Table of Contents

STRESS SUMMARY
CASE 4 (SUS) W+P1+H

**** CODE STRESS CHECK PASSED
PIPING CODE: B31.3 -2002, April 30, 2002
HIGHEST STRESSES: (lb./sq.in.)

CODE STRESS %:	25.1	@NODE	60
STRESS:	4737.4	ALLOWABLE:	18900.
BENDING STRESS:	1804.7	@NODE	60
TORSIONAL STRESS:	138.7	@NODE	80
AXIAL STRESS:	2960.4	@NODE	20
HOOP STRESS:	6175.2	@NODE	30
3D MAX INTENSITY:	7096.5	@NODE	110

STRESS REPORT, Stresses on Elements
CASE 4 (SUS) W+P1+H

ELEMENT NODES	--Stress(lb./sq.in.)--- BENDING STRESS	TORSION STRESS	SIF'S IN/OUT PLANE	CODE STRESS	--(lb./sq.in.)-- ALLOWABLE STRESS	%
10	0.	0.	0.000 / 0.000	0.	0.	0.
20	0.	0.	0.000 / 0.000	0.	0.	0.
20	209.	-1.	1.000 / 1.000	3169.	18900.	17.
30	15.	1.	1.000 / 1.000	2938.	18900.	16.
30	27.	-1.	1.776 / 1.480	2950.	18900.	16.
39	105.	1.	1.776 / 1.480	3034.	18900.	16.
39	105.	-1.	1.776 / 1.480	3034.	18900.	16.
40	361.	-1.	1.776 / 1.480	3312.	18900.	18.
40	203.	1.	1.000 / 1.000	3154.	18900.	17.
50	205.	-1.	1.000 / 1.000	3156.	18900.	17.
50	205.	1.	1.000 / 1.000	3156.	18900.	17.
60	1737.	-1.	1.000 / 1.000	4689.	18900.	25.
60	1805.	3.	1.000 / 1.000	4737.	18900.	25.
70	148.	-3.	1.000 / 1.000	3081.	18900.	16.
70	232.	3.	1.776 / 1.480	3165.	18900.	17.
79	309.	10.	1.776 / 1.480	3244.	18900.	17.
79	309.	-10.	1.776 / 1.480	3244.	18900.	17.
80	639.	139.	1.776 / 1.480	3582.	18900.	19.
80	432.	-139.	1.000 / 1.000	3375.	18900.	18.
90	436.	139.	1.000 / 1.000	3380.	18900.	18.
90	436.	-139.	1.000 / 1.000	3380.	18900.	18.
100	1224.	139.	1.000 / 1.000	4168.	18900.	22.
100	1224.	-139.	1.000 / 1.000	4159.	18900.	22.
110	1509.	139.	1.000 / 1.000	4443.	18900.	24.
110	1509.	-139.	1.000 / 1.000	4429.	18900.	23.
120	216.	139.	1.000 / 1.000	3137.	18900.	17.
120	376.	-139.	1.776 / 1.480	3296.	18900.	17.
129	232.	132.	1.776 / 1.480	3108.	18900.	16.
129	232.	-132.	1.776 / 1.480	3108.	18900.	16.
130	414.	59.	1.776 / 1.480	3291.	18900.	17.
130	269.	-59.	1.000 / 1.000	3146.	18900.	17.
140	268.	59.	1.000 / 1.000	3145.	18900.	17.

STRESS REPORT, Stresses on Elements
CASE 4 (SUS) W+P1+H

ELEMENT NODES	--Stress(lb./sq.in.)--- BENDING STRESS	TORSION STRESS	SIF'S IN/OUT PLANE	CODE STRESS	--(lb./sq.in.)-- ALLOWABLE STRESS	%
140	268.	-59.	1.000 / 1.000	3145.	18900.	17.
150	219.	59.	1.000 / 1.000	3108.	18900.	16.
150	0.	0.	0.000 / 0.000	0.	0.	0.
160	0.	0.	0.000 / 0.000	0.	0.	0.
60	0.	0.	0.000 / 0.000	0.	0.	0.
170	0.	0.	0.000 / 0.000	0.	0.	0.
180	0.	0.	1.000 / 1.000	2780.	18900.	15.
190	90.	0.	1.000 / 1.000	2864.	18900.	15.

