

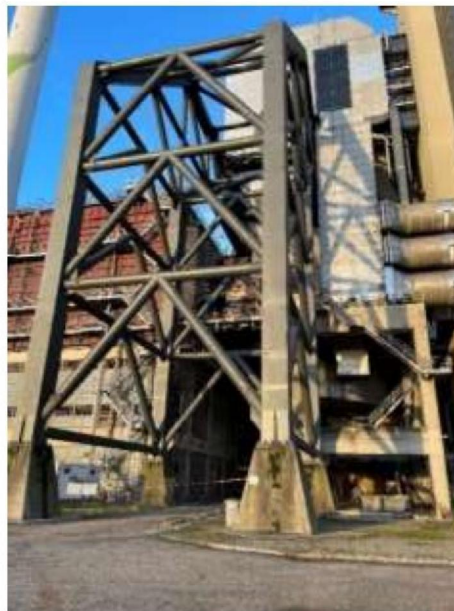
Design for Explosive Demolition

Site: Gelderland Central Power Station

Document No: C2002/MM/D004

Title: Design for the Demolition of the Air Heaters and Denox Support Structures using Controlled Explosives.

Date: 30th March 2022



Document authorisation:

Designer	5.1.2e	5.1.2e	30/03/22
		Signature	Date
Checker	5.1.2e	5.1.2e	30/03/22
		Signature	Date

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1.0 CHANGE LOG

Rev	Date	By	Comment
-	01/04/2022	5.1.2e	Initial Issue

2.0 OBJECTIVE / PURPOSE OF CALCULATIONS

The purpose of the following calculations is to determine stability of the Denox support structure following the proposed alterations to facilitate their demolition with the aid of Controlled Explosives.

3.0 EXECUTIVE SUMMARY

The calculations confirm that the proposed alterations to the Denox support structure do not adversely affect its stability and the attendant design drawings must be used to prepare the structure for demolition.

4.0 BASE DATA USED

1. EG300.106.001 Blad 01: DeNO_x INSTALLATIE t.b.v. CG13 – LAYOUT DENOX INSTALLATIE.
2. EG300.106.001 Blad 02: DeNO_x INSTALLATIE t.b.v. CG13 – LAYOUT DENOX INSTALLATIE.
3. EG300.106.001 Blad 03: DeNO_x INSTALLATIE t.b.v. CG13 – LAYOUT DENOX INSTALLATIE.
4. EG300.106.001 Blad 12: DeNO_x INSTALLATIE t.b.v. CG13 – LAYOUT DENOX INSTALLATIE.
5. EG300.106.EM.3001 Blad 03: DeNO_x INSTALLATIE t.b.v. CG13 - FUNDATIEPLAN (definitief).
6. EG300.166.001 Blad 02: DeNO_x - INSTALLATIE t.b.v. CG13- OPSTELLING STATIEF.
7. EG300.166.001 Blad 03: DeNO_x - INSTALLATIE t.b.v. CG13 – OPSTELLING STATIEF.
8. EG300.166.001 Blad 04: DeNO_x INSTALLATIE t.b.v. CG13 – OPSTELLING STATIEF.
9. EG300.167.001 Blad 01: DeNO_x INSTALLATIE t.b.v. CG13 – OPSTELLING TOREN.
10. EG300.167.001 Blad 02: DeNO_x INSTALLATIE t.b.v. CG13 – OPSTELLING TOREN.
11. EG300.168.001 Blad 01: DeNO_x INSTALLATIE t.b.v. CG13: OPSTELLING HOOFDBRUG EN NOORD-PORTAAL.
12. EG300.168.001 Blad 02: DeNO_x t.b.v. CG13 – OPSTELLING HOOFDBRUG EN NOORD-PORTAAL.
13. Site measurements.

5.0 DESIGN CODES / STANDARDS USED

1. NEN3851: 1973 – Technical Principles for the Design and Calculation of Building Structures. TGB 1972 – STEEL.

2.

3.

5.1.2f

6.0 REFERENCES

1.

5.1.2f

7.0 ASSUMPTION LOG

ASSUMPTION LOG			
Ref	Date	By	Assumption
A1	30/03/22	5.1.2e	The concrete density = 24kN/m ³ .
A2	30/03/22		The concrete strength is 25N/mm ² .
			Estimated AirHeater mass = 600 tonnes

8.0 DESIGN INFORMATION

Building Age	The Denox was built circa 1993.
General Loading Conditions	
	Services – N/A.
	Wind loading conditions – basic wind speed 24.5m/s.
Material data	
Static coefficient of friction	N/A

9.0 **CONDITION**

The Air Heaters & Denox Support Structures.

B&M have satisfied themselves of the condition of the Air Heaters & Denox support structures under consideration and the assessment are going to be undertaken on the basis that the respective reinforced concrete and structural steelwork members have suffered any deterioration.

A visual assessment of the structures was conducted on 17/01/2022.

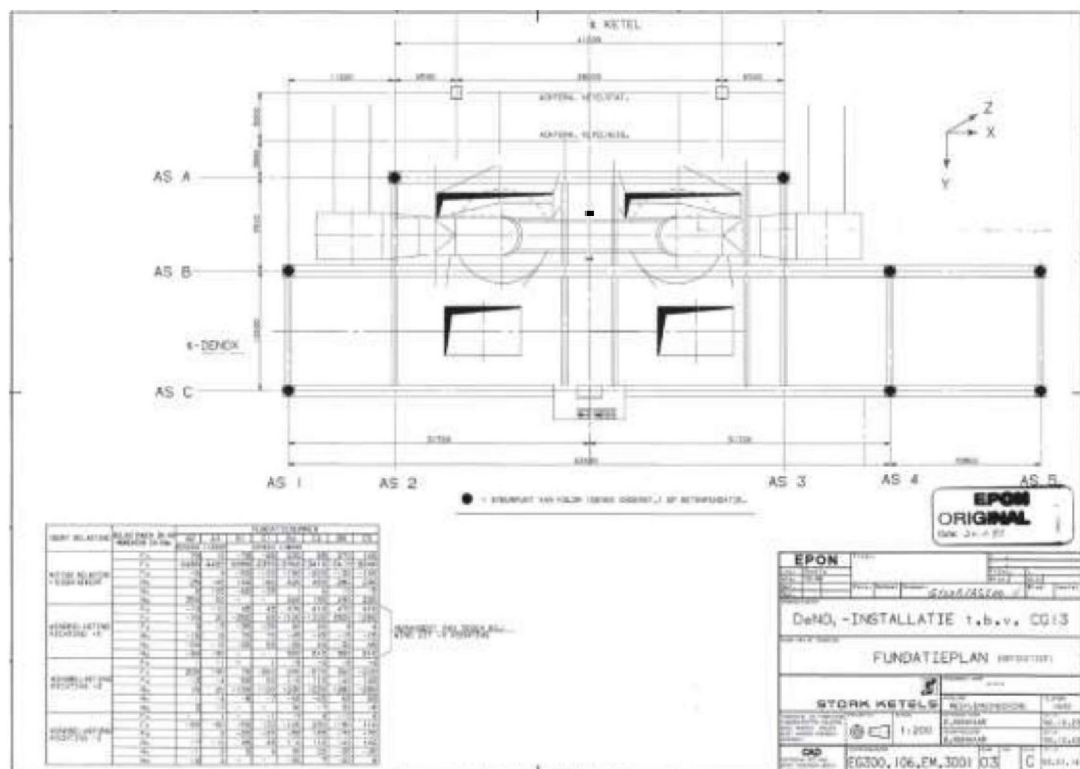
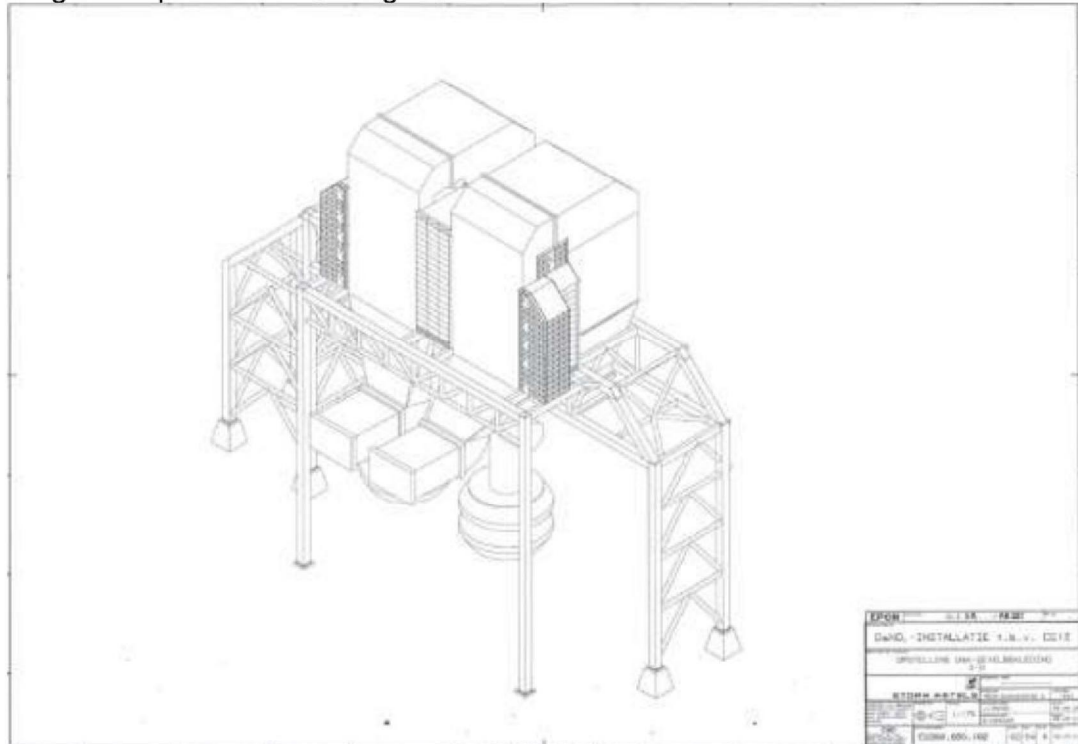
10.0 STRUCTURAL SUMMARY

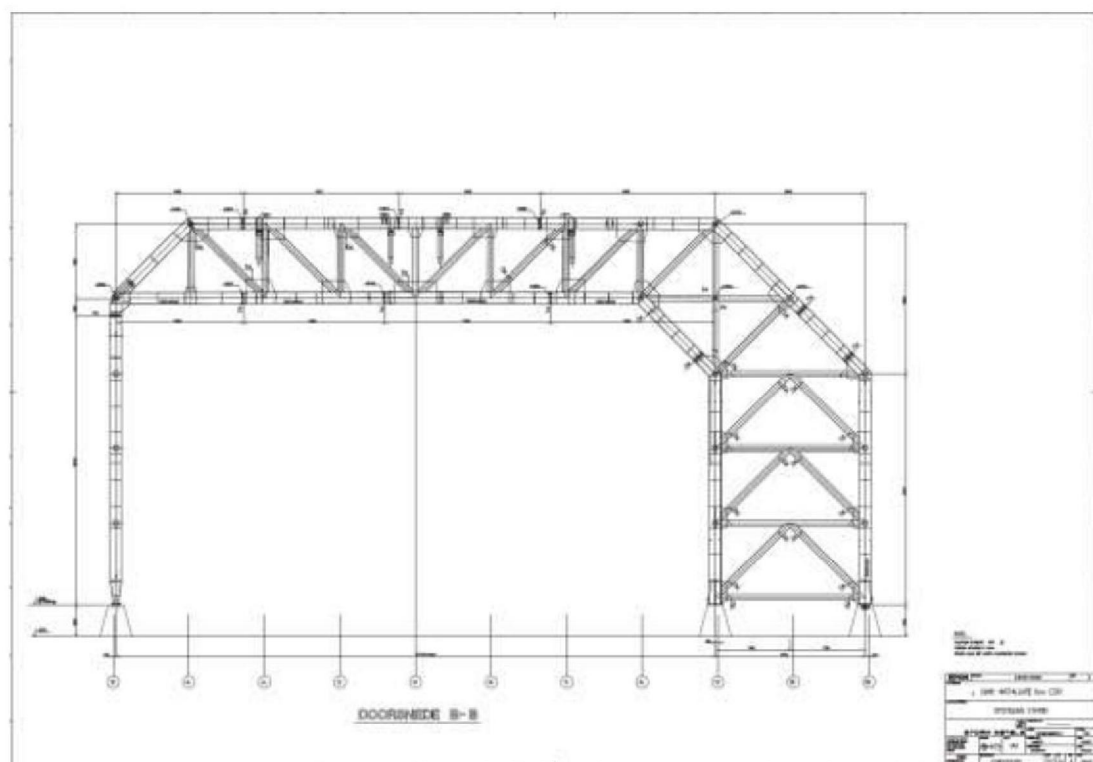
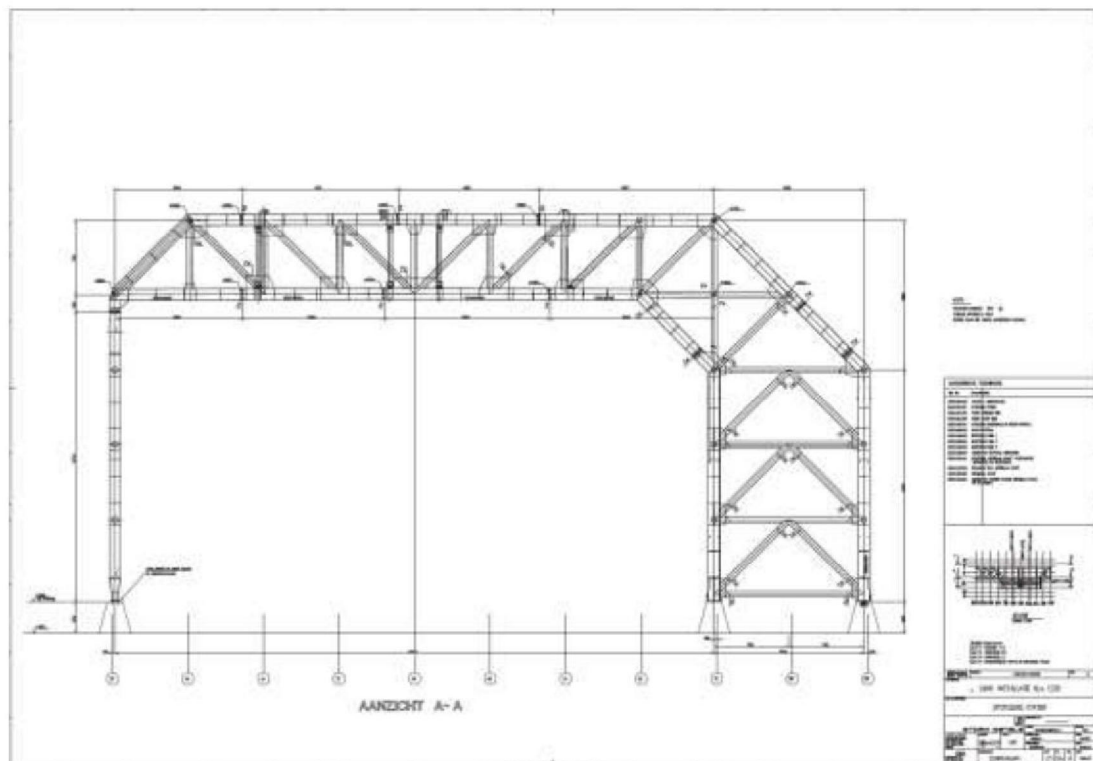
Denox Structure.

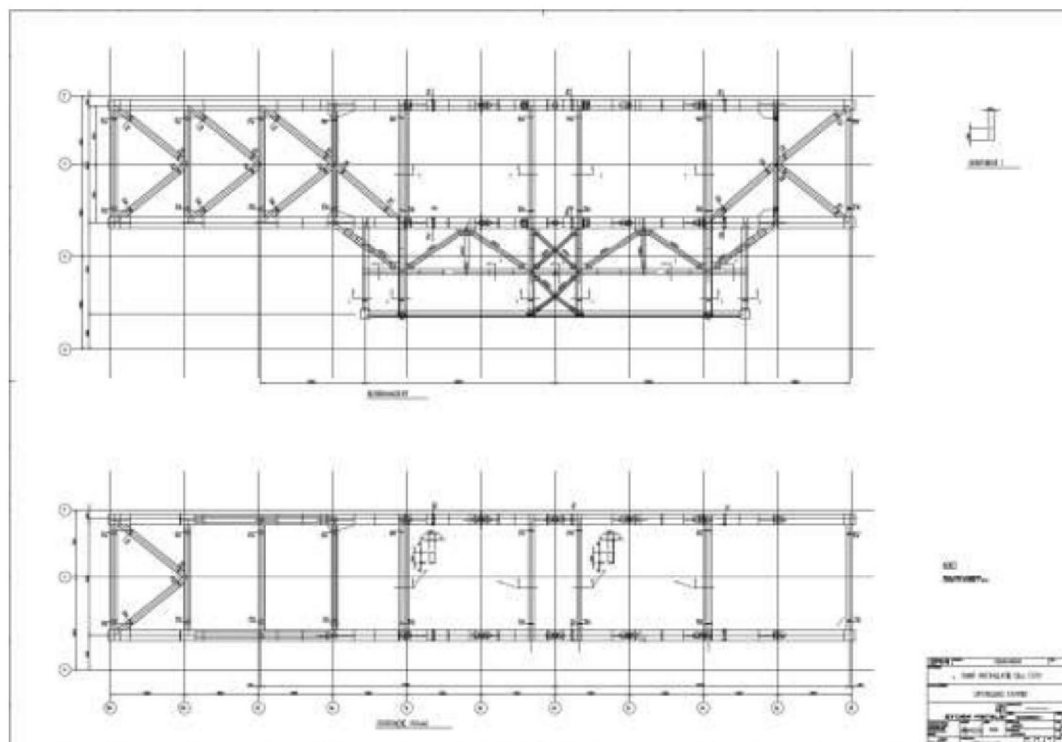
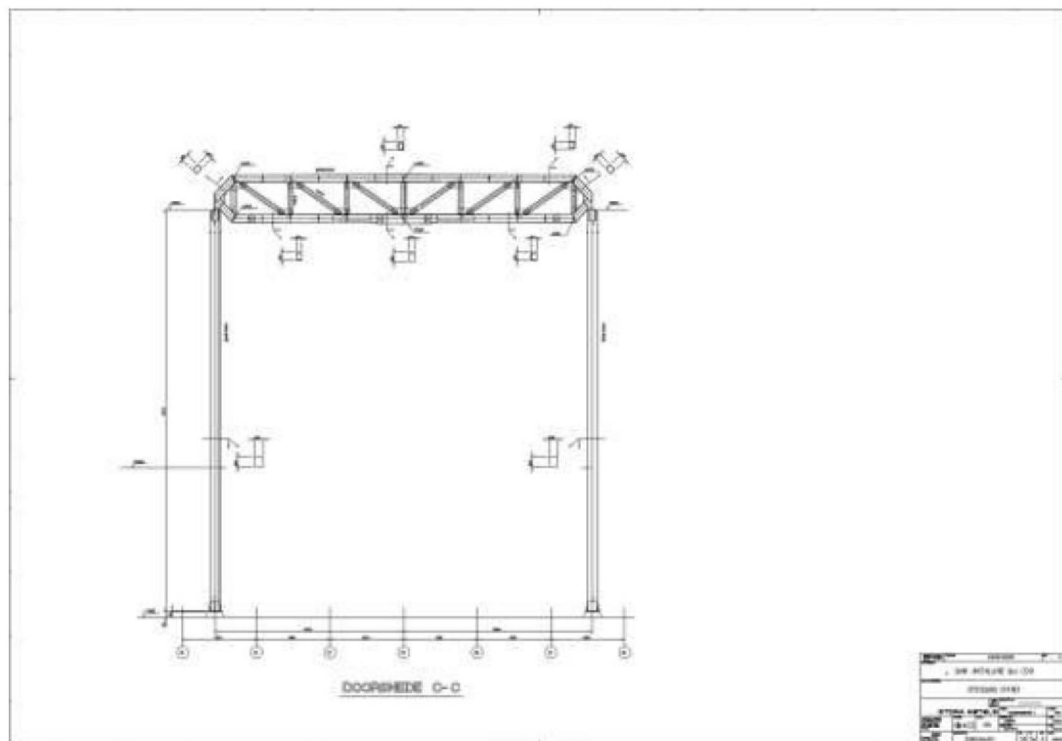
Trestle height 44.4m.

