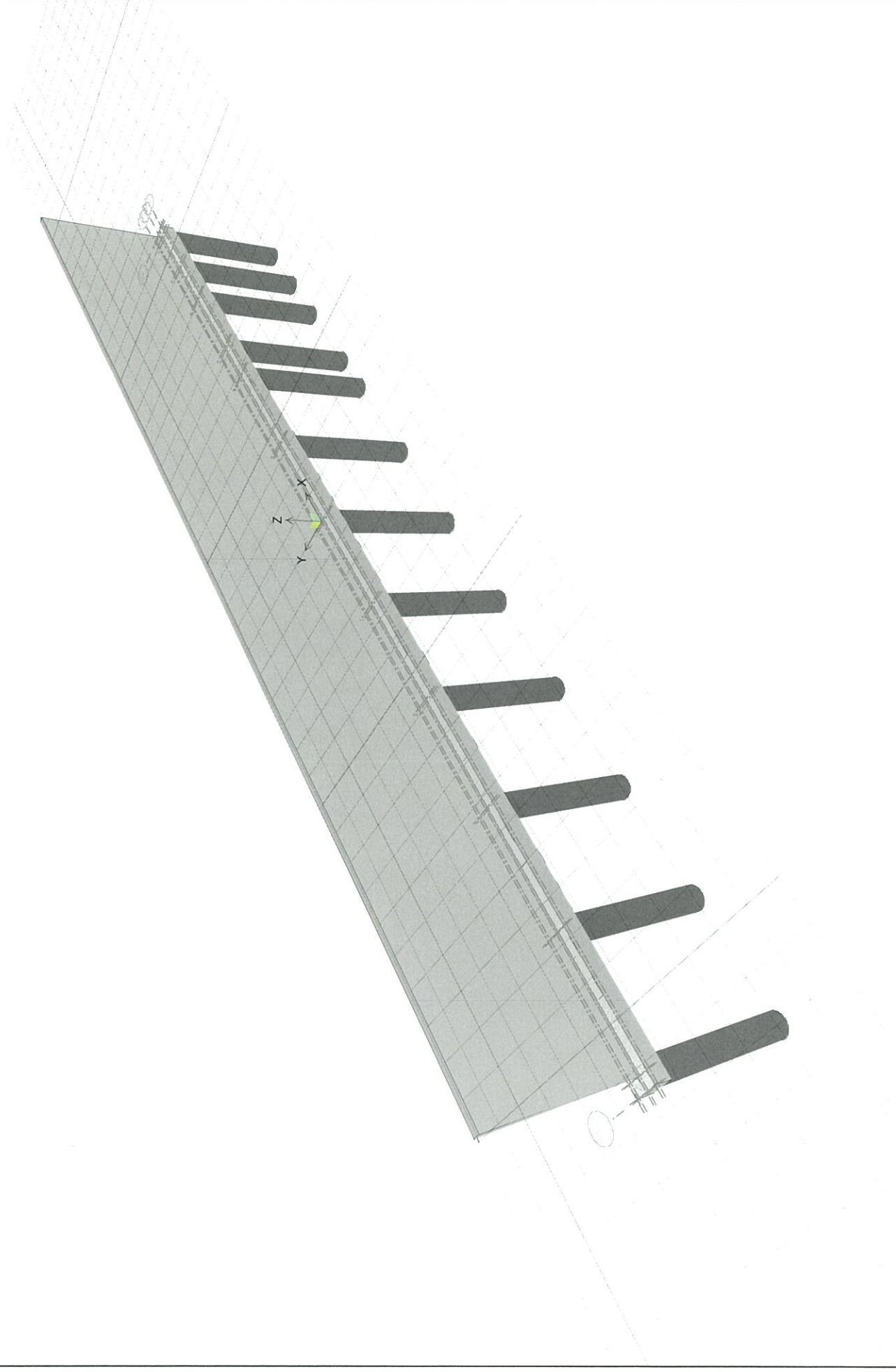
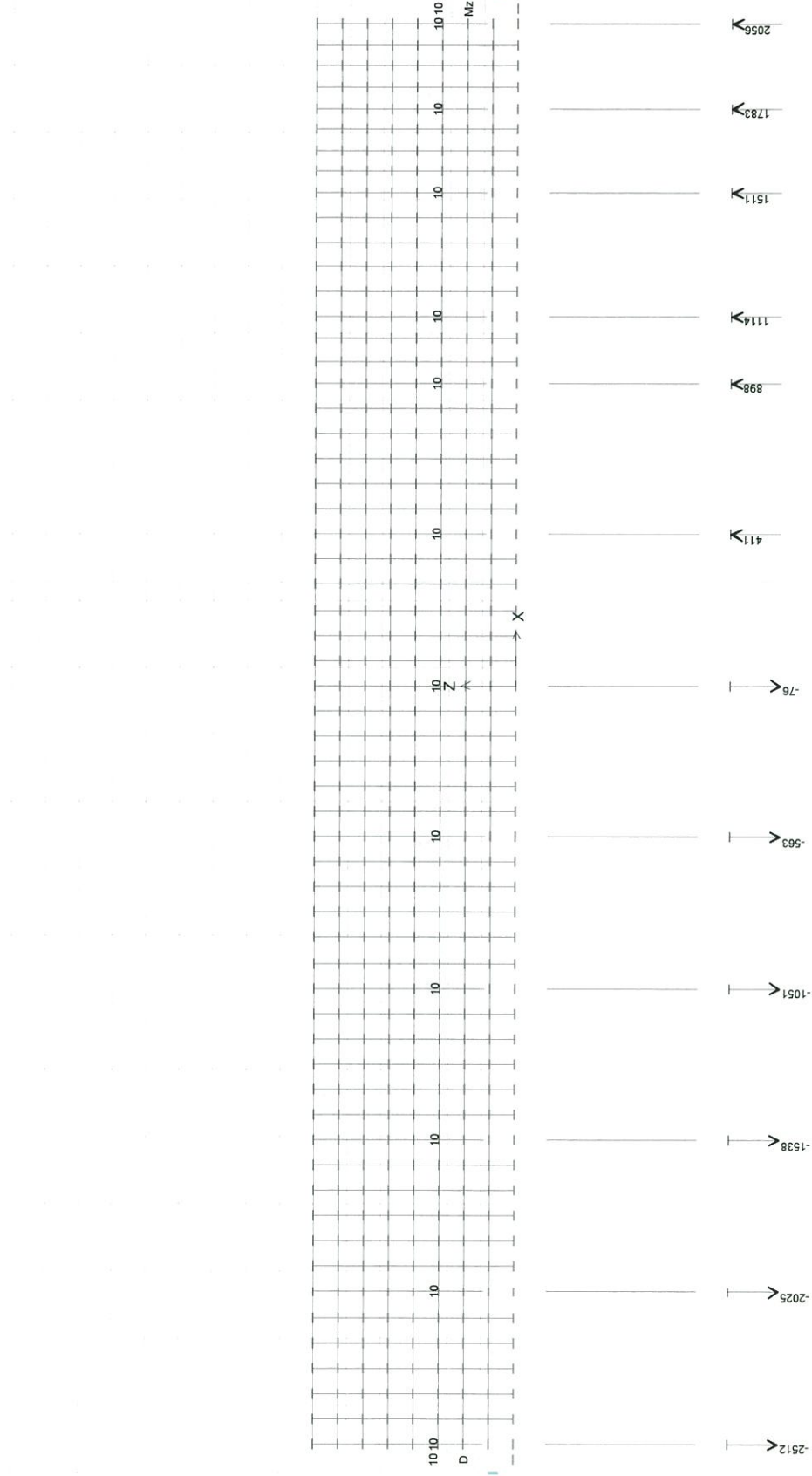