STRESS SUMMARY
CASE 5 (EXP) L5=L3-L4

**** CODE STRESS CHECK PASSED
PIPING CODE: B31.3 -2002, April 30, 2002
HIGHEST STRESSES: (lb./sq.in.)

CODE STRESS %:	16.5	@NODE	79
STRESS:	7472.5	ALLOWABLE:	45380.
BENDING STRESS:	7465.5	@NODE	79
TORSIONAL STRESS:	1363.5	@NODE	130
AXIAL STRESS:	427.8	@NODE	129
HOOP STRESS:	0.0	@NODE	20
3D MAX INTENSITY:	9255.4	@NODE	129

STRESS REPORT, Stresses on Elements
CASE 5 (EXP) L5=L3-L4

ELEMENT NODES	--Stress(lb./sq.in.)--- BENDING STRESS	TORSION STRESS	SIF'S IN/OUT PLANE	CODE STRESS	--(lb./sq.in.)-- ALLOWABLE STRESS	%
10	0.	0.	0.000 / 0.000	0.	0.	0.
20	0.	0.	0.000 / 0.000	0.	0.	0.
20	2840.	-1213.	1.000 / 1.000	3735.	45456.	8.
30	532.	1213.	1.000 / 1.000	2483.	45686.	5.
30	880.	-1213.	1.776 / 1.480	2581.	45675.	6.
39	2552.	997.	1.776 / 1.480	3238.	45590.	7.
39	2552.	-997.	1.776 / 1.480	3238.	45590.	7.
40	3843.	228.	1.776 / 1.480	3870.	45313.	9.
40	2515.	-228.	1.000 / 1.000	2556.	45470.	6.
50	2513.	228.	1.000 / 1.000	2555.	45468.	6.
50	2513.	-228.	1.000 / 1.000	2555.	45468.	6.
60	1870.	228.	1.000 / 1.000	1925.	43936.	4.
60	1920.	-172.	1.000 / 1.000	1951.	43888.	4.
70	4108.	172.	1.000 / 1.000	4122.	45544.	9.
70	7296.	-172.	1.776 / 1.480	7304.	45460.	16.
79	7466.	161.	1.776 / 1.480	7472.	45380.	16.
79	7466.	-161.	1.776 / 1.480	7472.	45380.	16.
80	7139.	67.	1.776 / 1.480	7141.	45042.	16.
80	4023.	-67.	1.000 / 1.000	4026.	45250.	9.
90	4019.	67.	1.000 / 1.000	4022.	45245.	9.
90	4019.	-67.	1.000 / 1.000	4022.	45245.	9.
100	3391.	67.	1.000 / 1.000	3394.	44457.	8.
100	3391.	-67.	1.000 / 1.000	3394.	44466.	8.
110	5141.	67.	1.000 / 1.000	5142.	44182.	12.
110	5141.	-67.	1.000 / 1.000	5142.	44196.	12.
120	3565.	67.	1.000 / 1.000	3568.	45488.	8.
120	5678.	-67.	1.776 / 1.480	5679.	45328.	13.
129	7070.	-944.	1.776 / 1.480	7318.	45517.	16.
129	7070.	944.	1.776 / 1.480	7318.	45517.	16.
130	6247.	-1364.	1.776 / 1.480	6816.	45334.	15.
130	3517.	1364.	1.000 / 1.000	4450.	45479.	10.
140	3505.	-1364.	1.000 / 1.000	4441.	45480.	10.

STRESS REPORT, Stresses on Elements
CASE 5 (EXP) L5=L3-L4

ELEMENT NODES	--Stress(lb./sq.in.)--- BENDING STRESS	TORSION STRESS	SIF'S IN/OUT PLANE	CODE STRESS	--(lb./sq.in.)-- ALLOWABLE STRESS	%
140	3505.	1364.	1.000 / 1.000	4441.	45480.	10.
150	1609.	-1364.	1.000 / 1.000	3166.	45517.	7.
150	0.	0.	0.000 / 0.000	0.	0.	0.
160	0.	0.	0.000 / 0.000	0.	0.	0.
60	0.	0.	0.000 / 0.000	0.	0.	0.
170	0.	0.	0.000 / 0.000	0.	0.	0.
180	0.	0.	1.000 / 1.000	0.	45845.	0.
190	272.	0.	1.000 / 1.000	272.	45761.	1.

