This document was too large to scan as a single document. It has been divided into smaller sections.

Section 5 of 13

Document Information			
Document #	RPP-24544	Revision	1D
Title	DEMONSTRATION BULK VITRIFICATION SYS INDEPENDENT QUALIFIED REGISTERED PROFESSIONAL ENGINEER (IQRPE & RCRA DESIGN REVIEW PACKAGE		
Date	05/11/2006		
Originator	SHUFORD DH	ORG CO	CH2M
Recipient		Recipient Co.	
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Keywords	SUPPL TREATMENT		
Projects			

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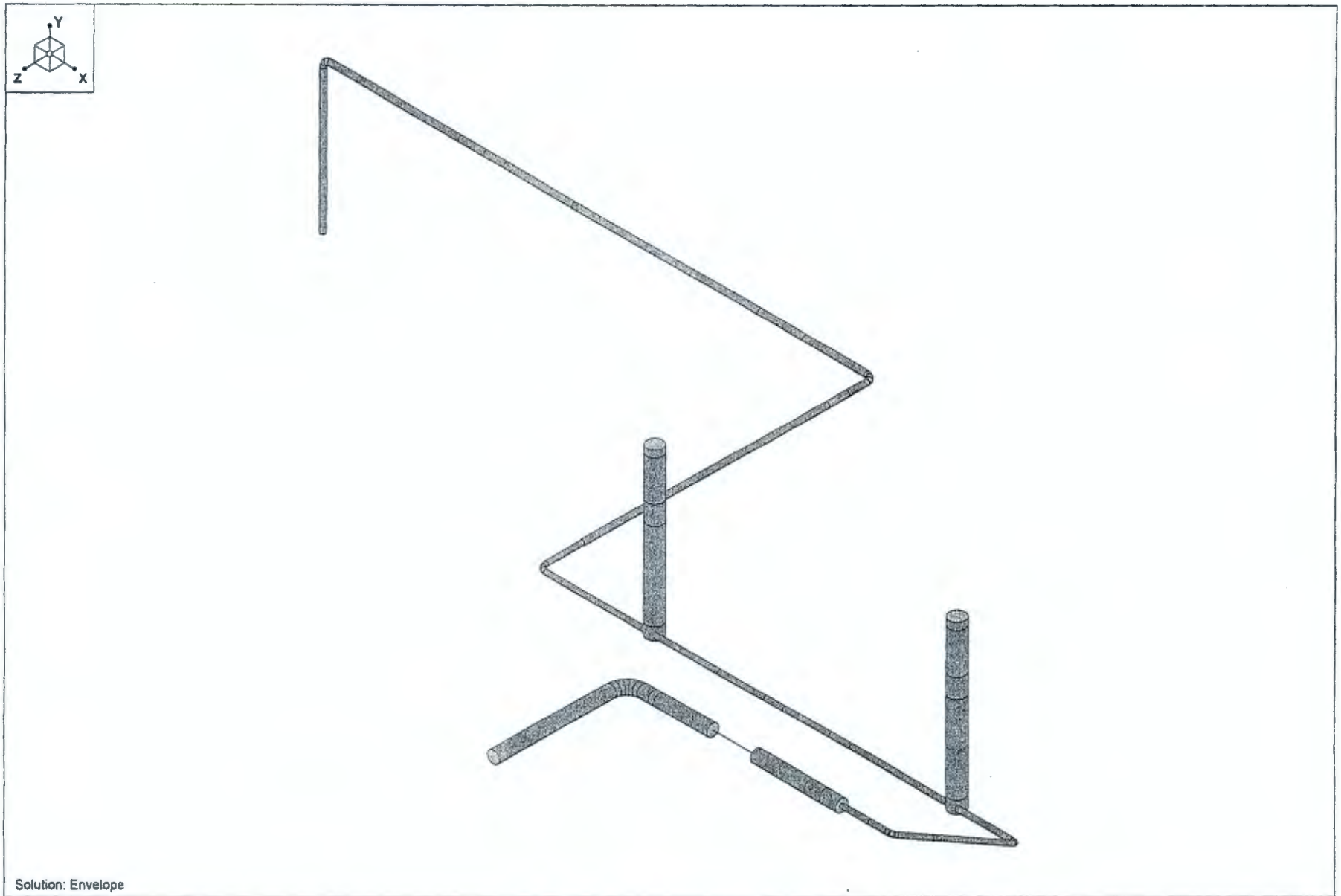
CALCULATION SHEET

CALC. NO.:	145579-V-CA-005	REV:	1	DATE:	March 26, 2006
CALC. TITLE:	Off-Gas Treatment System Pipe Stress Analysis				
PROJECT NO.:	145579	PROJECT TITLE:	Final DBVS Design		

Attachment 5: Model 2 RISA 3D Analysis Input and Output Data

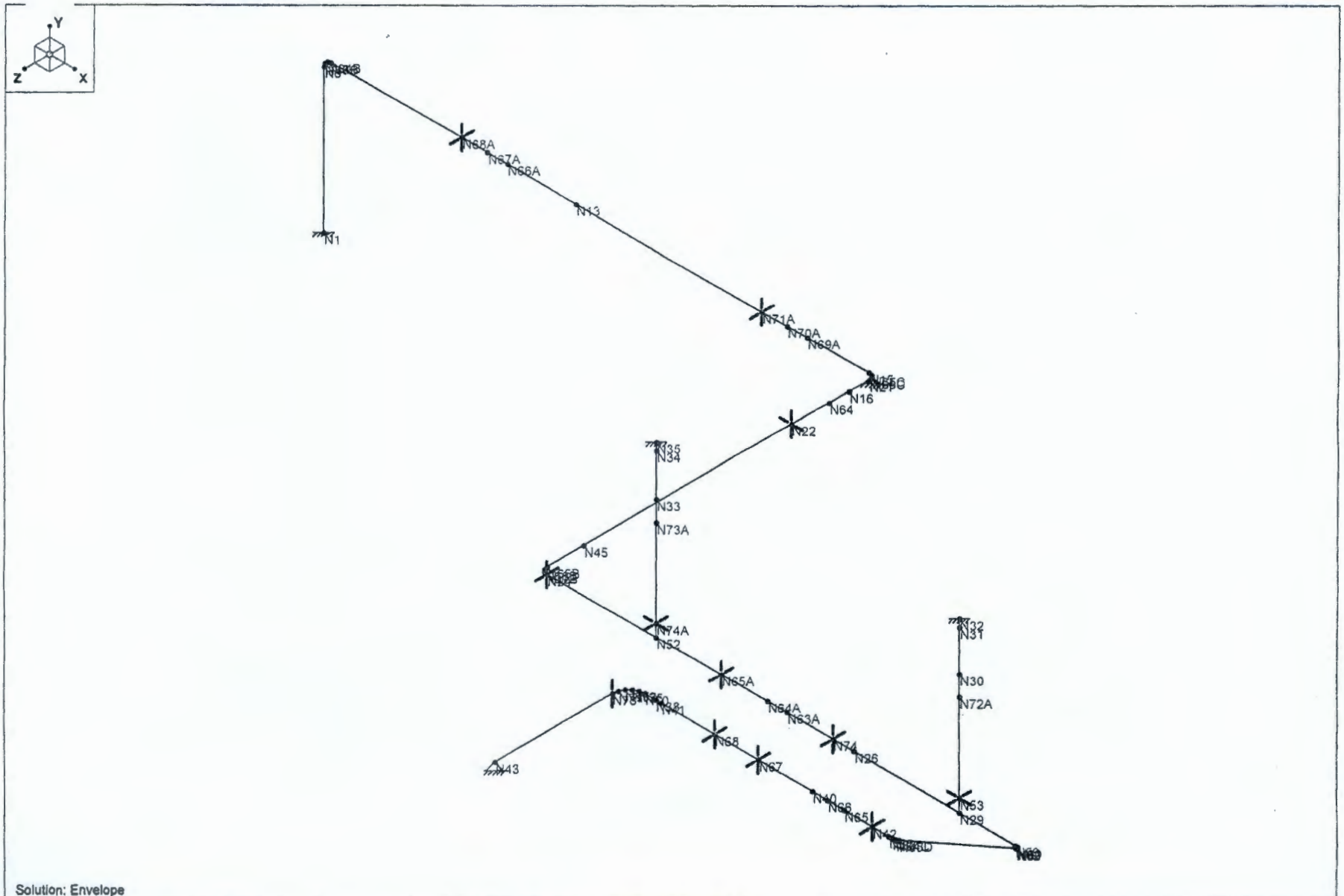
NOTE: This cover sheet represents the approval signatures of the originator and checker for all pages of this attachment

ORIGINATOR:	DATE:	CHECKER:	DATE:
Kevin M. Jones KMJ	3/26/06	J. Van Corbach JVC	3/26/06



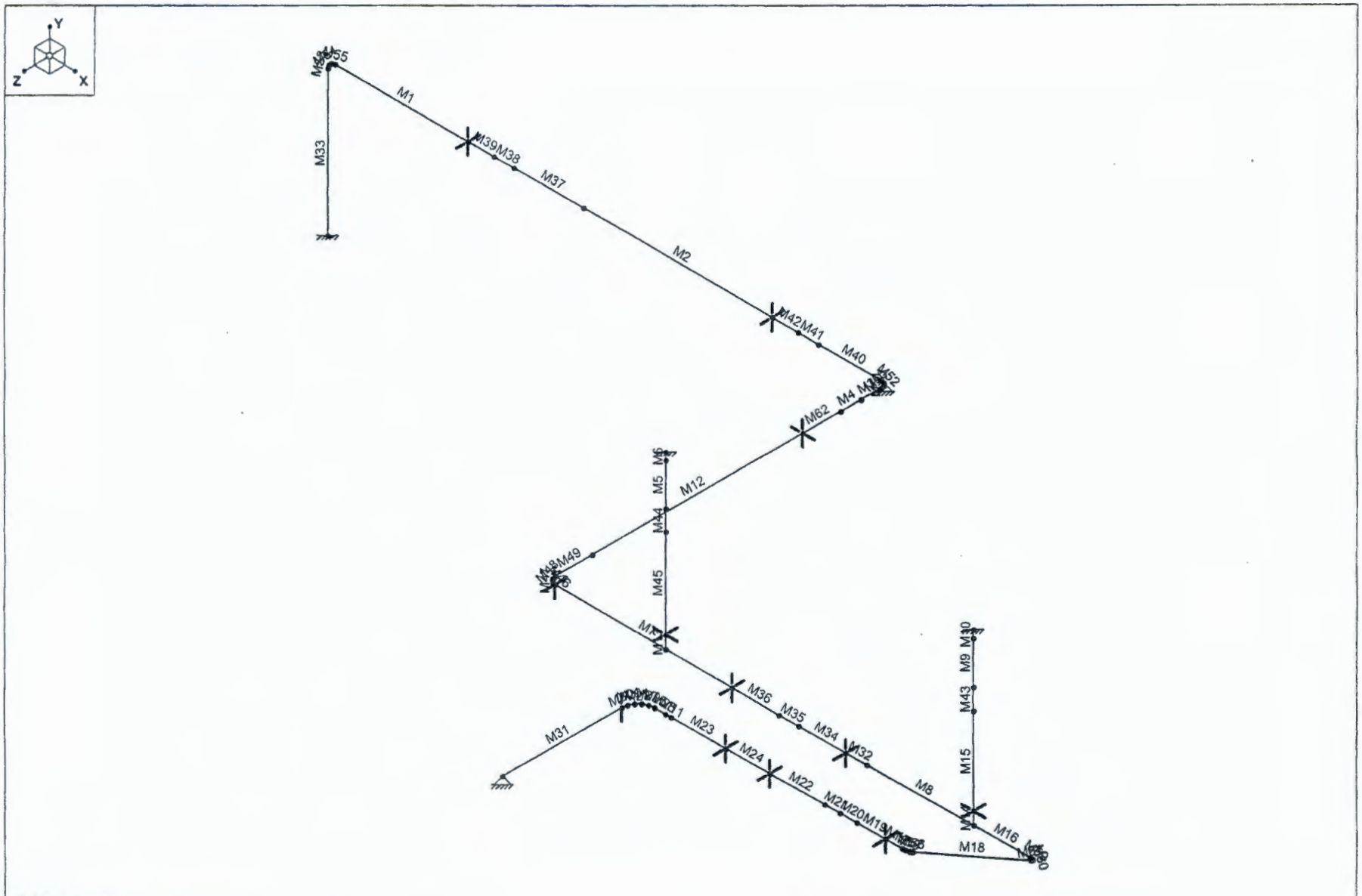
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 8:14 AM
145579-V-CA-005 - Model 2	Rendered Model Geometry	145579-V-CA-005 Model 2.r3d



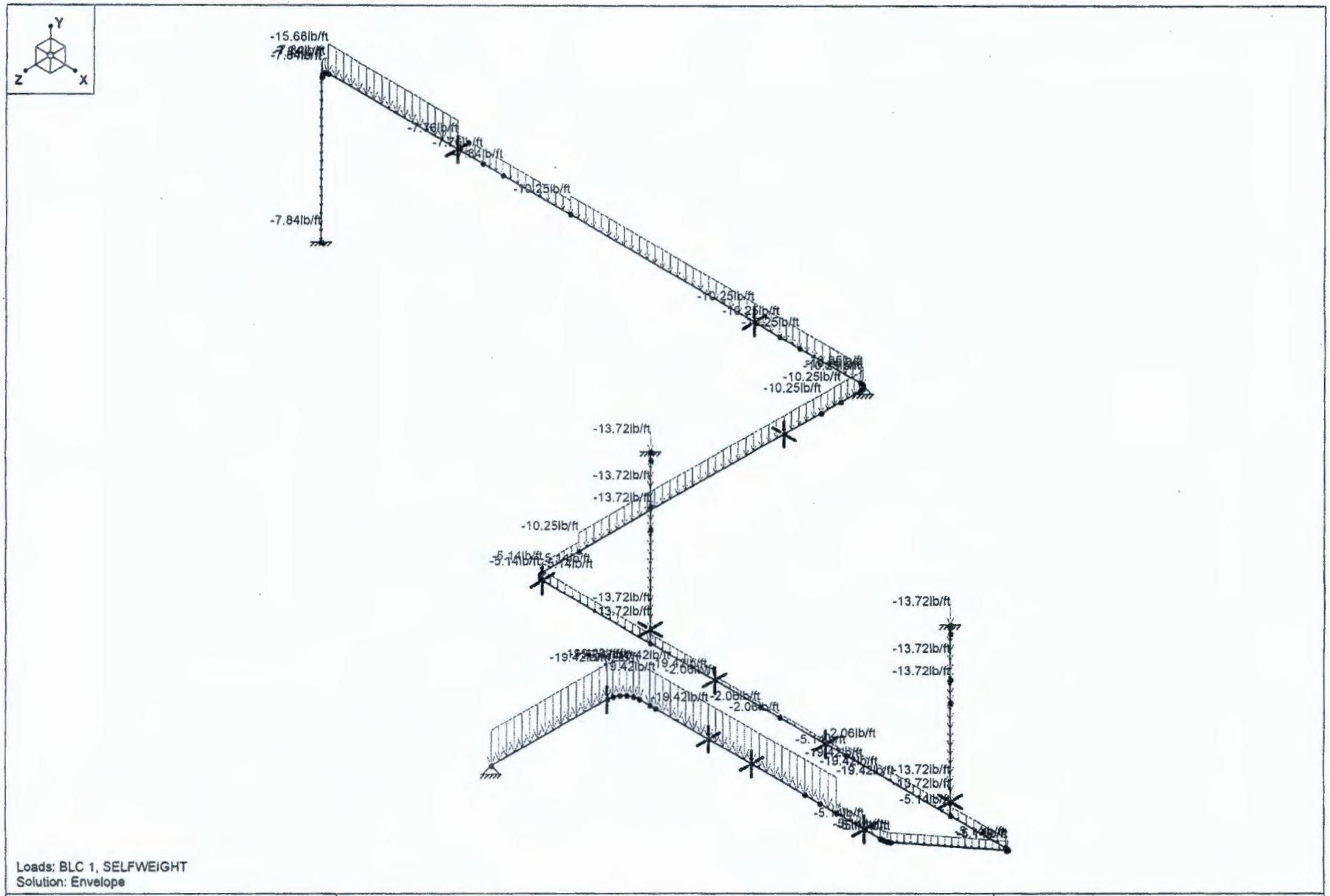
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 8:15 AM
145579-V-CA-005 - Model 2	Nodes and Support Locations	145579-V-CA-005 Model 2.r3d