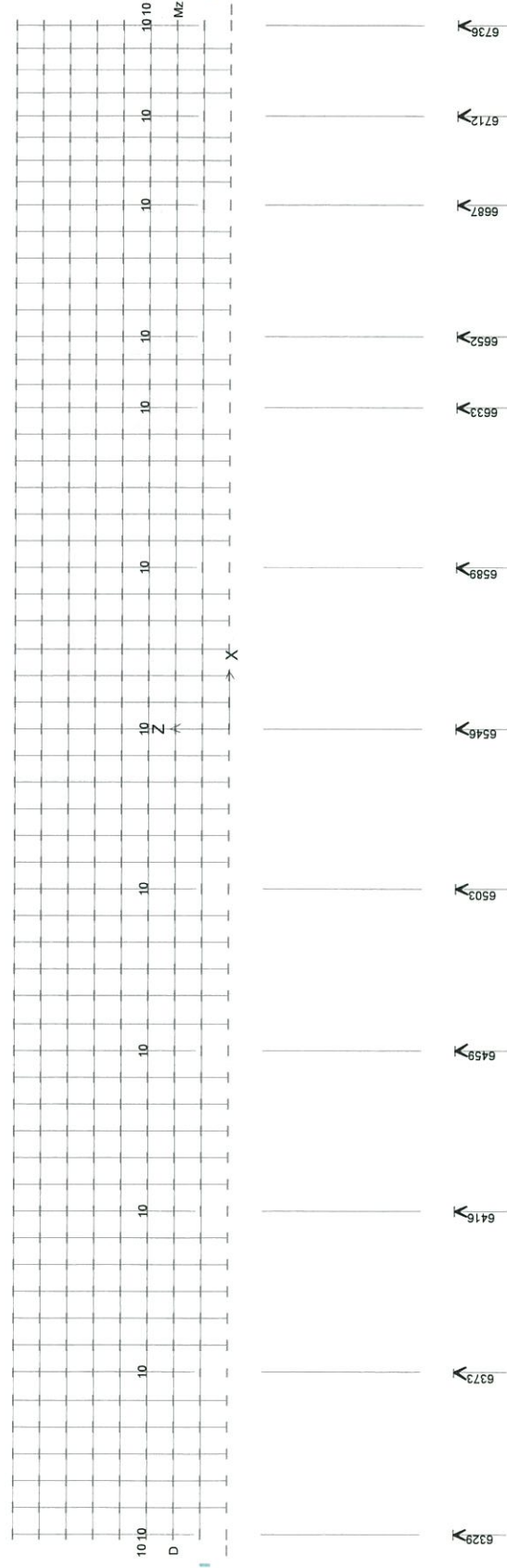
Alexandra Park

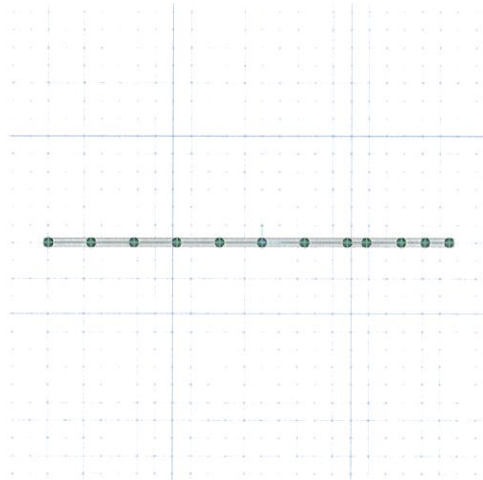
Item 4

Deep Foundation









SAFE Analysis & Design Report

Model Name: FOOTING+Caisson.fdb

23 January 2015

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Model Definition

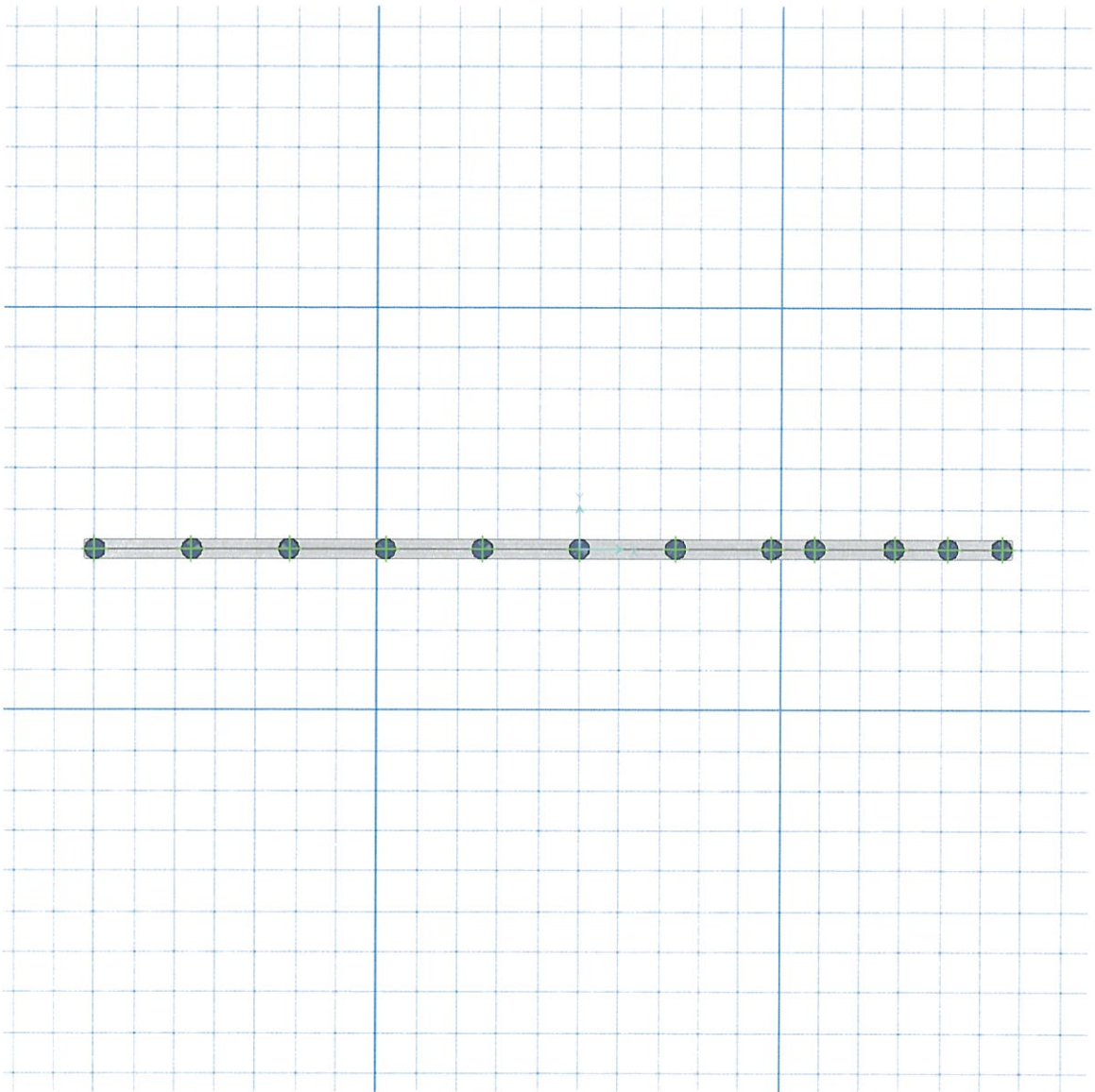


Figure 1: Finite element model

1. Model geometry

This section provides model geometry information, including items such as joint coordinates, joint restraints, and element connectivity.

1.1. *Connectivity*

2. Model properties

This section provides model properties, including items such as material properties, section properties, and support properties.

2.1. Material properties

Table 1: Material Properties 03 - Concrete

Table 1: Material Properties 03 - Concrete						
Material	E N/mm2	U	A 1/C	UnitWt kN/m3	Fc N/mm2	LtWtConc
C30	29667.31234	0.200000	9.9000E-06	2.4000E+01	30.00000	No
C45	29667.31234	0.200000	9.9000E-06	2.4000E+01	45.00000	No
WallConc30	396667	0.200000	9.9000E-06	2.3563E+01	30.00000	No

Table 2: Material Properties 04 - Rebar

Table 2: Material Properties 04 - Rebar				
Material	E N/mm2	UnitWt kN/m3	Fy N/mm2	Fu N/mm2
CSA-G30.18Gr4 00	200000	7.6973E+01	400.00000	500.00000

Table 3: Material Properties 05 - Tendon

Table 3: Material Properties 05 - Tendon				
Material	E N/mm2	UnitWt kN/m3	Fy N/mm2	Fu N/mm2
A416MGr186	196501	7.6973E+01	1690.00000	1860.00000

2.2. Section properties

Table 4: Slab Properties 02 - Solid Slabs

Table 4: Slab Properties 02 - Solid Slabs				
Slab	Type	MatProp	Thickness mm	Ortho
S900	Slab	C30	900.000	No
SLAB2	Slab	C45	1200.000	No
Sump	Slab	C45	500.000	No

Table 5: Beam Properties 02 - Rectangular Beam

Table 5: Beam Properties 02 - Rectangular Beam

Beam	MatProp	Depth mm	WidthTop mm	WidthBot mm
BEAM1	C45	600.000	300.000	300.000

Table 6: Beam Properties 06 - Design Data

Table 6: Beam Properties 06 - Design Data

Beam	MatRebarL	MatRebarS	FlingWOpt	CoverTop mm	CoverBot mm	NoDesign
BEAM1	CSA-G30.18Gr4 00	CSA-G30.18Gr4 00	Analysis Property	75.000	75.000	No

Table 7: Tendon Properties

Table 7: Tendon Properties

TendonProp	MatProp	StrandArea mm2
TENDON1	A416MGr186	98.71

Table 8: Column Properties 03 - Circular

Table 8: Column Properties 03 - Circular