DISPLACEMENT REPORT, Nodal Movements
CASE 3 (OPE) W+T1+P1+H

NODE	Translations(in.) DX	DY	DZ	Rotations(deg.) RX	RY	RZ
10	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20	0.0000	-0.0125	0.0000	0.0001	-0.0001	0.0000
30	0.0002	-0.2297	-0.0282	0.0294	-0.0817	0.0027
39	-0.0065	-0.2635	-0.0196	0.0169	-0.0994	-0.0016
40	-0.0288	-0.2782	0.0115	0.0003	-0.1381	-0.0088
50	-0.0292	-0.2782	0.0120	0.0003	-0.1382	-0.0088
60	-0.2383	-0.2731	0.2291	0.0004	-0.1922	0.0066
70	-1.1986	-0.0630	1.1339	-0.0961	-0.0653	0.0539
79	-1.1902	-0.0409	1.1667	-0.0955	0.0187	0.0555
80	-1.1546	-0.0232	1.1683	-0.0935	0.1011	0.0556
90	-1.1541	-0.0231	1.1680	-0.0935	0.1013	0.0556
100	-1.0817	0.0000	1.1184	-0.0894	0.1330	0.0521
110	-0.1768	0.0000	0.0957	-0.0385	0.1398	-0.1348
120	-0.0684	-0.0994	0.0204	-0.0324	0.1011	-0.1562
129	-0.0270	-0.1112	0.0044	-0.0172	0.0525	-0.0979
130	-0.0032	-0.0850	0.0000	-0.0007	0.0298	-0.0224
140	-0.0031	-0.0845	0.0000	-0.0007	0.0296	-0.0222
150	0.0000	-0.0124	0.0000	0.0000	0.0001	0.0000
160	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
170	-0.2373	-0.3002	0.2290	0.0004	-0.1922	0.0066
180	-0.2373	0.0362	0.2290	0.0003	0.0000	0.0003
190	-0.2372	0.0000	0.2289	0.0000	0.0000	0.0000

DISPLACEMENT REPORT, Nodal Movements
CASE 4 (SUS) W+P1+H

NODE	Translations(in.) DX	DY	DZ	Rotations(deg.) RX	RY	RZ
10	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	0.0002	0.0000	0.0020	-0.0024	-0.0001	0.0003
39	0.0003	0.0002	0.0025	-0.0022	-0.0001	0.0003
40	0.0003	0.0005	0.0026	-0.0001	-0.0001	0.0003
50	0.0003	0.0005	0.0026	-0.0001	-0.0001	0.0003
60	-0.0001	-0.0074	0.0026	0.0189	-0.0005	0.0002
70	-0.0008	-0.0087	0.0025	-0.0476	0.0018	-0.0006
79	-0.0004	0.0002	0.0023	-0.0472	0.0030	-0.0011
80	-0.0001	0.0033	0.0017	-0.0449	0.0036	-0.0059
90	-0.0001	0.0033	0.0017	-0.0449	0.0036	-0.0060
100	-0.0001	0.0000	0.0002	-0.0423	0.0032	-0.0118
110	-0.0002	0.0000	0.0001	-0.0101	-0.0016	0.0075
120	-0.0002	0.0007	0.0010	-0.0062	-0.0012	-0.0015
129	0.0000	0.0002	0.0008	-0.0048	-0.0009	-0.0021
130	0.0001	0.0000	0.0003	-0.0016	-0.0011	0.0000
140	0.0001	0.0000	0.0003	-0.0015	-0.0011	0.0000
150	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
160	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
170	0.0000	-0.0074	-0.0003	0.0189	-0.0005	0.0002
180	0.0000	-0.0001	-0.0003	-0.0002	0.0000	0.0000
190	0.0000	0.0000	-0.0003	0.0000	0.0000	0.0000