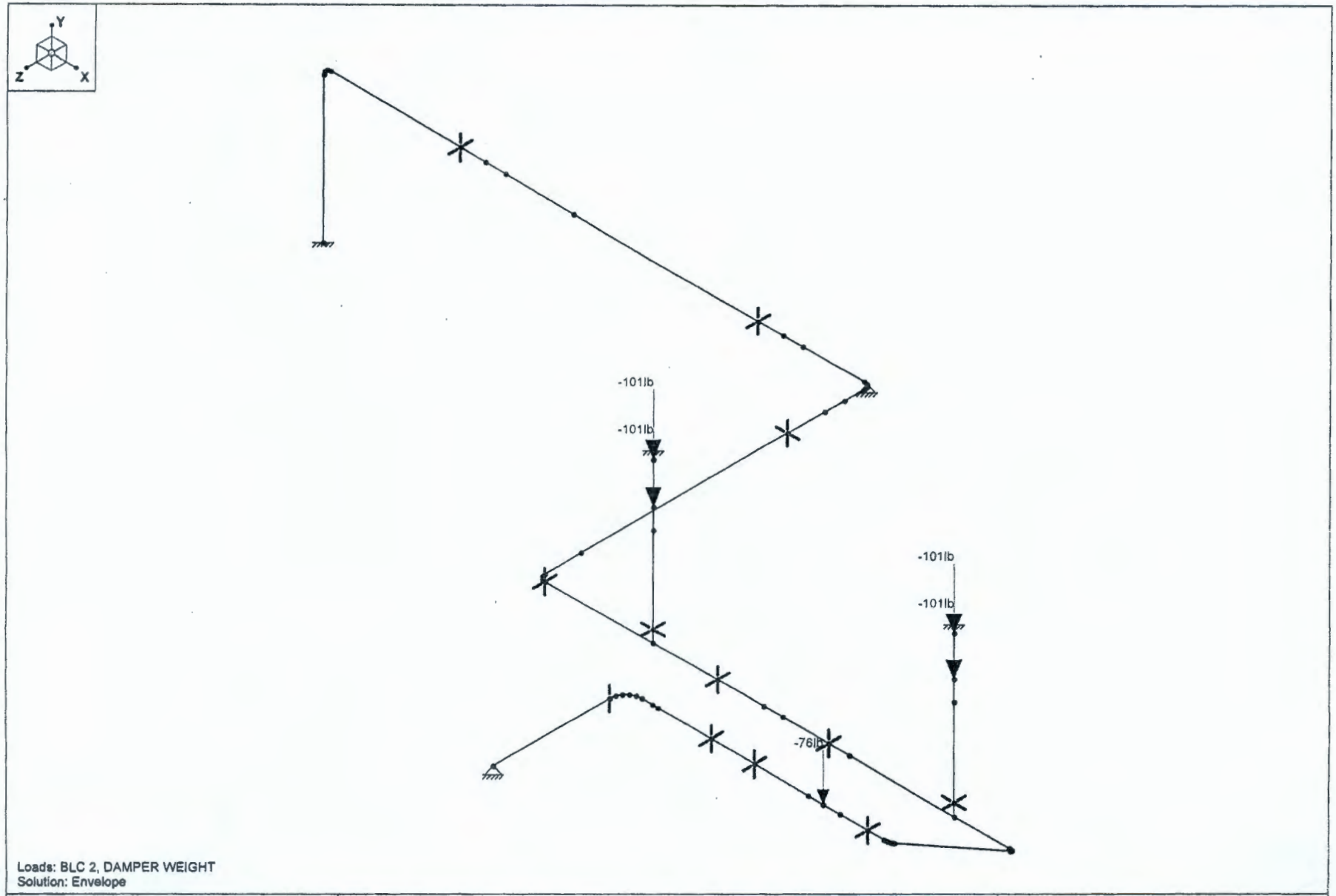
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 8:16 AM
145579-V-CA-005 - Model 2	Members	145579-V-CA-005 Model 2.r3d



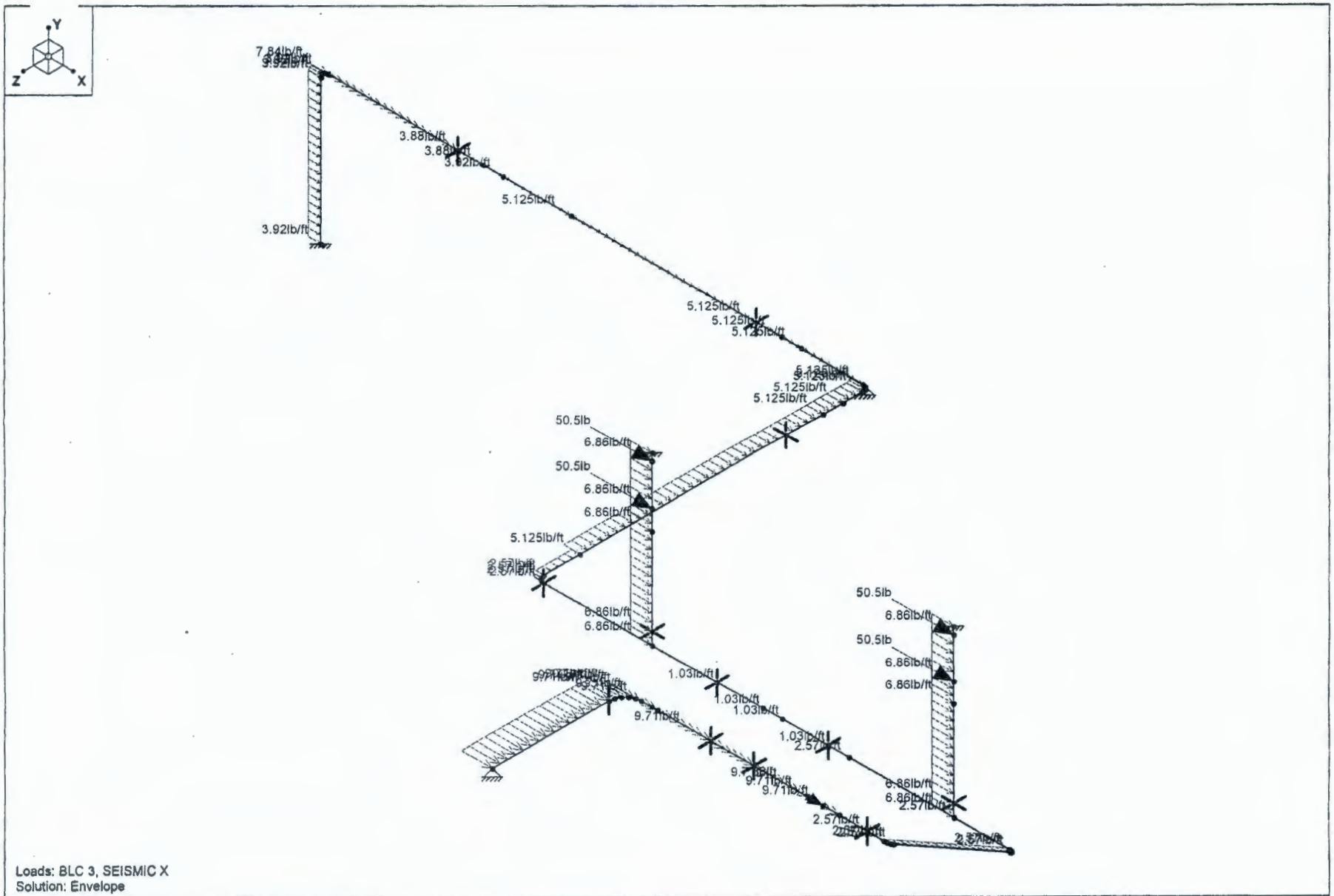
Loads: BLC 1, SELFWEIGHT
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 8:19 AM
145579-V-CA-005 - Model 2	BLC - Selfweight	145579-V-CA-005 Model 2.r3d



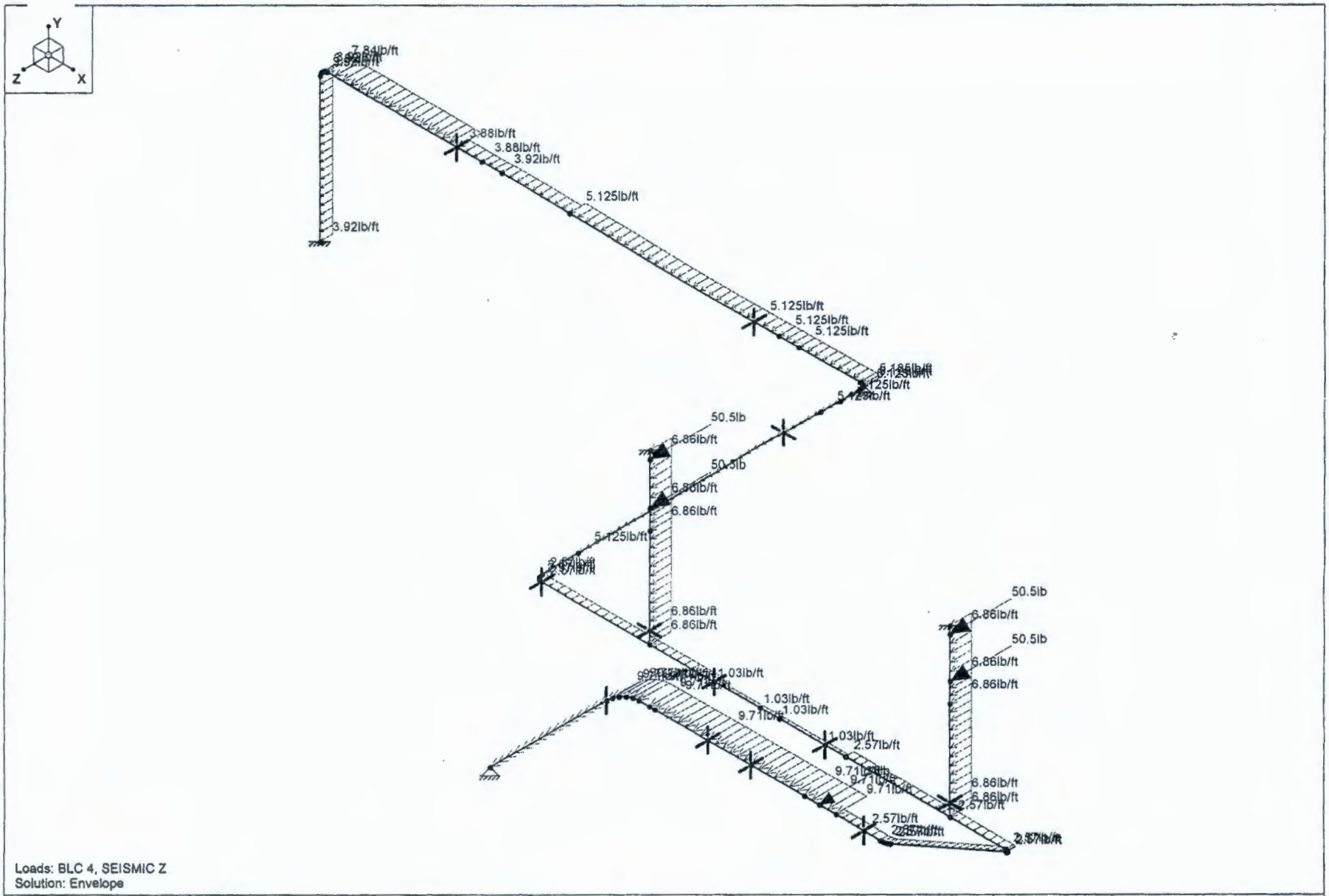
Loads: BLC 2, DAMPER WEIGHT
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 8:19 AM
145579-V-CA-005 - Model 2	BLC - Dampers	145579-V-CA-005 Model 2.r3d



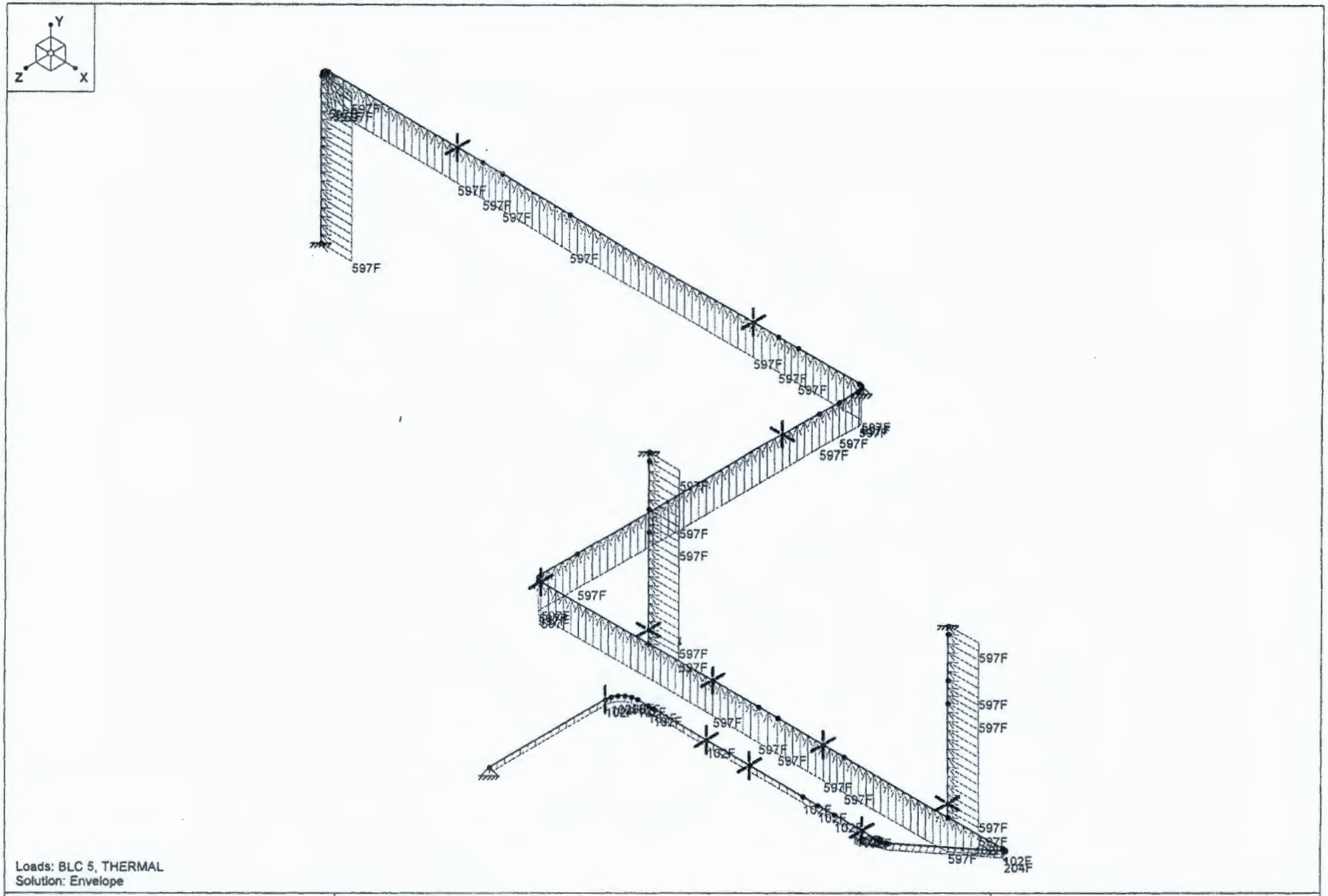
Loads: BLC 3, SEISMIC X
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 8:20 AM
145579-V-CA-005 - Model 2	BLC - Seismic X	145579-V-CA-005 Model 2.r3d