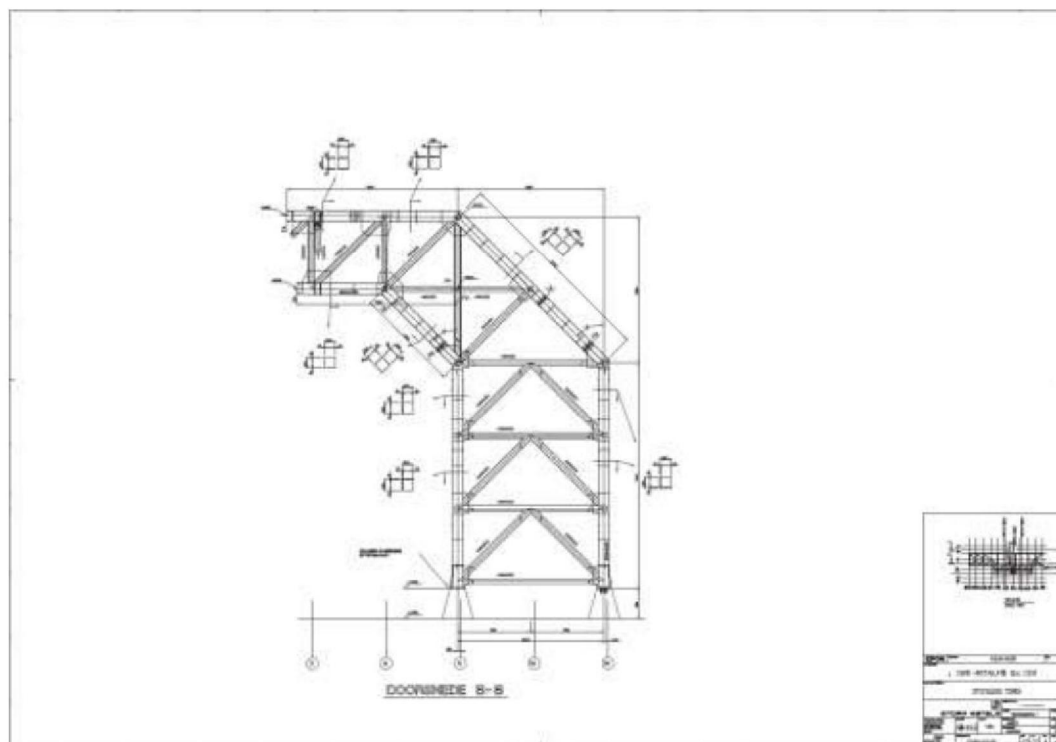
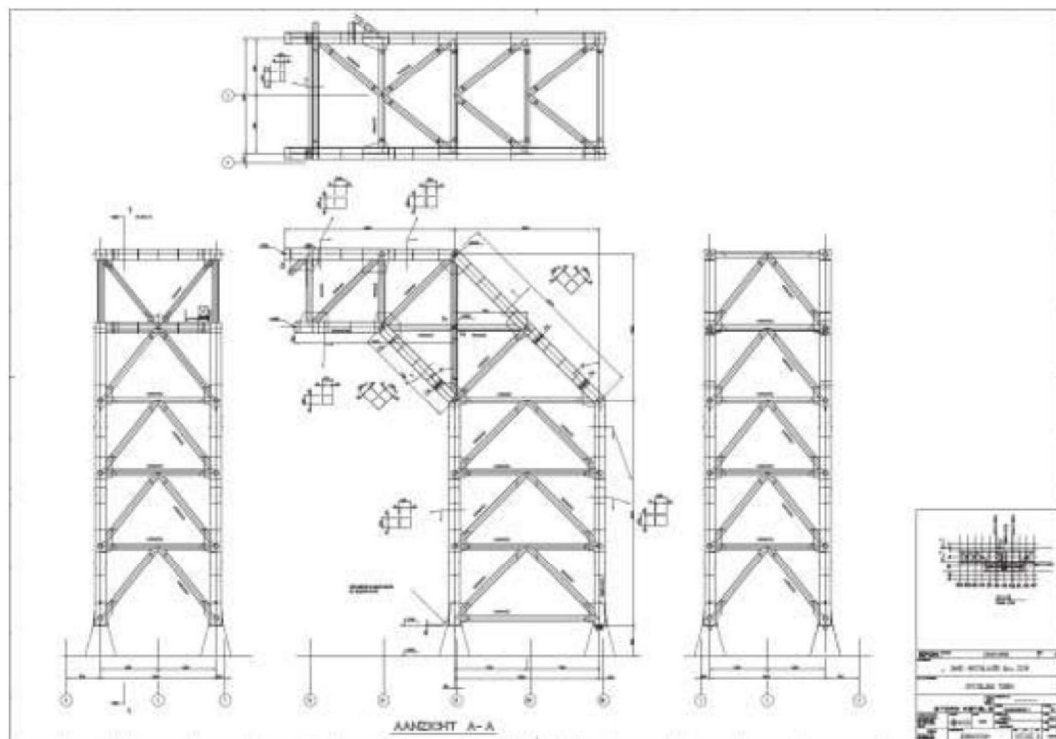
Denox Casing size: 23m high by 20m wide x 45m long.

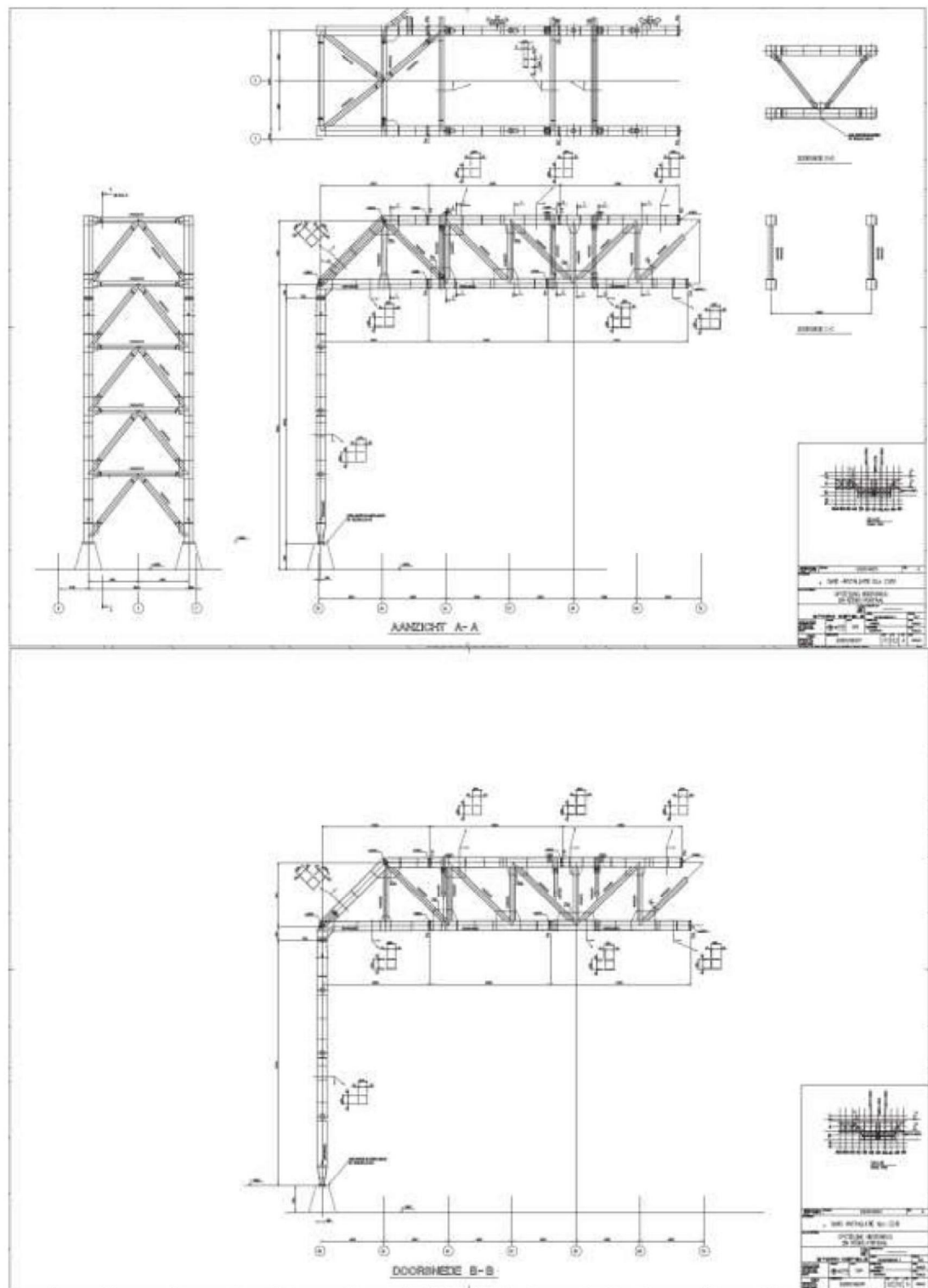
Height to top of Denox Casing = 67.4m











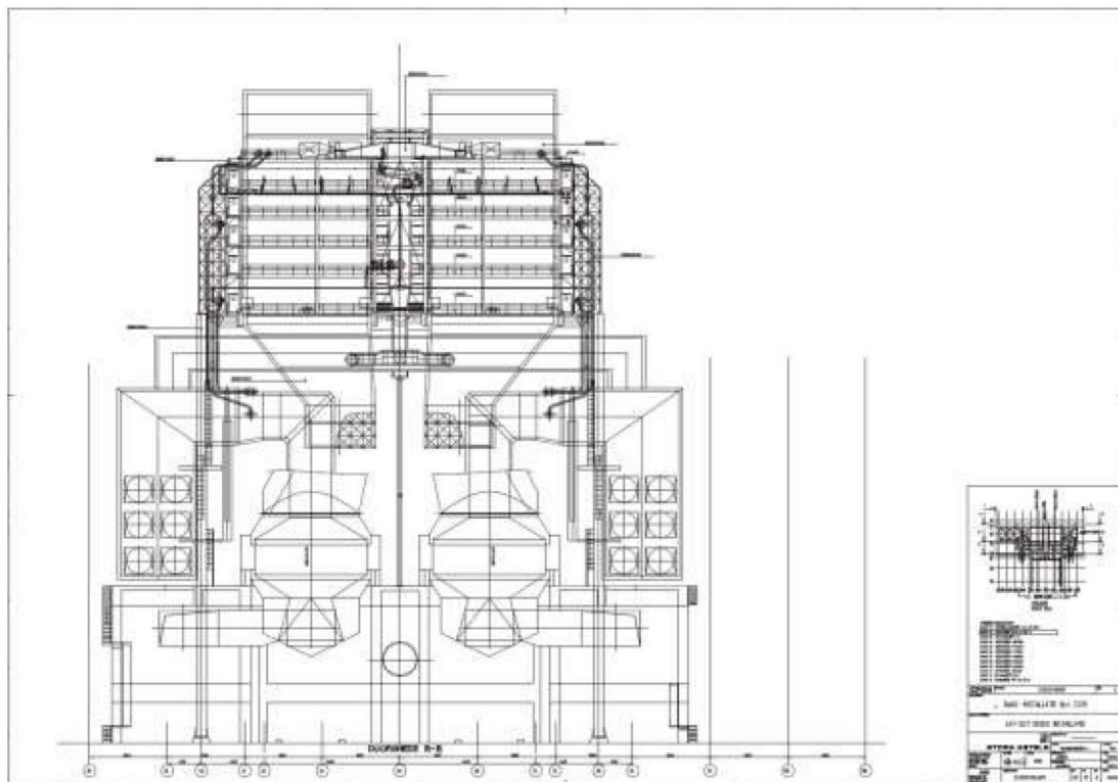
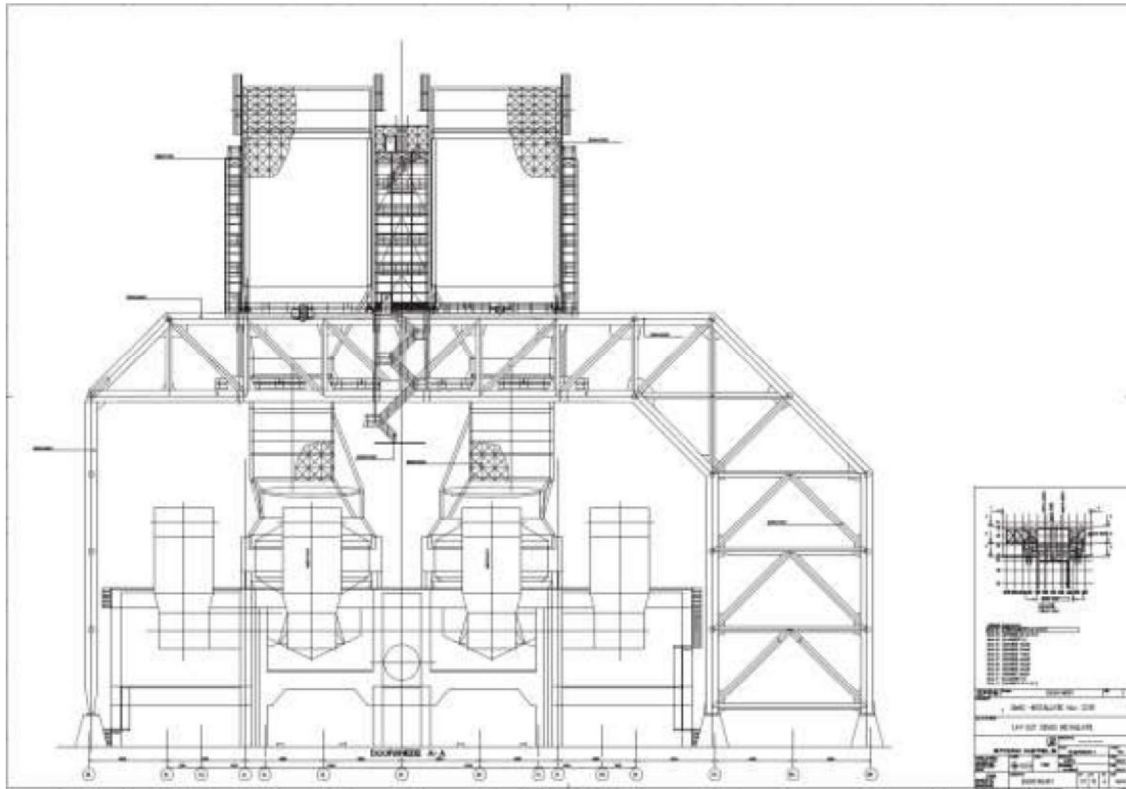
Air Heater Concrete Support Structure.

Height of concrete Structure = 16m

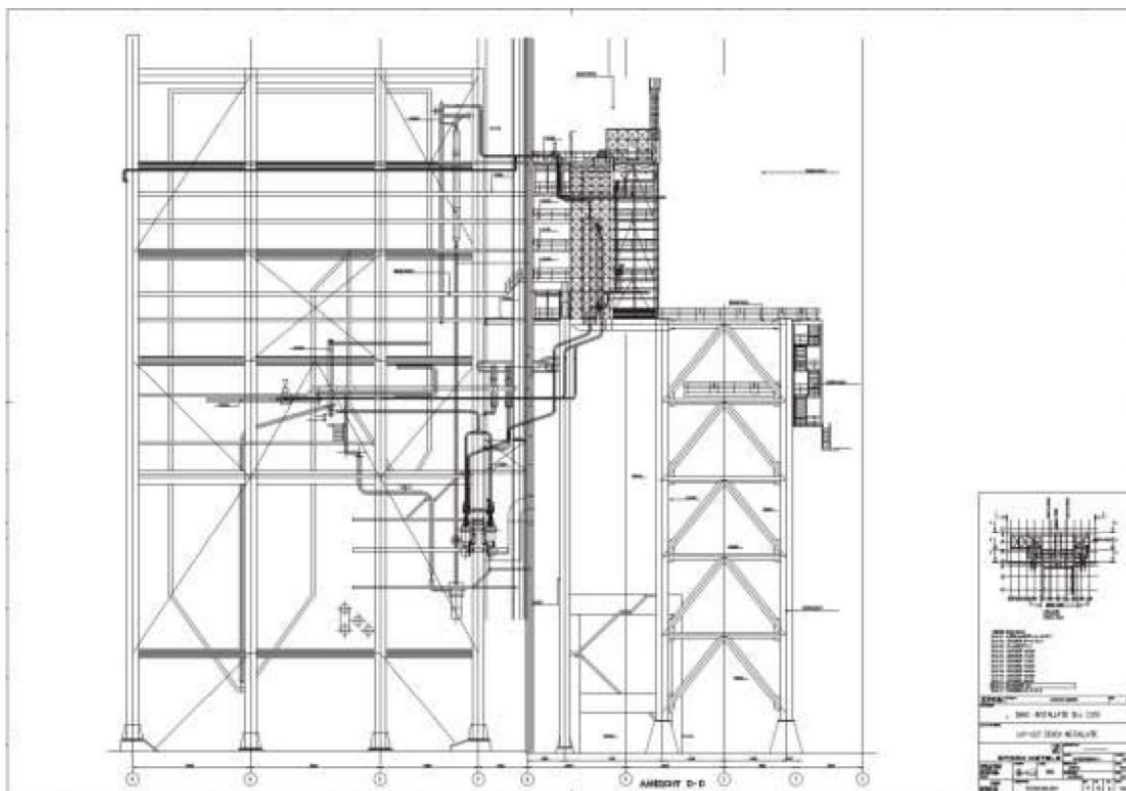
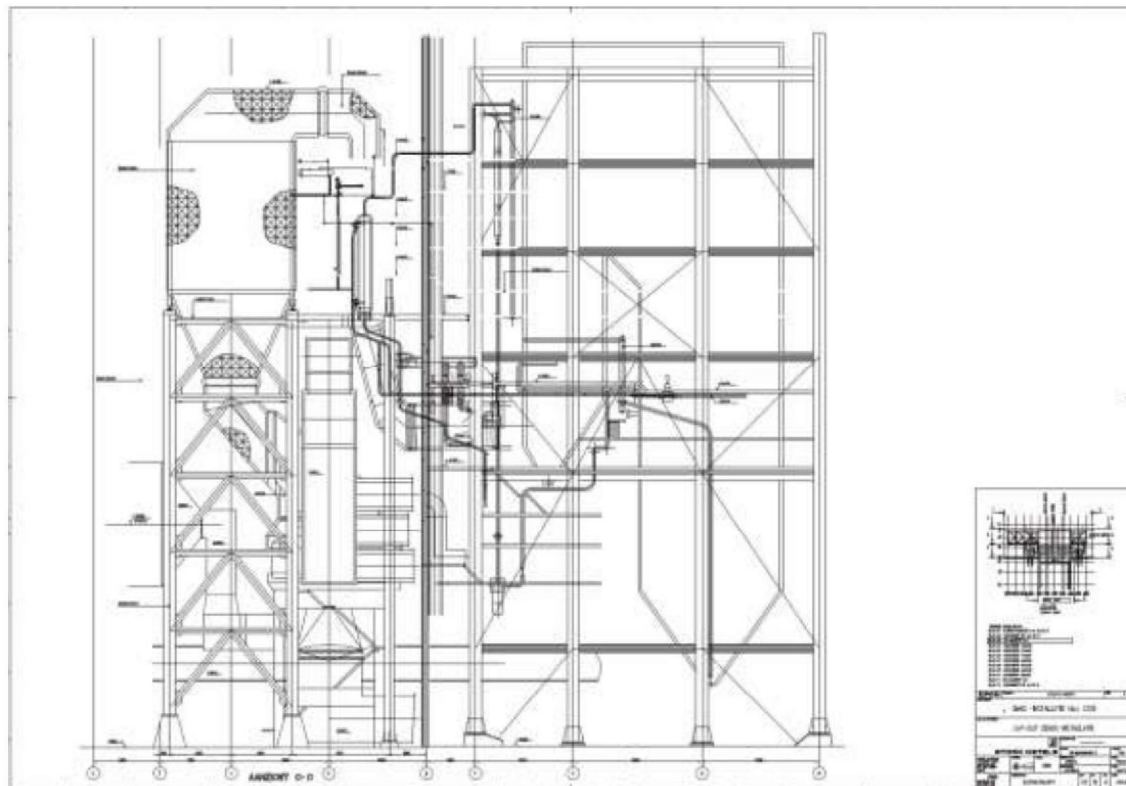
Small column size = 1000mm x 1000mm

Large column size – shaped

Beams size = 1000mm wide x 2000mm deep.



Design for the Demolition of the Air Heaters & Denox Support Structures



11.0 DESIGN PHILOSOPHY

1. Demolition phasing.

5.1.2f

2. Demolition Strategy.

5.1.2f

3. Structural Checks.

The global stability and stresses of the respective structures will be checked in their respective pre-weakened states.

There is going to be minor modifications to the existing Air Heater supporting structure as some the concrete columns and beams will be drilled with a 5.1.2f mm blind hole to receive the explosive charges. By inspection, the effect of drilling the staggered blind holes on the concrete support structure leading columns will not materially reduce the concrete compressive capacity. No reinforcement bars will be cut during the drilling process and as a result the full tensile capacity is retained. No further checks will be made with respect to this.