RESTRAINT REPORT, Loads on Restraints
RESTRAINT SUMMARY

RESTRAINT SUMMARY REPORT

LOAD CASE DEFINITION KEY

CASE 3 (OPE) W+T1+P1+H
CASE 4 (SUS) W+P1+H

RESTRAINT REPORT, Loads on Restraints
RESTRAINT SUMMARY

NODE	CASE	TYPE	Forces(lb.) FX	FY	FZ	Moments(ft.lb.) MX	MY	MZ
10			Rigid ANC					
	3	OPE	-313.	3.	-1949.	10794.	-9228.	-646.
	4	SUS	11.	-308.	101.	-688.	-7.	77.
100			Rigid +Y					
	3	OPE	-406.	-1948.	420.	0.	0.	0.
	4	SUS	-136.	-2487.	194.	0.	0.	0.
110			Rigid +Y					
	3	OPE	-2964.	-11236.	1604.	0.	0.	0.
	4	SUS	-215.	-2747.	76.	0.	0.	0.
160			Rigid ANC					
	3	OPE	3993.	8623.	-481.	354.	9997.	-4329.
	4	SUS	364.	787.	-89.	-554.	-369.	489.
170			Rigid X Rigid Z Prog Design VSH					
	3	OPE	-599.	-2725.	578.	0.	0.	0.
	4	SUS	-24.	-2528.	-282.	0.	0.	0.
190			Rigid RY Rigid RX Rigid RZ Rigid +Y					
	3	OPE	-609.	-2821.	588.	578.	0.	599.
	4	SUS	-24.	-2623.	-282.	-282.	0.	24.

```
 RESTRAINT REPORT, Loads on Restraints
 RESTRAINT SUMMARY
                     ---- Forces(lb.) ------      -- Moments(ft.lb.) ----
 NODE CASE TYPE        FX       FY       FZ         MX       MY       MZ


Job Description:

  PROJECT:

  CLIENT :

  ANALYST:

  NOTES  :

PIPE DATA
------------------------------------------------------------------------------
------------------------------------------------------------------------------
From  10  To  20 DY= -.344 ft.
PIPE
   Dia= 10.750 in.   Wall= .594 in.   Insul= .000 in.   Cor= .1180 in.
GENERAL
   T1= 500 F   P1= 600.0000 lb./sq.in.   Mat= (106)A106 B
   E= 29,500,000 lb./sq.in.   v = .292   Density= .2830 lb./cu.in.
   Fluid= .0361274 lb./cu.in.
RIGID  Weight= 53.00 lb.
RESTRAINTS
   Node  10  ANC
ALLOWABLE STRESSES
   B31.3 (1999)       Sc= 20,000 lb./sq.in.   Sh1= 18,900 lb./sq.in.
   Sh2= 20,000 lb./sq.in.   Sh3= 20,000 lb./sq.in.   Sh4= 20,000 lb./sq.in.
   Sh5= 20,000 lb./sq.in.   Sh6= 20,000 lb./sq.in.   Sh7= 20,000 lb./sq.in.
   Sh8= 20,000 lb./sq.in.   Sh9= 20,000 lb./sq.in.
------------------------------------------------------------------------------
From  20  To  30 DY= -6.000 ft.
------------------------------------------------------------------------------
From  30  To  40 DY= -1.250 ft.
BEND at "TO" end
   Radius= 15.000 in. (LONG)   Bend Angle= 90.000   Angle/Node @1= 45.00 39
------------------------------------------------------------------------------
From  40  To  50 DZ= 1.250 ft.
------------------------------------------------------------------------------
From  50  To  60 DZ= 6.000 ft.
------------------------------------------------------------------------------
From  60  To  70 DZ= 25.000 ft.
------------------------------------------------------------------------------
From  70  To  80 DZ= 1.250 ft.
BEND at "TO" end
   Radius= 15.000 in. (LONG)   Bend Angle= 90.000   Angle/Node @1= 45.00 79
------------------------------------------------------------------------------
From  80  To  90  DX= 1.250 ft.
------------------------------------------------------------------------------
From  90  To  100  DX= 2.000 ft.
```

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 RESTRAINT REPORT, Loads on Restraints
 RESTRAINT SUMMARY
                     ---- Forces(lb.) ------      -- Moments(ft.lb.) ----
 NODE CASE TYPE        FX       FY       FZ         MX       MY       MZ