Loads: BLC 4, SEISMIC Z
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 8:20 AM
145579-V-CA-005 - Model 2	BLC - Seismic Z	145579-V-CA-005 Model 2.r3d



Loads: BLC 5, THERMAL
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
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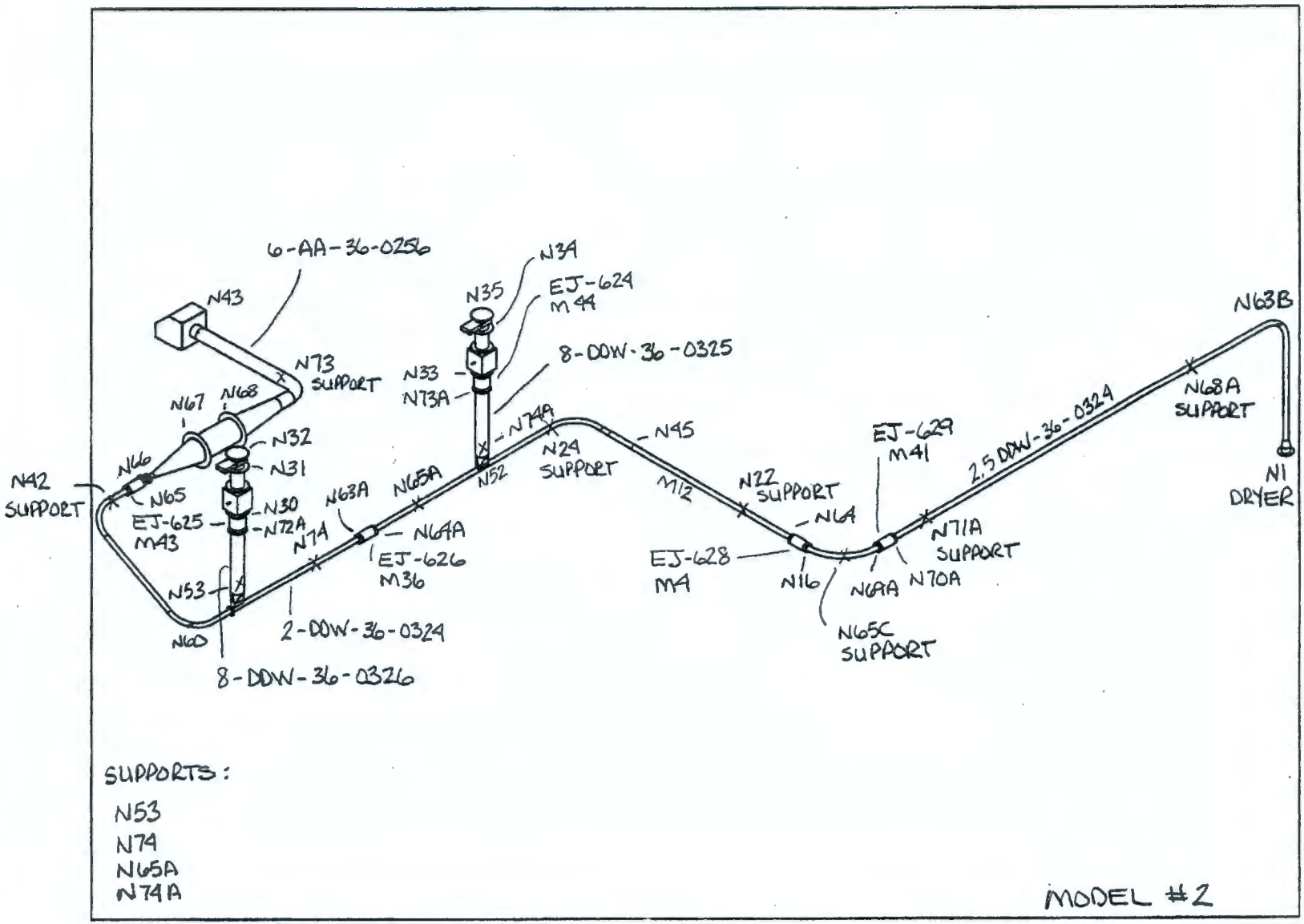
145579-V-CA-005 - Model 2	BLC - Thermal	145579-V-CA-005 Model 2.r3d


6-AA-36-0256
N43
N73
SUPPORT
N67
N68
N32
N31
N66
N42
SUPPORT
N65
EJ-625
M43
N30
N72A
N74
N53
N60
2-DDW-36-0324
8-DDW-36-0326
N63A
N65A
N64A
EJ-626
M36
N35
N3A
EJ-624
M44
N33
N73A
8-DDW-36-0325
N74A
N52
N24
SUPPORT
N45
M12
N22
SUPPORT
N64
EJ-628
M4
N16
N65C
SUPPORT
N64A
N70A
EJ-629
M41
N71A
SUPPORT
2.5 DDW-36-0324
N68A
SUPPORT
N63B
N1
DRYER
SUPPORTS:
N53
N74
N65A
N74A
MODEL #2

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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Global

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation	Yes
Include Warping	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Vertical Axis	Y

Hot Rolled Steel Code	AISC: ASD 9th
Cold Formed Steel Code	AISI 99: ASD
NDS Wood Code	NDS 91: ASD
NDS Temperature	< 100F
Concrete Code	ACI 1999

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections	Yes
Bad Framing Warnings	No
Unused Force Warnings	Yes

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diaphragm
1	N1	0	-57.75	0	0	
2	N6	0	21.5	0	0	
3	N7	3.75	25.25	0	0	
4	N13	139	25.25	0	0	
5	N15	301.75	25.25	0	0	
6	N16	305.5	25.25	14.75	0	
7	N21	305.5	25.25	3.75	0	
8	N22	305.5	25.25	46.375	0	
9	N24	309.25	25.25	185.5	0	
10	N26	479.42	25.25	185.5	0	
11	N29	537.5	25.25	185.5	0	
12	N30	537.5	91.1245	185.5	0	
13	N31	537.5	114.0005	185.5	0	
14	N32	537.5	118.0625	185.5	0	
15	N33	369.75	91.1245	185.5	0	
16	N34	369.75	114.0005	185.5	0	
17	N35	369.75	118.0625	185.5	0	
18	N38	439.045	64.262	254.978	0	
19	N40	525.92	64.262	254.978	0	
20	N41	442.17	64.262	254.978	0	
21	N42	559.045	64.262	254.978	0	
22	N43	424.045	64.262	328.978	0	
23	N45	305.5	25.25	161.5	0	
24	N52	369.75	25.25	185.5	0	
25	N53	537.5	32	185.5	0	
26	N58	568.045	64.262	254.978	0	
27	N59	568.045	25.25	185.5	0	
28	N65	543.42	64.262	254.978	0	
29	N66	534.295	64.262	254.978	0	
30	N67	496.107	64.262	254.978	0	
31	N68	471.982	64.262	254.978	0	

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diaphragm
32	N69	425.764	64.262	258.688	0	
33	N70	433.045	64.262	254.978	0	
34	N71	424.485	64.262	261.197	0	
35	N72	427.755	64.262	256.697	0	
36	N73	424.045	64.262	263.978	0	
37	N74	467.92	25.25	185.5	0	
38	N75	430.263	64.262	255.419	0	
39	N63A	442.319	25.25	185.5	0	
40	N64A	431.692	25.25	185.5	0	
41	N65A	406.092	25.25	185.5	0	
42	N66A	101	25.25	0	0	
43	N67A	90	25.25	0	0	
44	N68A	76	25.25	0	0	
45	N69A	267.5	25.25	0	0	
46	N70A	256.5	25.25	0	0	
47	N71A	242.5	25.25	0	0	
48	N72A	537.5	80.1245	185.5	0	
49	N73A	369.75	80.1245	185.5	0	
50	N74A	369.75	32	185.5	0	
51	N65B	305.5	25.25	181.75	0	
52	N66B	306.002	25.25	183.625	0	
53	N67B	307.375	25.25	184.998	0	
54	N65C	303.625	25.25	.502	0	
55	N66C	304.998	25.25	1.875	0	
56	N63B	.502	23.375	0	0	
57	N64B	1.875	24.748	0	0	
58	N60	569.545	25.441	185.845	0	
59	N61	570.643	25.963	186.787	0	
60	N62	571.045	26.677	188.074	0	
61	N63	569.545	64.071	254.633	0	
62	N64C	570.643	63.549	253.691	0	
63	N65D	571.045	62.835	252.404	0	
64	N64	305.5	25.25	25.75	0	

Joint Boundary Conditions

	Joint Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N13						
2	N22	Reaction	Reaction				
3	N32	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N35	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
6	N41						
7	N42		Reaction	Reaction			
8	N38						
9	N74		Reaction	Reaction			
10	N43	Reaction	Reaction	Reaction			
11	N65A		Reaction	Reaction			
12	N68		Reaction	Reaction			
13	N67		Reaction	Reaction			
14	N73		Reaction				
15	N68A		Reaction	Reaction			
16	N71A		Reaction	Reaction			
17	N53	Reaction		Reaction			
18	N74A	Reaction		Reaction			
19	N65C	Reaction	Reaction	Reaction			
20	N24		Reaction	Reaction			

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[lb/in^3]
1	gen_Conc3NW	3155	1372	.15	.6	.084
2	gen_Conc4NW	3644	1584	.15	.6	.084
3	gen_Conc3LW	2085	906	.15	.6	.064
4	gen_Conc4LW	2408	1047	.15	.6	.064
5	gen_Alum	10600	4077	.3	1.29	.1
6	gen_Steel	29000	11154	.3	.65	.284
7	RIGID	1e+7		0	0	0

General Section Sets

	Label	Shape	Type	Material	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	GEN1A	RE4X4	Beam	gen_Conc3NW	16	21.333	21.333	36.053
2	RIGID		None	RIGID	1e+6	1e+8	1e+8	1e+6

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[lb/in^3]	Yield[ksi]
1	A36	29000	11154	.3	.779	.283	36
2	A312TP316L	29000	11154	.3	1.013	.29	25
3	A312TP316	29000	11154	.3	1.013	.29	30

Hot Rolled Steel Section Sets

	Label	Shape	Design List	Type	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	2DIADUCTSCH80	2 in Sch 80...	Pipe	Beam	A312TP316L	Typical	1.241	.752	.752	1.504
2	2-1/2DIADUCTSC...	2-1/2 in Sc...	Pipe	Beam	A312TP316L	Typical	1.894	1.671	1.671	3.342
3	2-1/2DIADUCTSC...	2-1/2 in Sc...	Pipe	Beam	A312TP316L	Typical	2.494	2.082	2.082	4.163
4	3DIADUCT	3 in Sch 40...	Pipe	Beam	A312TP316L	Typical	1.86	2.572	2.572	5.145
5	4DIADUCT	4 in Sch 40...	Pipe	Beam	A312TP316L	Typical	2.644	6.136	6.136	12.272
6	5DIADUCT	5 in Sch 40...	Pipe	Beam	A312TP316L	Typical	3.578	12.82	12.82	25.64
7	6DIADUCT	6 in Sch 40...	Pipe	Beam	A312TP316L	Typical	4.64	23.744	23.744	47.488
8	8DIADUCT	8 in dia Sch...	Pipe	Beam	A312TP316L	Typical	3.262	29.483	29.483	58.965
9	12DIADUCT	12 in dia Sc...	Pipe	Beam	A312TP316L	Typical	5.879	116.711	116.711	233.423
10	16DIADUCT	16 in dia Sc...	Pipe	Beam	A312TP316L	Typical	7.721	242.316	242.316	484.632

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Design List	Type	Material	Design Rules
1	M1	N7	N68A			2-1/2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
2	M2	N13	N71A			2-1/2DIADUCTSCH...	Pipe	Beam	A312TP3...	Typical
3	M3	N21	N16			2-1/2DIADUCTSCH...	Pipe	Beam	A312TP3...	Typical
4	M4	N16	N64			2-1/2DIADUCTSCH...	Pipe	Beam	A312TP3...	Typical
5	M5	N33	N34			8DIADUCT	Pipe	Beam	A312TP3...	Typical
6	M6	N34	N35			8DIADUCT	Pipe	Beam	A312TP3...	Typical
7	M7	N24	N65A			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
8	M8	N26	N29			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
9	M9	N30	N31			8DIADUCT	Pipe	Beam	A312TP3...	Typical
10	M10	N31	N32			8DIADUCT	Pipe	Beam	A312TP3...	Typical
11	M11	N41	N38			6DIADUCT	Pipe	Beam	A312TP3...	Typical
12	M12	N45	N22			2-1/2DIADUCTSCH...	Pipe	Beam	A312TP3...	Typical
13	M13	N52	N74A			8DIADUCT	Pipe	Beam	A312TP3...	Typical
14	M14	N29	N53			8DIADUCT	Pipe	Beam	A312TP3...	Typical
15	M15	N53	N72A			8DIADUCT	Pipe	Beam	A312TP3...	Typical
16	M16	N29	N59			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
17	M17	N42	N58			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis**

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Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Design List	Type	Material	Design Rules
18	M18	N65D	N62			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
19	M19	N42	N65			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
20	M20	N65	N66			6DIADUCT	Pipe	Beam	A312TP3...	Typical
21	M21	N66	N40			6DIADUCT	Pipe	Beam	A312TP3...	Typical
22	M22	N40	N67			6DIADUCT	Pipe	Beam	A312TP3...	Typical
23	M23	N68	N41			6DIADUCT	Pipe	Beam	A312TP3...	Typical
24	M24	N68	N67			RIGID	None	None	RIGID	Typical
25	M25	N38	N70			6DIADUCT	Pipe	Beam	A312TP3...	Typical
26	M26	N70	N75			6DIADUCT	Pipe	Beam	A312TP3...	Typical
27	M27	N75	N72			6DIADUCT	Pipe	Beam	A312TP3...	Typical
28	M28	N72	N69			6DIADUCT	Pipe	Beam	A312TP3...	Typical
29	M29	N69	N71			6DIADUCT	Pipe	Beam	A312TP3...	Typical
30	M30	N71	N73			6DIADUCT	Pipe	Beam	A312TP3...	Typical
31	M31	N73	N43			6DIADUCT	Pipe	Beam	A312TP3...	Typical
32	M32	N74	N26			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
33	M33	N1	N6			2-1/2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
34	M34	N63A	N74			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
35	M35	N64A	N63A			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
36	M36	N65A	N64A			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
37	M37	N66A	N13			2-1/2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
38	M38	N67A	N66A			2-1/2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
39	M39	N68A	N67A			2-1/2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
40	M40	N69A	N15			2-1/2DIADUCTSCH...	Pipe	Beam	A312TP3...	Typical
41	M41	N70A	N69A			2-1/2DIADUCTSCH...	Pipe	Beam	A312TP3...	Typical
42	M42	N71A	N70A			2-1/2DIADUCTSCH...	Pipe	Beam	A312TP3...	Typical
43	M43	N72A	N30			8DIADUCT	Pipe	Beam	A312TP3...	Typical
44	M44	N73A	N33			8DIADUCT	Pipe	Beam	A312TP3...	Typical
45	M45	N74A	N73A			8DIADUCT	Pipe	Beam	A312TP3...	Typical
46	M46	N24	N67B			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
47	M47	N67B	N66B			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
48	M48	N66B	N65B			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
49	M49	N65B	N45			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
50	M50	N21	N66C			2-1/2DIADUCTSCH...	Pipe	Beam	A312TP3...	Typical
51	M51	N66C	N65C			2-1/2DIADUCTSCH...	Pipe	Beam	A312TP3...	Typical
52	M52	N65C	N15			2-1/2DIADUCTSCH...	Pipe	Beam	A312TP3...	Typical
53	M53	N6	N63B			2-1/2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
54	M54	N63B	N64B			2-1/2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
55	M55	N64B	N7			2-1/2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
56	M56	N65D	N64C			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
57	M57	N64C	N63			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
58	M58	N63	N58			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
59	M59	N59	N60			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
60	M60	N60	N61			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
61	M61	N61	N62			2DIADUCTSCH80	Pipe	Beam	A312TP3...	Typical
62	M62	N64	N22			2-1/2DIADUCTSCH...	Pipe	Beam	A312TP3...	Typical