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Ref.	Calculations					Output	

12.0 CALCULATIONS

BS6399:2	WIND LOAD ASSESSMENT.	
5.1.2f		

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	SELF-WEIGHT ASSESSMENTS.	
	5.1.2f	

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	SECTION PROPERTIES' CALCULATIONS. Note: Standard sections will be calculated automatically by the analysis software.	
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THE DENOX SUPPORTING STRUCTURE. Structure view 		
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Output

Nodes

Node	X (m)	Y (m)	Z (m)	Support code	Support
1	0.0	0.0	2.70	xxxxfx	Support_1
2	0.0	0.0	5.20		
3	0.0	0.0	5.50		
4	0.0	0.0	10.00		
5	0.0	0.0	11.84		
6	0.0	0.0	18.00		
7	0.0	0.0	19.84		
8	0.0	0.0	27.84		
9	0.0	0.0	35.84		
10	7.93	0.0	43.80		
11	7.93	0.0	35.84		
12	15.86	0.0	43.80		
13	15.86	0.0	35.84		
14	23.79	0.0	43.80		
15	23.79	0.0	35.84		
16	28.50	0.0	35.84		
17	31.72	0.0	43.80		
18	31.72	0.0	35.84		
19	34.94	0.0	35.84		
20	39.65	0.0	43.80		
21	39.65	0.0	35.84		
22	47.58	0.0	43.80		
23	47.58	0.0	35.84		
24	55.51	0.0	43.80		
25	55.51	0.0	35.84		
26	63.44	0.0	43.80		
27	63.44	0.0	35.84		
28	71.37	0.0	35.84		
29	63.44	0.0	27.84		
30	71.37	0.0	27.84		
31	79.30	0.0	27.84		
32	63.44	0.0	19.84		
33	71.37	0.0	19.84		
34	79.30	0.0	19.84		
35	63.44	0.0	18.00		
36	69.60	0.0	18.00		
37	73.14	0.0	18.00		
38	79.30	0.0	18.00		
39	63.44	0.0	11.84		
40	71.37	0.0	11.84		
41	79.30	0.0	11.84		
42	63.44	0.0	10.00		
45	79.30	0.0	10.00		
46	63.44	0.0	5.20		
49	79.30	0.0	5.20		
50	63.44	0.0	2.70	xxxxxx	Fixed
51	79.30	0.0	2.70	xxxxxx	Fixed
52	0.0	6.30	11.84		
53	0.0	6.30	19.84		
54	0.0	6.30	27.84		
55	0.0	6.30	35.84		



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Output

Node	X (m)	Y (m)	Z (m)	Support code	Support
56	7.93	6.30	43.80		
57	55.51	6.30	43.80		
58	63.44	6.30	43.80		
60	71.37	6.30	35.84		
67	0.0	12.60	2.70	xxxxfx	Support_1
68	0.0	12.60	5.20		
69	0.0	12.60	5.50		
70	0.0	12.60	10.00		
71	0.0	12.60	11.84		
72	0.0	12.60	19.84		
73	0.0	12.60	27.84		
74	0.0	12.60	35.84		
75	7.93	12.60	43.80		
76	7.93	12.60	35.84		
77	11.22	12.60	43.80		
78	15.86	12.60	35.84		
80	22.18	12.60	43.80		
81	23.79	12.60	43.80		
82	23.79	12.60	35.84		
83	28.50	12.60	43.80		
84	28.50	12.60	35.84		
85	31.72	12.60	43.80		
86	31.72	12.60	35.84		
87	34.94	12.60	43.80		
88	34.94	12.60	35.84		
89	39.65	12.60	43.80		
90	39.65	12.60	35.84		
91	41.26	12.60	43.80		
92	47.58	12.60	43.80		
93	47.58	12.60	35.84		
94	52.22	12.60	43.80		
95	55.51	12.60	43.80		
96	55.51	12.60	35.84		
97	63.44	12.60	43.80		
98	63.44	12.60	35.84		
99	71.37	12.60	35.84		
100	63.44	12.60	27.84		
101	71.37	12.60	27.84		
102	79.30	12.60	27.84		
103	63.44	12.60	19.84		
104	71.37	12.60	19.84		
105	79.30	12.60	19.84		
106	63.44	12.60	11.84		
107	71.37	12.60	11.84		
108	79.30	12.60	11.84		
109	63.44	12.60	10.00		
112	79.30	12.60	10.00		
113	63.44	12.60	5.20		
116	79.30	12.60	5.20		
117	63.44	12.60	2.70	xxxxxx	Fixed
118	79.30	12.60	2.70	xxxxxx	Fixed
119	11.22	22.51	0.0	xxxxxx	Fixed



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Output

Node	X (m)	Y (m)	Z (m)	Support code	Support
120	11.22	22.51	16.20		
121	11.22	22.51	46.00		
122	13.24	22.51	48.10		
123	13.24	22.51	43.80		
124	19.40	22.51	48.10		
125	19.40	22.51	43.80		
126	25.56	22.51	48.10		
127	25.56	22.51	43.80		
129	31.72	22.51	48.10		
130	31.72	22.51	43.80		
132	37.88	22.51	48.10		
133	37.88	22.51	43.80		
134	44.04	22.51	48.10		
135	44.04	22.51	43.80		
136	50.20	22.51	48.10		
137	50.20	22.51	43.80		
138	52.22	22.51	46.00		
139	52.22	22.51	16.20		
140	52.22	22.51	0.0	xxxxxxx	Fixed
141	52.22	18.00	43.80		
142	47.58	18.00	43.80		
143	41.26	18.00	43.80		
144	34.94	18.00	43.80		
145	28.50	18.00	43.80		
146	22.18	18.00	43.80		
147	15.86	18.00	43.80		
148	11.22	18.00	43.80		
149	52.22	22.51	43.80		
150	47.58	22.51	43.80		
151	34.94	22.51	43.80		
152	28.50	22.51	43.80		
153	15.86	22.51	43.80		
154	11.22	22.51	43.80		
155	45.72	31.31	43.80	xxxfff	Pinned
156	17.72	31.31	43.80	xxxfff	Pinned
157	15.86	6.30	35.84		
158	28.50	6.30	35.84		
159	34.94	6.30	35.84		
160	47.58	6.30	35.84		
161	28.50	0.0	43.80		
162	34.94	0.0	43.80		
164	79.30	12.60	5.50		
165	15.86	12.60	43.80		
166	79.30	6.30	11.84		
167	79.30	6.30	19.84		
168	79.30	6.30	27.84		
169	63.44	6.30	11.84		
170	63.44	6.30	19.84		
171	63.44	6.30	27.84		
172	55.51	6.30	35.84		

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Loads

	Case	Load type	List
	1	nodal force	26 97
	1	nodal force	147
	1	nodal force	144 145
	1	nodal force	142
	1	nodal force	165
	1	nodal force	83 87
	1	nodal force	92
	1	nodal force	12
	1	nodal force	161 162
	1	nodal force	22

	Load values
	FX=-552.00(kN)
	FZ=-1597.00(kN)
	FZ=-2321.00(kN)
	FZ=-1479.00(kN)
	FZ=-5326.00(kN)
	FZ=-7737.00(kN)
	FZ=-4924.00(kN)
	FZ=-3729.00(kN)
	FZ=-5417.00(kN)
	FZ=-3447.00(kN)



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reactions: values

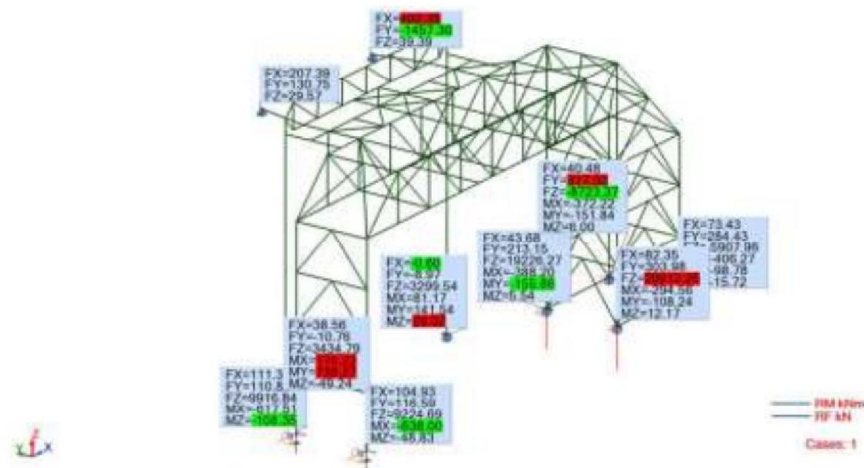
In the coordinate system: global - Case: 1 (1.5 x Vertical Load + 1.5 x Horizontal Load)

Node/Case	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
1/ 1	104.93	116.58	9224.69	-638.00	0.0	-48.83
50/ 1	82.35	303.98	20912.25	-294.56	-108.24	12.17
51/ 1	73.43	284.43	-5907.96	-406.27	-98.78	-15.72
67/ 1	111.38	110.81	9916.84	-617.51	0.0	-108.35
117/ 1	43.68	213.15	19226.27	-388.20	-155.86	5.54
118/ 1	40.48	317.32	-8723.37	-372.22	-151.84	6.00
119/ 1	38.56	-10.76	3434.79	176.23	739.27	-49.24
140/ 1	-0.60	-8.97	3299.54	81.17	141.54	28.32
155/ 1	402.39	-1457.30	39.39	-0.00	0.00	0.0
156/ 1	207.39	130.75	29.57	-0.00	0.00	0.00

Case 1 1.5 x Vertical Load + 1.5 x Horizontal Load

Sum of val.	1104.00	-0.00	51452.00	-2459.36	365.09	-170.11
Sum of reac.	1104.00	-0.00	51452.00	463046.40	-1570982.52	-6955.20
Sum of forc.	-1104.00	0.0	-51452.00	-463046.40	1570982.52	6955.20
Check val.	0.00	-0.00	-0.00	-0.00	0.00	-0.00
Precision	1.37156e-12	1.75202e-27				

View - Reaction forces(kN),Reaction moments(kN*m), Case: 1





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Ref.

Calculations

Output

displacements: values

- Case: 1 (1.5 x Vertical Load + 1.5 x Horizontal Load)

Node/Case	UX (mm)	UY (mm)	UZ (mm)	RX (Rad)	RY (Rad)	RZ (Rad)
1/ 1	0.0	0.0	0.0	0.0	-0.007	0.0
2/ 1	-17	-1	-1	0.000	-0.007	0.000
3/ 1	-19	-1	-2	0.000	-0.007	0.000
4/ 1	-49	-3	-4	0.000	-0.006	0.000
5/ 1	-61	-3	-5	0.000	-0.006	0.000
6/ 1	-92	-4	-7	0.000	-0.004	0.000
7/ 1	-100	-4	-8	0.000	-0.004	0.000
8/ 1	-114	-5	-12	0.000	0.000	0.001
9/ 1	-91	-5	-16	0.000	0.006	0.001
10/ 1	-43	1	-72	0.000	0.008	0.001
11/ 1	-88	2	-72	-0.000	0.008	0.001
12/ 1	-50	14	-134	-0.002	0.007	0.001
13/ 1	-84	8	-129	-0.001	0.006	0.001
14/ 1	-58	19	-179	-0.002	0.006	0.000
15/ 1	-77	9	-175	-0.002	0.005	-0.000
16/ 1	-72	8	-192	-0.003	0.002	-0.000
17/ 1	-67	16	-201	-0.003	-0.000	-0.001
18/ 1	-69	5	-195	-0.002	-0.000	-0.001
19/ 1	-66	3	-189	-0.002	-0.003	-0.001
20/ 1	-76	5	-175	-0.002	-0.006	-0.002
21/ 1	-61	-3	-170	-0.002	-0.005	-0.001
22/ 1	-63	-10	-133	-0.001	-0.006	-0.002
23/ 1	-57	-11	-127	-0.001	-0.006	-0.000
24/ 1	-67	-19	-81	0.000	-0.006	-0.000
25/ 1	-57	-9	-77	0.001	-0.006	0.000
26/ 1	-67	-18	-40	0.000	-0.005	0.000
27/ 1	-52	-12	-33	0.001	-0.004	-0.000
28/ 1	-46	-13	-5	0.000	-0.003	0.000
29/ 1	-17	-6	-26	0.000	-0.003	-0.000
30/ 1	-21	-8	-5	0.000	-0.002	-0.000
31/ 1	-25	-8	8	0.000	-0.002	0.000
32/ 1	-7	-4	-18	0.000	-0.001	-0.000
33/ 1	-8	-5	-4	0.000	-0.001	-0.000
34/ 1	-8	-5	6	0.000	-0.002	0.000
35/ 1	-6	-4	-16	0.000	-0.001	-0.000
36/ 1	-5	-4	-6	0.000	-0.001	-0.000
37/ 1	-5	-4	-1	0.000	-0.001	-0.000
38/ 1	-6	-4	5	0.000	-0.001	0.000
39/ 1	-1	-2	-10	0.000	-0.001	-0.000
40/ 1	-1	-2	-0	0.000	-0.001	-0.000
41/ 1	-1	-2	3	0.000	-0.000	0.000
42/ 1	-1	-1	-8	0.000	-0.000	-0.000
45/ 1	-0	-2	2	0.000	-0.000	0.000
46/ 1	0	-0	-3	0.000	-0.000	-0.000
49/ 1	0	-0	1	0.000	0.000	0.000
50/ 1	0.0	0.0	0.0	0.0	0.0	0.0
51/ 1	0.0	0.0	0.0	0.0	0.0	0.0
52/ 1	-62	-3	-5	-0.000	-0.006	0.000
53/ 1	-103	-4	-5	-0.000	-0.004	0.001
54/ 1	-118	-4	-9	-0.000	-0.001	0.001



Anson House, Schooner Court,
Crossways Business Park, Dartford,
Kent, DA26QQ
Tel : 01322 277731 Fax : 01322 284152

Project:
Gelderland Central Power Station

Job Ref.: C2002

Part of Structure: Air Heaters & Denox Support
Structures.

Sheet No./rev.:

Calc. by:
5.1.2e

Date:
30/03/22

App'd by:
5.1.2e

Date:
30/03/22

Ref.

Calculations

Output

Node/Case	UX (mm)	UY (mm)	UZ (mm)	RX (Rad)	RY (Rad)	RZ (Rad)
55/ 1	-95	-4	-13	-0.000	0.004	0.001
56/ 1	-44	0	-68	-0.001	0.008	0.000
57/ 1	-89	-20	-88	-0.001	-0.006	-0.000
58/ 1	-95	-18	-43	-0.000	-0.005	0.000
60/ 1	-44	-13	-9	0.000	-0.003	0.000
67/ 1	0.0	0.0	0.0	0.0	-0.007	0.0
68/ 1	-19	-1	-2	0.000	-0.007	0.000
69/ 1	-21	-1	-2	0.000	-0.007	0.000
70/ 1	-53	-3	-4	0.000	-0.007	0.000
71/ 1	-85	-3	-5	0.000	-0.006	0.000
72/ 1	-107	-4	-9	0.000	-0.004	0.001
73/ 1	-122	-4	-13	-0.000	0.000	0.001
74/ 1	-99	-4	-18	0.000	0.006	0.001
75/ 1	-51	-0	-77	0.003	0.008	0.002
76/ 1	-95	4	-77	-0.000	0.008	0.001
77/ 1	-53	7	-106	0.005	0.009	0.002
78/ 1	-91	9	-137	-0.000	0.007	0.000
80/ 1	-62	17	-185	0.003	0.006	0.000
81/ 1	-63	17	-194	0.003	0.006	0.000
82/ 1	-83	10	-188	-0.001	0.005	-0.000
83/ 1	-67	18	-218	0.004	0.002	-0.000
84/ 1	-76	8	-207	0.000	0.002	-0.001
85/ 1	-70	16	-218	0.003	-0.001	-0.001
86/ 1	-72	6	-210	-0.000	-0.001	-0.001
87/ 1	-73	13	-214	0.004	-0.003	-0.001
88/ 1	-88	3	-203	0.000	-0.004	-0.001
89/ 1	-78	4	-187	0.003	-0.006	-0.002
90/ 1	-63	-2	-180	-0.000	-0.005	-0.001
91/ 1	-79	1	-177	0.003	-0.006	-0.002
92/ 1	-84	-10	-139	0.004	-0.006	-0.002
93/ 1	-57	-10	-132	0.000	-0.006	-0.000
94/ 1	-95	-18	-106	0.005	-0.007	-0.001
95/ 1	-87	-21	-83	0.004	-0.006	-0.000
96/ 1	-58	-9	-78	0.000	-0.007	0.000
97/ 1	-87	-20	-39	0.002	-0.005	0.000
98/ 1	-52	-10	-32	0.001	-0.005	-0.000
99/ 1	-47	-13	-4	0.001	-0.003	-0.000
100/ 1	-16	-6	-25	0.000	-0.003	0.000
101/ 1	-21	-7	-4	0.000	-0.002	-0.000
102/ 1	-25	-8	10	0.000	-0.002	0.000
103/ 1	-7	-4	-17	0.000	-0.001	0.000
104/ 1	-8	-4	-3	0.000	-0.001	-0.000
105/ 1	-8	-5	7	0.000	-0.002	-0.000
106/ 1	-1	-2	-9	0.000	-0.001	-0.000
107/ 1	-1	-2	-0	0.000	-0.001	-0.000
108/ 1	-1	-2	4	0.000	-0.000	-0.000
109/ 1	-0	-1	-7	0.000	-0.000	-0.000
112/ 1	-0	-2	3	0.000	-0.000	-0.000
113/ 1	0	-0	-2	0.000	0.000	-0.000
116/ 1	0	-0	1	0.000	0.000	-0.000
117/ 1	0.0	0.0	0.0	0.0	0.0	0.0
118/ 1	0.0	0.0	0.0	0.0	0.0	0.0



Anson House, Schooner Court,
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Project:
Gelderland Central Power Station

Part of Structure: Air Heaters & Denox Support Structures.

Job Ref.: C2002

Sheet No./rev.:

Calc. by:
5.1.2e

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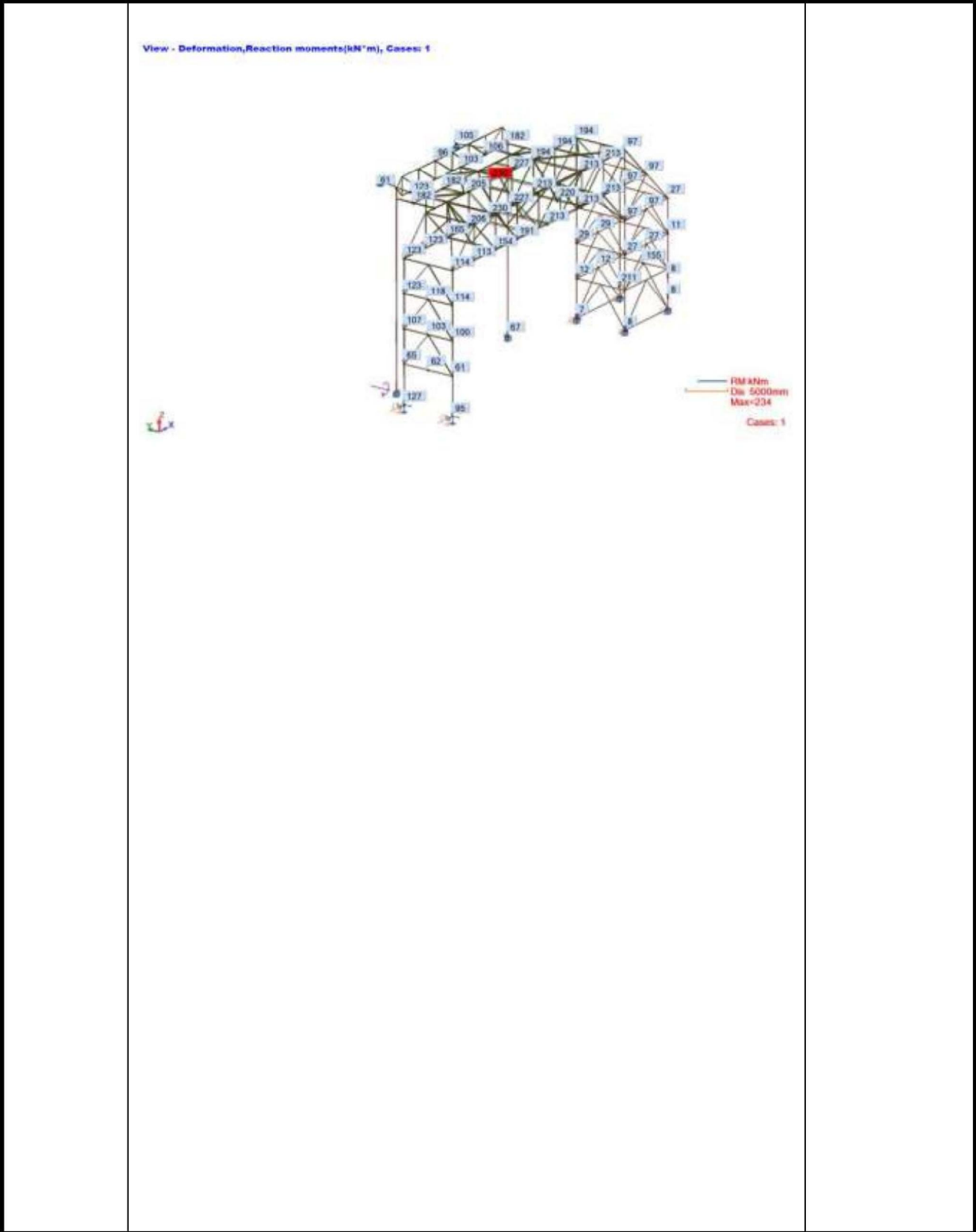
Ref.