Column	MatProp	Diameter mm	AutoRigid	AutoDrop	IncludeCap
CS1200	C45	1200.000	No	No	No

Table 9: Wall Properties

Table 9: Wall Properties

Wall	MatProp	Thickness mm	AutoRigid	OutOfPlane
WALL200	WallConc30	200.000	No	No
WALL300	WallConc30	300.000	No	No

2.3. Support properties

Table 10: Soil Properties

Table 10: Soil Properties

Soil	Subgrade kN/m3
SOIL1	1.5000E+04

Table 11: Spring Properties - Point

Table 11: Spring Properties - Point

Spring	Ux kN/mm	Uy kN/mm	Uz kN/mm	Rx kN-mm/rad	Ry kN-mm/rad	Rz kN-mm/rad	NonlinOpt
CS1100	999999	999999	950.00000	999999.00	999999.00	999999.00	None (Linear)
CS1200	999999	999999	1130.00000	999999.00	999999.00	999999.00	None (Linear)

Table 12: Spring Properties - Line

Table 12: Spring Properties - Line

Spring	VertStiff kN/mm/mm	RotStiff kN/rad	NonlinOpt
LSPR1	0.001000	1.000E-003	None (Linear)

3. Model assignments

This section provides model assignments, including assignments to slabs, beams, and joints.

3.1. Slab assignments

Table 13: Slab Property Assignments

Table 13: Slab Property Assignments

Area	SlabProp
3	S900

Table 14: Slab Property Modifiers

Table 14: Slab Property Modifiers

Area	f11	f22	f12	m11	m22	m12	v13	v23	Weight
3	1.000E+011	1.000E+011	1.000E+011	1.000E+011	1.000E+011	1.000E+011	1.000E+011	1.000E+011	1.000000

3.2. Column assignments

Table 15: Column Property Assignments

Table 15: Column Property Assignments

Line	ColProp
1	CS1200
2	CS1200
3	CS1200
4	CS1200
5	CS1200
6	CS1200
7	CS1200
8	CS1200
9	CS1200
10	CS1200
11	CS1200
12	CS1200

3.3. Wall assignments

Table 16: Wall Property Assignments

Table 16: Wall Property Assignments	
Area	WallProp
4	WALL300

3.4. Support assignments

Table 17: Point Restraint Assignments

Table 17: Point Restraint Assignments						
Point	Ux	Uy	Uz	Rx	Ry	Rz
20	Yes	Yes	Yes	Yes	Yes	Yes
21	Yes	Yes	Yes	Yes	Yes	Yes
23	Yes	Yes	Yes	Yes	Yes	Yes
25	Yes	Yes	Yes	Yes	Yes	Yes
27	Yes	Yes	Yes	Yes	Yes	Yes
29	Yes	Yes	Yes	Yes	Yes	Yes
31	Yes	Yes	Yes	Yes	Yes	Yes
33	Yes	Yes	Yes	Yes	Yes	Yes
35	Yes	Yes	Yes	Yes	Yes	Yes
37	Yes	Yes	Yes	Yes	Yes	Yes
39	Yes	Yes	Yes	Yes	Yes	Yes
41	Yes	Yes	Yes	Yes	Yes	Yes

4. Model loading

This section provides model loading information, including load patterns, load cases, and load combinations.