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area (Me...	Surface (...
1	SELFWEIGHT	DL						63		
2	DAMPER WEIGHT	DL				5				
3	SEISMIC X	ELX				5		63		
4	SEISMIC Z	ELZ				5		63		
5	THERMAL	None						62		
6	WIND X	WLX								
7	WIND Z	WLZ								

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Designer : Kevin M. Jones
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Joint Loads and Enforced Displacements (BLC 2 : DAMPER WEIGHT)

	Joint Label	L.D.M	Direction	Magnitude[lb,lb-ft in,rad lb*s^2/in]
1	N34	L	Y	-101
2	N31	L	Y	-101
3	N30	L	Y	-101
4	N33	L	Y	-101
5	N66	L	Y	-76

Joint Loads and Enforced Displacements (BLC 3 : SEISMIC X)

	Joint Label	L.D.M	Direction	Magnitude[lb,lb-ft in,rad lb*s^2/in]
1	N34	L	X	50.5
2	N31	L	X	50.5
3	N30	L	X	50.5
4	N33	L	X	50.5
5	N66	L	X	38

Joint Loads and Enforced Displacements (BLC 4 : SEISMIC Z)

	Joint Label	L.D.M	Direction	Magnitude[lb,lb-ft in,rad lb*s^2/in]
1	N34	L	Z	50.5
2	N31	L	Z	50.5
3	N30	L	Z	50.5
4	N33	L	Z	50.5
5	N66	L	Z	38

Member Distributed Loads (BLC 1 : SELFWEIGHT)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M1	Y	-7.84	-7.84	0	0
2	M2	Y	-10.25	-10.25	0	0
3	M3	Y	-10.25	-10.25	0	0
4	M4	Y	-10.25	-10.25	0	0
5	M12	Y	-10.25	-10.25	0	0
6	M5	Y	-13.72	-13.72	0	0
7	M6	Y	-13.72	-13.72	0	0
8	M7	Y	-5.14	-5.14	0	0
9	M8	Y	-5.14	-5.14	0	0
10	M9	Y	-13.72	-13.72	0	0
11	M10	Y	-13.72	-13.72	0	0
12	M11	Y	-19.42	-19.42	0	0
13	M13	Y	-13.72	-13.72	0	0
14	M14	Y	-13.72	-13.72	0	0
15	M15	Y	-13.72	-13.72	0	0
16	M16	Y	-5.14	-5.14	0	0
17	M17	Y	-5.14	-5.14	0	0
18	M18	Y	-5.14	-5.14	0	0
19	M19	Y	-5.14	-5.14	0	0
20	M20	Y	-19.42	-19.42	0	0
21	M21	Y	-19.42	-19.42	0	0
22	M22	Y	-19.42	-19.42	0	0
23	M23	Y	-19.42	-19.42	0	0
24	M24	Y	-19.42	-19.42	0	0
25	M25	Y	-19.42	-19.42	0	0
26	M26	Y	-19.42	-19.42	0	0
27	M27	Y	-19.42	-19.42	0	0
28	M28	Y	-19.42	-19.42	0	0
29	M29	Y	-19.42	-19.42	0	0
30	M30	Y	-19.42	-19.42	0	0

Member Distributed Loads (BLC 1 : SELFWEIGHT) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
31	M31	Y	-19.42	-19.42	0	0
32	M32	Y	-5.14	-5.14	0	0
33	M33	Y	-7.84	-7.84	0	0
34	M34	Y	-5.14	-5.14	0	0
35	M35	Y	-5.14	-5.14	0	0
36	M36	Y	-5.14	-5.14	0	0
37	M37	Y	-5.14	-5.14	0	0
38	M38	Y	-7.76	-7.76	0	0
39	M39	Y	-7.76	-7.76	0	0
40	M40	Y	-10.25	-10.25	0	0
41	M41	Y	-10.25	-10.25	0	0
42	M42	Y	-10.25	-10.25	0	0
43	M43	Y	-13.72	-13.72	0	0
44	M44	Y	-13.72	-13.72	0	0
45	M45	Y	-13.72	-13.72	0	0
46	M62	Y	-10.25	-10.25	0	0
47	M58	Y	-5.14	-5.14	0	0
48	M57	Y	-5.14	-5.14	0	0
49	M56	Y	-5.14	-5.14	0	0
50	M61	Y	-5.14	-5.14	0	0
51	M60	Y	-5.14	-5.14	0	0
52	M59	Y	-5.14	-5.14	0	0
53	M46	Y	-5.14	-5.14	0	0
54	M47	Y	-5.14	-5.14	0	0
55	M48	Y	-5.14	-5.14	0	0
56	M49	Y	-5.14	-5.14	0	0
57	M50	Y	-10.25	-10.25	0	0
58	M51	Y	-10.25	-10.25	0	0
59	M52	Y	-10.25	-10.25	0	0
60	M55	Y	-7.84	-7.84	0	0
61	M54	Y	-7.84	-7.84	0	0
62	M53	Y	-7.84	-7.84	0	0
63	M1	Y	-7.84	-7.84	0	0

Member Distributed Loads (BLC 3 : SEISMIC X)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M1	X	3.92	3.92	0	0
2	M2	X	5.125	5.125	0	0
3	M3	X	5.125	5.125	0	0
4	M4	X	5.125	5.125	0	0
5	M12	X	5.125	5.125	0	0
6	M5	X	6.86	6.86	0	0
7	M6	X	6.86	6.86	0	0
8	M7	X	2.57	2.57	0	0
9	M8	X	2.57	2.57	0	0
10	M9	X	6.86	6.86	0	0
11	M10	X	6.86	6.86	0	0
12	M11	X	9.71	9.71	0	0
13	M13	X	6.86	6.86	0	0
14	M14	X	6.86	6.86	0	0
15	M15	X	6.86	6.86	0	0
16	M16	X	2.57	2.57	0	0
17	M17	X	2.57	2.57	0	0
18	M18	X	2.57	2.57	0	0
19	M19	X	2.57	2.57	0	0
20	M20	X	9.71	9.71	0	0
21	M21	X	9.71	9.71	0	0

Member Distributed Loads (BLC 3 : SEISMIC X) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i..	End Location[i...
22	M22	X	9.71	9.71	0	0
23	M23	X	9.71	9.71	0	0
24	M24	X	9.71	9.71	0	0
25	M25	X	9.71	9.71	0	0
26	M26	X	9.71	9.71	0	0
27	M27	X	9.71	9.71	0	0
28	M28	X	9.71	9.71	0	0
29	M29	X	9.71	9.71	0	0
30	M30	X	9.71	9.71	0	0
31	M31	X	9.71	9.71	0	0
32	M32	X	2.57	2.57	0	0
33	M33	X	3.92	3.92	0	0
34	M34	X	2.57	2.57	0	0
35	M35	X	2.57	2.57	0	0
36	M36	X	2.57	2.57	0	0
37	M37	X	2.57	2.57	0	0
38	M38	X	3.88	3.88	0	0
39	M39	X	3.88	3.88	0	0
40	M40	X	5.125	5.125	0	0
41	M41	X	5.125	5.125	0	0
42	M42	X	5.125	5.125	0	0
43	M43	X	6.86	6.86	0	0
44	M44	X	6.86	6.86	0	0
45	M45	X	6.86	6.86	0	0
46	M62	X	5.125	5.125	0	0
47	M58	X	2.57	2.57	0	0
48	M57	X	2.57	2.57	0	0
49	M56	X	2.57	2.57	0	0
50	M61	X	2.57	2.57	0	0
51	M60	X	2.57	2.57	0	0
52	M59	X	2.57	2.57	0	0
53	M46	X	2.57	2.57	0	0
54	M47	X	2.57	2.57	0	0
55	M48	X	2.57	2.57	0	0
56	M49	X	2.57	2.57	0	0
57	M50	X	5.125	5.125	0	0
58	M51	X	5.125	5.125	0	0
59	M52	X	5.125	5.125	0	0
60	M55	X	3.92	3.92	0	0
61	M54	X	3.92	3.92	0	0
62	M53	X	3.92	3.92	0	0
63	M1	X	3.92	3.92	0	0

Member Distributed Loads (BLC 4 : SEISMIC Z)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i..	End Location[i...
1	M1	Z	3.92	3.92	0	0
2	M2	Z	5.125	5.125	0	0
3	M3	Z	5.125	5.125	0	0
4	M4	Z	5.125	5.125	0	0
5	M12	Z	5.125	5.125	0	0
6	M5	Z	6.86	6.86	0	0
7	M6	Z	6.86	6.86	0	0
8	M7	Z	2.57	2.57	0	0
9	M8	Z	2.57	2.57	0	0
10	M9	Z	6.86	6.86	0	0
11	M10	Z	6.86	6.86	0	0
12	M11	Z	9.71	9.71	0	0

Member Distributed Loads (BLC 4 : SEISMIC Z) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
13	M13	Z	6.86	6.86	0	0
14	M14	Z	6.86	6.86	0	0
15	M15	Z	6.86	6.86	0	0
16	M16	Z	2.57	2.57	0	0
17	M17	Z	2.57	2.57	0	0
18	M18	Z	2.57	2.57	0	0
19	M19	Z	2.57	2.57	0	0
20	M20	Z	9.71	9.71	0	0
21	M21	Z	9.71	9.71	0	0
22	M22	Z	9.71	9.71	0	0
23	M23	Z	9.71	9.71	0	0
24	M24	Z	9.71	9.71	0	0
25	M25	Z	9.71	9.71	0	0
26	M26	Z	9.71	9.71	0	0
27	M27	Z	9.71	9.71	0	0
28	M28	Z	9.71	9.71	0	0
29	M29	Z	9.71	9.71	0	0
30	M30	Z	9.71	9.71	0	0
31	M31	Z	9.71	9.71	0	0
32	M32	Z	2.57	2.57	0	0
33	M33	Z	3.92	3.92	0	0
34	M34	Z	2.57	2.57	0	0
35	M35	Z	2.57	2.57	0	0
36	M36	Z	2.57	2.57	0	0
37	M37	Z	2.57	2.57	0	0
38	M38	Z	3.88	3.88	0	0
39	M39	Z	3.88	3.88	0	0
40	M40	Z	5.125	5.125	0	0
41	M41	Z	5.125	5.125	0	0
42	M42	Z	5.125	5.125	0	0
43	M43	Z	6.86	6.86	0	0
44	M44	Z	6.86	6.86	0	0
45	M45	Z	6.86	6.86	0	0
46	M62	Z	5.125	5.125	0	0
47	M58	Z	2.57	2.57	0	0
48	M57	Z	2.57	2.57	0	0
49	M56	Z	2.57	2.57	0	0
50	M61	Z	2.57	2.57	0	0
51	M60	Z	2.57	2.57	0	0
52	M59	Z	2.57	2.57	0	0
53	M46	Z	2.57	2.57	0	0
54	M47	Z	2.57	2.57	0	0
55	M48	Z	2.57	2.57	0	0
56	M49	Z	2.57	2.57	0	0
57	M50	Z	5.125	5.125	0	0
58	M51	Z	5.125	5.125	0	0
59	M52	Z	5.125	5.125	0	0
60	M55	Z	3.92	3.92	0	0
61	M54	Z	3.92	3.92	0	0
62	M53	Z	3.92	3.92	0	0
63	M1	Z	3.92	3.92	0	0

Member Distributed Loads (BLC 5 : THERMAL)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M1	T	597	597	0	0
2	M2	T	597	597	0	0
3	M3	T	597	597	0	0

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Designer : Kevin M. Jones
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Member Distributed Loads (BLC 5 : THERMAL) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
4	M4	T	597	597	0	0
5	M5	T	597	597	0	0
6	M6	T	597	597	0	0
7	M7	T	597	597	0	0
8	M8	T	597	597	0	0
9	M9	T	597	597	0	0
10	M10	T	597	597	0	0
11	M11	T	102	102	0	0
12	M12	T	597	597	0	0
13	M13	T	597	597	0	0
14	M14	T	597	597	0	0
15	M15	T	597	597	0	0
16	M16	T	597	102	0	0
17	M17	T	102	102	0	0
18	M18	T	102	102	0	0
19	M19	T	102	102	0	0
20	M20	T	102	102	0	0
21	M21	T	102	102	0	0
22	M22	T	102	102	0	0
23	M23	T	102	102	0	0
24	M24	T	102	102	0	0
25	M25	T	102	102	0	0
26	M26	T	102	102	0	0
27	M27	T	102	102	0	0
28	M28	T	102	102	0	0
29	M29	T	102	102	0	0
30	M30	T	102	102	0	0
31	M31	T	102	102	0	0
32	M32	T	597	597	0	0
33	M33	T	597	597	0	0
34	M34	T	597	597	0	0
35	M35	T	597	597	0	0
36	M36	T	597	597	0	0
37	M37	T	597	597	0	0
38	M38	T	597	597	0	0
39	M39	T	597	597	0	0
40	M40	T	597	597	0	0
41	M41	T	597	597	0	0
42	M42	T	597	597	0	0
43	M43	T	597	597	0	0
44	M44	T	597	597	0	0
45	M45	T	597	597	0	0
46	M62	T	597	597	0	0
47	M53	T	597	597	0	0
48	M55	T	597	597	0	0
49	M54	T	597	597	0	0
50	M52	T	597	597	0	0
51	M51	T	597	597	0	0
52	M50	T	597	597	0	0
53	M49	T	597	597	0	0
54	M48	T	597	597	0	0
55	M47	T	597	597	0	0
56	M46	T	597	597	0	0
57	M59	T	102	102	0	0
58	M59	T	102	102	0	0
59	M61	T	102	102	0	0
60	M56	T	102	102	0	0

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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Member Distributed Loads (BLC 5 : THERMAL) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
61	M57	T	102	102	0	0
62	M58	T	102	102	0	0

Member Point Loads

Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
No Data to Print ...			