Calculations

Output

Node/Case	UX (mm)	UY (mm)	UZ (mm)	RX (Rad)	RY (Rad)	RZ (Rad)
119/ 1	0.0	0.0	0.0	0.0	0.0	0.0
120/ 1	-27	6	-3	-0.001	-0.003	0.001
121/ 1	-61	4	-10	0.001	0.003	0.002
122/ 1	-54	3	-17	0.002	0.004	0.001
123/ 1	-67	14	-17	0.004	0.005	0.001
124/ 1	-56	4	-50	0.002	0.005	0.000
125/ 1	-66	13	-48	0.003	0.004	0.000
126/ 1	-59	4	-75	0.003	0.003	-0.000
127/ 1	-64	18	-74	0.004	0.003	0.001
129/ 1	-62	1	-83	0.003	-0.000	-0.001
130/ 1	-62	16	-84	0.004	0.000	-0.001
132/ 1	-64	-6	-72	0.003	-0.003	-0.001
133/ 1	-60	9	-74	0.004	-0.003	-0.001
134/ 1	-67	-16	-48	0.003	-0.005	-0.002
135/ 1	-56	-1	-48	0.004	-0.004	-0.002
136/ 1	-69	-26	-17	0.002	-0.004	-0.001
137/ 1	-55	-16	-16	0.003	-0.005	-0.001
138/ 1	-62	-23	-9	0.002	-0.003	-0.001
139/ 1	-7	2	-3	-0.000	-0.001	-0.000
140/ 1	0.0	0.0	0.0	0.0	0.0	0.0
141/ 1	-69	-19	-62	0.011	-0.008	-0.003
142/ 1	-69	-10	-98	0.012	-0.007	-0.002
143/ 1	-68	1	-140	0.013	-0.006	-0.002
144/ 1	-67	13	-167	0.015	-0.003	-0.001
145/ 1	-66	18	-169	0.015	0.002	-0.000
146/ 1	-65	17	-145	0.013	0.006	0.000
147/ 1	-65	14	-101	0.013	0.008	0.001
148/ 1	-65	7	-82	0.011	0.009	0.001
149/ 1	-56	-19	-8	0.002	-0.003	-0.001
150/ 1	-55	-11	-31	0.004	-0.006	-0.003
151/ 1	-61	13	-82	0.004	-0.002	-0.001
152/ 1	-63	18	-82	0.004	0.002	-0.000
153/ 1	-67	14	-31	0.004	0.008	-0.002
154/ 1	-65	7	-9	0.001	0.002	0.001
155/ 1	0.0	0.0	0.0	0.005	-0.005	-0.008
156/ 1	0.0	0.0	0.0	0.005	0.005	-0.011
157/ 1	-88	8	-137	-0.001	0.006	0.001
158/ 1	-75	8	-207	-0.001	0.002	0.001
159/ 1	-66	3	-204	-0.001	-0.003	0.001
160/ 1	-57	-11	-134	-0.000	-0.005	0.000
161/ 1	-63	18	-201	-0.003	0.002	-0.000
162/ 1	-71	12	-198	-0.003	-0.003	-0.001
164/ 1	0	-0	1	0.000	0.000	-0.000
165/ 1	-56	14	-144	0.004	0.007	0.001
166/ 1	-1	-2	0	0.000	-0.000	-0.000
167/ 1	-8	-4	3	0.000	-0.001	-0.000
168/ 1	-25	-8	6	0.000	-0.002	0.000
169/ 1	-1	-2	0	0.000	-0.000	-0.000
170/ 1	-7	-4	-10	0.000	-0.001	-0.000
171/ 1	-16	-6	-18	-0.000	-0.002	-0.000
172/ 1	-62	-9	-71	-0.000	-0.007	0.000

 BROWN & MASON Anson House, Schooner Court, Crossways Business Park, Dartford, Kent, DA26QQ Tel : 01322 277731 Fax : 01322 284152		Project: Gelderland Central Power Station			Job Ref.: C2002	
		Part of Structure: Air Heaters & Denox Support Structures.			Sheet No./rev.:	
	Calc. by: 5.1.2e	Date: 30/03/22	App'd by: 5.1.2e	Date: 30/03/22		
Ref.	Calculations				Output	





Anson House, Schooner Court,
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Project:
Gelderland Central Power Station

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Part of Structure: Air Heaters & Denox Support Structures.

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Calculations

Output

forces: values

- Case: 1 (1.5 x Vertical Load + 1.5 x Horizontal Load)

Member/Node/Case	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
1/ 1	9224.69	116.59	-104.93	-48.83	0.0	638.00
1/ 2	9224.69	116.59	-104.93	-48.83	-262.32	346.52
2/ 2	9224.69	116.59	-104.93	-48.83	-262.32	346.52
2/ 3	9224.69	116.59	-104.93	-48.83	-293.80	311.54
3/ 3	9224.69	116.59	-104.93	-48.83	-293.80	311.54
3/ 4	9224.69	116.59	-104.93	-48.83	-765.97	-213.13
4/ 4	9224.69	116.59	-104.93	-48.83	-765.97	-213.13
4/ 5	9224.69	116.59	-104.93	-48.83	-959.04	-427.67
5/ 5	8972.57	-55.64	-108.53	-54.21	-921.32	-374.55
5/ 6	8972.57	-55.64	-108.53	-54.21	-1589.85	-31.81
6/ 6	8972.57	-55.64	-108.53	-54.21	-1589.85	-31.81
6/ 7	8972.57	-55.64	-108.53	-54.21	-1789.54	70.68
7/ 7	8844.75	-7.85	-110.17	-55.78	-1735.87	-37.64
7/ 8	8844.75	-7.85	-110.17	-55.78	-2617.22	25.15
8/ 8	8658.51	-32.51	-113.65	-73.13	-2536.71	-77.57
8/ 9	8658.51	-32.51	-113.65	-73.13	-3445.94	182.52
9/ 5	20317.44	23.85	79.07	8.14	-96.88	275.23
9/ 4	20317.44	23.85	79.07	8.14	100.80	215.62
10/ 4	20317.44	23.85	79.07	8.14	100.80	215.62
10/ 4	20317.44	23.85	79.07	8.14	480.36	101.15
11/ 4	20317.44	23.85	79.07	8.14	480.36	101.15
11/ 3	20317.44	23.85	79.07	8.14	625.86	57.27
12/ 3	19946.79	-36.61	-127.69	16.86	527.12	-182.04
12/ 3	19946.79	-36.61	-127.69	16.86	-259.44	43.50
13/ 3	19946.79	-36.61	-127.69	16.86	-259.44	43.50
13/ 3	19946.79	-36.61	-127.69	16.86	-494.39	110.87
14/ 3	19387.24	-42.16	557.49	11.67	-745.80	-114.09
14/ 2	19387.24	-42.16	557.49	11.67	3714.13	223.20
15/ 5	-6080.04	50.17	61.44	-11.21	-87.63	382.31
15/ 4	-6080.04	50.17	61.44	-11.21	65.96	256.90
16/ 4	-6080.04	50.17	61.44	-11.21	65.96	256.90
16/ 4	-6080.04	50.17	61.44	-11.21	360.86	16.10
17/ 4	-6080.04	50.17	61.44	-11.21	360.86	16.10
17/ 4	-6080.04	50.17	61.44	-11.21	473.91	-76.20
18/ 4	-6445.23	11.21	61.76	-15.33	457.10	59.29
18/ 3	-6445.23	11.21	61.76	-15.33	837.56	-9.73
19/ 3	-6445.23	11.21	61.76	-15.33	837.56	-9.73
19/ 3	-6445.23	11.21	61.76	-15.33	951.21	-30.35
20/ 3	-6586.86	13.19	-214.84	-29.63	1035.04	83.66
20/ 3	-6586.86	13.19	-214.84	-29.63	-683.67	-21.89
21/ 9	-8155.31	-26.77	438.83	190.35	-2834.46	-189.38
21/ 1	-8155.31	-26.77	438.83	190.35	645.43	22.90
22/ 1	-8282.02	-46.81	124.30	294.34	143.54	40.64
22/ 1	-8282.02	-46.81	124.30	294.34	1129.22	411.81
23/ 1	-16275.37	60.17	220.77	155.71	160.75	630.51
23/ 1	-16275.37	60.17	220.77	155.71	1911.44	153.34
24/ 1	-20850.59	-8.09	509.22	412.78	1123.99	264.11
24/ 1	-20850.59	-8.09	509.22	412.78	3522.44	302.23
25/ 1	-20904.79	104.61	90.98	-265.91	3507.59	619.71
25/ 1	-20904.79	104.61	90.98	-265.91	3800.54	282.87



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Part of Structure: Air Heaters & Denox Support Structures.

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Output

Member/Node/Case	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
26/ 1	-18132.28	-13.38	-271.55	196.17	4051.49	281.12
26/ 1	-18132.28	-13.38	-271.55	196.17	3177.08	324.20
27/ 1	-18187.07	171.55	-712.32	-541.27	3200.71	713.56
27/ 2	-18187.07	171.55	-712.32	-541.27	-154.31	-94.44
28/ 2	-10367.86	80.00	-154.00	-198.86	1255.53	-239.14
28/ 2	-10367.86	80.00	-154.00	-198.86	34.30	-873.57
29/ 2	559.61	-173.55	-284.55	-475.68	1487.22	-1021.70
29/ 2	559.61	-173.55	-284.55	-475.68	-789.28	354.59
30/ 2	12752.15	31.97	-404.77	-29.34	1027.31	330.05
30/ 2	12752.15	31.97	-404.77	-29.34	-3532.18	-30.11
31/ 9	11231.43	82.78	-24.67	-114.76	-656.81	267.28
31/ 1	11231.43	82.78	-24.67	-114.76	-934.02	-662.82
32/ 1	15896.45	-214.75	582.76	657.34	-1704.64	-722.87
32/ 1	15896.45	-214.75	582.76	657.34	2916.63	980.13
34/ 1	20552.07	3.87	-314.87	125.89	1839.67	679.99
34/ 1	20552.07	3.87	-314.87	125.89	-657.29	649.33
35/ 1	22354.87	76.40	2161.61	429.95	-1680.40	702.05
35/ 1	22354.87	76.40	2161.61	429.95	8500.79	342.20
36/ 1	22320.00	16.92	-3239.13	-227.79	8497.41	599.86
36/ 1	22320.00	16.92	-3239.13	-227.79	-1932.59	545.39
37/ 1	22280.05	94.91	3060.03	103.99	-1774.55	548.32
37/ 1	22280.05	94.91	3060.03	103.99	8078.75	242.72
38/ 1	22176.51	77.30	-2282.07	-516.79	8107.39	844.08
38/ 2	22176.51	77.30	-2282.07	-516.79	-2641.17	480.02
39/ 2	17518.85	159.62	296.17	-174.19	-1073.46	457.41
39/ 2	17518.85	159.62	296.17	-174.19	1275.18	-808.36
40/ 2	9591.97	114.34	-705.45	-525.97	2817.77	-156.58
40/ 2	9591.97	114.34	-705.45	-525.97	-2776.47	-1063.30
41/ 2	-1448.45	-155.26	185.94	-63.30	-1157.84	-1051.51
41/ 2	-1448.45	-155.26	185.94	-63.30	316.69	179.67
42/ 2	-6477.72	-13.73	-219.01	-30.79	605.82	-52.89
42/ 2	-6477.72	-13.73	-219.01	-30.79	-1855.00	101.41
43/ 2	-9532.71	-20.96	214.82	9.18	-1799.44	-113.47
43/ 3	-9532.71	-20.96	214.82	9.18	620.41	122.65
44/ 1	314.53	-20.04	-126.70	-17.74	506.66	-55.49
44/ 1	314.53	-20.04	-126.70	-17.74	-501.69	103.99
45/ 1	-6208.73	-16.68	-40.23	-23.59	283.13	-85.29
45/ 1	-6208.73	-16.68	-40.23	-23.59	-168.87	122.14
46/ 1	4081.67	51.58	-164.78	-7.85	616.58	187.19
46/ 1	4081.67	51.58	-164.78	-7.85	-693.10	-223.42
47/ 1	-2293.24	-20.95	-27.54	-14.15	330.01	-100.03
47/ 1	-2293.24	-20.95	-27.54	-14.15	20.52	135.37
48/ 1	6299.16	77.99	39.95	2.94	-159.96	289.02
48/ 1	6299.16	77.99	39.95	2.94	158.04	-331.77
49/ 1	-6153.19	19.05	39.29	12.43	-70.47	135.41
49/ 2	-6153.19	19.05	39.29	12.43	370.96	-78.61
50/ 2	-3515.37	20.57	48.18	1.84	-310.52	110.81
50/ 2	-3515.37	20.57	48.18	1.84	230.98	-120.36
51/ 2	-5301.85	14.03	-7.37	-10.83	-51.66	80.24
51/ 2	-5301.85	14.03	-7.37	-10.83	-110.07	-31.04
52/ 2	-5245.46	4.62	26.52	14.71	-145.83	-2.91
52/ 2	-5245.46	4.62	26.52	14.71	64.48	-39.57



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Project:
Gelderland Central Power Station

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Part of Structure: Air Heaters & Denox Support Structures.

Sheet No./rev.:

Calc. by:
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Output

Member/Node/Case	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
53/ 2	4169.72	10.66	-5.15	-5.31	35.71	64.63
53/ 2	4169.72	10.66	-5.15	-5.31	-22.33	-55.51
54/ 2	6773.63	3.83	-35.78	7.45	192.85	36.60
54/ 2	6773.63	3.83	-35.78	7.45	-93.38	5.97
55/ 2	6739.75	13.24	20.62	-20.67	-57.63	31.51
55/ 2	6739.75	13.24	20.62	-20.67	106.47	-73.87
56/ 1	-10981.41	-17.41	-40.77	12.00	278.57	-25.40
56/ 1	-10981.41	-17.41	-40.77	12.00	-179.47	170.17
57/ 1	7369.36	84.16	-193.77	-33.13	764.65	303.69
57/ 1	7369.36	84.16	-193.77	-33.13	-777.80	-366.20
58/ 2	6909.69	-63.27	287.09	24.06	-1196.75	-278.14
58/ 2	6909.69	-63.27	287.09	24.06	1088.45	225.51
60/ 2	5524.82	3.55	-1.73	-0.26	-71.43	16.75
60/ 3	5524.82	3.55	-1.73	-0.26	-85.12	-11.39
61/ 3	6022.45	3.96	17.64	-0.66	-66.03	-4.53
61/ 3	6022.45	3.96	17.64	-0.66	73.87	-35.94
63/ 2	-15049.82	40.96	53.45	-27.91	-300.79	275.85
63/ 2	-15049.82	40.96	53.45	-27.91	299.75	-184.36
64/ 2	11567.93	-129.97	351.92	55.87	-1338.66	-554.68
64/ 2	11567.93	-129.97	351.92	55.87	1462.65	479.99
65/ 3	373.35	0.06	-8.28	-0.22	71.86	2.80
65/ 3	373.35	0.06	-8.28	-0.22	-21.38	2.15
66/ 3	-331.58	-0.35	6.35	3.00	-40.48	-4.78
66/ 3	-331.58	-0.35	6.35	3.00	31.08	-0.79
67/ 3	505.77	1.01	-14.47	-0.37	64.50	8.03
67/ 3	505.77	1.01	-14.47	-0.37	-50.26	-0.01
68/ 3	418.63	0.96	33.18	-0.93	-109.49	4.31
68/ 3	418.63	0.96	33.18	-0.93	153.61	-3.27
69/ 3	96.49	-0.24	4.13	0.53	-6.66	-1.17
69/ 3	96.49	-0.24	4.13	0.53	29.36	0.93
70/ 3	96.56	-0.24	2.26	0.55	29.36	0.92
70/ 3	96.56	-0.24	2.26	0.55	35.13	1.53
71/ 3	-32.08	-0.30	0.56	1.17	-24.09	-2.91
71/ 3	-32.08	-0.30	0.56	1.17	-22.66	-2.15
72/ 3	-32.06	-0.30	1.18	1.13	-22.66	-2.17
72/ 4	-32.06	-0.30	1.18	1.13	-12.37	0.43
73/ 4	22.85	1.26	-5.24	-0.33	15.05	6.58
73/ 4	22.85	1.26	-5.24	-0.33	-28.49	-3.38
74/ 4	-273.57	-0.54	25.77	0.89	-100.38	-1.90
74/ 3	-273.57	-0.54	25.77	0.89	103.97	2.39
81/ 5	0.0	0.0	0.0	0.0	0.0	0.0
81/ 5	0.0	0.0	0.0	0.0	0.0	0.0
82/ 6	9916.84	110.81	-111.38	-108.35	0.0	617.51
82/ 6	9916.84	110.81	-111.38	-108.35	-278.45	340.49
83/ 6	9916.84	110.81	-111.38	-108.35	-278.45	340.49
83/ 6	9916.84	110.81	-111.38	-108.35	-311.86	307.25
84/ 6	9916.84	110.81	-111.38	-108.35	-311.86	307.25
84/ 7	9916.84	110.81	-111.38	-108.35	-813.06	-191.39
85/ 7	9916.84	110.81	-111.38	-108.35	-813.06	-191.39
85/ 7	9916.84	110.81	-111.38	-108.35	-1018.00	-395.28
86/ 7	10092.36	-40.81	-115.42	-94.54	-957.87	-343.89
86/ 7	10092.36	-40.81	-115.42	-94.54	-1881.21	-17.38



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87/ 7	10221.26	33.89	-119.46	-84.27	-1808.31	108.13
87/ 7	10221.26	33.89	-119.46	-84.27	-2763.99	-162.96
88/ 7	10406.34	-31.73	-121.66	-89.07	-2672.41	-41.23
88/ 7	10406.34	-31.73	-121.66	-89.07	-3645.68	212.59
89/ 1	19287.80	57.64	87.19	1.99	-141.99	366.15
89/ 1	19287.80	57.64	87.19	1.99	75.98	222.05
90/ 1	19287.80	57.64	87.19	1.99	75.98	222.05
90/ 1	19287.80	57.64	87.19	1.99	494.48	-54.63
91/ 1	19287.80	57.64	87.19	1.99	494.48	-54.63
91/ 1	19287.80	57.64	87.19	1.99	654.91	-160.69
92/ 1	19624.48	33.98	-137.60	-4.33	562.18	145.89
92/ 1	19624.48	33.98	-137.60	-4.33	-538.63	-125.98
93/ 1	19769.15	33.47	583.03	-9.32	-798.00	139.92
93/ 1	19769.15	33.47	583.03	-9.32	3868.24	-127.82
94/ 1	-8188.80	38.24	70.21	9.82	-137.47	350.47
94/ 1	-8188.80	38.24	70.21	9.82	59.12	243.38
95/ 1	-8188.80	38.24	70.21	9.82	59.12	243.38
95/ 1	-8188.80	38.24	70.21	9.82	375.05	71.28
96/ 1	-8188.80	38.24	70.21	9.82	375.05	71.28
96/ 1	-8188.80	38.24	70.21	9.82	504.24	0.91
97/ 1	-7814.41	-13.23	71.15	-4.76	482.63	-58.35
97/ 1	-7814.41	-13.23	71.15	-4.76	1031.85	47.49
98/ 1	-7203.92	-24.91	-231.61	-19.95	1111.21	-16.37
98/ 1	-7203.92	-24.91	-231.61	-19.95	-741.69	182.95
99/ 7	14164.24	-94.83	-72.14	-616.36	-504.16	13.56
99/ 7	14164.24	-94.83	-72.14	-616.36	-1314.68	1079.03
100/ 7	-9924.53	-19.17	496.97	85.72	-3185.64	193.62
100/ 7	-9924.53	-19.17	496.97	85.72	755.34	345.64
101/ 7	-10079.80	34.64	112.65	0.93	142.73	390.50
101/ 7	-10079.80	34.64	112.65	0.93	1038.05	115.81
102/ 7	-20238.42	-80.44	328.34	120.63	-266.17	28.94
102/ 8	-20238.42	-80.44	328.34	120.63	2337.54	666.80
103/ 8	-26457.15	110.54	556.07	-383.26	1355.95	515.49
103/ 8	-26457.15	110.54	556.07	-383.26	3975.04	-5.15
104/ 8	-26414.34	-68.13	118.42	366.07	3944.34	282.42
104/ 8	-26414.34	-68.13	118.42	366.07	4325.67	501.79
105/ 8	-22893.45	216.61	-354.90	-450.26	4645.49	483.95
105/ 8	-22893.45	216.61	-354.90	-450.26	3502.72	-213.53
106/ 8	-22810.67	-7.85	-820.21	390.13	3588.88	249.61
106/ 9	-22810.67	-7.85	-820.21	390.13	-274.32	286.60
107/ 9	-12327.55	228.66	-237.79	-210.55	1491.25	463.38
107/ 9	-12327.55	228.66	-237.79	-210.55	-394.46	-1349.69
108/ 9	933.24	-185.18	-323.53	-0.79	1481.33	-1103.27
108/ 9	933.24	-185.18	-323.53	-0.79	-1084.30	365.21
109/ 9	14506.24	-8.53	-414.06	-41.38	1001.56	6.87
109/ 1	14506.24	-8.53	-414.06	-41.38	-3662.59	103.01
110/ 9	-5064.07	116.83	-187.77	66.38	322.58	1047.59
110/ 9	-5064.07	116.83	-187.77	66.38	-1787.25	-265.13
111/ 9	-9370.13	-23.41	217.40	77.41	-1774.28	-133.44
111/ 1	-9370.13	-23.41	217.40	77.41	674.57	130.26
112/ 7	19218.77	-352.61	654.18	-2430.84	-2297.86	-121.34
112/ 7	19218.77	-352.61	654.18	-2430.84	-145.60	1038.74