4.1. Load patterns

Table 18: Load Patterns

Table 18: Load Patterns

LoadPat	Type	SelfWtMult
DEAD	DEAD	1.000000
LIVE	LIVE	0.000000
EQ	QUAKE	0.000000

Table 19: Load Assignments - Point Loads, Part 1 of 2

Table 19: Load Assignments - Point Loads, Part 1 of 2

Point	LoadPat	Fx kN	Fy kN	Fgrav kN
42	DEAD	0	0	62700
42	LIVE	0	0	8550
42	EQ	0	0	0

Table 19: Load Assignments - Point Loads, Part 2 of 2

Table 19: Load Assignments - Point Loads, Part 2 of 2

Point	Mx kN-m	My kN-m	Mz kN-m	XDim mm	YDim mm
42	0.0000	0.0000	0.0000	1000.000	1000.000
42	0.0000	0.0000	0.0000	1000.000	1000.000
42	0.0000	322364.0000	0.0000	1000.000	1000.000

4.2. Load cases

Table 20: Load Cases 02 - Static

Table 20: Load Cases 02 - Static

LoadCase	InitialCond	AType
DEAD	Zero	Linear
LIVE	Zero	Linear
EQ	Zero	Linear

Table 21: Load Cases 06 - Loads Applied

Table 21: Load Cases 06 - Loads Applied		
LoadCase	LoadPat	SF
DEAD	DEAD	1.000000
LIVE	LIVE	1.000000
EQ	EQ	1.000000

4.3. Load combinations

Table 22: Load Combinations

Table 22: Load Combinations							
Combo	Load	SF	Type	DSSstrength	DSServInit	DSServNorm	DSServLong
DCONU1	DEAD	1.40000 0	Linear Add	Yes	No	No	No
DCONU2	DEAD	1.25000 0	Linear Add	Yes	No	No	No
DCONU2	LIVE	1.50000 0					
DCONU3	DEAD	1.00000 0	Linear Add	Yes	No	No	No
DCONU3	EQ	1.00000 0					
DCONU4	DEAD	1.00000 0	Linear Add	Yes	No	No	No
DCONU4	EQ	-1.00000 0					
DCONU5	DEAD	1.00000 0	Linear Add	Yes	No	No	No
DCONU5	LIVE	0.50000 0					
DCONU5	EQ	1.00000 0					
DCONU6	DEAD	1.00000 0	Linear Add	Yes	No	No	No
DCONU6	LIVE	0.50000 0					
DCONU6	EQ	-1.00000 0					
SERVICE	DEAD	1.00000 0	Linear Add	No	No	No	No
SERVICE	LIVE	1.00000 0					
SERVICE	EQ	1.00000 0					

Analysis Results

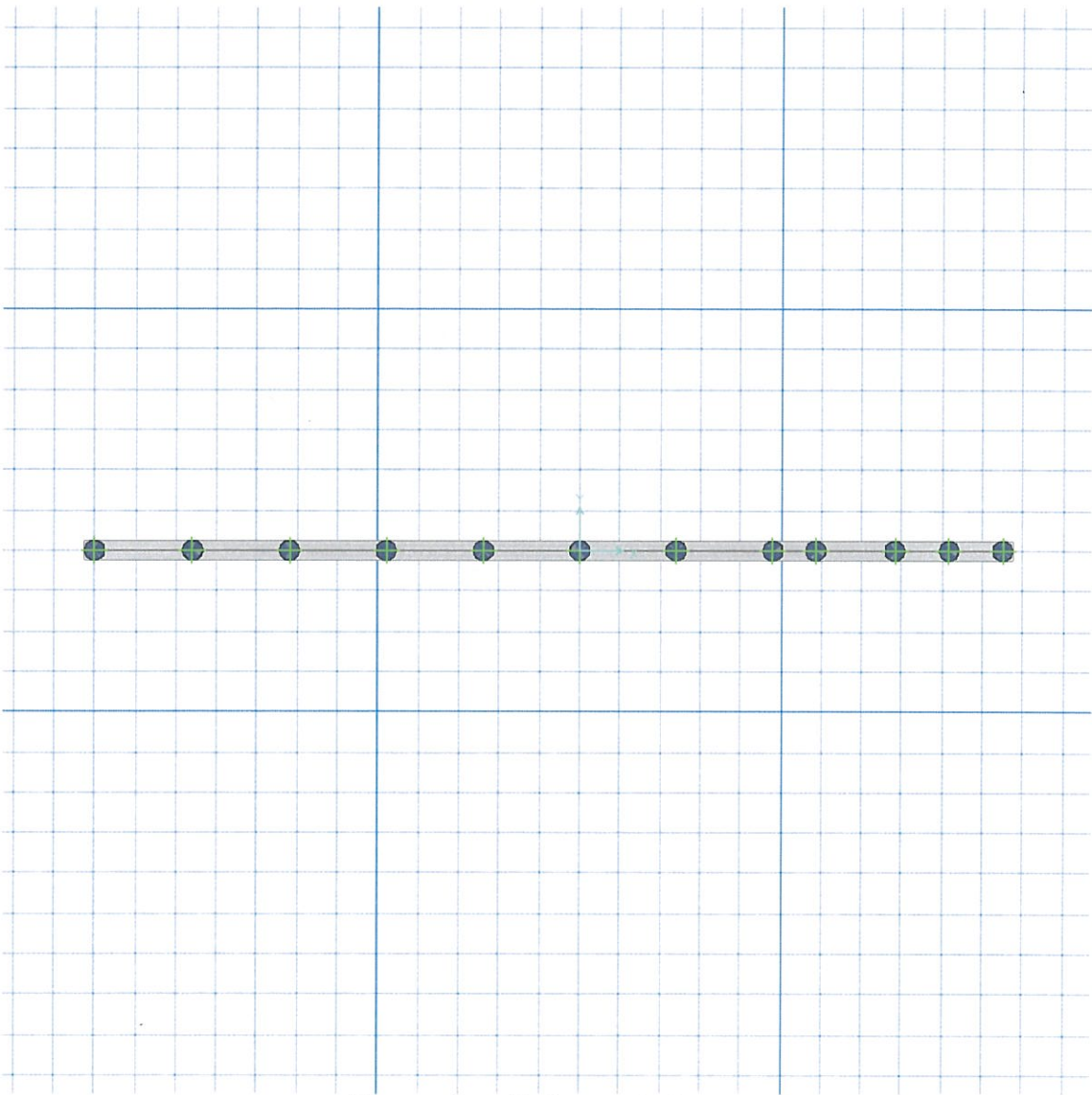


Figure 2: Deformed shape

5. Analysis results

5.1. Support results

This section provides support results, including items such as column, support, and spring reactions, .