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	Normal Load	Yes			DL	1														
2	Normal + Wind (+X) + Ther...	Yes			DL	1	WLX	1	5	1										
3	Normal + Wind (-X) + Thermal	Yes			DL	1	WLX	-1	5	1										
4	Normal + Wind (+Z) + Thermal	Yes			DL	1	WLZ	1	5	1										
5	Normal + Wind (-Z) + Thermal	Yes			DL	1	WLZ	-1	5	1										
6	Normal + Seismic (+X)(+Z) +...	Yes			DL	1	ELX	1	ELZ	1	5	1								
7	Normal + Seismic (+X)(-Z) + ...	Yes			DL	1	ELX	1	ELZ	-1	5	1								
8	Normal + Seismic (-X)(+Z) + ...	Yes			DL	1	ELX	-1	ELZ	1	5	1								
9	Normal + Seismic (-X)(-Z) + ...	Yes			DL	1	ELX	-1	ELZ	-1	5	1								

Envelope Joint Reactions

	Joint		X [lb]	lc	Y [lb]	lc	Z [lb]	lc	MX [lb-ft]	lc	MY [lb-ft]	lc	MZ [lb-ft]	lc
1	N22	max	176.562	8	123.071	8	0	1	0	1	0	1	0	1
2		min	-.094	1	117.863	7	0	1	0	1	0	1	0	1
3	N32	max	72.829	9	245.376	1	136.667	7	85.989	8	159.847	1	4.098	9
4		min	-167.144	6	245.376	2	-108.358	8	-151.237	7	-25.554	7	-221.482	6
5	N35	max	145.495	8	245.376	1	134.627	7	99.689	8	-.863	1	171.583	8
6		min	-92.049	7	245.376	2	-114.303	8	-146.535	7	-65.102	7	-48.397	7
7	N1	max	141.398	8	263.739	8	31.001	7	113.578	7	22.002	7	852.152	6
8		min	-141.398	6	82.775	1	-31.196	8	-112.183	8	-21.324	8	-237.842	9
9	N42	max	0	1	174.856	7	168.625	7	0	1	0	1	0	1
10		min	0	1	149.107	8	38.55	8	0	1	0	1	0	1
11	N74	max	0	1	127.854	8	13.187	9	0	1	0	1	0	1
12		min	0	1	79.118	1	-16.146	6	0	1	0	1	0	1
13	N43	max	232.21	8	39.52	1	-24.3	1	0	1	0	1	0	1
14		min	-163.148	7	34.736	8	-1899.069	8	0	1	0	1	0	1
15	N65A	max	0	1	81.843	1	18.927	7	0	1	0	1	0	1
16		min	0	1	64.198	8	-5.21	8	0	1	0	1	0	1
17	N68	max	0	1	106.915	6	4931.783	8	0	1	0	1	0	1
18		min	0	1	59.366	1	114.369	1	0	1	0	1	0	1
19	N67	max	0	1	104.285	1	-134.145	1	0	1	0	1	0	1
20		min	0	1	33.458	6	-3255.658	8	0	1	0	1	0	1
21	N73	max	0	1	104.472	8	0	1	0	1	0	1	0	1
22		min	0	1	101.761	1	0	1	0	1	0	1	0	1
23	N68A	max	0	1	121.011	1	75.106	9	0	1	0	1	0	1
24		min	0	1	-110.538	8	-75.018	6	0	1	0	1	0	1
25	N71A	max	0	1	206.304	8	51.751	7	0	1	0	1	0	1
26		min	0	1	116.173	1	-57.598	8	0	1	0	1	0	1
27	N53	max	96.782	8	0	1	11.762	9	0	1	0	1	0	1
28		min	-71.549	7	0	1	-116.06	1	0	1	0	1	0	1
29	N74A	max	20.703	9	0	1	-2.746	1	0	1	0	1	0	1
30		min	-149.894	6	0	1	-108.809	6	0	1	0	1	0	1
31	N65C	max	.058	1	-9.345	1	14.248	9	0	1	0	1	0	1
32		min	-92.069	6	-52.103	8	-8.295	6	0	1	0	1	0	1

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Envelope Joint Reactions (Continued)

	Joint		X [lb]	lc	Y [lb]	lc	Z [lb]	lc	MX [lb-ft]	lc	MY [lb-ft]	lc	MZ [lb-ft]	lc
33	N24	max	0	1	69.469	8	130.697	7	0	1	0	1	0	1
34		min	0	1	68.974	1	-37.748	8	0	1	0	1	0	1
35	Totals:	max	814.056	8	1628.126	1	814.063	7						
36		min	-814.075	7	1628.126	7	-814.063	6						

Envelope Joint Displacements

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
1	N1	max	0	6	0	1	0	8	0	8	0	8	0	9
2		min	0	8	0	8	0	7	0	7	0	7	0	6
3	N6	max	.433	6	.479	7	.045	8	7.391e-4	8	5.439e-4	8	-9.478e-5	1
4		min	.004	1	0	1	-.046	7	-7.791e-4	7	-5.612e-4	7	-8.118e-3	6
5	N7	max	.486	6	.485	9	.046	8	7.268e-4	8	5.788e-4	8	-9.676e-5	1
6		min	.004	1	0	1	-.047	7	-7.714e-4	7	-5.975e-4	7	-8.078e-3	6
7	N13	max	1.304	6	-.035	1	.007	6	3.007e-4	8	2.174e-4	9	-1.595e-5	8
8		min	.004	1	-.173	9	-.006	9	-4.646e-4	7	-2.237e-4	6	-3.804e-4	1
9	N15	max	0	1	0	8	0	1	-1.084e-4	6	1.533e-4	9	-1.455e-4	1
10		min	-.011	9	0	1	-.003	6	-1.708e-4	9	-3.757e-7	1	-5.284e-4	9
11	N16	max	.013	9	.001	1	.086	6	-1.058e-4	1	7.66e-5	8	-1.843e-4	1
12		min	0	1	0	8	0	1	-1.26e-4	9	-4.551e-6	7	-5.519e-4	9
13	N21	max	.012	9	0	1	.019	6	-1.216e-4	6	1.678e-4	9	-1.567e-4	1
14		min	0	1	0	8	0	1	-1.626e-4	9	-3.612e-7	1	-5.352e-4	9
15	N22	max	0	1	0	7	0	1	3.125e-4	1	7.153e-7	1	-2.637e-4	1
16		min	0	8	0	8	-.849	7	2.882e-4	8	-1.206e-3	8	-6.012e-4	8
17	N24	max	0	1	0	1	0	8	-8.699e-4	8	-2.991e-7	1	-7.406e-4	1
18		min	-.366	9	0	8	0	7	-8.871e-4	7	-1.699e-3	7	-9.037e-4	8
19	N26	max	0	1	-.018	1	0	6	-9.421e-6	8	9.07e-5	1	-1.797e-3	1
20		min	-.352	8	-.029	8	0	1	-3.977e-5	7	-3.132e-5	6	-2.933e-3	8
21	N29	max	0	1	-.101	1	0	7	-1.362e-5	8	4.327e-5	7	-2.334e-5	1
22		min	0	6	-.171	8	0	8	-4.148e-5	7	-2.707e-4	1	-1.055e-4	6
23	N30	max	0	6	0	1	0	8	1.682e-5	7	1.256e-5	7	3.044e-5	6
24		min	0	9	-.163	2	0	7	-4.16e-6	8	-7.856e-5	1	5.13e-6	1
25	N31	max	0	6	0	1	0	8	7.311e-6	7	1.894e-6	7	1.102e-5	6
26		min	0	9	-.025	2	0	7	-3.864e-6	8	-1.185e-5	1	4.616e-7	9
27	N32	max	0	6	0	2	0	8	0	7	0	7	0	6
28		min	0	9	0	1	0	7	0	8	0	1	0	9
29	N33	max	0	7	0	1	0	8	1.59e-5	7	3.2e-5	7	-3.131e-6	7
30		min	0	8	-.163	2	0	7	-6.818e-6	8	4.241e-7	1	-2.076e-5	8
31	N34	max	0	7	0	1	0	8	7.062e-6	7	4.825e-6	7	1.878e-6	7
32		min	0	8	-.025	2	0	7	-4.588e-6	8	6.395e-8	1	-8.386e-6	8
33	N35	max	0	7	0	2	0	8	0	7	0	7	0	7
34		min	0	8	0	1	0	7	0	8	0	1	0	8
35	N38	max	.224	7	0	1	0	1	-2.314e-5	1	1.901e-6	1	2.516e-6	8
36		min	-.003	1	0	8	-.044	9	-4.442e-5	8	-2.095e-3	6	-6.048e-7	1
37	N40	max	.289	7	0	6	.002	6	-9.43e-5	1	-4.763e-5	9	3.376e-5	6
38		min	-.003	1	0	1	0	9	-1.546e-4	8	-1.115e-4	6	5.433e-6	1
39	N41	max	.227	7	0	1	0	1	-2.668e-5	1	7.691e-8	1	3.49e-6	8
40		min	-.003	1	0	8	-.037	9	-4.99e-5	8	-1.969e-3	6	5.253e-7	1
41	N42	max	.323	7	0	8	0	8	-6.734e-4	1	7.799e-4	6	-2.17e-4	1
42		min	-.003	1	0	7	0	7	-1.052e-3	8	3.892e-4	1	-4.374e-4	6
43	N43	max	0	7	0	8	0	8	-9.278e-6	8	5.378e-5	1	-2.91e-6	8
44		min	0	8	0	1	0	1	-1.4e-5	1	-3.005e-3	7	-5.756e-6	1
45	N45	max	0	1	-.017	8	0	1	-6.644e-4	6	1.976e-6	1	-5.527e-4	1
46		min	-.337	8	-.018	1	-.152	7	-6.734e-4	9	-3.539e-3	7	-7.819e-4	8
47	N52	max	0	8	-.033	1	0	7	-1.485e-6	8	1.102e-4	7	6.006e-5	8
48		min	0	1	-.038	8	0	8	-3.654e-5	7	1.461e-6	1	4.294e-5	1
49	N53	max	0	7	-.101	1	0	1	-7.364e-6	8	4.013e-5	7	-1.776e-5	1

Envelope Joint Displacements (Continued)

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
50		min	0	8	-.131	8	0	9	-3.644e-5	7	-2.51e-4	1	-8.36e-5	6
51	N58	max	.332	7	-.003	1	-.005	1	-9.956e-4	1	1.449e-3	7	-4.598e-4	1
52		min	-.003	1	-.006	6	-.01	6	-1.551e-3	8	6.132e-4	1	-9.504e-4	6
53	N59	max	.108	9	-.09	1	.036	1	-7.113e-4	1	1.376e-3	7	4.692e-4	1
54		min	0	1	-.179	8	-.018	7	-1.189e-3	9	-1.376e-3	1	-8.963e-4	6
55	N65	max	.307	7	.001	6	.004	6	-1.141e-4	1	-5.29e-5	1	5.399e-5	6
56		min	-.003	1	0	1	.002	9	-1.854e-4	8	-1.087e-4	6	2.404e-5	1
57	N66	max	.297	7	0	6	.003	6	-1.038e-4	1	-5.385e-5	1	4.632e-5	6
58		min	-.003	1	0	1	.001	9	-1.693e-4	8	-1.15e-4	6	1.583e-5	1
59	N67	max	.258	7	0	6	0	8	-6.049e-5	1	0	1	0	6
60		min	-.003	1	0	1	0	1	-1.023e-4	8	0	8	0	1
61	N68	max	.258	7	0	1	0	1	-6.049e-5	1	0	1	0	6
62		min	-.003	1	0	6	0	8	-1.023e-4	8	0	8	0	1
63	N69	max	.201	7	0	1	0	1	-6.765e-6	1	1.454e-5	1	-1.985e-6	8
64		min	-.003	1	0	8	-.068	9	-1.94e-5	8	-2.48e-3	6	-5.035e-6	1
65	N70	max	.217	7	0	1	0	1	-1.633e-5	1	6.37e-6	1	7.672e-7	8
66		min	-.003	1	0	8	-.057	9	-3.388e-5	8	-2.294e-3	6	-2.57e-6	1
67	N71	max	.193	7	0	1	0	1	-3.629e-6	1	1.75e-5	1	-2.661e-6	8
68		min	-.003	1	0	8	-.068	7	-1.488e-5	8	-2.522e-3	6	-5.564e-6	1
69	N72	max	.208	7	0	1	0	1	-9.903e-6	1	1.164e-5	1	-1.044e-6	8
70		min	-.003	1	0	8	-.066	9	-2.406e-5	8	-2.429e-3	6	-4.266e-6	1
71	N73	max	.186	7	0	1	0	1	-3.248e-7	1	2.043e-5	1	-2.91e-6	8
72		min	-.003	1	0	8	-.067	7	-1.028e-5	8	-2.56e-3	6	-5.756e-6	1
73	N74	max	0	1	0	1	0	6	-8.589e-6	8	6.384e-5	1	-1.311e-3	1
74		min	-.421	8	0	8	0	9	-3.943e-5	7	-2.059e-6	7	-2.076e-3	8
75	N75	max	.214	7	0	1	0	1	-1.31e-5	1	8.894e-6	1	-6.483e-8	8
76		min	-.003	1	0	8	-.062	9	-2.891e-5	8	-2.368e-3	6	-3.405e-6	1
77	N63A	max	0	1	.026	8	0	6	-6.737e-6	8	2.176e-5	6	-1.084e-4	8
78		min	-.576	8	.017	1	0	9	-3.868e-5	7	-5.988e-6	9	-1.305e-4	1
79	N64A	max	.375	8	.024	8	0	6	-5.968e-6	8	1.073e-5	7	4.43e-4	8
80		min	0	1	.017	1	0	9	-3.836e-5	7	-1.811e-5	1	2.439e-4	1
81	N65A	max	.22	8	0	8	0	8	-4.115e-6	8	-7.857e-6	9	1.32e-3	8
82		min	0	1	0	1	0	7	-3.761e-5	7	-4.438e-5	6	1.055e-3	1
83	N66A	max	1.074	6	-.013	1	.002	7	4.204e-4	8	1.057e-4	9	-6.615e-4	1
84		min	.004	1	-.112	9	-.002	8	-5.508e-4	7	-1.209e-4	6	-3.299e-3	9
85	N67A	max	1.007	6	-.006	1	.003	7	4.551e-4	8	3.564e-5	8	-5.54e-4	1
86		min	.004	1	-.07	9	-.002	8	-5.757e-4	7	-5.283e-5	7	-4.342e-3	9
87	N68A	max	.923	6	0	8	0	6	4.992e-4	8	3.193e-4	8	-2.534e-4	1
88		min	.004	1	0	1	0	9	-6.075e-4	7	-3.386e-4	7	-5.688e-3	9
89	N69A	max	0	1	.013	9	0	9	-2.247e-5	6	5.911e-5	7	1.631e-6	9
90		min	-.219	9	.004	1	-.002	6	-2.325e-4	9	1.362e-8	1	-1.617e-5	1
91	N70A	max	2.014	6	.011	9	0	9	5.12e-6	6	5.239e-5	6	4.216e-4	9
92		min	.004	1	.003	1	-.001	6	-2.523e-4	9	-1.109e-5	9	1.125e-4	1
93	N71A	max	1.93	6	0	1	0	8	4.024e-5	6	1.416e-4	6	1.18e-3	9
94		min	.004	1	0	8	0	7	-2.775e-4	9	-1.156e-4	9	3.866e-4	1
95	N72A	max	.001	6	.182	7	0	8	9.045e-6	7	1.769e-5	7	2.08e-5	6
96		min	0	1	-.101	1	0	7	1.87e-6	8	-1.106e-4	1	4.425e-6	1
97	N73A	max	0	7	.295	7	0	8	8.259e-6	7	4.506e-5	7	-8.158e-6	7
98		min	0	8	-.033	1	0	7	-4.222e-7	8	5.973e-7	1	-1.245e-5	8
99	N74A	max	0	6	.004	7	0	6	1.834e-6	8	1.022e-4	7	5.01e-5	8
100		min	0	9	-.033	1	0	1	-3.328e-5	7	1.355e-6	1	3.26e-5	7
101	N65B	max	0	1	0	8	0	1	-9.24e-4	8	3.031e-7	1	-6.933e-4	1
102		min	-.383	8	0	1	-.03	7	-9.393e-4	7	-2.277e-3	7	-8.698e-4	8
103	N66B	max	0	1	.001	8	0	1	-9.13e-4	8	1.069e-7	1	-7.069e-4	1
104		min	-.383	8	0	1	-.018	7	-9.289e-4	7	-2.099e-3	7	-8.784e-4	8
105	N67B	max	0	1	.001	8	0	1	-8.949e-4	8	-9.459e-8	1	-7.212e-4	1
106		min	-.376	8	0	1	-.006	7	-9.115e-4	7	-1.906e-3	7	-8.882e-4	8

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

Mar 24, 2006
4:32 PM
Checked By:_____

Envelope Joint Displacements (Continued)

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
107	N65C	max	0	6	0	8	0	6	-1.137e-4	6	1.608e-4	9	-1.484e-4	1
108		min	0	1	0	1	0	9	-1.68e-4	9	-3.735e-7	1	-5.309e-4	9
109	N66C	max	.009	9	0	1	.008	6	-1.184e-4	6	1.665e-4	9	-1.521e-4	1
110		min	0	1	0	8	0	1	-1.655e-4	9	-3.689e-7	1	-5.326e-4	9
111	N63B	max	.451	6	.488	9	.046	8	7.356e-4	8	5.568e-4	8	-9.68e-5	1
112		min	.004	1	0	1	-.048	7	-7.769e-4	7	-5.746e-4	7	-8.115e-3	6
113	N64B	max	.47	6	.49	9	.046	8	7.32e-4	8	5.682e-4	8	-9.77e-5	1
114		min	.004	1	0	1	-.048	7	-7.748e-4	7	-5.865e-4	7	-8.101e-3	6
115	N60	max	.111	7	-.089	1	.038	1	-7.451e-4	1	1.481e-3	7	4.421e-4	1
116		min	0	1	-.179	8	-.019	7	-1.246e-3	9	-1.327e-3	1	-9.612e-4	6
117	N61	max	.113	7	-.088	1	.039	1	-7.753e-4	1	1.586e-3	7	4.096e-4	1
118		min	-.002	1	-.179	8	-.022	7	-1.297e-3	9	-1.272e-3	1	-1.029e-3	6
119	N62	max	.116	7	-.086	1	.039	1	-8.02e-4	1	1.688e-3	7	3.771e-4	1
120		min	-.004	1	-.176	8	-.022	7	-1.341e-3	9	-1.212e-3	1	-1.093e-3	6
121	N63	max	.333	7	-.004	1	-.006	1	-1.049e-3	1	1.555e-3	7	-4.673e-4	1
122		min	-.003	1	-.009	6	-.012	6	-1.634e-3	8	6.184e-4	1	-1.012e-3	6
123	N64C	max	.332	7	-.006	1	-.006	1	-1.095e-3	1	1.655e-3	7	-4.645e-4	1
124		min	-.004	1	-.012	6	-.014	7	-1.706e-3	8	6.158e-4	1	-1.064e-3	6
125	N65D	max	.329	7	-.008	1	-.005	1	-1.134e-3	1	1.747e-3	7	-4.599e-4	1
126		min	-.005	1	-.015	6	-.015	7	-1.766e-3	8	6.059e-4	1	-1.115e-3	6
127	N64	max	.013	9	.002	1	0	1	-3.046e-5	1	-2.275e-8	1	-2.119e-4	1
128		min	0	1	.002	8	-.973	7	-5.214e-5	8	-2.234e-4	7	-5.688e-4	8