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113/ 7	19074.00	-25.37	898.93	1219.07	-149.25	1344.56
113/ 1	19074.00	-25.37	898.93	1219.07	4021.80	1462.26
114/ 1	25438.07	263.79	-434.24	251.60	2841.42	1591.72
114/ 8	25438.07	263.79	-434.24	251.60	97.00	-75.45
115/ 8	24669.49	-124.79	-471.77	449.63	102.16	-25.71
115/ 8	24669.49	-124.79	-471.77	449.63	-657.39	175.20
116/ 8	27105.84	-318.71	3069.80	-555.54	-1866.62	-104.16
116/ 8	27105.84	-318.71	3069.80	-555.54	12592.15	1396.97
117/ 8	26572.67	190.44	-4278.26	498.17	12500.47	1662.94
117/ 8	26572.67	190.44	-4278.26	498.17	-1275.52	1049.73
118/ 8	26523.26	15.74	4055.09	-343.29	-1081.45	1052.33
118/ 8	26523.26	15.74	4055.09	-343.29	11975.95	1001.84
119/ 8	26878.50	412.97	-3339.25	634.00	12173.90	1719.75
119/ 8	26878.50	412.97	-3339.25	634.00	-3553.96	-225.34
120/ 8	20816.36	186.91	467.58	-536.29	-1642.17	58.96
120/ 9	20816.36	186.91	467.58	-536.29	-889.37	-241.96
121/ 9	21179.86	-42.20	419.67	-375.84	-899.61	-253.07
121/ 9	21179.86	-42.20	419.67	-375.84	1752.70	13.66
122/ 9	11705.18	376.98	-985.38	-1467.48	3554.41	422.40
122/ 9	11705.18	376.98	-985.38	-1467.48	-1017.75	-1326.78
123/ 9	11998.05	-77.04	-729.20	2054.09	-1102.88	-2295.12
123/ 9	11998.05	-77.04	-729.20	2054.09	-3501.95	-2041.65
124/ 9	736.99	-333.91	177.64	945.16	-1475.82	-1871.02
124/ 9	736.99	-333.91	177.64	945.16	-87.17	776.85
125/ 7	384.32	53.81	-155.27	-44.88	623.36	343.53
125/ 7	384.32	53.81	-155.27	-44.88	-612.61	-84.80
126/ 1	-8480.76	53.85	-55.90	45.60	379.97	413.94
126/ 8	-8480.76	53.85	-55.90	45.60	-248.08	-191.15
127/ 8	5740.93	-137.13	-193.66	-15.90	733.50	-400.66
127/ 8	5740.93	-137.13	-193.66	-15.90	-808.01	690.86
128/ 8	-3140.94	56.80	-36.58	35.18	401.21	408.61
128/ 8	-3140.94	56.80	-36.58	35.18	-9.78	-229.59
129/ 8	8333.35	-174.70	49.41	2.60	-199.21	-549.14
129/ 8	8333.35	-174.70	49.41	2.60	194.07	841.46
130/ 8	-8043.15	-53.24	53.03	-30.34	-130.39	-212.84
130/ 8	-8043.15	-53.24	53.03	-30.34	465.41	385.37
131/ 9	-4756.50	14.60	-51.37	-23.06	248.38	53.05
131/ 9	-4756.50	14.60	-51.37	-23.06	-328.81	-111.01
132/ 9	-5220.66	6.40	-13.89	-17.46	-31.49	47.94
132/ 9	-5220.66	6.40	-13.89	-17.46	-141.68	-2.83
133/ 9	-5150.63	7.25	21.44	0.75	-131.72	25.37
133/ 9	-5150.63	7.25	21.44	0.75	38.28	-32.16
134/ 9	4062.34	6.57	-1.65	-4.06	13.28	21.90
134/ 1	4062.34	6.57	-1.65	-4.06	-5.25	-52.14
135/ 1	6634.88	0.84	-36.50	10.06	197.95	24.66
135/ 9	6634.88	0.84	-36.50	10.06	-94.03	17.96
136/ 9	6599.55	-0.02	33.53	-18.14	-103.97	36.17
136/ 9	6599.55	-0.02	33.53	-18.14	162.94	36.30
137/ 7	-13975.84	50.76	-55.43	28.72	360.53	432.77
137/ 7	-13975.84	50.76	-55.43	28.72	-262.34	-137.58
138/ 7	9313.51	-212.90	-246.88	-28.77	958.05	-625.96
138/ 1	9313.51	-212.90	-246.88	-28.77	-1007.14	1068.73



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139/ 8	9467.50	172.82	347.95	33.82	-1446.39	875.87
139/ 9	9467.50	172.82	347.95	33.82	1323.31	-499.77
140/ 9	-14272.87	-63.69	87.23	-77.98	-442.25	-220.12
140/ 9	-14272.87	-63.69	87.23	-77.98	537.85	495.53
141/ 9	12555.20	215.54	347.20	80.16	-1394.69	1112.17
141/ 9	12555.20	215.54	347.20	80.16	1369.00	-803.52
142/ 9	-18166.85	-36.76	73.56	-98.73	-417.87	-79.03
142/ 9	-18166.85	-36.76	73.56	-98.73	408.69	333.99
143/ 9	13691.51	58.89	422.73	49.68	-1637.97	580.59
143/ 9	13691.51	58.89	422.73	49.68	1726.99	111.84
144/ 1	6168.27	4.15	-2.59	-5.54	-66.64	30.02
144/ 1	6168.27	4.15	-2.59	-5.54	-87.20	-2.86
145/ 1	6600.62	4.58	17.16	-6.29	-64.96	4.17
145/ 1	6600.62	4.58	17.16	-6.29	71.12	-32.12
146/ 1	327.84	0.15	-8.78	0.72	76.80	5.31
146/ 1	327.84	0.15	-8.78	0.72	-22.07	3.60
147/ 1	-284.45	-0.28	6.93	1.91	-44.32	-3.74
147/ 1	-284.45	-0.28	6.93	1.91	33.77	-0.61
148/ 1	500.39	0.84	-12.45	-1.10	56.58	5.14
148/ 1	500.39	0.84	-12.45	-1.10	-42.13	-1.51
149/ 1	486.46	0.65	33.19	-1.41	-107.42	0.04
149/ 1	486.46	0.65	33.19	-1.41	155.73	-5.10
150/ 1	43.07	0.22	3.89	-0.05	-4.52	3.48
150/ 1	43.07	0.22	3.89	-0.05	39.33	0.98
151/ 1	18.33	0.03	1.02	-0.10	-25.96	-1.37
151/ 1	18.33	0.03	1.02	-0.10	-14.50	-1.73
152/ 1	-12.00	1.01	-0.37	-1.99	-5.57	3.64
152/ 1	-12.00	1.01	-0.37	-1.99	-8.50	-4.40
153/ 1	-254.06	-0.62	23.09	-1.10	-88.55	-2.83
153/ 1	-254.06	-0.62	23.09	-1.10	94.58	2.10
160/ 1	0.0	0.0	0.0	0.0	0.0	0.0
160/ 1	0.0	0.0	0.0	0.0	0.0	0.0
163/ 7	-19.57	0.15	-5.59	5.36	35.34	5.24
163/ 5	-19.57	0.15	-5.59	5.36	0.16	4.32
164/ 5	-19.57	0.15	-5.59	5.36	0.16	4.32
164/ 5	-19.57	0.15	-5.59	5.36	-35.03	3.40
165/ 7	-215.20	-4.19	-1.40	18.92	16.05	-54.83
165/ 5	-215.20	-4.19	-1.40	18.92	1.82	-12.20
166/ 5	312.35	3.45	-1.84	-19.75	0.62	-4.10
166/ 5	312.35	3.45	-1.84	-19.75	-18.09	-39.27
167/ 7	146.30	3.30	-39.82	-14.50	128.94	18.05
167/ 5	146.30	3.30	-39.82	-14.50	-121.95	-2.76
168/ 5	-177.55	-4.34	36.77	22.23	-120.75	-8.43
168/ 7	-177.55	-4.34	36.77	22.23	110.92	18.89
169/ 7	-114.28	-7.35	1.15	31.83	-3.42	-88.19
169/ 5	-114.28	-7.35	1.15	31.83	8.27	-11.39
170/ 5	209.59	5.98	0.12	-30.88	-3.89	-11.42
170/ 7	209.59	5.98	0.12	-30.88	-2.72	-72.29
171/ 7	51.15	8.27	-40.83	-27.05	130.88	38.65
171/ 5	51.15	8.27	-40.83	-27.05	-126.37	-13.43
172/ 5	-150.22	-5.06	34.68	29.67	-114.21	-12.67
172/ 8	-150.22	-5.06	34.68	29.67	104.28	19.19



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Member/Node/Case	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
173/ 7	-185.56	-10.47	2.49	46.80	-9.16	-114.14
173/ 5	-185.56	-10.47	2.49	46.80	16.18	-7.56
174/ 5	281.76	8.54	0.71	-39.47	-8.80	-22.19
174/ 8	281.76	8.54	0.71	-39.47	-1.57	-109.17
175/ 7	-53.31	17.25	-45.86	-40.97	155.34	80.09
175/ 5	-53.31	17.25	-45.86	-40.97	-133.61	-28.57
176/ 5	-344.95	-1.78	30.82	35.78	-108.83	-13.78
176/ 9	-344.95	-1.78	30.82	35.78	85.52	-2.67
177/ 1	-486.82	-0.22	2.26	-1.57	-13.34	2.46
177/ 1	-486.82	-0.22	2.26	-1.57	11.71	4.92
178/ 1	407.39	-0.03	2.49	2.10	-13.03	3.05
178/ 5	407.39	-0.03	2.49	2.10	14.66	3.40
179/ 1	271.57	0.59	25.68	4.07	-70.18	1.40
179/ 1	271.57	0.59	25.68	4.07	91.63	-2.31
180/ 1	-239.82	0.40	-39.85	-4.59	116.36	-0.82
180/ 4	-239.82	0.40	-39.85	-4.59	-134.68	-3.33
181/ 1	-524.20	1.98	-0.29	-9.25	7.63	25.30
181/ 1	-524.20	1.98	-0.29	-9.25	4.70	5.13
182/ 1	451.25	-1.74	0.71	9.96	-8.81	5.12
182/ 4	451.25	-1.74	0.71	9.96	-1.59	22.80
183/ 1	315.71	-1.05	23.81	10.71	-65.37	-2.85
183/ 1	315.71	-1.05	23.81	10.71	84.66	3.76
184/ 1	-288.12	2.67	-34.11	-9.22	98.17	4.32
184/ 3	-288.12	2.67	-34.11	-9.22	-116.73	-12.49
185/ 1	-528.99	3.35	0.88	-4.69	1.32	23.93
185/ 1	-528.99	3.35	0.88	-4.69	10.07	-10.17
186/ 1	461.80	-2.92	1.38	5.97	-12.48	-7.60
186/ 3	461.80	-2.92	1.38	5.97	1.53	21.98
187/ 1	357.88	-2.08	19.01	-2.80	-45.64	-5.33
187/ 1	357.88	-2.08	19.01	-2.80	74.15	7.79
188/ 1	-256.87	4.19	-34.10	4.71	96.69	7.32
188/ 3	-256.87	4.19	-34.10	4.71	-118.13	-19.08
189/ 1	-840.95	-1.99	-0.76	-8.89	1.18	-5.74
189/ 6	-840.95	-1.99	-0.76	-8.89	-8.62	19.90
190/ 6	515.43	-1.01	1.75	1.94	-25.11	-5.39
190/ 3	515.43	-1.01	1.75	1.94	-2.55	7.68
191/ 9	229.22	-36.90	29.38	18.30	-67.75	-127.77
191/ 6	229.22	-36.90	29.38	18.30	117.37	104.73
192/ 6	-337.97	38.39	-50.39	-18.99	144.17	120.27
192/ 2	-337.97	38.39	-50.39	-18.99	-173.26	-121.61
193/ 9	-776.08	-1.55	6.56	-20.70	-56.69	6.20
193/ 5	-776.08	-1.55	6.56	-20.70	27.84	26.13
194/ 5	730.18	-6.17	-3.81	7.42	-5.62	-34.78
194/ 2	730.18	-6.17	-3.81	7.42	-54.66	44.75
195/ 9	806.44	-9.01	-12.12	-0.31	100.20	-19.86
195/ 5	806.44	-9.01	-12.12	-0.31	23.84	36.94
196/ 5	62.67	27.13	-32.33	6.67	82.31	76.62
196/ 2	62.67	27.13	-32.33	6.67	-121.34	-94.31
197/ 1	-269.02	-0.27	2.60	-2.34	-14.63	3.27
197/ 1	-269.02	-0.27	2.60	-2.34	14.18	6.29
198/ 1	489.42	0.14	1.94	2.61	-10.52	5.34
198/ 5	489.42	0.14	1.94	2.61	10.97	3.75



Anson House, Schooner Court,
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Project:
Gelderland Central Power Station

Job Ref.: C2002

Part of Structure: Air Heaters & Denox Support Structures.

Sheet No./rev.:

Calc. by:
5.1.2e

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30/03/22

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30/03/22

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Calculations

Output

Member/Node/Case	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
199/ 1	174.36	0.25	-97.67	5.98	314.37	0.93
199/ 1	174.36	0.25	-97.67	5.98	-300.95	-0.66
200/ 1	-259.80	-0.16	84.18	-6.40	-276.26	0.09
200/ 3	-259.80	-0.16	84.18	-6.40	254.05	1.12
201/ 1	-318.58	1.46	1.68	-1.36	-4.18	9.93
201/ 1	-318.58	1.46	1.68	-1.36	12.92	-4.95
202/ 1	520.29	-1.33	-1.09	1.10	-1.54	-4.45
202/ 3	520.29	-1.33	-1.09	1.10	-12.84	9.10
203/ 1	202.11	-1.73	-85.08	-3.25	275.67	-4.74
203/ 1	202.11	-1.73	-85.08	-3.25	-260.34	6.13
204/ 1	-317.35	1.07	75.11	2.61	-245.89	5.62
204/ 3	-317.35	1.07	75.11	2.61	227.29	-1.09
205/ 1	-323.68	-1.13	2.00	-14.29	-5.09	18.76
205/ 1	-323.68	-1.13	2.00	-14.29	15.31	30.32
206/ 1	520.08	1.10	0.14	13.65	-6.84	30.14
206/ 3	520.08	1.10	0.14	13.65	-5.41	18.94
208/ 1	199.51	0.85	-84.71	33.23	275.46	4.61
208/ 1	199.51	0.85	-84.71	33.23	-258.21	-0.74
209/ 1	-324.20	-1.39	70.75	-31.55	-236.06	-1.13
209/ 2	-324.20	-1.39	70.75	-31.55	209.66	7.60
210/ 1	-430.66	1.82	10.61	-24.78	-107.63	37.51
210/ 1	-430.66	1.82	10.61	-24.78	29.32	14.03
211/ 1	601.69	-7.00	-8.29	15.66	2.27	-26.18
211/ 2	601.69	-7.00	-8.29	15.66	-104.78	64.11
212/ 9	138.76	51.80	-73.77	-1.44	247.68	171.35
212/ 1	138.76	51.80	-73.77	-1.44	-217.10	-155.01
213/ 1	-370.11	-38.62	47.07	8.25	-175.16	-129.11
213/ 2	-370.11	-38.62	47.07	8.25	121.41	114.22
214/ 1	-261.26	36.37	-358.15	-46.38	3514.79	213.44
214/ 1	-261.26	36.37	-358.15	-46.38	-997.88	-244.82
215/ 7	-378.74	8.73	332.73	-81.84	-822.95	-1.80
215/ 1	-208.54	-20.34	-285.08	24.35	-571.35	73.97
216/ 8	-226.58	-39.47	-358.44	-13.25	3803.71	-232.37
216/ 1	-226.58	-39.47	-358.44	-13.25	-712.68	264.90
217/ 8	-178.67	-42.80	437.85	-30.70	-749.33	-287.57
217/ 1	-112.70	-54.19	-418.25	14.85	-678.70	317.48
218/ 8	-302.15	-88.02	-341.80	33.68	3633.12	-567.96
218/ 1	-302.15	-88.02	-341.80	33.68	-673.62	541.09
219/ 8	-224.46	-82.78	465.31	86.16	-840.39	-463.14
219/ 1	-184.93	-54.79	-440.76	-23.62	-737.44	389.36
220/ 9	305.70	-100.18	-347.32	42.16	3344.03	-645.42
220/ 2	305.70	-100.18	-347.32	42.16	-1032.26	616.84
221/ 9	-666.14	-39.85	348.75	88.92	-799.58	-201.07
221/ 2	89.01	-8.20	-367.79	-29.85	-944.77	96.16
222/ 1	529.90	-14.04	-19.36	-5.49	128.26	-75.71
222/ 1	529.90	-14.04	-19.36	-5.49	-68.27	66.77
223/ 1	238.25	15.03	5.59	-1.69	-19.58	71.66
223/ 1	238.25	15.03	5.59	-1.69	37.13	-80.94
224/ 8	595.79	-6.79	-22.59	3.54	149.13	-39.12
224/ 1	595.79	-6.79	-22.59	3.54	-80.22	29.80
225/ 1	471.34	4.60	8.23	4.64	-28.84	29.17
225/ 1	471.34	4.60	8.23	4.64	54.94	-17.53



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Part of Structure: Air Heaters & Denox Support Structures.

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Member/Node/Case	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
226/ 8	608.71	12.48	-21.98	10.45	144.27	56.38
226/ 1	608.71	12.48	-21.98	10.45	-78.83	-70.14
227/ 1	525.19	-15.53	7.88	8.59	-27.12	-71.33
227/ 1	525.19	-15.53	7.88	8.59	52.84	86.28
228/ 9	1062.11	13.17	-16.02	11.69	109.96	63.28
228/ 1	1062.11	13.17	-16.02	11.69	-52.71	-70.39
229/ 1	-166.37	-18.49	6.78	6.83	-27.43	-84.93
229/ 2	-166.37	-18.49	6.78	6.83	41.39	102.79
230/ 7	-43.32	10.94	-2.05	32.63	-3.15	56.14
230/ 5	-43.32	10.94	-2.05	32.63	-29.60	-84.83
231/ 5	516.45	-0.09	10.20	-1.94	-113.30	-10.66
231/ 9	516.45	-0.09	10.20	-1.94	18.06	-9.47
232/ 7	433.97	19.48	-150.13	1.95	616.76	123.51
232/ 5	433.97	19.48	-150.13	1.95	-329.05	0.78
233/ 5	334.97	46.22	79.75	-14.61	-298.69	108.74
233/ 1	334.97	46.22	79.75	-14.61	203.75	-182.46
234/ 5	333.08	-26.56	52.85	-53.37	-190.11	-147.31
234/ 1	333.08	-26.56	52.85	-53.37	345.20	121.66
235/ 9	-928.11	2.97	-19.56	56.95	159.68	-21.73
235/ 5	-928.11	2.97	-19.56	56.95	-38.43	-51.80
236/ 5	-276.53	-2.09	-2.44	-1.49	-29.68	-17.70
236/ 2	-276.53	-2.09	-2.44	-1.49	-54.37	3.45
237/ 9	1220.08	3.93	-36.03	-8.48	267.78	1.07
237/ 5	1220.08	3.93	-36.03	-8.48	40.78	-23.69
238/ 5	440.53	-28.92	-52.36	19.77	127.06	-76.36
238/ 2	440.53	-28.92	-52.36	19.77	-202.82	105.80
239/ 5	-601.61	5.04	-0.79	-45.29	16.88	18.58
239/ 9	-601.61	5.04	-0.79	-45.29	8.84	-32.46
240/ 7	-327.24	-144.77	-244.75	3.65	3849.91	-305.63
240/ 1	-327.24	-144.77	-244.75	3.65	2328.26	475.95
241/ 1	-237.85	143.14	-447.93	0.0	2020.18	645.58
241/ 1	-237.85	143.14	-447.93	0.0	0.0	0.0
242/ 1	-317.10	-162.87	190.55	-78.79	4326.25	-467.17
242/ 1	-317.10	-162.87	190.55	-78.79	5355.21	412.31
243/ 1	46.02	81.39	-1276.47	0.0	5756.90	367.05
243/ 1	46.02	81.39	-1276.47	0.0	0.0	0.0
244/ 8	-859.99	-9.60	450.68	33.63	4976.50	-5.02
244/ 1	-859.99	-9.60	450.68	33.63	7410.19	46.80
245/ 1	111.55	34.61	-1738.90	0.0	7842.42	156.09
245/ 1	111.55	34.61	-1738.90	0.0	0.0	0.0
246/ 8	-826.79	-83.71	487.96	-97.56	4724.56	-177.87
246/ 1	-826.79	-83.71	487.96	-97.56	7359.55	186.16
247/ 1	110.38	7.35	-1709.50	0.0	7709.87	33.17
247/ 1	110.38	7.35	-1709.50	0.0	0.0	0.0
248/ 9	-325.78	195.82	196.00	140.26	4024.53	602.96
248/ 1	-325.78	195.82	196.00	140.26	5082.92	-454.49
249/ 1	1319.39	92.94	-1195.72	0.0	5392.69	419.16
249/ 1	1319.39	92.94	-1195.72	0.0	0.0	0.0
250/ 9	454.02	292.87	-256.18	85.13	3521.57	968.34
250/ 1	454.02	292.87	-256.18	85.13	2138.20	-613.14
251/ 1	150.55	34.78	-424.76	0.0	1915.68	156.85
251/ 1	150.55	34.78	-424.76	0.0	0.0	0.0