Table 23: Nodal Reactions

Point	OutputCase	Fx kN	Fy kN	Fz kN	Mx kN-m	My kN-m	Mz kN-m
20	DEAD	-3.407E-001	9.428E-002	7868	0.4661	4.4464	-0.0074
21	DEAD	-3.407E-001	8.578E-002	7475	0.5022	4.4464	-0.0074
23	DEAD	-3.407E-001	7.728E-002	7082	0.5383	4.4464	-0.0074
25	DEAD	-3.407E-001	6.878E-002	6689	0.5745	4.4464	-0.0074
27	DEAD	-3.407E-001	6.029E-002	6296	0.6106	4.4464	-0.0074
29	DEAD	-3.407E-001	5.179E-002	5903	0.6467	4.4464	-0.0074
31	DEAD	-3.407E-001	4.329E-002	5510	0.6828	4.4464	-0.0074
33	DEAD	-3.407E-001	3.479E-002	5117	0.7189	4.4464	-0.0074
35	DEAD	-3.407E-001	3.104E-002	4943	0.7349	4.4464	-0.0074
37	DEAD	-3.407E-001	2.410E-002	4623	0.7644	4.4464	-0.0074
39	DEAD	-3.407E-001	1.935E-002	4403	0.7845	4.4464	-0.0074
41	DEAD	-3.407E-001	1.461E-002	4184	0.8047	4.4464	-0.0074
20	LIVE	-4.413E-002	1.212E-002	974	0.0614	0.5757	-9.537E-004
21	LIVE	-4.413E-002	1.102E-002	924	0.0661	0.5757	-9.537E-004
23	LIVE	-4.413E-002	9.926E-003	873	0.0707	0.5757	-9.537E-004
25	LIVE	-4.413E-002	8.829E-003	822	0.0754	0.5757	-9.537E-004
27	LIVE	-4.413E-002	7.732E-003	771	0.0801	0.5757	-9.537E-004
29	LIVE	-4.413E-002	6.636E-003	720	0.0847	0.5757	-9.537E-004
31	LIVE	-4.413E-002	5.539E-003	669	0.0894	0.5757	-9.537E-004
33	LIVE	-4.413E-002	4.442E-003	618	0.0940	0.5757	-9.537E-004
35	LIVE	-4.413E-002	3.958E-003	596	0.0961	0.5757	-9.537E-004
37	LIVE	-4.413E-002	3.062E-003	554	0.0999	0.5757	-9.537E-004
39	LIVE	-4.413E-002	2.449E-003	526	0.1025	0.5757	-9.537E-004
41	LIVE	-4.413E-002	1.837E-003	497	0.1051	0.5757	-9.537E-004
20	EQ	4.262E-001	-9.576E-002	-2513	-0.8327	-5.4979	0.0084
21	EQ	4.262E-001	-8.606E-002	-2025	-0.8739	-5.4979	0.0084
23	EQ	4.262E-001	-7.637E-002	-1538	-0.9151	-5.4979	0.0084
25	EQ	4.262E-001	-6.668E-002	-1051	-0.9563	-5.4979	0.0084
27	EQ	4.262E-001	-5.699E-002	-563	-0.9975	-5.4979	0.0084
29	EQ	4.262E-001	-4.730E-002	-76	-1.0387	-5.4979	0.0084
31	EQ	4.262E-001	-3.761E-002	411	-1.0799	-5.4979	0.0084
33	EQ	4.262E-001	-2.791E-002	898	-1.1210	-5.4979	0.0084
35	EQ	4.262E-001	-2.363E-002	1114	-1.1392	-5.4979	0.0084
37	EQ	4.262E-001	-1.572E-002	1512	-1.1729	-5.4979	0.0084
39	EQ	4.262E-001	-1.031E-002	1784	-1.1959	-5.4979	0.0084
41	EQ	4.262E-001	-4.896E-003	2056	-1.2189	-5.4979	0.0084

Table 24: Integrated Wall Forces

Table 24: Integrated Wall Forces								
Area	OutputCase	CaseType	Fx kN	Fy kN	Fz kN	Mx kN-m	My kN-m	Mz kN-m
4	DEAD	LinStatic	1.015E-010	2.190E-016	-2.076E-010	-1.510E-016	6.507E-010	1.730E-015
4	LIVE	LinStatic	1.059E-011	4.090E-017	-7.611E-012	-6.450E-018	-3.306E-010	4.683E-016
4	EQ	LinStatic	4.563E-011	-3.649E-016	5.891E-011	5.870E-017	-1.172E-009	-5.332E-015
4	SERVICE	Combination	1.577E-010	-1.050E-016	-1.563E-010	-9.873E-017	-8.518E-010	-3.133E-015

5.2. Structure results

Table 25: Sum Of Reactions, Part 1 of 2

Table 25: Sum Of Reactions, Part 1 of 2						
OutputCase	GlobalFX kN	GlobalFY kN	GlobalFZ kN	GlobalMX kN-m	GlobalMY kN-m	GlobalMZ kN-m
DEAD	-4.088E+000	6.054E-001	70091	12.9742	193114.6959	-5.1240
LIVE	-5.295E-001	7.755E-002	8544	1.6846	25507.5446	-0.6619
EQ	5.114E+000	-5.492E-001	8.753E+000	-17.2104	-321690	5.9775
SERVICE	4.966E-001	1.337E-001	78644	-2.5516	-103067	0.1916

Table 25: Sum Of Reactions, Part 2 of 2

Table 25: Sum Of Reactions, Part 2 of 2			
OutputCase	GlobalX m	GlobalY m	GlobalZ m
DEAD	0.00000	0.00000	0.00000
LIVE	0.00000	0.00000	0.00000
EQ	0.00000	0.00000	0.00000
SERVICE	0.00000	0.00000	0.00000