Envelope Member Section Stresses

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
1	M1	1	...	.06	8	.22	8	.003	7	.598	7	5.996	8	.24	7	.233	8
2			...	-.06	7	.029	1	-.004	8	-5.9...	8	-.598	7	-.233	8	-.24	7
3		2	...	.054	8	.195	8	.009	6	1.68	6	2.945	9	.198	7	.195	8
4			...	-.054	7	.004	1	-.009	9	-2.9...	9	-1.68	6	-.195	8	-.198	7
5		3	...	.048	8	.17	8	.021	6	2.3...	6	.261	9	.031	6	.031	9
6			...	-.048	7	-.021	1	-.022	9	-.261	9	-2.395	6	-.031	9	-.031	6
7		4	...	.041	8	.145	8	.034	6	2.7...	6	.34	1	.438	6	.44	9
8			...	-.041	7	-.046	1	-.034	9	-.34	1	-2.743	6	-.44	9	-.438	6
9		5	...	.035	8	.12	8	.046	6	4.0...	8	1.201	1	1.028	6	1.033	9
10			...	-.035	7	-.071	1	-.047	9	-1.2...	1	-4.007	8	-1.033	9	-1.028	6
11	M2	1	...	.02	8	.017	1	.012	9	2.5...	9	-.599	1	.132	9	.141	6
12			...	-.02	6	-.023	8	-.012	6	.599	1	-2.579	9	-.141	6	-.132	9
13		2	...	.016	8	0	1	.003	9	1.86	9	-.783	1	.297	9	.308	6
14			...	-.016	6	-.041	8	-.003	6	.783	1	-1.86	9	-.308	6	-.297	9
15		3	...	.011	8	-.018	1	.006	8	.745	9	-.572	1	.266	9	.279	6
16			...	-.011	6	-.059	8	-.006	7	.572	1	-.745	9	-.279	6	-.266	9
17		4	...	.007	8	-.036	1	.015	8	-.034	1	.765	8	.037	9	.052	6
18			...	-.007	6	-.077	8	-.015	7	-.765	8	.034	1	-.052	6	-.037	9
19		5	...	.002	8	-.054	1	.024	8	-1.0...	1	2.669	8	.394	8	.411	7
20			...	-.002	6	-.094	8	-.024	7	-2.6...	8	1.034	1	-.411	7	-.394	8
21	M3	1	...	.002	7	-.011	7	.07	8	.055	8	.077	7	.122	7	.047	8
22			...	-.002	6	-.015	8	0	1	-.077	7	-.055	8	-.047	8	-.122	7
23		2	...	.001	7	-.013	7	.071	8	.016	8	.105	7	.246	7	0	1
24			...	-.001	6	-.017	8	0	1	-.105	7	-.016	8	0	1	-.246	7
25		3	...	0	7	-.015	7	.072	8	-.026	8	.139	7	.367	7	0	1
26			...	0	6	-.019	8	0	1	-.139	7	.026	8	0	1	-.367	7
27		4	...	0	7	-.017	7	.073	8	-.074	8	.176	7	.51	9	0	1
28			...	0	6	-.021	8	0	1	-.176	7	.074	8	0	1	-.51	9
29		5	...	0	1	-.019	7	.074	8	-.125	8	.218	7	.675	9	0	1
30			...	0	1	-.023	8	0	1	-.218	7	.125	8	0	1	-.675	9
31	M4	1	...	0	1	-.019	7	.074	8	-.125	8	.218	7	.675	9	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
32			...	0	1	-.023	8	0	1	-.218	7	.125	8	0	1	-.675	9
33		2	...	0	6	-.021	7	.075	8	-.182	8	.265	7	.843	9	0	1
34			...	0	7	-.025	8	0	1	-.265	7	.182	8	0	1	-.843	9
35		3	...	0	6	-.022	7	.076	8	-.242	8	.316	7	1.013	9	0	1
36			...	0	7	-.027	8	0	1	-.316	7	.242	8	0	1	-1.013	9
37		4	...	.001	6	-.024	7	.077	8	-.307	8	.372	7	1.185	9	0	1
38			...	-.001	7	-.028	8	0	1	-.372	7	.307	8	0	1	-1.185	9
39		5	...	.002	6	-.026	7	.078	8	-.377	8	.432	7	1.359	9	.001	1
40			...	-.002	7	-.03	8	0	1	-.432	7	.377	8	-.001	1	-1.359	9
41	M5	1	...	-.035	2	.049	8	.03	8	.078	6	.073	9	.074	9	.076	6
42			...	-.035	1	-.016	7	-.042	7	-.073	9	-.078	6	-.076	6	-.074	9
43		2	...	-.037	2	.051	8	.032	8	.055	6	.005	9	.017	9	.036	6
44			...	-.037	1	-.018	7	-.044	7	-.005	9	-.055	6	-.036	6	-.017	9
45		3	...	-.039	2	.053	8	.034	8	.066	8	-.029	7	.01	8	.047	7
46			...	-.039	1	-.02	7	-.046	7	.029	7	-.066	8	-.047	7	-.01	8
47		4	...	-.041	2	.055	8	.036	8	.139	8	0	7	.058	8	.111	7
48			...	-.041	1	-.022	7	-.048	7	0	7	-.139	8	-.111	7	-.058	8
49		5	...	-.043	2	.057	8	.038	8	.215	8	.031	7	.108	8	.178	7
50			...	-.043	1	-.024	7	-.05	7	-.031	7	-.215	8	-.178	7	-.108	8
51	M6	1	...	-.074	2	.088	8	.069	8	.215	8	.031	7	.108	8	.178	7
52			...	-.074	1	-.055	7	-.081	7	-.031	7	-.215	8	-.178	7	-.108	8
53		2	...	-.074	2	.088	8	.069	8	.237	8	.044	7	.124	8	.198	7
54			...	-.074	1	-.055	7	-.081	7	-.044	7	-.237	8	-.198	7	-.124	8
55		3	...	-.075	2	.089	8	.069	8	.258	8	.058	7	.141	8	.217	7
56			...	-.075	1	-.056	7	-.082	7	-.058	7	-.258	8	-.217	7	-.141	8
57		4	...	-.075	2	.089	8	.07	8	.28	8	.071	7	.158	8	.237	7
58			...	-.075	1	-.056	7	-.082	7	-.071	7	-.28	8	-.237	7	-.158	8
59		5	...	-.075	2	.089	8	.07	8	.301	8	.085	7	.175	8	.257	7
60			...	-.075	1	-.056	7	-.083	7	-.085	7	-.301	8	-.257	7	-.175	8
61	M7	1	...	.049	6	.045	8	.101	7	-.355	9	.427	1	.004	1	3.805	7
62			...	0	1	.043	1	0	1	-.427	1	.355	9	-3.805	7	-.004	1
63		2	...	.054	6	.028	8	.092	7	.5	8	-.404	1	0	1	1.518	7
64			...	0	1	.027	1	0	1	.404	1	-.5	8	-1.518	7	0	1
65		3	...	.058	6	.011	8	.088	6	.96	8	-.838	1	.571	7	.004	1
66			...	0	1	.01	1	0	1	.838	1	-.96	8	-.004	1	-.571	7
67		4	...	.009	8	-.107	8	.002	1	1.8...	8	-1.647	1	.206	7	0	1
68			...	-.009	6	-.108	1	-.012	6	1.6...	1	-1.875	8	0	1	-.206	7
69		5	...	.004	8	-.124	8	.002	1	-.855	8	1.109	1	.046	1	.143	7
70			...	-.004	6	-.125	1	-.019	7	-1.1...	1	.855	8	-.143	7	-.046	1
71	M8	1	...	.008	7	.135	8	.009	1	-.964	1	1.789	8	.035	6	.032	1
72			...	-.008	8	.084	1	-.009	6	-1.7...	8	.964	1	-.032	1	-.035	6
73		2	...	.011	7	.125	8	.009	1	.162	1	-.066	8	.091	1	.057	6
74			...	-.011	8	.074	1	-.004	6	.066	8	-.162	1	-.057	6	-.091	1
75		3	...	.013	7	.115	8	.009	1	1.7...	8	-1.146	1	.214	1	.077	6
76			...	-.013	8	.064	1	-.004	7	1.1...	1	-1.778	8	-.077	6	-.214	1
77		4	...	.016	7	.105	8	.009	1	3.3...	8	-1.988	1	.337	1	.066	7
78			...	-.016	8	.054	1	-.009	7	1.9...	1	-3.348	8	-.066	7	-.337	1
79		5	...	.018	7	.095	8	.012	8	4.7...	8	-2.687	1	.46	1	.231	7
80			...	-.018	8	.044	1	-.014	7	2.6...	1	-4.775	8	-.231	7	-.46	1
81	M9	1	...	-.035	2	.004	9	.026	8	.071	7	.081	8	.074	9	.077	6
82			...	-.035	1	-.062	6	-.043	7	-.081	8	-.071	7	-.077	6	-.074	9
83		2	...	-.037	2	.006	9	.028	8	-.011	1	.077	8	.014	9	.041	6
84			...	-.037	1	-.064	6	-.045	7	-.077	8	.011	1	-.041	6	-.014	9
85		3	...	-.039	2	.008	9	.03	8	-.02	1	.104	6	0	8	.05	7
86			...	-.039	1	-.066	6	-.047	7	-.104	6	.02	1	-.05	7	0	8
87		4	...	-.041	2	.01	9	.032	8	-.03	1	.196	6	.042	8	.116	7
88			...	-.041	1	-.068	6	-.049	7	-.196	6	.03	1	-.116	7	-.042	8

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

Mar 24, 2006
4:32 PM
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
89		5	...	-.043	2	.012	9	.034	8	-.035	9	.29	6	.087	8	.185	7
90			...	-.043	1	-.07	6	-.051	7	-.29	6	.035	9	-.185	7	-.087	8
91	M10	1	...	-.074	2	.043	9	.065	8	-.035	9	.29	6	.087	8	.185	7
92			...	-.074	1	-.101	6	-.082	7	-.29	6	.035	9	-.185	7	-.087	8
93		2	...	-.074	2	.044	9	.065	8	-.025	9	.315	6	.103	8	.205	7
94			...	-.074	1	-.101	6	-.083	7	-.315	6	.025	9	-.205	7	-.103	8
95		3	...	-.075	2	.044	9	.066	8	-.014	9	.339	6	.119	8	.225	7
96			...	-.075	1	-.102	6	-.083	7	-.339	6	.014	9	-.225	7	-.119	8
97		4	...	-.075	2	.044	9	.066	8	-.004	9	.364	6	.135	8	.245	7
98			...	-.075	1	-.102	6	-.083	7	-.364	6	.004	9	-.245	7	-.135	8
99		5	...	-.075	2	.045	9	.066	8	.007	9	.389	6	.151	8	.265	7
100			...	-.075	1	-.102	6	-.084	7	-.389	6	-.007	9	-.265	7	-.151	8
101	M11	1	...	.035	8	.002	8	-.01	1	.035	1	-.03	8	4.11	6	.051	1
102			...	-.02	7	0	1	-.788	8	.03	8	-.035	1	-.051	1	-4.11	6
103		2	...	.035	8	0	8	-.01	1	.035	1	-.03	8	3.992	6	.053	1
104			...	-.02	7	0	1	-.788	8	.03	8	-.035	1	-.053	1	-3.992	6
105		3	...	.035	8	0	8	-.01	1	.035	1	-.03	8	3.874	6	.056	1
106			...	-.02	7	0	1	-.788	8	.03	8	-.035	1	-.056	1	-3.874	6
107		4	...	.035	8	0	8	-.01	1	.035	1	-.03	8	3.756	6	.059	1
108			...	-.02	7	-.001	1	-.789	8	.03	8	-.035	1	-.059	1	-3.756	6
109		5	...	.035	8	0	8	-.01	1	.034	1	-.03	8	3.638	6	.061	1
110			...	-.02	7	-.002	1	-.789	8	.03	8	-.034	1	-.061	1	-3.638	6
111	M12	1	...	.025	6	.025	1	0	1	.434	7	-.428	8	.887	8	0	1
112			...	-.025	7	.025	8	-.045	6	.428	8	-.434	7	0	1	-.887	8
113		2	...	.02	6	.005	1	0	1	.802	7	-.794	8	.332	8	.4	7
114			...	-.02	7	.005	8	-.035	6	.794	8	-.802	7	-.4	7	-.332	8
115		3	...	.015	6	-.015	1	0	1	.682	7	-.671	8	0	1	1.107	7
116			...	-.015	7	-.015	8	-.037	8	.671	8	-.682	7	-1.107	7	0	1
117		4	...	.01	6	-.034	1	0	1	.074	7	-.059	8	.001	1	1.593	6
118			...	-.01	7	-.035	8	-.047	8	.059	8	-.074	7	-1.593	6	-.001	1
119		5	...	.005	6	-.054	1	0	1	-1.0...	1	1.041	8	.002	1	2.795	8
120			...	-.005	7	-.054	8	-.057	8	-1.0...	8	1.023	1	-2.795	8	-.002	1
121	M13	1	...	.019	1	.007	9	.041	6	-.183	1	.192	6	.036	1	-.035	7
122			...	.019	2	-.054	6	0	1	-.192	6	.183	1	.035	7	-.036	1
123		2	...	.019	1	.008	9	.042	6	-.183	1	.214	6	.052	6	-.035	1
124			...	.019	2	-.054	6	0	1	-.214	6	.183	1	.035	1	-.052	6
125		3	...	.018	1	.008	9	.042	6	-.183	1	.236	6	.069	6	-.035	1
126			...	.018	2	-.055	6	0	1	-.236	6	.183	1	.035	1	-.069	6
127		4	...	.017	1	.009	9	.043	6	-.18	9	.258	6	.086	6	-.035	1
128			...	.017	2	-.056	6	0	1	-.258	6	.18	9	.035	1	-.086	6
129		5	...	.017	1	.01	9	.044	6	-.176	9	.28	6	.104	6	-.034	1
130			...	.017	2	-.056	6	0	1	-.28	6	.176	9	.034	1	-.104	6
131	M14	1	...	.019	1	.008	9	.06	1	.465	8	-.109	1	.094	8	-.054	1
132			...	.019	2	-.051	6	.004	9	.109	1	-.465	8	.054	1	-.094	8
133		2	...	.019	1	.009	9	.06	1	.468	8	-.106	1	.105	8	-.078	1
134			...	.019	2	-.051	6	.003	9	.106	1	-.468	8	.078	1	-.105	8
135		3	...	.018	1	.009	9	.06	1	.471	8	-.103	1	.116	8	-.094	7
136			...	.018	2	-.052	6	.003	9	.103	1	-.471	8	.094	7	-.116	8
137		4	...	.017	1	.01	9	.06	1	.475	8	-.101	1	.13	6	-.096	9
138			...	.017	2	-.052	6	.002	9	.101	1	-.475	8	.096	9	-.13	6
139		5	...	.017	1	.011	9	.06	1	.479	8	-.098	1	.151	1	-.097	9
140			...	.017	2	-.053	6	.002	9	.098	1	-.479	8	.097	9	-.151	1
141	M15	1	...	.017	1	-.007	1	.009	9	.479	8	-.098	1	.151	1	-.097	9
142			...	.017	2	-.05	8	-.026	6	.098	1	-.479	8	.097	9	-.151	1
143		2	...	.013	1	-.007	1	.005	9	.341	8	-.078	1	.121	7	-.071	8
144			...	.013	2	-.046	8	-.022	6	.078	1	-.341	8	.071	8	-.121	7
145		3	...	.008	1	-.007	1	0	9	.279	6	-.058	1	.126	7	-.016	8