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Part of Structure: Air Heaters & Denox Support
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Member/Node/Case	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
252/ 1	-170.81	175.87	-29.57	-0.00	265.94	1581.87
252/ 1	-170.81	175.87	-29.57	-0.00	-0.00	-0.00
253/ 1	1509.01	92.33	-39.39	-0.00	354.30	830.43
253/ 1	1509.01	92.33	-39.39	-0.00	-0.00	0.00
254/ 1	287.92	-89.39	203.18	-308.08	3.65	-169.63
254/ 1	287.92	-89.39	203.18	-308.08	946.42	245.12
255/ 1	1483.95	59.41	79.60	-57.42	845.38	294.04
255/ 1	1483.95	59.41	79.60	-57.42	1348.45	-81.44
256/ 1	1495.46	-43.53	99.49	-243.46	1352.50	-51.26
256/ 1	1495.46	-43.53	99.49	-243.46	1981.26	223.85
257/ 1	2107.09	3.95	-13.47	46.98	2050.03	133.52
257/ 1	2107.09	3.95	-13.47	46.98	1963.28	109.07
258/ 1	2379.79	53.25	-115.77	256.00	1826.86	229.56
258/ 1	2379.79	53.25	-115.77	256.00	1095.18	-108.99
259/ 1	2376.19	-55.21	-89.52	57.15	1091.93	-117.57
259/ 1	2376.19	-55.21	-89.52	57.15	526.18	231.34
260/ 1	258.09	-303.47	-168.58	222.52	697.09	-638.10
260/ 1	258.09	-303.47	-168.58	222.52	-85.13	769.99
266/ 7	1047.81	-3.13	1.95	-45.38	32.40	-7.24
266/ 1	1047.81	-3.13	1.95	-45.38	51.11	22.75
267/ 1	-112.71	2.68	-4.45	39.13	84.67	19.09
267/ 8	-112.71	2.68	-4.45	39.13	47.72	-3.21
268/ 8	-102.94	-11.50	19.89	4.05	78.65	-31.94
268/ 1	-102.94	-11.50	19.89	4.05	188.04	30.18
269/ 8	879.94	-6.36	13.20	-43.50	39.33	-21.01
269/ 1	879.94	-6.36	13.20	-43.50	149.03	31.83
270/ 1	501.12	4.68	-15.93	44.66	155.68	24.23
270/ 9	501.12	4.68	-15.93	44.66	23.28	-14.65
271/ 9	-108.46	3.61	26.25	-3.26	57.07	6.90
271/ 1	-108.46	3.61	26.25	-3.26	198.84	-10.58
272/ 9	28.48	-3.81	5.73	-39.86	36.94	-12.44
272/ 1	28.48	-3.81	5.73	-39.86	84.53	19.24
273/ 1	2483.10	6.13	-2.49	44.58	39.69	15.04
273/ 9	2483.10	6.13	-2.49	44.58	15.77	-43.76
274/ 8	742.67	-1.16	0.01	-12.53	31.81	-1.53
274/ 1	742.67	-1.16	0.01	-12.53	31.90	8.22
275/ 1	19.74	-0.57	-5.30	0.00	41.64	-4.51
275/ 1	19.74	-0.57	-5.30	0.00	0.00	0.00
276/ 8	447.34	0.94	0.56	12.79	31.62	0.92
276/ 1	447.34	0.94	0.56	12.79	36.31	-7.00
277/ 1	-289.65	0.75	-4.71	0.00	37.00	5.86
277/ 1	-289.65	0.75	-4.71	0.00	0.00	0.00
278/ 1	3434.79	-10.76	-38.56	-49.24	738.27	-176.23
278/ 1	3434.79	-10.76	-38.56	-49.24	113.58	-1.95
279/ 1	3434.79	-10.76	-38.56	-49.24	113.58	-1.95
279/ 1	3434.79	-10.76	-38.56	-49.24	-950.72	294.96
280/ 1	2986.86	-248.61	104.58	-49.24	-950.72	294.96
280/ 1	2986.86	-248.61	104.58	-49.24	-720.63	841.91
281/ 1	3299.54	-8.97	0.60	28.32	141.54	-81.17
281/ 1	3299.54	-8.97	0.60	28.32	151.30	64.20
282/ 1	3299.54	-8.97	0.60	28.32	151.30	64.20
282/ 1	3299.54	-8.97	0.60	28.32	167.93	311.87



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Member/Node/Case	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
283/ 1	2874.78	141.58	35.38	28.32	167.93	311.67
283/ 1	2874.78	141.58	35.38	28.32	245.77	0.40
284/ 1	2502.47	42.70	-82.88	87.37	-867.02	250.99
284/ 1	2502.47	42.70	-82.88	87.37	-908.50	126.57
285/ 1	4258.52	24.72	273.28	-23.07	-1033.38	130.62
285/ 1	4258.52	24.72	273.28	-23.07	650.01	-21.64
286/ 1	6596.13	-10.56	77.22	-62.87	318.22	-10.85
286/ 1	6596.13	-10.56	77.22	-62.87	793.87	54.20
287/ 1	4422.83	9.90	-41.84	24.27	568.03	59.87
287/ 1	4422.83	9.90	-41.84	24.27	310.28	-1.14
288/ 1	4317.45	9.95	-229.85	41.88	543.28	-7.38
288/ 1	4317.45	9.95	-229.85	41.88	-872.61	-68.64
289/ 1	2574.85	-3.96	129.70	77.53	-773.82	-32.06
289/ 1	2574.85	-3.96	129.70	77.53	-395.90	-20.53
290/ 1	-2063.43	-137.62	-607.57	4.70	150.13	-56.66
290/ 1	-2063.43	-137.62	-607.57	4.70	-1664.50	354.38
291/ 1	-1896.33	-151.51	977.98	298.94	-1786.04	236.50
291/ 1	-2205.77	-13.59	-178.35	-47.71	71.64	-148.85
292/ 1	-6907.45	-12.52	141.10	-13.59	-186.89	-124.08
292/ 1	-6907.45	-12.52	141.10	-13.59	682.48	-46.93
293/ 1	-4349.34	-61.64	-128.96	-4.10	616.91	-172.85
293/ 1	-4349.34	-61.64	-128.96	-4.10	-177.43	206.87
294/ 1	-1834.05	-105.91	210.85	128.40	52.12	172.09
294/ 1	-1960.06	-282.67	-1036.05	-131.79	-1860.93	-294.27
295/ 1	-2198.40	-291.31	559.72	-277.21	-1725.34	-144.97
295/ 1	-2198.40	-291.31	559.72	-277.21	-53.62	725.09
296/ 1	7694.54	-4.61	102.57	-33.39	591.54	71.86
296/ 1	7694.54	-4.61	102.57	-33.39	1223.38	100.23
297/ 1	6725.61	5.34	-142.69	0.12	1249.98	94.87
297/ 1	6725.61	5.34	-142.69	0.12	371.02	61.94
298/ 1	-6661.98	-62.94	932.85	-24.50	372.40	155.02
298/ 1	-6712.43	60.41	-811.34	-24.50	502.45	145.53
299/ 1	-7717.58	46.19	798.37	-8.04	530.42	166.01
299/ 1	-7962.63	-8.98	-915.84	-8.04	408.59	43.69
300/ 1	204.73	-8.64	-60.92	7.97	135.58	-51.10
300/ 1	204.73	-8.64	-60.92	7.97	-128.39	-13.95
301/ 1	-2930.65	9.34	0.06	-10.84	-1.52	26.65
301/ 1	-2930.65	9.34	0.06	-10.84	-1.04	-43.55
302/ 1	1337.72	-34.92	-112.24	5.28	228.51	-98.67
302/ 1	1337.72	-34.92	-112.24	5.28	-254.11	51.48
303/ 1	-2702.69	0.36	-16.11	-6.42	77.68	-11.20
303/ 1	-2702.69	0.36	-16.11	-6.42	-43.30	-13.89
304/ 1	729.89	1.65	-87.27	10.11	201.20	-7.19
304/ 1	729.89	1.65	-87.27	10.11	-174.06	-14.29
305/ 1	-1232.38	-4.30	-1.06	-8.13	28.27	-14.88
305/ 1	-1232.38	-4.30	-1.06	-8.13	20.30	17.44
306/ 1	-905.18	9.92	5.98	-1.52	-7.67	13.14
306/ 1	-905.18	9.92	5.98	-1.52	18.05	-29.53
307/ 1	1167.33	-0.03	10.06	-5.47	-8.55	0.86
307/ 1	1167.33	-0.03	10.06	-5.47	67.04	1.07
308/ 1	-1434.66	3.52	92.23	0.77	-206.85	-1.66
308/ 1	-1434.66	3.52	92.23	0.77	189.72	-16.80



Anson House, Schooner Court,
Crossways Business Park, Dartford,
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Project:
Gelderland Central Power Station

Job Ref.: C2002

Part of Structure: Air Heaters & Denox Support
Structures.

Sheet No./rev.:

Calc. by:
5.1.2e

Date:
30/03/22

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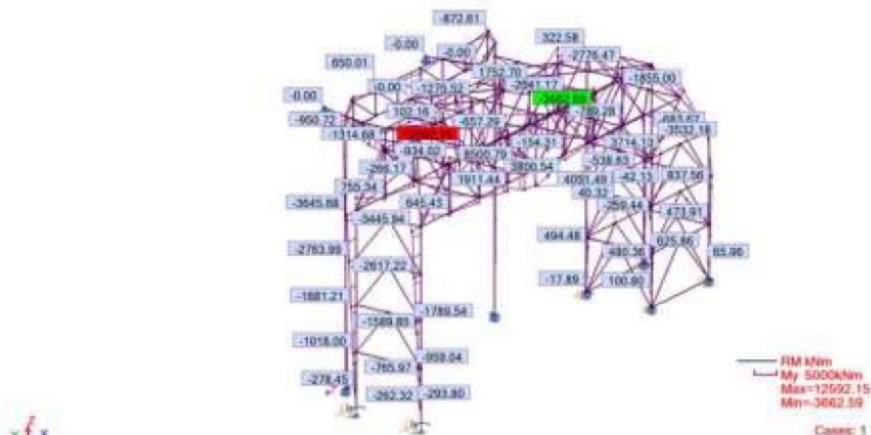
Ref.

Calculations

Output

Member/Node/Case	FX (kN)	FY (kN)	FZ (kN)	MX (kNm)	MY (kNm)	MZ (kNm)
309/ 1	2691.53	-1.04	6.21	-7.66	-7.29	-1.87
309/ 1	2691.53	-1.04	6.21	-7.66	39.35	5.96
310/ 1	-188.01	0.04	105.38	-6.24	-220.13	-17.43
310/ 1	-188.01	0.04	105.38	-6.24	233.00	-17.61
311/ 1	-2910.41	-0.01	-1.29	6.03	1.15	-15.50
311/ 1	-2910.41	-0.01	-1.29	6.03	-8.57	-15.39
312/ 1	131.02	13.89	53.23	-0.29	-107.35	24.99
312/ 1	131.02	13.89	53.23	-0.29	121.54	-34.72
313/ 2	-10606.59	28.27	65.37	2.97	-321.39	167.95
313/ 2	-10606.59	28.27	65.37	2.97	413.06	-149.74
314/ 5	251.62	0.79	4.40	-2.44	-15.92	8.94
314/ 4	251.62	0.79	4.40	-2.44	37.34	-0.58
315/ 4	-210.68	-1.01	4.27	2.84	-36.55	-2.39
315/ 5	-210.68	-1.01	4.27	2.84	15.13	9.84
316/ 1	205.66	0.70	4.81	-2.13	-17.89	7.97
316/ 1	205.66	0.70	4.81	-2.13	40.32	-0.49
317/ 1	-174.68	-0.94	4.71	2.55	-39.73	-2.39
317/ 1	-174.68	-0.94	4.71	2.55	17.29	8.93
318/ 2	10386.95	123.59	276.08	69.37	-1102.28	452.82
318/ 2	10386.95	123.59	276.08	69.37	1095.33	-530.92

View - MY, Reaction moments (kN*m), Cases: 1





Anson House, Schooner Court,
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Project:
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Part of Structure: Air Heaters & Denox Support Structures.

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Calculations

Output

stresses: values

- Case: 1 (1.5 x Vertical Load + 1.5 x Horizontal Load)

Member/Node/Case	S max (MPa)	S min (MPa)	S max(My) (MPa)	S max(Mz) (MPa)	S min(My) (MPa)	S min(Mz) (MPa)
1/ 1	170.39	107.46	0.0	31.47	0.0	-31.47
1/ 2	114.39	81.05	7.18	9.49	-7.18	-9.49
2/ 2	114.39	81.05	7.18	9.49	-7.18	-9.49
2/ 3	114.29	81.14	8.04	8.53	-8.04	-8.53
3/ 3	114.29	81.14	8.04	8.53	-8.04	-8.53
3/ 4	124.53	70.91	20.97	5.84	-20.97	-5.84
4/ 4	124.53	70.91	20.97	5.84	-20.97	-5.84
4/ 5	135.69	59.75	26.26	11.71	-26.26	-11.71
5/ 5	130.53	59.57	25.23	10.26	-25.23	-10.26
5/ 6	139.45	50.65	43.53	0.87	-43.53	-0.87
6/ 6	139.45	50.65	43.53	0.87	-43.53	-0.87
6/ 7	145.98	44.12	49.00	1.93	-49.00	-1.93
7/ 7	142.25	45.13	47.53	1.03	-47.53	-1.03
7/ 8	168.04	21.34	71.66	0.69	-71.66	-0.69
8/ 8	163.30	20.14	69.46	2.12	-69.46	-2.12
8/ 9	191.07	-7.63	94.35	5.00	-94.35	-5.00
9/ 5	225.42	205.04	2.65	7.54	-2.65	-7.54
9/ 4	223.89	206.56	2.76	5.90	-2.76	-5.90
10/ 4	223.89	206.56	2.76	5.90	-2.76	-5.90
10/ 4	231.15	199.30	13.15	2.77	-13.15	-2.77
11/ 4	231.15	199.30	13.15	2.77	-13.15	-2.77
11/ 3	233.93	196.52	17.14	1.57	-17.14	-1.57
12/ 3	230.72	191.88	14.43	4.98	-14.43	-4.98
12/ 3	219.60	203.01	7.10	1.19	-7.10	-1.19
13/ 3	219.60	203.01	7.10	1.19	-7.10	-1.19
13/ 3	227.87	194.73	13.54	3.04	-13.54	-3.04
14/ 3	228.92	181.83	20.42	3.12	-20.42	-3.12
14/ 2	313.18	97.57	101.69	6.11	-101.69	-6.11
15/ 5	-51.54	-77.27	2.40	10.47	-2.40	-10.47
15/ 4	-55.57	-73.25	1.81	7.03	-1.81	-7.03
16/ 4	-55.57	-73.25	1.81	7.03	-1.81	-7.03
16/ 4	-54.09	-74.73	9.88	0.44	-9.88	-0.44
17/ 4	-54.09	-74.73	9.88	0.44	-9.88	-0.44
17/ 4	-49.34	-79.47	12.98	2.09	-12.98	-2.09
18/ 4	-54.14	-82.41	12.52	1.62	-12.52	-1.62
18/ 3	-45.08	-91.48	22.93	0.27	-22.93	-0.27
19/ 3	-45.08	-91.48	22.93	0.27	-22.93	-0.27
19/ 3	-41.40	-95.15	26.04	0.83	-26.04	-0.83
20/ 3	-39.15	-100.41	28.34	2.29	-28.34	-2.29
20/ 3	-50.46	-89.09	18.72	0.60	-18.72	-0.60
21/ 9	-3.60	-169.19	77.61	5.19	-77.61	-5.19
21/ 1	-68.09	-104.69	17.67	0.63	-17.67	-0.63
22/ 1	-82.69	-92.78	3.93	1.11	-3.93	-1.11
22/ 1	-45.54	-129.93	30.92	11.28	-30.92	-11.28
23/ 1	-150.74	-194.07	4.40	17.26	-4.40	-17.26
23/ 1	-115.87	-228.94	52.34	4.20	-52.34	-4.20
24/ 1	-182.87	-258.88	30.78	7.23	-30.78	-7.23
24/ 1	-116.15	-325.60	96.45	8.28	-96.45	-8.28
25/ 1	-108.44	-334.46	96.04	16.97	-96.04	-16.97
25/ 1	-109.64	-333.25	104.06	7.75	-104.06	-7.75



Anson House, Schooner Court,
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Project:
Gelderland Central Power Station

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Part of Structure: Air Heaters & Denox Support Structures.

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Calculations

Output

Member/Node/Case	S max (MPa)	S min (MPa)	S max(My) (MPa)	S max(Mz) (MPa)	S min(My) (MPa)	S min(Mz) (MPa)
26/ 1	-73.45	-310.71	110.93	7.70	-110.93	-7.70
26/ 1	-96.21	-287.95	86.99	8.88	-86.99	-8.88
27/ 1	-85.48	-299.83	87.64	19.54	-87.64	-19.54
27/ 2	-185.85	-199.47	4.23	2.59	-4.23	-2.59
28/ 2	-68.90	-150.75	34.38	6.55	-34.38	-6.55
28/ 2	-84.97	-134.69	0.94	23.92	-0.94	-23.92
29/ 2	74.08	-62.22	40.17	27.97	-40.17	-27.97
29/ 2	37.25	-25.39	21.61	9.71	-21.61	-9.71
30/ 2	172.25	97.92	28.13	9.04	-28.13	-9.04
30/ 2	232.62	37.55	96.71	0.82	-96.71	-0.82
31/ 9	144.28	93.67	17.98	7.32	-17.98	-7.32
31/ 1	162.70	75.25	25.57	18.15	-25.57	-18.15
32/ 1	234.86	101.93	46.67	19.79	-46.67	-19.79
32/ 1	275.09	61.70	79.86	26.84	-79.86	-26.84
34/ 1	286.70	148.72	50.37	18.62	-50.37	-18.62
34/ 1	253.49	181.94	18.00	17.78	-18.00	-17.78
35/ 1	302.04	171.58	46.01	19.22	-46.01	-19.22
35/ 1	478.94	-5.32	232.76	9.37	-232.76	-9.37
36/ 1	485.53	-12.65	232.66	16.42	-232.66	-16.42
36/ 1	304.29	168.59	52.92	14.93	-52.92	-14.93
37/ 1	299.62	172.42	48.59	15.01	-48.59	-15.01
37/ 1	463.86	8.17	221.20	6.65	-221.20	-6.65
38/ 1	480.02	-10.18	221.98	23.11	-221.98	-23.11
38/ 2	320.38	149.46	72.32	13.14	-72.32	-13.14
39/ 2	227.50	143.66	29.39	12.52	-29.39	-12.52
39/ 2	242.63	128.53	34.91	22.13	-34.91	-22.13
40/ 2	183.05	20.17	77.15	4.29	-77.15	-4.29
40/ 2	206.74	-3.53	76.02	29.11	-76.02	-29.11
41/ 2	45.15	-75.84	31.70	28.79	-31.70	-28.79
41/ 2	-1.75	-28.93	8.67	4.92	-8.67	-4.92
42/ 2	-50.58	-86.66	16.59	1.45	-16.59	-1.45
42/ 2	-15.05	-122.19	50.79	2.78	-50.79	-2.78
43/ 2	-48.61	-153.36	49.27	3.11	-49.27	-3.11
43/ 3	-80.64	-121.33	16.99	3.36	-16.99	-3.36
44/ 1	104.80	-87.82	95.17	1.14	-95.17	-1.14
44/ 1	105.34	-88.36	92.67	3.99	-92.67	-3.99
45/ 1	-112.68	-222.47	52.13	2.77	-52.13	-2.77
45/ 1	-128.19	-206.95	25.85	13.53	-25.85	-13.53
46/ 1	232.28	-11.96	111.88	10.25	-111.88	-10.25
46/ 1	247.77	-27.45	124.65	12.95	-124.65	-12.95
47/ 1	3.27	-127.05	59.68	5.48	-59.68	-5.48
47/ 1	-36.02	-87.76	0.58	25.29	-0.58	-25.29
48/ 1	232.43	107.59	14.64	47.78	-14.64	-47.78
48/ 1	239.45	100.57	12.84	56.80	-12.84	-56.80
49/ 1	-137.22	-194.92	6.15	22.70	-6.15	-22.70
49/ 2	-94.41	-237.72	68.58	3.08	-68.58	-3.08
50/ 2	-32.58	-157.18	55.26	7.04	-55.26	-7.04
50/ 2	-45.66	-144.09	38.71	10.51	-38.71	-10.51
51/ 2	-125.06	-161.12	5.28	12.75	-5.28	-12.75
51/ 2	-121.48	-164.70	20.02	1.59	-20.02	-1.59
52/ 2	-114.01	-169.13	27.55	0.01	-27.55	-0.01
52/ 2	-127.27	-155.87	10.38	3.91	-10.38	-3.91



Anson House, Schooner Court,
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Part of Structure: Air Heaters & Denox Support Structures.