Table 26: Nodal Displacements - Summary, Part 1 of 2

Table 26: Nodal Displacements - Summary, Part 1 of 2								
Panel	Node	OutputCase	Ux mm	Uy mm	Uz mm	Rx Radians	Ry Radians	Rz Radians
1	~91	DEAD	0.000000	0.000000	-1.973850	0.000000	0.000000	0.000000
2	15	DEAD	0.000000	0.000000	-1.975314	0.000000	0.000000	0.000000
3	16	DEAD	0.000000	0.000000	-1.963895	0.000000	0.000000	0.000000
4	~139	DEAD	0.000000	0.000000	-1.965359	0.000000	0.000000	0.000000
5	22	DEAD	0.000000	0.000000	-1.864348	0.000000	0.000000	0.000000
6	~145	DEAD	0.000000	0.000000	-1.865811	0.000000	0.000000	0.000000
7	24	DEAD	0.000000	0.000000	-1.764800	0.000000	0.000000	0.000000
8	~151	DEAD	0.000000	0.000000	-1.766264	0.000000	0.000000	0.000000
9	26	DEAD	0.000000	0.000000	-1.665253	0.000000	0.000000	0.000000
10	~157	DEAD	0.000000	0.000000	-1.666717	0.000000	0.000000	0.000000
11	28	DEAD	0.000000	0.000000	-1.565705	0.000000	0.000000	0.000000
12	~163	DEAD	0.000000	0.000000	-1.567169	0.000000	0.000000	0.000000
13	30	DEAD	0.000000	0.000000	-1.466158	0.000000	0.000000	0.000000
14	~169	DEAD	0.000000	0.000000	-1.467622	0.000000	0.000000	0.000000
15	32	DEAD	0.000000	0.000000	-1.366610	0.000000	0.000000	0.000000

Table 26: Nodal Displacements - Summary, Part 1 of 2

Panel	Node	OutputCase	Ux mm	Uy mm	Uz mm	Rx Radians	Ry Radians	Rz Radians
16	~175	DEAD	0.000000	0.000000	-1.368074	0.000000	0.000000	0.000000
17	34	DEAD	0.000000	0.000000	-1.267063	0.000000	0.000000	0.000000
18	~181	DEAD	0.000000	0.000000	-1.268527	0.000000	0.000000	0.000000
19	36	DEAD	0.000000	0.000000	-1.223096	0.000000	0.000000	0.000000
20	~184	DEAD	0.000000	0.000000	-1.224560	0.000000	0.000000	0.000000
21	38	DEAD	0.000000	0.000000	-1.141799	0.000000	0.000000	0.000000
22	~189	DEAD	0.000000	0.000000	-1.143263	0.000000	0.000000	0.000000
23	40	DEAD	0.000000	0.000000	-1.086218	0.000000	0.000000	0.000000
24	~193	DEAD	0.000000	0.000000	-1.087682	0.000000	0.000000	0.000000
25	17	DEAD	0.000000	0.000000	-1.030637	0.000000	0.000000	0.000000
26	~197	DEAD	0.000000	0.000000	-1.032101	0.000000	0.000000	0.000000
1	~91	LIVE	0.000000	0.000000	-0.248142	0.000000	0.000000	0.000000
2	15	LIVE	0.000000	0.000000	-0.248332	0.000000	0.000000	0.000000
3	16	LIVE	0.000000	0.000000	-0.246853	0.000000	0.000000	0.000000
4	~139	LIVE	0.000000	0.000000	-0.247043	0.000000	0.000000	0.000000
5	22	LIVE	0.000000	0.000000	-0.233963	0.000000	0.000000	0.000000
6	~145	LIVE	0.000000	0.000000	-0.234154	0.000000	0.000000	0.000000
7	24	LIVE	0.000000	0.000000	-0.221073	0.000000	0.000000	0.000000
8	~151	LIVE	0.000000	0.000000	-0.221264	0.000000	0.000000	0.000000
9	26	LIVE	0.000000	0.000000	-0.208184	0.000000	0.000000	0.000000
10	~157	LIVE	0.000000	0.000000	-0.208375	0.000000	0.000000	0.000000
11	28	LIVE	0.000000	0.000000	-0.195294	0.000000	0.000000	0.000000
12	~163	LIVE	0.000000	0.000000	-0.195485	0.000000	0.000000	0.000000
13	30	LIVE	0.000000	0.000000	-0.182405	0.000000	0.000000	0.000000
14	~169	LIVE	0.000000	0.000000	-0.182595	0.000000	0.000000	0.000000
15	32	LIVE	0.000000	0.000000	-0.169515	0.000000	0.000000	0.000000
16	~175	LIVE	0.000000	0.000000	-0.169706	0.000000	0.000000	0.000000
17	34	LIVE	0.000000	0.000000	-0.156625	0.000000	0.000000	0.000000
18	~181	LIVE	0.000000	0.000000	-0.156816	0.000000	0.000000	0.000000
19	36	LIVE	0.000000	0.000000	-0.150933	0.000000	0.000000	0.000000
20	~184	LIVE	0.000000	0.000000	-0.151123	0.000000	0.000000	0.000000
21	38	LIVE	0.000000	0.000000	-0.140406	0.000000	0.000000	0.000000
22	~189	LIVE	0.000000	0.000000	-0.140597	0.000000	0.000000	0.000000
23	40	LIVE	0.000000	0.000000	-0.133209	0.000000	0.000000	0.000000
24	~193	LIVE	0.000000	0.000000	-0.133400	0.000000	0.000000	0.000000
25	17	LIVE	0.000000	0.000000	-0.126013	0.000000	0.000000	0.000000
26	~197	LIVE	0.000000	0.000000	-0.126203	0.000000	0.000000	0.000000
1	~91	EQ	0.000000	0.000000	0.648840	0.000000	0.000000	0.000000
2	15	EQ	0.000000	0.000000	0.650934	0.000000	0.000000	0.000000
3	16	EQ	0.000000	0.000000	0.636496	0.000000	0.000000	0.000000
4	~139	EQ	0.000000	0.000000	0.638589	0.000000	0.000000	0.000000
5	22	EQ	0.000000	0.000000	0.513052	0.000000	0.000000	0.000000
6	~145	EQ	0.000000	0.000000	0.515145	0.000000	0.000000	0.000000
7	24	EQ	0.000000	0.000000	0.389607	0.000000	0.000000	0.000000
8	~151	EQ	0.000000	0.000000	0.391701	0.000000	0.000000	0.000000
9	26	EQ	0.000000	0.000000	0.266163	0.000000	0.000000	0.000000
10	~157	EQ	0.000000	0.000000	0.268257	0.000000	0.000000	0.000000
11	28	EQ	0.000000	0.000000	0.142719	0.000000	0.000000	0.000000
12	~163	EQ	0.000000	0.000000	0.144813	0.000000	0.000000	0.000000
13	~68	EQ	0.000000	0.000000	-0.106263	0.000000	0.000000	0.000000
14	32	EQ	0.000000	0.000000	-0.104169	0.000000	0.000000	0.000000
15	~74	EQ	0.000000	0.000000	-0.229707	0.000000	0.000000	0.000000
16	34	EQ	0.000000	0.000000	-0.227614	0.000000	0.000000	0.000000
17	~77	EQ	0.000000	0.000000	-0.284228	0.000000	0.000000	0.000000