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

Mar 24, 2006
4:32 PM
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
146			...	.008	2	-.042	8	-.018	6	.058	1	-.279	6	.016	8	-.126	7
147		4	...	.004	1	-.007	1	-.004	9	.219	6	-.037	1	.12	7	.027	8
148			...	.004	2	-.037	8	-.013	6	.037	1	-.219	6	-.027	8	-.12	7
149		5	...	0	1	-.007	1	-.008	9	.147	6	.005	9	.101	7	.059	8
150			...	0	1	-.033	8	-.011	1	-.005	9	-.147	6	-.059	8	-.101	7
151	M16	1	...	-.007	9	-.006	8	-.023	9	1.5...	1	.527	6	3.488	1	.715	7
152			...	-.048	6	-.057	1	-.15	1	-.527	6	-1.513	1	-.715	7	-3.488	1
153		2	...	-.009	1	-.011	8	-.026	9	1.0...	1	.676	6	2.367	1	1.092	7
154			...	-.047	6	-.062	1	-.15	1	-.676	6	-1.067	1	-1.092	7	-2.367	1
155		3	...	-.009	1	-.016	8	-.029	9	.582	1	.865	6	1.246	1	1.489	7
156			...	-.046	6	-.068	1	-.15	1	-.865	6	-.582	1	-1.489	7	-1.246	1
157		4	...	-.009	1	-.022	8	-.031	9	.057	1	1.094	6	.125	1	1.915	6
158			...	-.044	6	-.073	1	-.15	1	-1.0...	6	-.057	1	-1.915	6	-.125	1
159		5	...	-.009	1	-.027	8	-.034	9	-.507	1	1.361	6	-.995	1	2.479	6
160			...	-.043	6	-.078	1	-.15	1	-1.3...	6	.507	1	-2.479	6	.995	1
161	M17	1	...	.03	8	.142	1	.15	1	-1.5...	1	2.404	6	-1.518	1	3.173	7
162			...	.009	1	.09	8	.017	8	-2.4...	6	1.544	1	-3.173	7	1.518	1
163		2	...	.03	8	.14	1	.15	1	-1.2...	1	2.181	6	-1.188	1	2.972	7
164			...	.009	1	.089	8	.017	8	-2.1...	6	1.234	1	-2.972	7	1.188	1
165		3	...	.03	8	.139	1	.15	1	-.927	1	1.961	6	-.857	1	2.773	7
166			...	.009	1	.087	8	.018	8	-1.9...	6	.927	1	-2.773	7	.857	1
167		4	...	.029	8	.137	1	.15	1	-.623	1	1.745	6	-.527	1	2.576	7
168			...	.009	1	.086	8	.019	8	-1.7...	6	.623	1	-2.576	7	.527	1
169		5	...	.029	8	.135	1	.15	1	-.323	1	1.532	6	-.197	1	2.38	7
170			...	.009	1	.084	8	.02	8	-1.5...	6	.323	1	-2.38	7	.197	1
171	M18	1	...	-.029	8	.06	8	.059	6	-.821	1	1.29	8	.298	1	2.34	6
172			...	-.098	1	.042	1	.018	1	-1.29	8	.821	1	-2.34	6	-.298	1
173		2	...	-.029	8	.046	8	.065	6	-.166	1	.408	9	.614	1	1.221	6
174			...	-.095	1	.031	1	.018	1	-.408	9	.166	1	-1.221	6	-.614	1
175		3	...	-.028	8	.032	8	.072	6	.373	6	-.192	9	.931	1	.027	7
176			...	-.091	1	.02	1	.018	1	.192	9	-.373	6	-.027	7	-.931	1
177		4	...	-.028	8	.021	9	.078	6	.817	8	-.543	1	1.364	6	-.914	9
178			...	-.088	1	.009	1	.018	1	.543	1	-.817	8	.914	9	-1.364	6
179		5	...	-.024	9	.013	9	.084	6	1.0...	8	-.596	1	2.828	6	-1.462	9
180			...	-.085	1	-.003	1	.018	1	.596	1	-1.006	8	1.462	9	-2.828	6
181	M19	1	...	.03	8	.176	6	-.046	8	-1.5...	1	2.404	6	3.173	7	-1.518	1
182			...	.009	1	.136	1	-.18	7	-2.4...	6	1.544	1	1.518	1	-3.173	7
183		2	...	.031	8	.174	6	-.047	8	-1.0...	1	1.735	6	2.485	7	-1.246	1
184			...	.009	1	.133	1	-.179	7	-1.7...	6	1.029	1	1.246	1	-2.485	7
185		3	...	.032	8	.171	6	-.048	8	-.524	1	1.076	6	1.962	6	-.974	1
186			...	.009	1	.131	1	-.178	7	-1.0...	6	.524	1	.974	1	-1.962	6
187		4	...	.032	8	.168	6	-.05	8	-.03	1	.428	6	1.589	6	-.646	9
188			...	.009	1	.128	1	-.176	7	-.428	6	.03	1	.646	9	-1.589	6
189		5	...	.033	8	.165	6	-.051	8	.454	1	-.21	6	1.21	6	-.16	9
190			...	.009	1	.125	1	-.175	7	.21	6	-.454	1	.16	9	-1.21	6
191	M20	1	...	.009	8	.044	6	-.014	8	.04	1	-.019	6	.107	6	-.014	9
192			...	.002	1	.033	1	-.047	7	.019	6	-.04	1	.014	9	-.107	6
193		2	...	.009	8	.043	6	-.014	8	.064	1	-.051	6	.087	6	.011	9
194			...	.002	1	.032	1	-.046	7	.051	6	-.064	1	-.011	9	-.087	6
195		3	...	.01	8	.041	6	-.015	8	.087	1	-.082	6	.066	6	.035	9
196			...	.002	1	.03	1	-.045	7	.082	6	-.087	1	-.035	9	-.066	6
197		4	...	.01	8	.039	6	-.016	8	.111	6	-.109	1	.048	8	.061	7
198			...	.002	1	.029	1	-.044	7	.109	1	-.111	6	-.061	7	-.048	8
199		5	...	.01	8	.038	6	-.017	8	.14	6	-.13	1	.036	8	.093	7
200			...	.002	1	.027	1	-.044	7	.13	1	-.14	6	-.093	7	-.036	8
201	M21	1	...	.019	8	.005	6	-.014	9	.14	6	-.13	1	.036	8	.093	7
202			...	-.004	7	-.006	1	-.046	6	.13	1	-.14	6	-.093	7	-.036	8

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
203		2	...	.019	8	.004	6	-.014	9	.143	6	-.125	1	.013	8	.112	7
204			...	-.004	7	-.007	1	-.047	6	.125	1	-.143	6	-.112	7	-.013	8
205		3	...	.019	8	.002	6	-.013	9	.145	6	-.12	1	-.01	8	.129	7
206			...	-.004	7	-.009	1	-.048	6	.12	1	-.145	6	-.129	7	.01	8
207		4	...	.02	8	0	6	-.012	9	.146	6	-.114	1	-.034	8	.146	7
208			...	-.005	7	-.01	1	-.048	6	.114	1	-.146	6	-.146	7	.034	8
209		5	...	.02	8	0	6	-.011	9	.146	6	-.106	1	-.058	8	.163	7
210			...	-.005	7	-.011	1	-.049	6	.106	1	-.146	6	-.163	7	.058	8
211	M22	1	...	.02	8	0	6	-.011	9	.146	6	-.106	1	-.058	8	.163	7
212			...	-.005	7	-.011	1	-.049	6	.106	1	-.146	6	-.163	7	.058	8
213		2	...	.021	8	-.006	6	-.009	9	.138	6	-.072	1	-.115	1	.227	6
214			...	-.006	7	-.017	1	-.052	6	.072	1	-.138	6	-.227	6	.115	1
215		3	...	.023	8	-.011	6	-.006	9	.117	6	-.026	1	-.158	9	.355	6
216			...	-.008	7	-.022	1	-.054	6	.026	1	-.117	6	-.355	6	.158	9
217		4	...	.024	8	-.016	6	-.004	9	.084	6	.033	1	-.169	9	.489	6
218			...	-.009	7	-.027	1	-.057	6	-.033	1	-.084	6	-.489	6	.169	9
219		5	...	.025	8	-.022	6	0	9	.038	6	.105	1	-.175	9	.63	6
220			...	-.01	7	-.032	1	-.06	6	-.105	1	-.038	6	-.63	6	.175	9
221	M23	1	...	.029	8	.022	8	-.01	1	-.072	1	.085	8	10.164	9	-.05	1
222			...	-.015	7	.021	1	-.797	9	-.085	8	.072	1	.05	1	-10.164	9
223		2	...	.031	8	.017	8	-.01	1	-.026	1	.038	8	8.245	9	-.025	1
224			...	-.016	7	.016	1	-.794	9	-.038	8	.026	1	.025	1	-8.245	9
225		3	...	.032	8	.012	8	-.01	1	.007	1	.003	8	6.349	6	0	1
226			...	-.017	7	.011	1	-.791	9	-.003	8	-.007	1	0	1	-6.349	6
227		4	...	.033	8	.007	8	-.01	1	.027	1	-.02	8	5.233	6	.026	1
228			...	-.018	7	.006	1	-.789	9	.02	8	-.027	1	-.026	1	-5.233	6
229		5	...	.035	8	.002	8	-.01	1	.035	1	-.03	8	4.11	6	.051	1
230			...	-.02	7	0	1	-.788	8	.03	8	-.035	1	-.051	1	-4.11	6
231	M24	1	...	0	8	0	1	0	1	0	1	0	1	0	1	0	1
232			...	0	7	0	1	0	1	0	1	0	1	0	1	0	1
233		2	...	0	8	0	1	0	1	0	1	0	1	0	1	0	1
234			...	0	7	0	1	0	1	0	1	0	1	0	1	0	1
235		3	...	0	8	0	1	0	1	0	1	0	1	0	1	0	1
236			...	0	7	0	1	0	1	0	1	0	1	0	1	0	1
237		4	...	0	8	0	1	0	1	0	1	0	1	0	1	0	1
238			...	0	7	0	1	0	1	0	1	0	1	0	1	0	1
239		5	...	0	8	0	1	0	1	0	1	0	1	0	1	0	1
240			...	0	7	0	1	0	1	0	1	0	1	0	1	0	1
241	M25	1	...	.035	8	0	8	-.01	1	.034	1	-.03	8	3.638	6	.061	1
242			...	-.02	7	-.002	1	-.789	8	.03	8	-.034	1	-.061	1	-3.638	6
243		2	...	.035	8	-.002	8	-.01	1	.033	1	-.029	8	3.411	6	.066	1
244			...	-.021	7	-.003	1	-.789	8	.029	8	-.033	1	-.066	1	-3.411	6
245		3	...	.036	8	-.003	8	-.01	1	.032	1	-.028	8	3.183	6	.072	1
246			...	-.021	7	-.004	1	-.79	8	.028	8	-.032	1	-.072	1	-3.183	6
247		4	...	.036	8	-.004	8	-.01	1	.03	1	-.027	8	2.955	6	.077	1
248			...	-.021	7	-.005	1	-.79	8	.027	8	-.03	1	-.077	1	-2.955	6
249		5	...	.036	8	-.005	8	-.01	1	.027	1	-.025	8	2.727	6	.082	1
250			...	-.021	7	-.006	1	-.791	8	.025	8	-.027	1	-.082	1	-2.727	6
251	M26	1	...	.098	8	-.005	8	-.01	1	.014	1	-.004	8	2.727	6	.082	1
252			...	.003	1	-.006	1	-.77	8	.004	8	-.014	1	-.082	1	-2.727	6
253		2	...	.098	8	-.005	8	-.01	1	.012	1	-.003	8	2.62	6	.084	1
254			...	.003	1	-.006	1	-.77	8	.003	8	-.012	1	-.084	1	-2.62	6
255		3	...	.098	8	-.006	8	-.01	1	.011	1	-.002	8	2.513	6	.138	9
256			...	.003	1	-.007	1	-.77	8	.002	8	-.011	1	-.138	9	-2.513	6
257		4	...	.098	8	-.006	8	-.01	1	.009	1	0	8	2.405	6	.311	9
258			...	.003	1	-.007	1	-.77	8	0	8	-.009	1	-.311	9	-2.405	6
259		5	...	.098	8	-.007	8	-.01	1	.008	1	.001	8	2.298	6	.485	9