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Calculations

Output

Member/Node/Case	S max (MPa)	S min (MPa)	S max(My) (MPa)	S max(Mz) (MPa)	S min(My) (MPa)	S min(Mz) (MPa)
53/ 2	126.47	98.80	3.27	10.67	-3.27	-10.67
53/ 2	123.84	101.23	1.57	9.73	-1.57	-9.73
54/ 2	219.91	145.72	35.80	1.29	-35.80	-1.29
54/ 2	200.50	165.13	17.61	0.07	-17.61	-0.07
55/ 2	194.31	169.49	9.55	2.86	-9.55	-2.86
55/ 2	206.39	157.41	16.53	7.98	-16.53	-7.98
56/ 1	-163.96	-238.10	36.76	0.31	-36.76	-0.31
56/ 1	-168.25	-233.80	17.26	15.52	-17.26	-15.52
57/ 1	243.94	25.87	94.18	14.86	-94.18	-14.86
57/ 1	248.83	20.98	93.26	20.67	-93.26	-20.67
58/ 2	289.31	-36.33	154.48	8.34	-154.48	-8.34
58/ 2	273.80	-20.82	141.24	6.06	-141.24	-6.06
60/ 2	110.86	91.42	9.22	0.51	-9.22	-0.51
60/ 3	112.52	89.76	11.18	0.20	-11.18	-0.20
61/ 3	119.02	101.48	8.73	0.04	-8.73	-0.04
61/ 3	121.14	99.36	8.80	2.08	-8.80	-2.08
63/ 2	-167.61	-252.90	23.16	19.48	-23.16	-19.48
63/ 2	-173.49	-247.03	26.68	10.09	-26.68	-10.09
64/ 2	223.24	0.08	95.23	16.35	-95.23	-16.35
64/ 2	230.20	-6.88	107.02	11.52	-107.02	-11.52
65/ 3	36.89	-5.05	20.94	0.03	-20.94	-0.03
65/ 3	22.19	9.66	6.20	0.06	-6.20	-0.06
66/ 3	-2.26	-26.02	11.72	0.16	-11.72	-0.16
66/ 3	-5.06	-23.21	9.06	0.01	-9.06	-0.01
67/ 3	40.52	2.62	18.66	0.29	-18.66	-0.29
67/ 3	36.22	6.92	14.65	0.00	-14.65	-0.00
68/ 3	49.80	-14.09	31.90	0.05	-31.90	-0.05
68/ 3	62.85	-26.94	44.77	0.02	-44.77	-0.02
69/ 3	6.09	2.14	1.91	0.08	-1.91	-0.08
69/ 3	12.88	-4.45	8.55	0.01	-8.55	-0.01
70/ 3	12.68	-4.45	8.55	0.01	-8.55	-0.01
70/ 3	14.37	-8.14	10.23	0.02	-10.23	-0.02
71/ 3	5.71	-8.44	6.97	0.10	-6.97	-0.10
71/ 3	5.27	-8.01	6.58	0.06	-6.58	-0.06
72/ 3	5.27	-8.01	6.58	0.06	-6.58	-0.06
72/ 4	2.24	-4.98	3.60	0.00	-3.60	-0.00
73/ 4	5.76	-3.81	4.02	0.77	-4.02	-0.77
73/ 4	8.76	-6.81	7.68	0.13	-7.68	-0.13
74/ 4	17.60	-40.94	29.26	0.01	-29.26	-0.01
74/ 3	18.85	-41.99	30.31	0.02	-30.31	-0.02
81/ 5	0.0	0.0	0.0	0.0	0.0	0.0
81/ 5	0.0	0.0	0.0	0.0	0.0	0.0
82/ 6	179.81	118.99	0.0	30.46	0.0	-30.46
82/ 6	122.00	88.10	7.62	9.32	-7.62	-9.32
83/ 6	122.00	88.10	7.62	9.32	-7.62	-9.32
83/ 6	122.00	88.10	8.54	8.41	-8.54	-8.41
84/ 6	122.00	88.10	8.54	8.41	-8.54	-8.41
84/ 7	132.55	77.55	22.26	5.24	-22.26	-5.24
85/ 7	132.55	77.55	22.26	5.24	-22.26	-5.24
85/ 7	143.75	66.35	27.87	10.82	-27.87	-10.82
86/ 7	142.55	71.27	26.23	9.42	-26.23	-9.42
86/ 7	158.90	54.93	51.51	0.48	-51.51	-0.48



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Calculations

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Member/Node/Case	S max (MPa)	S min (MPa)	S max(My) (MPa)	S max(Mz) (MPa)	S min(My) (MPa)	S min(Mz) (MPa)
87/ 7	160.75	55.80	49.51	2.96	-49.51	-2.96
87/ 7	188.42	28.13	75.68	4.46	-75.68	-4.46
88/ 7	184.54	35.94	73.17	1.13	-73.17	-1.13
88/ 7	215.88	4.60	99.82	5.82	-99.82	-5.82
89/ 1	218.23	190.41	3.89	10.03	-3.89	-10.03
89/ 1	212.48	196.16	2.08	6.08	-2.08	-6.08
90/ 1	212.48	196.16	2.08	6.08	-2.08	-6.08
90/ 1	219.35	189.28	13.54	1.50	-13.54	-1.50
91/ 1	219.35	189.28	13.54	1.50	-13.54	-1.50
91/ 1	226.65	181.99	17.93	4.40	-17.93	-4.40
92/ 1	227.27	188.50	15.39	3.99	-15.39	-3.99
92/ 1	226.08	189.69	14.75	3.45	-14.75	-3.45
93/ 1	235.10	183.74	21.85	3.83	-21.85	-3.83
93/ 1	318.78	100.06	105.86	3.50	-105.86	-3.50
94/ 1	-73.39	-100.11	3.76	9.80	-3.76	-9.80
94/ 1	-78.46	-95.03	1.62	6.66	-1.62	-6.66
95/ 1	-78.46	-95.03	1.62	6.66	-1.62	-6.66
95/ 1	-74.52	-98.97	10.27	1.95	-10.27	-1.95
96/ 1	-74.52	-98.97	10.27	1.95	-10.27	-1.95
96/ 1	-72.91	-100.58	13.81	0.02	-13.81	-0.02
97/ 1	-68.51	-97.04	12.67	1.60	-12.67	-1.60
97/ 1	-53.23	-112.33	28.25	1.30	-28.25	-1.30
98/ 1	-45.44	-107.19	30.43	0.45	-30.43	-0.45
98/ 1	-50.99	-101.63	20.31	5.01	-20.31	-5.01
99/ 7	164.22	135.87	13.80	0.37	-13.80	-0.37
99/ 7	215.59	84.50	36.00	29.54	-36.00	-29.54
100/ 7	-12.61	-197.66	87.22	5.30	-87.22	-5.30
100/ 7	-74.99	-135.28	20.68	9.46	-20.68	-9.46
101/ 7	-92.18	-121.38	3.91	10.69	-3.91	-10.69
101/ 7	-75.24	-138.32	28.37	3.17	-28.37	-3.17
102/ 7	-206.31	-222.47	7.29	0.79	-7.29	-0.79
102/ 8	-132.13	-296.65	64.00	18.26	-64.00	-18.26
103/ 8	-229.03	-331.51	37.13	14.11	-37.13	-14.11
103/ 8	-171.29	-389.25	108.84	0.14	-108.84	-0.14
104/ 8	-164.08	-395.54	108.00	7.73	-108.00	-7.73
104/ 8	-147.83	-411.99	118.44	13.74	-118.44	-13.74
105/ 8	-102.07	-382.96	127.20	13.25	-127.20	-13.25
105/ 8	-140.76	-344.27	95.91	5.85	-95.91	-5.85
106/ 8	-136.54	-346.74	98.27	6.83	-98.27	-6.83
106/ 9	-226.28	-257.00	7.51	7.85	-7.51	-7.85
107/ 9	-77.07	-184.11	40.83	12.69	-40.83	-12.69
107/ 9	-82.83	-178.35	10.80	36.96	-10.80	-36.96
108/ 9	80.65	-60.88	40.56	30.21	-40.56	-30.21
108/ 9	49.57	-29.80	29.69	10.00	-29.69	-10.00
109/ 9	181.28	126.06	27.42	0.19	-27.42	-0.19
109/ 1	256.77	50.56	100.28	2.82	-100.28	-2.82
110/ 9	-16.13	-91.16	8.83	28.68	-8.83	-28.68
110/ 9	2.55	-109.84	48.94	7.26	-48.94	-7.26
111/ 9	-47.03	-151.49	48.58	3.65	-48.58	-3.65
111/ 1	-77.22	-121.30	18.47	3.57	-18.47	-3.57
112/ 7	182.17	91.60	43.01	2.27	-43.01	-2.27
112/ 7	159.06	114.72	2.73	19.44	-2.73	-19.44



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Part of Structure: Air Heaters & Denox Support Structures.

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113/ 7	163.82	107.89	2.79	25.17	-2.79	-25.17
113/ 1	238.51	33.20	75.28	27.37	-75.28	-27.37
114/ 1	264.17	99.20	53.19	29.80	-53.19	-29.80
114/ 8	184.41	177.95	1.82	1.41	-1.82	-1.41
115/ 8	178.10	173.32	1.91	0.48	-1.91	-0.48
115/ 8	191.29	160.12	12.31	3.29	-12.31	-3.29
116/ 8	229.95	156.17	34.94	1.95	-34.94	-1.95
116/ 8	454.92	-68.80	235.71	26.15	-235.71	-26.15
117/ 8	454.39	-75.86	233.99	31.13	-233.99	-31.13
117/ 8	232.79	145.74	23.88	19.65	-23.88	-19.65
118/ 8	228.85	148.97	20.24	19.70	-20.24	-19.70
118/ 8	431.84	-54.01	224.18	18.75	-224.18	-18.75
119/ 8	451.51	-68.63	227.88	32.19	-227.88	-32.19
119/ 8	262.19	120.70	66.53	4.22	-66.53	-4.22
120/ 8	180.11	116.42	30.74	1.10	-30.74	-1.10
120/ 9	169.44	127.09	16.65	4.53	-16.65	-4.53
121/ 9	172.43	129.28	16.84	4.74	-16.84	-4.74
121/ 9	183.92	117.79	32.81	0.26	-32.81	-0.26
122/ 9	157.81	8.93	66.53	7.91	-66.53	-7.91
122/ 9	127.26	39.48	19.05	24.84	-19.05	-24.84
123/ 9	149.06	21.85	20.64	42.96	-20.64	-42.96
123/ 9	189.23	-18.31	65.55	38.22	-65.55	-38.22
124/ 9	67.90	-57.40	27.63	35.02	-27.63	-35.02
124/ 9	21.05	-10.55	1.26	14.54	-1.26	-14.54
125/ 7	144.99	-124.24	103.25	31.36	-103.25	-31.36
125/ 7	127.34	-106.59	114.77	2.20	-114.77	-2.20
126/ 1	-122.66	-335.20	48.60	57.67	-48.60	-57.67
126/ 8	-169.70	-288.16	37.17	22.08	-37.17	-22.08
127/ 8	313.04	-3.10	121.75	36.32	-121.75	-36.32
127/ 8	356.03	-46.09	116.15	84.91	-116.15	-84.91
128/ 8	23.52	-193.09	53.16	55.14	-53.16	-55.14
128/ 8	-41.33	-128.25	0.08	43.38	-0.08	-43.38
129/ 8	335.43	114.47	12.85	97.63	-12.85	-97.63
129/ 8	388.27	61.63	8.25	155.07	-8.25	-155.07
130/ 8	-169.91	-264.32	12.88	34.33	-12.88	-34.33
130/ 8	-102.84	-331.39	67.80	46.48	-67.80	-46.48
131/ 9	-80.36	-176.43	45.94	2.10	-45.94	-2.10
131/ 9	-82.76	-194.03	58.92	6.72	-58.92	-6.72
132/ 9	-130.08	-151.77	3.27	7.58	-3.27	-7.58
132/ 9	-114.13	-167.72	26.79	0.01	-26.79	-0.01
133/ 9	-113.67	-164.40	24.46	0.91	-24.46	-0.91
133/ 9	-129.58	-148.49	5.54	3.91	-5.54	-3.91
134/ 9	114.50	104.81	1.30	3.54	-1.30	-3.54
134/ 1	119.57	99.75	0.10	9.81	-0.10	-9.81
135/ 1	216.83	141.37	37.15	0.58	-37.15	-0.58
135/ 9	197.20	160.99	17.47	0.64	-17.47	-0.64
136/ 9	198.97	157.33	18.57	2.25	-18.57	-2.25
136/ 9	209.72	146.58	30.08	1.49	-30.08	-1.49
137/ 7	-181.20	-330.49	30.58	44.06	-30.58	-44.06
137/ 7	-216.59	-295.10	30.79	8.47	-30.79	-8.47
138/ 7	322.15	18.84	106.29	45.37	-106.29	-45.37
138/ 1	365.11	-24.11	91.54	103.07	-91.54	-103.07



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139/ 8	397.40	-50.77	163.96	60.12	-163.96	-60.12
139/ 9	360.77	-14.14	164.06	23.40	-164.06	-23.40
140/ 9	-195.82	-326.75	52.47	13.00	-52.47	-13.00
140/ 9	-164.37	-358.20	52.42	44.50	-52.42	-44.50
141/ 9	361.79	-10.98	113.93	72.45	-113.93	-72.45
141/ 9	331.73	19.08	130.88	25.44	-130.88	-25.44
142/ 9	-209.37	-298.24	42.90	1.53	-42.90	-1.53
142/ 9	-198.86	-308.95	33.08	22.08	-33.08	-22.08
143/ 9	265.98	-1.66	118.88	14.94	-118.88	-14.94
143/ 9	265.43	-1.10	132.71	0.56	-132.71	-0.56
144/ 1	122.60	103.23	8.05	1.63	-8.05	-1.63
144/ 1	124.48	101.36	11.55	0.01	-11.55	-0.01
145/ 1	129.46	112.21	8.59	0.04	-8.59	-0.04
145/ 1	131.17	110.49	8.59	1.75	-8.59	-1.75
146/ 1	36.43	-8.46	22.34	0.11	-22.34	-0.11
146/ 1	20.50	7.46	6.35	0.17	-6.35	-0.17
147/ 1	0.84	-25.10	12.88	0.09	-12.88	-0.09
147/ 1	-2.28	-21.98	9.84	0.00	-9.84	-0.00
148/ 1	37.90	4.78	16.43	0.14	-16.43	-0.14
148/ 1	33.63	9.05	12.27	0.02	-12.27	-0.02
149/ 1	52.07	-10.57	31.32	0.00	-31.32	-0.00
149/ 1	66.17	-24.68	45.38	0.05	-45.38	-0.05
150/ 1	3.50	0.17	1.05	0.62	-1.05	-0.62
150/ 1	13.31	-9.63	11.46	0.01	-11.46	-0.01
151/ 1	8.36	-6.80	7.56	0.02	-7.56	-0.02
151/ 1	5.04	-3.48	4.20	0.06	-4.20	-0.06
152/ 1	1.43	-2.45	1.36	0.58	-1.36	-0.58
152/ 1	2.28	-3.30	2.20	0.59	-2.20	-0.59
153/ 1	14.99	-36.66	25.80	0.03	-25.80	-0.03
153/ 1	18.75	-38.42	27.57	0.01	-27.57	-0.01
160/ 1	0.0	0.0	0.0	0.0	0.0	0.0
160/ 1	0.0	0.0	0.0	0.0	0.0	0.0
163/ 7	9.58	-11.25	10.19	0.22	-10.19	-0.22
163/ 5	0.43	-2.10	0.00	1.26	-0.00	-1.26
164/ 5	0.43	-2.10	0.00	1.26	-0.00	-1.26
164/ 5	9.43	-11.10	10.17	0.10	-10.17	-0.10
165/ 7	7.48	-25.83	1.31	15.34	-1.31	-15.34
165/ 5	-5.56	-12.77	0.08	3.52	-0.08	-3.52
166/ 5	14.53	12.11	0.03	1.18	-0.03	-1.18
166/ 5	25.93	0.71	2.21	10.40	-2.21	-10.40
167/ 7	44.20	-31.72	37.23	0.73	-37.23	-0.73
167/ 5	41.80	-29.32	35.55	0.02	-35.55	-0.02
168/ 5	27.72	-42.86	35.12	0.17	-35.12	-0.17
168/ 7	25.23	-40.38	31.88	0.92	-31.88	-0.92
169/ 7	20.27	-30.02	0.04	25.11	-0.04	-25.11
169/ 5	-0.77	-8.98	1.42	2.69	-1.42	-2.69
170/ 5	12.46	5.42	0.37	3.15	-0.37	-3.15
170/ 7	30.03	-12.15	0.03	21.06	-0.03	-21.06
171/ 7	41.97	-37.61	36.60	3.19	-36.60	-3.19
171/ 5	39.23	-34.87	36.64	0.41	-36.64	-0.41
172/ 5	27.10	-39.91	33.09	0.41	-33.09	-0.41
172/ 8	24.51	-37.32	29.90	1.01	-29.90	-1.01



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173/ 7	25.47	-41.30	0.21	33.17	-0.21	-33.17
173/ 5	-2.71	-13.12	4.27	0.93	-4.27	-0.93
174/ 5	18.88	5.08	0.94	6.02	-0.94	-6.02
174/ 8	43.85	-19.82	0.01	31.83	-0.01	-31.83
175/ 7	48.68	-53.23	40.25	10.70	-40.25	-10.70
175/ 5	37.56	-42.11	38.09	1.74	-38.09	-1.74
176/ 5	17.21	-46.84	31.42	0.50	-31.42	-0.50
176/ 9	10.23	-39.68	24.92	0.02	-24.92	-0.02
177/ 1	-16.81	-24.72	3.82	0.13	-3.82	-0.13
177/ 1	-17.06	-24.46	3.15	0.56	-3.15	-0.56
178/ 1	21.28	13.47	3.70	0.20	-3.70	-0.20
178/ 5	21.78	12.99	4.16	0.22	-4.16	-0.22
179/ 1	32.05	-8.88	20.46	0.01	-20.46	-0.01
179/ 1	38.30	-15.14	26.71	0.02	-26.71	-0.02
180/ 1	23.70	-44.15	33.93	0.00	-33.93	-0.00
180/ 4	29.05	-49.50	39.25	0.02	-39.25	-0.02
181/ 1	-14.65	-30.06	0.64	7.06	-0.64	-7.06
181/ 1	-20.33	-24.39	0.93	1.10	-0.93	-1.10
182/ 1	22.22	16.27	2.22	0.75	-2.22	-0.75
182/ 4	25.91	12.58	0.03	6.63	-0.03	-6.63
183/ 1	32.54	-5.61	19.04	0.04	-19.04	-0.04
183/ 1	38.17	-11.24	24.66	0.05	-24.66	-0.05
184/ 1	16.36	-40.94	28.59	0.06	-28.59	-0.06
184/ 3	21.94	-46.52	33.84	0.39	-33.84	-0.39
185/ 1	-15.57	-29.55	0.02	6.97	-0.02	-6.97
185/ 1	-18.39	-26.73	2.07	2.11	-2.07	-2.11
186/ 1	23.98	15.40	3.09	1.20	-3.09	-1.20
186/ 3	26.12	13.27	0.03	6.39	-0.03	-6.39
187/ 1	28.66	1.87	13.22	0.18	-13.22	-0.18
187/ 1	37.00	-6.47	21.50	0.24	-21.50	-0.24
188/ 1	17.32	-39.23	28.11	0.16	-28.11	-0.16
188/ 3	23.93	-45.84	34.00	0.89	-34.00	-0.89
189/ 1	-25.63	-29.04	0.07	1.64	-0.07	-1.64
189/ 6	-21.01	-33.68	1.00	5.32	-1.00	-5.32
190/ 6	29.47	14.50	7.16	0.33	-7.16	-0.33
190/ 3	24.34	19.62	0.23	2.12	-0.23	-2.12
191/ 9	51.94	-32.39	9.25	32.91	-9.25	-32.91
191/ 6	55.84	-36.09	25.53	20.33	-25.53	-20.33
192/ 6	40.32	-69.15	32.28	22.46	-32.28	-22.46
192/ 2	47.30	-76.13	41.35	20.37	-41.35	-20.37
193/ 9	-16.47	-49.72	16.43	0.20	-16.43	-0.20
193/ 5	-21.96	-44.23	5.92	5.21	-5.92	-5.21
194/ 5	41.41	20.87	0.26	10.01	-0.26	-10.01
194/ 2	51.74	10.55	12.33	8.26	-12.33	-8.26
195/ 9	64.17	4.61	28.66	1.13	-28.66	-1.13
195/ 5	47.21	21.57	3.77	9.05	-3.77	-9.05
196/ 5	35.46	-30.11	17.56	15.22	-17.56	-15.22
196/ 2	47.48	-42.13	27.93	16.87	-27.93	-16.87
197/ 1	-7.10	-15.84	4.16	0.21	-4.16	-0.21
197/ 1	-6.95	-15.99	3.78	0.74	-3.78	-0.74
198/ 1	24.31	17.43	2.73	0.70	-2.73	-0.70
198/ 5	24.25	17.49	3.03	0.35	-3.03	-0.35



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199/ 1	99.09	-84.22	91.65	0.00	-91.65	-0.00
199/ 1	95.18	-80.31	87.74	0.00	-87.74	-0.00
200/ 1	69.46	-91.62	80.54	0.00	-80.54	-0.00
200/ 3	62.99	-85.15	74.07	0.00	-74.07	-0.00
201/ 1	-10.44	-16.73	0.47	2.67	-0.47	-2.67
201/ 1	-9.55	-17.62	3.52	0.52	-3.52	-0.52
202/ 1	23.56	20.82	0.15	1.23	-0.15	-1.23
202/ 3	26.73	17.65	2.99	1.55	-2.99	-1.55
203/ 1	89.00	-71.76	80.36	0.02	-80.36	-0.02
203/ 1	84.54	-67.30	75.88	0.04	-75.88	-0.04
204/ 1	58.17	-85.24	71.67	0.04	-71.67	-0.04
204/ 3	52.73	-79.80	66.27	0.00	-66.27	-0.00
205/ 1	-8.14	-19.47	0.39	5.28	-0.39	-5.28
205/ 1	-3.90	-23.71	2.01	7.89	-2.01	-7.89
206/ 1	31.19	13.17	0.44	8.57	-0.44	-8.57
206/ 3	27.92	16.44	0.43	5.31	-0.43	-5.31
208/ 1	88.83	-71.81	80.30	0.02	-80.30	-0.02
208/ 1	83.79	-66.77	75.28	0.00	-75.28	-0.00
209/ 1	55.00	-82.65	68.82	0.00	-68.82	-0.00
209/ 2	47.34	-74.99	61.09	0.08	-61.09	-0.08
210/ 1	14.86	-51.60	29.63	3.60	-29.63	-3.60
210/ 1	-8.89	-27.84	7.71	1.76	-7.71	-1.76
211/ 1	33.32	18.00	0.06	7.61	-0.06	-7.61
211/ 2	61.47	-10.15	26.06	9.76	-26.06	-9.76
212/ 9	93.72	-81.89	59.38	28.42	-59.38	-28.42
212/ 1	83.69	-71.86	51.51	26.26	-51.51	-26.26
213/ 1	47.66	-79.22	41.11	22.33	-41.11	-22.33
213/ 2	32.82	-64.38	25.78	22.82	-25.78	-22.82
214/ 1	161.52	-169.62	148.95	16.62	-148.95	-16.62
214/ 1	57.30	-65.40	42.29	19.07	-42.29	-19.07
215/ 7	29.14	-40.88	34.87	0.14	-34.87	-0.14
215/ 1	26.74	-33.21	24.21	5.76	-24.21	-5.76
216/ 8	175.77	-182.80	161.19	18.10	-161.19	-18.10
216/ 1	47.32	-54.34	30.20	20.63	-30.20	-20.63
217/ 8	51.38	-56.92	31.75	22.39	-31.75	-22.39
217/ 1	51.74	-55.23	28.76	24.72	-28.76	-24.72
218/ 8	193.51	-202.88	153.96	44.23	-153.96	-44.23
218/ 1	66.00	-75.37	28.55	42.14	-28.55	-42.14
219/ 8	68.20	-75.16	35.61	36.07	-35.61	-36.07
219/ 1	58.71	-64.44	31.25	30.32	-31.25	-30.32
220/ 9	196.71	-187.23	141.71	50.26	-141.71	-50.26
220/ 2	96.52	-87.04	43.74	48.04	-43.74	-48.04
221/ 9	39.21	-59.87	33.88	15.66	-33.88	-15.66
221/ 2	48.91	-46.15	40.04	7.49	-40.04	-7.49
222/ 1	134.61	-59.18	71.85	25.04	-71.85	-25.04
222/ 1	99.84	-24.41	31.76	30.37	-31.76	-30.37
223/ 1	65.29	-31.37	3.36	44.97	-3.36	-44.97
223/ 1	74.89	-40.97	10.07	47.86	-10.07	-47.86
224/ 8	142.71	-57.90	93.85	6.46	-93.85	-6.46
224/ 1	98.08	-13.26	48.92	6.75	-48.92	-6.75
225/ 1	60.14	6.95	13.05	13.54	-13.05	-13.54
225/ 1	71.07	-3.97	34.05	3.47	-34.05	-3.47



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Part of Structure: Air Heaters & Denox Support Structures.