Table 26: Nodal Displacements - Summary, Part 1 of 2

Panel	Node	OutputCase	Ux mm	Uy mm	Uz mm	Rx Radians	Ry Radians	Rz Radians
18	36	EQ	0.000000	0.000000	-0.282135	0.000000	0.000000	0.000000
19	~82	EQ	0.000000	0.000000	-0.385041	0.000000	0.000000	0.000000
20	38	EQ	0.000000	0.000000	-0.382947	0.000000	0.000000	0.000000
21	~86	EQ	0.000000	0.000000	-0.453964	0.000000	0.000000	0.000000
22	40	EQ	0.000000	0.000000	-0.451870	0.000000	0.000000	0.000000
23	~90	EQ	0.000000	0.000000	-0.522887	0.000000	0.000000	0.000000
24	17	EQ	0.000000	0.000000	-0.520793	0.000000	0.000000	0.000000
25	13	EQ	0.000000	0.000000	-0.535232	0.000000	0.000000	0.000000
26	~138	EQ	0.000000	0.000000	-0.533138	0.000000	0.000000	0.000000

Table 26: Nodal Displacements - Summary, Part 2 of 2

Table 26: Nodal Displacements - Summary, Part 2 of 2

Panel	Node	OutputCase	GlobalX m	GlobalY m
1	~91	DEAD	-30.60000	0.00000
2	15	DEAD	-30.60000	0.60000
3	16	DEAD	-30.00000	0.00000
4	~139	DEAD	-30.00000	0.60000
5	22	DEAD	-24.00000	0.00000
6	~145	DEAD	-24.00000	0.60000
7	24	DEAD	-18.00000	0.00000
8	~151	DEAD	-18.00000	0.60000
9	26	DEAD	-12.00000	0.00000
10	~157	DEAD	-12.00000	0.60000
11	28	DEAD	-6.00000	0.00000
12	~163	DEAD	-6.00000	0.60000
13	30	DEAD	0.00000	0.00000
14	~169	DEAD	0.00000	0.60000
15	32	DEAD	6.00000	0.00000
16	~175	DEAD	6.00000	0.60000
17	34	DEAD	12.00000	0.00000
18	~181	DEAD	12.00000	0.60000
19	36	DEAD	14.65000	0.00000
20	~184	DEAD	14.65000	0.60000
21	38	DEAD	19.55000	0.00000
22	~189	DEAD	19.55000	0.60000
23	40	DEAD	22.90000	0.00000
24	~193	DEAD	22.90000	0.60000
25	17	DEAD	26.25000	0.00000
26	~197	DEAD	26.25000	0.60000
1	~91	LIVE	-30.60000	0.00000
2	15	LIVE	-30.60000	0.60000
3	16	LIVE	-30.00000	0.00000
4	~139	LIVE	-30.00000	0.60000
5	22	LIVE	-24.00000	0.00000
6	~145	LIVE	-24.00000	0.60000
7	24	LIVE	-18.00000	0.00000
8	~151	LIVE	-18.00000	0.60000
9	26	LIVE	-12.00000	0.00000
10	~157	LIVE	-12.00000	0.60000
11	28	LIVE	-6.00000	0.00000
12	~163	LIVE	-6.00000	0.60000

Table 26: Nodal Displacements - Summary, Part 2 of 2

Panel	Node	OutputCase	GlobalX m	GlobalY m
13	30	LIVE	0.00000	0.00000
14	~169	LIVE	0.00000	0.60000
15	32	LIVE	6.00000	0.00000
16	~175	LIVE	6.00000	0.60000
17	34	LIVE	12.00000	0.00000
18	~181	LIVE	12.00000	0.60000
19	36	LIVE	14.65000	0.00000
20	~184	LIVE	14.65000	0.60000
21	38	LIVE	19.55000	0.00000
22	~189	LIVE	19.55000	0.60000
23	40	LIVE	22.90000	0.00000
24	~193	LIVE	22.90000	0.60000
25	17	LIVE	26.25000	0.00000
26	~197	LIVE	26.25000	0.60000
1	~91	EQ	-30.60000	0.00000
2	15	EQ	-30.60000	0.60000
3	16	EQ	-30.00000	0.00000
4	~139	EQ	-30.00000	0.60000
5	22	EQ	-24.00000	0.00000
6	~145	EQ	-24.00000	0.60000
7	24	EQ	-18.00000	0.00000
8	~151	EQ	-18.00000	0.60000
9	26	EQ	-12.00000	0.00000
10	~157	EQ	-12.00000	0.60000
11	28	EQ	-6.00000	0.00000
12	~163	EQ	-6.00000	0.60000
13	~68	EQ	6.00000	-0.60000
14	32	EQ	6.00000	0.00000
15	~74	EQ	12.00000	-0.60000
16	34	EQ	12.00000	0.00000
17	~77	EQ	14.65000	-0.60000
18	36	EQ	14.65000	0.00000
19	~82	EQ	19.55000	-0.60000
20	38	EQ	19.55000	0.00000
21	~86	EQ	22.90000	-0.60000
22	40	EQ	22.90000	0.00000
23	~90	EQ	26.25000	-0.60000
24	17	EQ	26.25000	0.00000
25	13	EQ	26.85000	-0.60000
26	~138	EQ	26.85000	0.00000