RESTRAINTS
   Node  100  +Y   Mu = .30
-------------------------------------------------------------------------------
From  100  To  110  DX= 25.000 ft.
RESTRAINTS
   Node  110  +Y   Mu = .30
-------------------------------------------------------------------------------
From  110  To  120  DX= 3.000 ft.
-------------------------------------------------------------------------------
From  120  To  130  DX= 1.250 ft.
BEND at "TO" end
   Radius= 15.000 in. (LONG)   Bend Angle= 90.000   Angle/Node @1= 45.00 129
-------------------------------------------------------------------------------
From  130  To  140 DY= 1.250 ft.
-------------------------------------------------------------------------------
From  140  To  150 DY= 2.000 ft.
-------------------------------------------------------------------------------
From  150  To  160 DY= .344 ft.
RIGID  Weight= 53.00 lb.
RESTRAINTS
   Node  160  ANC
-------------------------------------------------------------------------------
From  60  To  170 DY= -.750 ft.
RIGID  Weight= .00 lb.
RESTRAINTS
   Node  170  X   Cnode  180
   Node  170  Z   Cnode  180
HANGERS
   Hanger Node = 170   Hanger Connecting Node = 180   Hanger Table = 0.0
   Available Space = -15.0000 in.   Allowed Load Variation = 25.0000
   No. Hangers = 0.0   Short Range Flag = 0.0   User Operating Load = .00 lb.
   Free Node = 0   Free Node = 0   Free Code = 0.0   Spring Rate = .00 lb./in.
   Theoretical Cold Load = .00 lb.
-------------------------------------------------------------------------------
From  180  To  190 DY= -1.000 ft.
RESTRAINTS
   Node  190  +Y   Mu = .30
   Node  190  RY
   Node  190  RX
   Node  190  RZ
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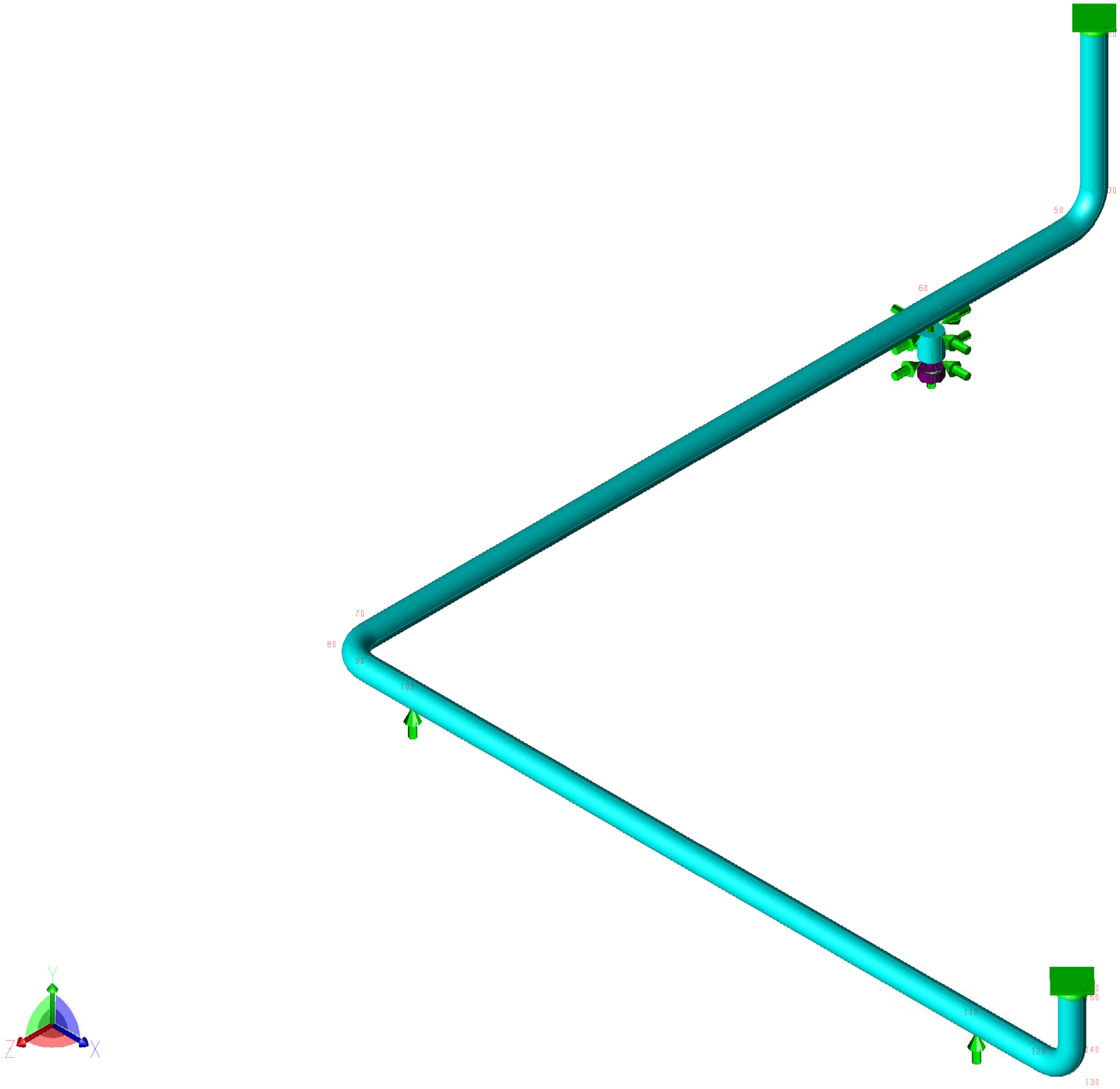
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