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5.1.2e

5.1.2e

Ref.

Calculations

Output

Member/Node/Case	S max (MPa)	S min (MPa)	S max(My) (MPa)	S max(Mz) (MPa)	S min(My) (MPa)	S min(Mz) (MPa)
226/ 8	143.96	-57.59	87.42	13.36	-87.42	-13.36
226/ 1	111.83	-25.48	38.31	30.33	-38.31	-30.33
227/ 1	87.03	-12.26	6.27	43.38	-6.27	-43.38
227/ 1	103.20	-28.44	17.96	47.87	-17.96	-47.87
228/ 9	158.14	-6.94	62.00	20.53	-62.00	-20.53
228/ 1	132.81	18.39	20.55	36.66	-20.55	-36.66
229/ 1	46.22	-69.90	5.48	52.58	-5.48	-52.58
229/ 2	60.25	-83.93	10.06	62.03	-10.06	-62.03
230/ 7	14.55	-18.24	0.05	16.34	-0.05	-16.34
230/ 5	24.35	-26.04	2.84	23.35	-2.84	-23.35
231/ 5	55.20	-11.15	32.89	0.29	-32.89	-0.29
231/ 9	27.97	16.08	4.66	1.28	-4.66	-1.28
232/ 7	201.89	-164.88	176.31	7.07	-176.31	-7.07
232/ 5	114.44	-77.43	95.94	0.00	-95.94	-0.00
233/ 5	106.96	-78.39	81.83	10.85	-81.83	-10.85
233/ 1	94.03	-65.45	44.25	35.49	-44.25	-35.49
234/ 5	84.32	-55.91	43.81	26.31	-43.81	-26.31
234/ 1	120.92	-92.51	94.92	11.79	-94.92	-11.79
235/ 9	7.40	-86.57	46.13	0.85	-46.13	-0.85
235/ 5	-20.78	-58.39	6.68	12.13	-6.68	-12.13
236/ 5	-1.72	-21.87	7.43	2.64	-7.43	-2.64
236/ 2	4.09	-27.68	15.82	0.06	-15.82	-0.06
237/ 9	130.10	-26.04	78.07	0.00	-78.07	-0.00
237/ 5	65.78	38.29	10.28	3.47	-10.28	-3.47
238/ 5	62.01	-24.43	31.75	11.47	-31.75	-11.47
238/ 2	85.48	-47.91	52.43	14.27	-52.43	-14.27
239/ 5	-18.34	-32.98	3.31	4.01	-3.31	-4.01
239/ 9	-15.85	-35.48	0.68	9.13	-0.68	-9.13
240/ 7	173.42	-183.56	154.67	23.82	-154.67	-23.82
240/ 1	130.66	-140.80	98.67	37.06	-98.67	-37.06
241/ 1	132.20	-139.57	85.61	50.27	-85.61	-50.27
241/ 1	-3.69	-3.69	0.00	0.00	-0.00	-0.00
242/ 1	214.80	-224.63	183.34	36.38	-183.34	-36.38
242/ 1	254.13	-263.97	226.94	32.11	-226.94	-32.11
243/ 1	273.26	-271.83	243.96	28.58	-243.96	-28.58
243/ 1	0.71	0.71	0.00	0.0	-0.00	0.0
244/ 8	197.95	-224.62	210.89	0.39	-210.89	-0.39
244/ 1	304.34	-331.00	314.03	3.64	-314.03	-3.64
245/ 1	346.23	-342.77	332.34	12.16	-332.34	-12.16
245/ 1	1.73	1.73	0.00	0.0	-0.00	0.0
246/ 8	204.35	-223.78	200.22	13.85	-200.22	-13.85
246/ 1	315.10	-334.54	311.88	12.94	-311.88	-12.94
247/ 1	331.02	-327.60	326.73	2.58	-326.73	-2.58
247/ 1	1.71	1.71	0.00	0.00	-0.00	-0.00
248/ 9	212.45	-222.56	170.55	46.96	-170.55	-46.96
248/ 1	245.74	-255.85	215.40	35.39	-215.40	-35.39
249/ 1	281.63	-240.72	228.53	32.64	-228.53	-32.64
249/ 1	20.46	20.46	0.00	0.0	-0.00	0.0
250/ 9	231.88	-217.61	149.24	75.41	-149.24	-75.41
250/ 1	145.40	-131.32	90.61	47.75	-90.61	-47.75
251/ 1	95.73	-91.06	81.18	12.21	-81.18	-12.21
251/ 1	2.33	2.33	0.00	0.00	-0.00	-0.00



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Member/Node/Case	S max (MPa)	S min (MPa)	S max(My) (MPa)	S max(Mz) (MPa)	S min(My) (MPa)	S min(Mz) (MPa)
252/ 1	131.81	-137.11	11.27	123.19	-11.27	-123.19
252/ 1	-2.65	-2.65	0.00	0.00	-0.00	-0.00
253/ 1	103.08	-56.29	15.01	64.67	-15.01	-64.67
253/ 1	23.40	23.40	0.00	0.0	-0.00	0.0
254/ 1	17.83	-8.90	0.15	13.21	-0.15	-13.21
254/ 1	63.66	-54.73	40.11	19.09	-40.11	-19.09
255/ 1	81.73	-35.72	35.83	22.90	-35.83	-22.90
255/ 1	86.49	-40.48	57.14	6.34	-57.14	-6.34
256/ 1	84.49	-38.12	57.32	3.99	-57.32	-3.99
256/ 1	124.58	-78.21	83.96	17.43	-83.96	-17.43
257/ 1	129.94	-64.60	86.88	10.40	-86.88	-10.40
257/ 1	124.28	-58.95	83.20	8.42	-83.20	-8.42
258/ 1	132.19	-58.40	77.42	17.68	-77.42	-17.68
258/ 1	91.64	-17.85	46.41	8.33	-46.41	-8.33
259/ 1	92.27	-18.59	46.27	9.16	-46.27	-9.16
259/ 1	77.15	-3.47	22.30	18.02	-22.30	-18.02
260/ 1	83.23	-75.23	29.54	49.69	-29.54	-49.69
260/ 1	67.57	-59.57	3.61	59.98	-3.61	-59.98
266/ 7	96.18	52.98	20.57	1.03	-20.57	-1.03
266/ 1	110.98	38.19	30.38	6.02	-30.38	-6.02
267/ 1	48.45	-64.49	53.74	2.73	-53.74	-2.73
267/ 8	23.09	-39.14	30.97	0.14	-30.97	-0.14
268/ 8	47.90	-62.55	47.41	7.82	-47.41	-7.82
268/ 1	115.29	-129.94	119.47	3.14	-119.47	-3.14
269/ 8	91.64	33.62	22.57	6.44	-22.57	-6.44
269/ 1	161.78	-36.51	94.82	4.32	-94.82	-4.32
270/ 1	138.17	-86.83	100.07	2.43	-100.07	-2.43
270/ 9	53.66	17.77	12.82	5.07	-12.82	-5.07
271/ 9	29.86	-45.30	36.68	0.89	-36.68	-0.89
271/ 1	121.82	-137.26	129.18	0.37	-129.18	-0.37
272/ 9	27.38	-23.33	22.77	2.58	-22.77	-2.58
272/ 1	58.43	-54.37	53.62	2.78	-53.62	-2.78
273/ 1	202.93	147.70	24.15	3.47	-24.15	-3.47
273/ 9	205.58	145.05	3.48	26.78	-3.48	-26.78
274/ 8	117.74	32.90	42.32	0.10	-42.32	-0.10
274/ 1	119.19	31.45	41.14	2.73	-41.14	-2.73
275/ 1	57.78	-53.78	55.13	0.65	-55.13	-0.65
275/ 1	2.00	2.00	0.00	0.00	-0.00	-0.00
276/ 8	87.50	3.24	42.09	0.04	-42.09	-0.04
276/ 1	94.62	-3.88	47.49	1.77	-47.49	-1.77
277/ 1	20.52	-79.27	48.68	1.22	-48.68	-1.22
277/ 1	-29.38	-29.38	0.00	0.0	-0.00	0.0
278/ 1	80.23	7.39	29.40	7.02	-29.40	-7.02
278/ 1	48.41	39.21	4.52	0.08	-4.52	-0.08
279/ 1	48.41	39.21	4.52	0.08	-4.52	-0.08
279/ 1	93.42	-5.80	37.86	11.75	-37.86	-11.75
280/ 1	87.71	-11.51	37.86	11.75	-37.86	-11.75
280/ 1	100.33	-24.13	28.70	33.53	-28.70	-33.53
281/ 1	50.96	33.22	5.64	3.23	-5.64	-3.23
281/ 1	50.67	33.50	6.03	2.56	-6.03	-2.56
282/ 1	50.67	33.50	6.03	2.56	-6.03	-2.56
282/ 1	61.19	22.98	6.69	12.42	-6.69	-12.42



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283/ 1	55.78	17.56	6.69	12.42	-6.69	-12.42
283/ 1	46.47	26.86	9.79	0.02	-9.79	-0.02
284/ 1	107.79	-23.92	41.56	24.29	-41.56	-24.29
284/ 1	110.79	-26.93	56.61	12.25	-56.61	-12.25
285/ 1	148.39	-5.68	64.39	12.64	-64.39	-12.64
285/ 1	113.95	28.76	40.50	2.09	-40.50	-2.09
286/ 1	131.40	89.65	19.83	1.05	-19.83	-1.05
286/ 1	165.24	55.81	49.47	5.25	-49.47	-5.25
287/ 1	115.30	32.92	35.39	5.79	-35.39	-5.79
287/ 1	93.55	54.66	19.33	0.11	-19.33	-0.11
288/ 1	106.91	37.78	33.85	0.71	-33.85	-0.71
288/ 1	133.36	11.33	54.37	6.84	-54.37	-6.84
289/ 1	94.46	-8.18	48.22	3.10	-48.22	-3.10
289/ 1	69.80	16.49	24.67	1.99	-24.67	-1.99
290/ 1	-19.74	-49.41	9.36	5.48	-9.36	-5.48
290/ 1	103.44	-172.59	103.72	34.30	-103.72	-34.30
291/ 1	102.41	-165.96	111.29	22.89	-111.29	-22.89
291/ 1	-18.09	-55.83	4.46	14.41	-4.46	-14.41
292/ 1	-92.10	-139.38	11.63	12.01	-11.63	-12.01
292/ 1	-68.67	-162.81	42.53	4.54	-42.53	-4.54
293/ 1	-17.71	-128.05	38.44	16.73	-38.44	-16.73
293/ 1	-41.80	-103.96	11.06	20.02	-11.06	-20.02
294/ 1	-10.83	-50.63	3.25	16.66	-3.25	-16.66
294/ 1	111.60	-177.28	115.96	28.48	-115.96	-28.48
295/ 1	84.70	-158.38	107.51	14.03	-107.51	-14.03
295/ 1	36.88	-110.36	3.34	70.18	-3.34	-70.18
296/ 1	117.29	57.59	24.66	5.19	-24.66	-5.19
296/ 1	145.88	29.19	51.01	7.24	-51.01	-7.24
297/ 1	135.39	17.46	52.12	6.85	-52.12	-6.85
297/ 1	96.37	56.49	15.47	4.47	-15.47	-4.47
298/ 1	-48.11	-90.68	11.65	9.63	-11.65	-9.63
298/ 1	-45.16	-94.68	15.72	9.04	-15.72	-9.04
299/ 1	-53.48	-107.30	16.60	10.31	-16.60	-10.31
299/ 1	-67.45	-98.44	12.78	2.71	-12.78	-2.71
300/ 1	108.93	-79.69	82.54	11.72	-82.54	-11.72
300/ 1	97.30	-68.15	81.73	1.00	-81.73	-1.00
301/ 1	-191.23	-225.97	0.06	17.31	-0.06	-17.31
301/ 1	-180.26	-236.94	0.02	28.33	-0.02	-28.33
302/ 1	257.15	-66.71	136.48	25.45	-136.48	-25.45
302/ 1	263.89	-73.46	162.03	6.65	-162.03	-6.65
303/ 1	-141.31	-243.43	50.02	1.04	-50.02	-1.04
303/ 1	-162.79	-221.96	26.83	2.76	-26.83	-2.76
304/ 1	182.93	-79.03	130.81	0.17	-130.81	-0.17
304/ 1	165.57	-61.67	112.86	0.76	-112.86	-0.76
305/ 1	-66.94	-108.50	16.27	4.51	-16.27	-4.51
305/ 1	-70.31	-105.13	10.02	7.39	-10.02	-7.39
306/ 1	-54.53	-74.33	2.51	7.38	-2.51	-7.38
306/ 1	-41.92	-86.94	6.12	16.39	-6.12	-16.39
307/ 1	86.68	77.50	5.53	0.06	-5.53	-0.06
307/ 1	126.71	39.47	43.61	0.01	-43.61	-0.01
308/ 1	32.46	-236.69	134.57	0.01	-134.57	-0.01
308/ 1	21.79	-226.03	122.95	0.96	-122.95	-0.96



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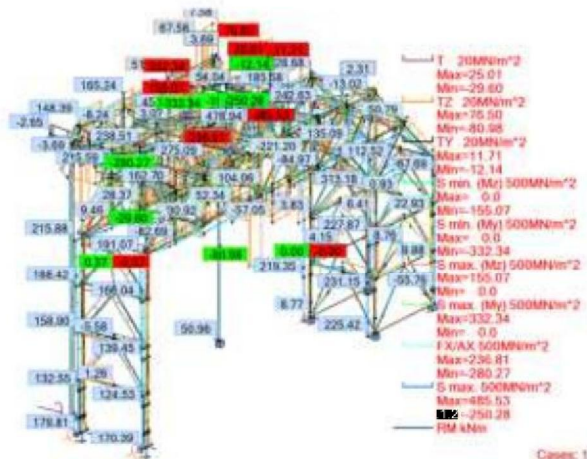
Ref.

Calculations

Output

Member/Node/Case	S max (MPa)	S min (MPa)	S max(My) (MPa)	S max(Mz) (MPa)	S min(My) (MPa)	S min(Mz) (MPa)
309/ 1	196.48	186.68	4.60	0.30	-4.60	-0.30
309/ 1	217.47	165.69	25.31	0.58	-25.31	-0.58
310/ 1	130.28	-157.04	142.76	0.89	-142.76	-0.89
310/ 1	138.63	-165.40	151.15	0.86	-151.15	-0.86
311/ 1	-197.05	-217.27	0.06	10.06	-0.06	-10.06
311/ 1	-195.70	-218.62	2.71	8.75	-2.71	-8.75
312/ 1	81.03	-62.36	68.02	3.69	-68.02	-3.69
312/ 1	91.58	-72.91	76.03	6.20	-76.03	-6.20
313/ 2	-146.11	-242.22	37.75	10.31	-37.75	-10.31
313/ 2	-135.94	-252.39	51.48	6.76	-51.48	-6.76
314/ 5	16.05	5.41	4.05	1.28	-4.05	-1.28
314/ 4	21.62	-0.16	10.88	0.00	-10.88	-0.00
315/ 4	1.69	-19.66	10.83	0.05	-10.83	-0.05
315/ 5	-3.72	-14.25	3.70	1.56	-3.70	-1.56
316/ 1	14.48	3.06	4.76	0.95	-4.76	-0.95
316/ 1	20.53	-2.99	11.76	0.00	-11.76	-0.00
317/ 1	4.15	-19.05	11.56	0.04	-11.56	-0.04
317/ 1	-1.78	-13.12	4.48	1.19	-4.48	-1.19
318/ 2	269.62	20.60	106.53	17.98	-106.53	-17.98
318/ 2	272.29	17.93	102.98	24.20	-102.98	-24.20

View - S max,S max(My),S max(Mz),S min(My),S min(Mz),Fx,AX,TY,TZ,T,Reaction moments(kN*m), Cases: 1



52 - 55

5.1.2f

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AIR HEATER SUPPORTING STRUCTURE.

Reinforced Concrete Structure



Concrete supporting structure volume from 3D model = 1194m^3

Weight of concrete = $1194 \times 24 = 28656\text{kN}$

2no. Air Heaters $2 \times 6000 = 12000\text{kN}$

Duct – $2 \times 100 = 200\text{kN}$

Total = 40856, say 41000kN

5.1.2f

 BROWN & MASON Anson House, Schooner Court, Crossways Business Park, Dartford, Kent, DA26QQ Tel : 01322 277731 Fax : 01322 284152	Project: Gelderland Central Power Station				Job Ref.: C2002		
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GLOBAL STABILITY.	
5.1.2f	

13.0 DESIGN CONCLUSION SUMMARY

Having concluded our design calculations we can confirm that the Air Heater & Denox Support Structures remain stable in their temporary state following the proposed alterations to aid their felling with the aid of controlled explosives.

The attendant drawings to be strictly adhered to during the alterations process.

14.0 Appendix

1. Designers Risk Assessment
2. Design Drawings – C2002/D004/DWG001 - 012.

Appendix 1

Designers Risk Assessment

Hazard/Risk Assessment

Hazard	Hazard Sub Category	Persons at Risk	Initial Risk Rating			Control Measures	Residual Risk Rating		
			S	L	RR		S	L	RR
Disproportionate Collapse caused by accidental loading.	a. Plant	B&M	3	3	9	All plant movement to be controlled and not come closer than 2m from the works (columns and beams) once the structural pre-weakening begins. MEWPs may be exceptions. However, MEWPs should be operated by experienced and authorised personnel only.	3	1	3
	b. Personnel	Contractors	3	3	9		3	1	3
		Others	3	3	9		3	1	3
'Drill' locations which are not readily accessible.	a. Some columns proposed drill locations are not reachable from ground level.	B&M	3	3	9	A safe system of access and egress to be established before any work begins. Suitable fall arrest system to be provided.	3	1	3
		Contractors	3	1	3		3	1	3
		Others	3	1	3		3	1	3
Gust wind speed exceeding 16.5m/s.		B&M	3	3	9	The structural stability of the building will not be compromised beyond the 16.5m/s wind speed and up to the designed wind speed. This measure is purely precautionary to protect personnel from windborne debris. All operations to be stopped and the premises vacated immediately should the limit be exceeded.	3	1	3
		Contractors	3	3	9		3	1	3
		Others	3	3	9		3	1	3
Compromising the integrity of the Air Heater Support Structure during the removal of the leading beams.		B&M	3	3	9	The proposed removal of the Air Heater beams at level +20.300 should be undertaken carefully and using small plant (hammer).	3	1	3
		Contractors	3	3	9		3	1	3
		Others	3	3	9		3	1	3
Excessive cutting of Denox sloping members with cuts Type 'L3'. The sloping members are in tension and their failure will result in the immediate collapse of the Denox Structure.		B&M	3	3	9	The Denox Sloping member cuts 5.1.2f number and lengths should not be reduced under any circumstance. All cuts markings should be inspected by the Engineering Director before the cuts are performed – all as stated on the drawings.	3	1	3
		Contractors	3	3	9		3	1	3
		Others	3	3	9		3	1	3

Severity

Likelihood

1 – Minor accident (First Aid)	2 – Major accident (RIDDOR)	3 – Fatality	1 - Low	2 – Medium	3 – High
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Risk Rating & Control & Monitoring Protocols

1-2: Work may proceed in accordance with Brown and Masons policy and procedures	3-4: Work may proceed providing stringent control measures have been implemented (e.g. permit to work, monitoring, etc.)	6-9: The work cannot commence until alternative method of work or additional control measures implemented
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Appendix 2

Design Drawings – C2002/D004/DWG001 - 012.

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5.1.2f