Design

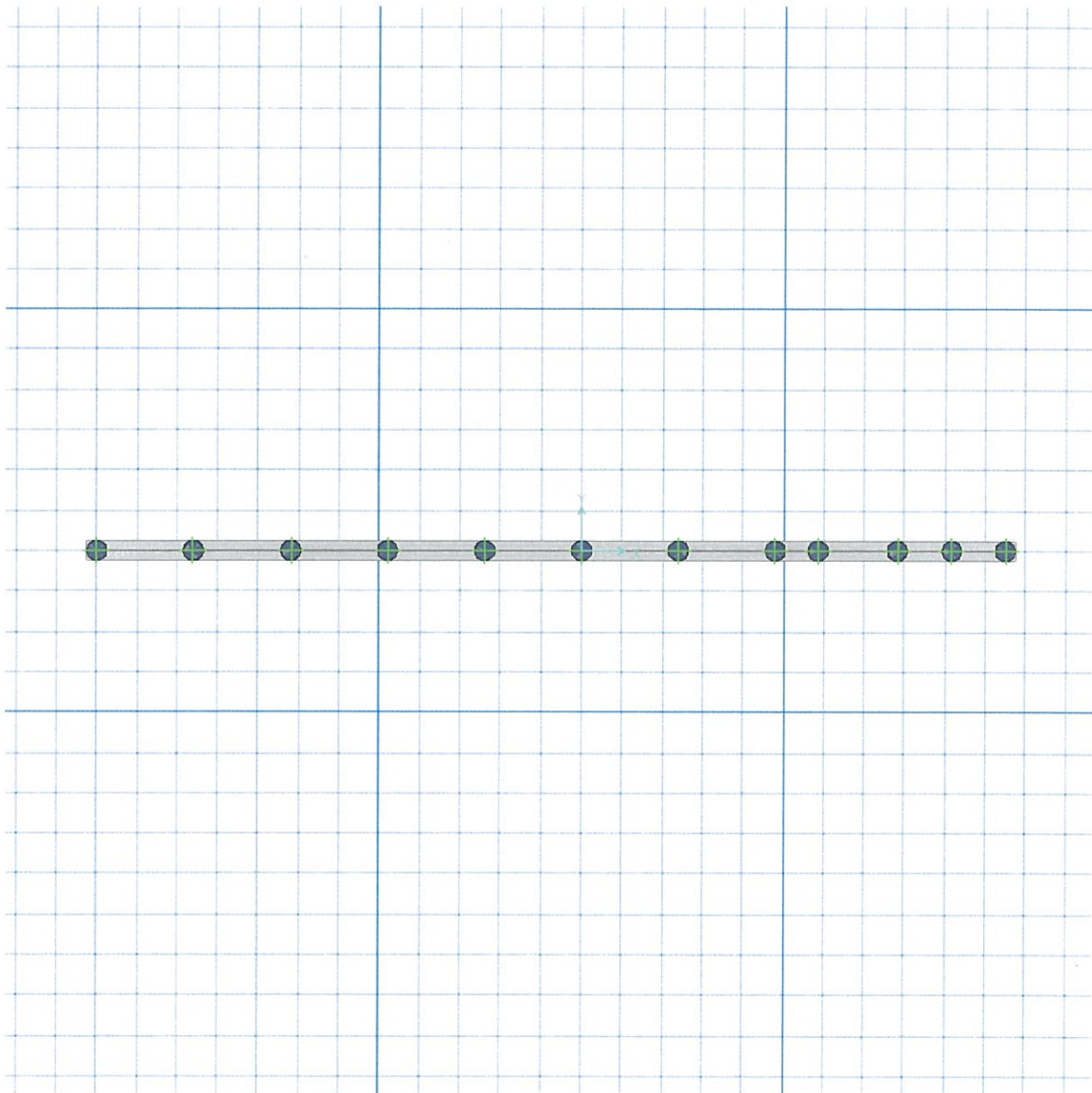


Figure 3: Finite element model

6. Design summary

This section provides design information for beams, strips, and punching checks.

6.1. Preferences

Table 27: Design Preferences 01 - Resistance Factors

Table 27: Design
Preferences 01 -
Resistance Factors

PhiSteel	PhiConc
0E+000	0E+000

Table 28: Design Preferences 02 - Rebar Cover - Slabs

Table 28: Design Preferences 02 - Rebar Cover - Slabs

CoverTop	CoverBot	BarSize	InnerLayer	PTCGSTop	PTCGSBotE xt	PTCGSBotl nt	SlabType
mm	mm			mm	mm	mm	
50.000	15.000	35M	B	25.000	40.000	25.000	Two Way

Table 29: Design Preferences 03 - Rebar Cover - Beams

Table 29: Design Preferences 03 - Rebar Cover - Beams

CoverTop	CoverBot	BarSizeF	BarSizeS	PTCGSTop	PTCGSBot
mm	mm			mm	mm
40.000	40.000	30M	10M	50.000	50.000

Table 30: Design Preferences 04 - Prestress Data, Part 1 of 2

Table 30: Design Preferences 04 - Prestress Data, Part 1 of 2

UserStress	InitConcRat	InitTopTen	InitBotTen	InitExComp	FinTopTen	FinBotTen	FinExComp	SusExComp
Yes	0.800000	0.250000	0.250000	0.600000	0.500000	0.500000	0.600000	0.450000

Table 30: Design Preferences 04 - Prestress Data, Part 2 of 2

Table 30:
Design
Preferences
04 -
Prestress
Data, Part 2
of 2

LLFraction
0.500000

6.2. Overwrites

Table 31: Slab Design Overwrites 02 - Finite Element Based, Part 1 of 2

Table 31: Slab Design Overwrites 02 - Finite Element Based, Part 1 of 2

Area	RebarMat
3	CSA-G30.18Gr400

Table 31: Slab Design Overwrites 02 - Finite Element Based, Part 2 of 2

Table 31: Slab Design Overwrites 02 - Finite Element Based, Part 2 of 2

Area	RLLF	Design	IgnorePT
3	1.000000	Yes	No

Table 32: Punching Shear Design Overwrites 01 - General

Table 32: Punching Shear Design Overwrites 01 - General

Point	Check	LocType	EffDepth	ReinfType
16	Program Determined	Auto	Auto	None
17	Program Determined	Auto	Auto	None
22	Program Determined	Auto	Auto	None
24	Program Determined	Auto	Auto	None
26	Program Determined	Auto	Auto	None
28	Program Determined	Auto	Auto	None
30	Program Determined	Auto	Auto	None
32	Program Determined	Auto	Auto	None
34	Program Determined	Auto	Auto	None
36	Program Determined	Auto	Auto	None
38	Program Determined	Auto	Auto	None
40	Program Determined	Auto	Auto	None
42	Program Determined	Auto	Auto	None

6.3. Slab design

6.4. Beam design

6.5. Punching check/design

Table 33: Concrete Slab Design 02 - Punching Shear Data, Part 1 of 3

Table 33: Concrete Slab Design 02 - Punching Shear Data, Part 1 of 3

Point	GlobalX m	GlobalY m	Location	Perimeter mm	Depth mm	Status	Ratio
16	-30.00000	0.00000				Not Calculated	
17	26.25000	0.00000				Not Calculated	
22	-24.00000	0.00000				Not Calculated	
24	-18.00000	0.00000				Not Calculated	
26	-12.00000	0.00000				Not Calculated	
28	-6.00000	0.00000				Not Calculated	
30	0.00000	0.00000				Not Calculated	
32	6.00000	0.00000				Not Calculated	
34	12.00000	0.00000				Not Calculated	
36	14.65000	0.00000				Not Calculated	
38	19.55000	0.00000				Not Calculated	
40	22.90000	0.00000				Not Calculated	
42	-3.00000	0.00000				Not Calculated	

Table 33: Concrete Slab Design 02 - Punching Shear Data, Part 2 of 3

Table 33: Concrete Slab Design 02 - Punching Shear Data, Part 2 of 3

Point	Combo	Vu kN	ShrStrMax N/mm2	Mu2 kN-m	ShrStrCap N/mm2
16					
17					
22					
24					
26					
28					
30					
32					
34					
36					
38					
40					
42					

Table 33: Concrete Slab Design 02 - Punching Shear Data, Part 3 of 3

Table 33: Concrete Slab Design 02 - Punching Shear Data, Part 3 of 3				
Point	Mu3 kN-m	ReinfType	NumRails	StudPerRail
16		None		
17		None		
22		None		
24		None		
26		None		
28		None		
30		None		
32		None		
34		None		
36		None		
38		None		
40		None		
42		None		