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

Mar 24, 2006
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
260			...	.003	1	-.008	1	-.771	8	-.001	8	-.008	1	-.485	9	-2.298	6
261	M27	1	...	.213	8	-.007	8	-.007	1	-.02	1	.042	8	2.298	6	.485	9
262			...	.004	1	-.008	1	-.672	8	-.042	8	.02	1	-.485	9	-2.298	6
263		2	...	.213	8	-.007	8	-.007	1	-.021	1	.044	8	2.198	6	.636	9
264			...	.004	1	-.008	1	-.672	8	-.044	8	.021	1	-.636	9	-2.198	6
265		3	...	.213	8	-.008	8	-.007	1	-.023	1	.045	8	2.098	6	.787	9
266			...	.004	1	-.009	1	-.672	8	-.045	8	.023	1	-.787	9	-2.098	6
267		4	...	.213	8	-.008	8	-.007	1	-.025	1	.047	8	1.999	7	.94	8
268			...	.004	1	-.009	1	-.673	8	-.047	8	.025	1	-.94	8	-1.999	7
269		5	...	.213	8	-.009	8	-.007	1	-.028	1	.049	8	1.901	7	1.093	8
270			...	.004	1	-.01	1	-.673	8	-.049	8	.028	1	-1.093	8	-1.901	7
271	M28	1	...	.307	8	-.009	8	-.004	1	-.052	1	.085	8	1.901	7	1.093	8
272			...	.005	1	-.01	1	-.508	8	-.085	8	.052	1	-1.093	8	-1.901	7
273		2	...	.307	8	-.009	8	-.004	1	-.055	1	.087	8	1.82	7	1.209	8
274			...	.005	1	-.01	1	-.508	8	-.087	8	.055	1	-1.209	8	-1.82	7
275		3	...	.307	8	-.01	8	-.004	1	-.057	1	.09	8	1.738	7	1.325	8
276			...	.005	1	-.011	1	-.508	8	-.09	8	.057	1	-1.325	8	-1.738	7
277		4	...	.307	8	-.01	8	-.004	1	-.06	1	.092	8	1.657	7	1.44	8
278			...	.005	1	-.011	1	-.508	8	-.092	8	.06	1	-1.44	8	-1.657	7
279		5	...	.307	8	-.011	8	-.004	1	-.062	1	.094	8	1.576	7	1.556	8
280			...	.005	1	-.012	1	-.508	8	-.094	8	.062	1	-1.556	8	-1.576	7
281	M29	1	...	.371	8	-.011	8	0	1	-.082	1	.122	8	1.576	7	1.556	8
282			...	.006	1	-.012	1	-.293	8	-.122	8	.082	1	-1.556	8	-1.576	7
283		2	...	.371	8	-.011	8	0	1	-.084	1	.124	8	1.519	7	1.623	8
284			...	.006	1	-.012	1	-.293	8	-.124	8	.084	1	-1.623	8	-1.519	7
285		3	...	.371	8	-.012	8	0	1	-.087	1	.127	8	1.462	7	1.69	8
286			...	.006	1	-.013	1	-.293	8	-.127	8	.087	1	-1.69	8	-1.462	7
287		4	...	.371	8	-.012	8	0	1	-.09	1	.13	8	1.405	7	1.756	8
288			...	.006	1	-.013	1	-.293	8	-.13	8	.09	1	-1.756	8	-1.405	7
289		5	...	.371	8	-.013	8	0	1	-.093	1	.132	8	1.349	7	1.823	8
290			...	.006	1	-.014	1	-.293	8	-.132	8	.093	1	-1.823	8	-1.349	7
291	M30	1	...	.399	8	-.013	8	.003	1	-.104	1	.147	8	1.349	7	1.823	8
292			...	.006	1	-.014	1	-.119	6	-.147	8	.104	1	-1.823	8	-1.349	7
293		2	...	.399	8	-.013	8	.003	1	-.107	1	.15	8	1.322	7	1.834	8
294			...	.006	1	-.014	1	-.12	6	-.15	8	.107	1	-1.834	8	-1.322	7
295		3	...	.399	8	-.014	8	.003	1	-.11	1	.154	8	1.295	7	1.845	8
296			...	.006	1	-.015	1	-.12	6	-.154	8	.11	1	-1.845	8	-1.295	7
297		4	...	.399	8	-.014	8	.003	1	-.114	1	.157	8	1.268	7	1.856	8
298			...	.006	1	-.015	1	-.12	6	-.157	8	.114	1	-1.856	8	-1.268	7
299		5	...	.399	8	-.015	8	.003	1	-.117	1	.16	8	1.241	7	1.867	8
300			...	.006	1	-.016	1	-.12	6	-.16	8	.117	1	-1.867	8	-1.241	7
301	M31	1	...	.398	8	.03	8	.077	8	-.119	1	.162	8	1.241	7	1.867	8
302			...	.005	1	.028	1	-.048	7	-.162	8	.119	1	-1.867	8	-1.241	7
303		2	...	.401	8	.019	8	.083	8	0	1	.032	8	.975	7	1.445	8
304			...	.005	1	.017	1	-.053	7	-.032	8	0	1	-1.445	8	-.975	7
305		3	...	.404	8	.008	8	.089	8	.06	1	-.038	8	.68	7	.993	8
306			...	.005	1	.006	1	-.059	7	.038	8	-.06	1	-.993	8	-.68	7
307		4	...	.406	8	-.004	8	.094	8	.06	1	-.049	8	.355	7	.512	8
308			...	.005	1	-.006	1	-.065	7	.049	8	-.06	1	-.512	8	-.355	7
309		5	...	.409	8	-.015	8	.1	8	0	1	0	1	0	1	0	1
310			...	.005	1	-.017	1	-.07	7	0	1	0	1	0	1	0	1
311	M32	1	...	.006	7	.143	8	.011	9	-1.9...	1	3.359	8	.158	6	.129	1
312			...	-.006	9	.092	1	-.013	6	-3.3...	8	1.958	1	-.129	1	-.158	6
313		2	...	.007	7	.141	8	.01	9	-1.7...	1	2.958	8	.123	6	.105	1
314			...	-.007	9	.09	1	-.012	6	-2.9...	8	1.701	1	-.105	1	-.123	6
315		3	...	.007	7	.139	8	.009	9	-1.45	1	2.563	8	.09	6	.08	1
316			...	-.007	9	.088	1	-.011	6	-2.5...	8	1.45	1	-.08	1	-.09	6

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

Mar 24, 2006
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
317		4	...	.008	7	.137	8	.009	1	-1.2...	1	2.173	8	.061	6	.056	1
318			...	-.008	9	.086	1	-.01	6	-2.1...	8	1.204	1	-.056	1	-.061	6
319		5	...	.008	7	.135	8	.009	1	-.964	1	1.789	8	.035	6	.032	1
320			...	-.008	9	.084	1	-.009	6	-1.7...	8	.964	1	-.032	1	-.035	6
321	M33	1	...	.139	8	.149	6	.033	7	2.4...	9	8.796	6	1.158	8	1.172	7
322			...	.044	1	-.149	8	-.033	8	-8.7...	6	-2.455	9	-1.172	7	-1.158	8
323		2	...	.132	8	.142	6	.026	7	.1	9	6.441	6	.681	8	.699	7
324			...	.037	1	-.142	8	-.026	8	-6.4...	6	-.1	9	-.699	7	-.681	8
325		3	...	.126	8	.136	6	.019	7	-.05	1	4.197	6	.315	8	.336	7
326			...	.03	1	-.136	8	-.019	8	-4.1...	6	.05	1	-.336	7	-.315	8
327		4	...	.119	8	.129	6	.012	7	-.05	1	4.278	8	.059	8	.084	7
328			...	.023	1	-.129	8	-.012	8	-4.2...	8	.05	1	-.084	7	-.059	8
329		5	...	.112	8	.122	6	.005	7	-.039	7	6.301	8	.059	7	.086	8
330			...	.016	1	-.122	8	-.006	8	-6.3...	8	.039	7	-.086	8	-.059	7
331	M34	1	...	.002	6	-.018	1	.004	6	-1.2...	1	2.009	8	.047	7	.063	8
332			...	-.002	9	-.045	8	-.003	1	-2.0...	8	1.293	1	-.063	8	-.047	7
333		2	...	.003	6	-.022	1	.006	6	-1.4...	1	2.305	8	.034	7	.075	1
334			...	-.003	9	-.049	8	-.004	9	-2.3...	8	1.417	1	-.075	1	-.034	7
335		3	...	.004	6	-.027	1	.009	6	-1.57	1	2.628	8	.021	6	.093	1
336			...	-.004	9	-.054	8	-.006	9	-2.6...	8	1.57	1	-.093	1	-.021	6
337		4	...	.005	6	-.031	1	.011	6	-1.75	1	2.98	8	.082	6	.111	1
338			...	-.005	9	-.058	8	-.008	9	-2.98	8	1.75	1	-.111	1	-.082	6
339		5	...	.006	6	-.035	1	.013	6	-1.9...	1	3.359	8	.158	6	.129	1
340			...	-.006	9	-.063	8	-.01	9	-3.3...	8	1.958	1	-.129	1	-.158	6
341	M35	1	...	0	1	-.01	1	.003	7	-1.1...	1	1.578	8	.042	9	.086	6
342			...	0	1	-.038	8	-.003	1	-1.5...	8	1.147	1	-.086	6	-.042	9
343		2	...	0	6	-.012	1	.002	7	-1.1...	1	1.679	8	.046	9	.083	6
344			...	0	8	-.04	8	-.003	1	-1.6...	8	1.176	1	-.083	6	-.046	9
345		3	...	0	6	-.014	1	.002	6	-1.21	1	1.784	8	.048	9	.078	6
346			...	0	8	-.041	8	-.003	1	-1.7...	8	1.21	1	-.078	6	-.048	9
347		4	...	.001	6	-.016	1	.003	6	-1.2...	1	1.894	8	.048	7	.071	8
348			...	-.001	8	-.043	8	-.003	1	-1.8...	8	1.249	1	-.071	8	-.048	7
349		5	...	.002	6	-.018	1	.004	6	-1.2...	1	2.009	8	.047	7	.063	8
350			...	-.002	8	-.045	8	-.003	1	-2.0...	8	1.293	1	-.063	8	-.047	7
351	M36	1	...	.004	8	.007	1	.012	7	-.855	8	1.109	1	.046	1	.143	7
352			...	-.004	6	-.02	8	-.009	8	-1.1...	1	.855	8	-.143	7	-.046	1
353		2	...	.003	8	.003	1	.009	7	-.994	8	1.077	1	.028	1	.077	7
354			...	-.003	6	-.024	8	-.007	8	-1.0...	1	.994	8	-.077	7	-.028	1
355		3	...	.002	8	-.002	1	.007	7	-1.0...	1	1.161	8	.01	1	.066	6
356			...	-.002	6	-.029	8	-.004	8	-1.1...	8	1.073	1	-.066	6	-.01	1
357		4	...	.001	8	-.006	1	.005	7	-1.0...	1	1.356	8	.022	9	.083	6
358			...	-.001	6	-.033	8	-.003	1	-1.3...	8	1.096	1	-.083	6	-.022	9
359		5	...	0	1	-.01	1	.003	7	-1.1...	1	1.578	8	.042	9	.086	6
360			...	0	1	-.038	8	-.003	1	-1.5...	8	1.147	1	-.086	6	-.042	9
361	M37	1	...	.031	9	.04	1	.024	9	3.9...	8	.218	1	.445	6	.453	9
362			...	-.031	6	-.014	8	-.024	6	-.218	1	-3.902	8	-.453	9	-.445	6
363		2	...	.03	9	.035	1	.022	9	3.78	8	-.073	1	.266	8	.275	7
364			...	-.03	6	-.018	8	-.022	6	.073	1	-3.78	8	-.275	7	-.266	8
365		3	...	.029	9	.031	1	.02	9	3.6...	9	-.33	1	.104	8	.114	7
366			...	-.029	6	-.022	8	-.02	6	.33	1	-3.624	9	-.114	7	-.104	8
367		4	...	.028	9	.027	1	.018	9	3.4...	9	-.555	1	.035	9	.045	6
368			...	-.028	6	-.027	8	-.018	6	.555	1	-3.435	9	-.045	6	-.035	9
369		5	...	.026	9	.023	1	.016	9	3.2...	9	-.746	1	.164	9	.175	6
370			...	-.026	6	-.031	8	-.016	6	.746	1	-3.213	9	-.175	6	-.164	9
371	M38	1	...	.033	9	.047	1	.028	9	3.9...	8	.608	1	.68	6	.687	9
372			...	-.033	6	-.006	8	-.028	6	-.608	1	-3.991	8	-.687	9	-.68	6
373		2	...	.032	9	.045	1	.027	9	3.9...	8	.504	1	.618	6	.625	9

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

Mar 24, 2006
4:32 PM
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
374			...	-.032	6	-.008	8	-.027	6	-.504	1	-3.975	8	-.625	9	-.618	6
375		3	...	.032	9	.043	1	.026	9	3.9...	8	.404	1	.558	6	.566	9
376			...	-.032	6	-.01	8	-.026	6	-.404	1	-3.955	8	-.566	9	-.558	6
377		4	...	.031	9	.042	1	.025	9	3.9...	8	.309	1	.501	6	.508	9
378			...	-.031	6	-.012	8	-.025	6	-.309	1	-3.931	8	-.508	9	-.501	6
379		5	...	.031	9	.04	1	.024	9	3.9...	8	.218	1	.445	6	.453	9
380			...	-.031	6	-.014	8	-.024	6	-.218	1	-3.902	8	-.453	9	-.445	6
381	M39	1	...	.035	8	.057	1	.033	9	4.0...	8	1.201	1	1.028	6	1.033	9
382			...	-.035	6	.003	8	-.033	6	-1.2...	1	-4.007	8	-1.033	9	-1.028	6
383		2	...	.034	8	.054	1	.032	9	4.0...	8	1.042	1	.936	6	.942	9
384			...	-.034	6	.001	8	-.032	6	-1.0...	1	-4.013	8	-.942	9	-.936	6
385		3	...	.034	8	.052	1	.03	9	4.0...	8	.891	1	.847	6	.853	9
386			...	-.034	6	-.001	8	-.03	6	-.891	1	-4.013	8	-.853	9	-.847	6
387		4	...	.033	8	.05	1	.029	9	4.0...	8	.746	1	.762	6	.769	9
388			...	-.033	6	-.004	8	-.029	6	-.746	1	-4.005	8	-.769	9	-.762	6
389		5	...	.033	8	.047	1	.028	9	3.9...	8	.608	1	.68	6	.687	9
390			...	-.033	6	-.006	8	-.028	6	-.608	1	-3.991	8	-.687	9	-.68	6
391	M40	1	...	.002	7	.054	8	.009	7	-.37	1	1.324	9	.047	6	.167	9
392			...	-.002	8	.022	1	-.014	8	-1.3...	9	.37	1	-.167	9	-.047	6
393		2	...	.003	7	.048	8	.006	7	-.228	1	.949	9	0	1	.133	9
394			...	-.003	8	.016	1	-.011	8	-.949	9	.228	1	-.133	9	0	1
395		3	...	.005	7	.042	8	.003	7	-.129	1	.616	9	0	1	.161	8
396			...	-.005	8	.011	1	-.008	8	-.616	9	.129	1	-.161	8	0	1
397		4	...	.006	7	.036	8	0	7	-.072	1	.327	9	0	1	.21	8
398			...	-.006	8	.005	1	-.005	8	-.327	9	.072	1	-.21	8	0	1
399		5	...	.008	7	.031	8	0	6	-.06	1	.081	9	0	1	.238	8
400			...	-.008	8	-.001	1	-.006	9	-.081	9	.06	1	-.238	8	0	1
401	M41	1	...	0	1	.062	8	.013	7	-.617	1	1.87	9	.168	6	.242	9
402			...	0	1	.03	1	-.018	8	-1.87	9	.617	1	-.242	9	-.168	6
403		2	...	0	6	.06	8	.012	7	-.549	1	1.727	9	.135	6	.22	9
404			...	0	8	.028	1	-.017	8	-1.7...	9	.549	1	-.22	9	-.135	6
405		3	...	0	6	.058	8	.011	7	-.485	1	1.588	9	.103	6	.2	9
406			...	0	8	.026	1	-.016	8	-1.5...	9	.485	1	-.2	9	-.103	6
407		4	...	.001	6	.056	8	.01	7	-.425	1	1.454	9	.074	6	.183	9
408			...	-.001	8	.024	1	-.015	8	-1.4...	9	.425	1	-.183	9	-.074	6
409		5	...	.002	6	.054	8	.009	7	-.37	1	1.324	9	.047	6	.167	9
410			...	-.002	8	.022	1	-.014	8	-1.3...	9	.37	1	-.167	9	-.047	6
411	M42	1	...	.002	8	.071	8	.018	7	-1.0...	1	2.669	8	.394	8	.411	7
412			...	-.002	6	.039	1	-.023	8	-2.6...	8	1.034	1	-.411	7	-.394	8
413		2	...	.002	8	.069	8	.017	7	-.919	1	2.458	8	.328	8	.359	7
414			...	-.002	6	.037	1	-.021	8	-2.4...	8	.919	1	-.359	7	-.328	8
415		3	...	.001	8	.066	8	.015	7	-.811	1	2.255	9	.265	8	.311	7
416			...	-.001	6	.035	1	-.02	8	-2.2...	9	.811	1	-.311	7	-.265	8
417		4	...	0	8	.064	8	.014	7	-.71	1	2.059	9	.214	6	.274	9
418			...	0	6	.032	1	-.019	8	-2.0...	9	.71	1	-.274	9	-.214	6
419		5	...	0	1	.062	8	.013	7	-.617	1	1.87	9	.168	6	.242	9
420			...	0	1	.03	1	-.018	8	-1.87	9	.617	1	-.242	9	-.168	6
421	M43	1	...	0	1	-.007	1	-.008	9	.147	6	.005	9	.101	7	.059	8
422			...	0	1	-.033	8	-.011	1	-.005	9	-.147	6	-.059	8	-.101	7
423		2	...	0	1	-.007	1	-.008	8	.129	6	.025	9	.095	7	.064	8
424			...	0	1	-.032	8	-.011	1	-.025	9	-.129	6	-.064	8	-.095	7
425		3	...	-.002	1	-.007	1	-.007	8	.11	6	.044	9	.089	7	.069	8
426			...	-.002	1	-.031	8	-.011	1	-.044	9	-.11	6	-.069	8	-.089	7
427		4	...	-.003	1	-.007	1	-.006	8	.091	6	.063	9	.082	7	.073	8
428			...	-.003	1	-.03	8	-.011	7	-.063	9	-.091	6	-.073	8	-.082	7
429		5	...	-.004	1	-.007	1	-.005	8	.071	7	.081	8	.074	9	.077	6
430			...	-.004	1	-.031	6	-.012	7	-.081	8	-.071	7	-.077	6	-.074	9

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
431	M44	1	...	0	1	.019	6	-.002	1	.034	7	.115	8	.098	7	.068	8
432			...	0	1	.013	1	-.007	7	-.115	8	-.034	7	-.068	8	-.098	7
433		2	...	0	1	.018	6	-.002	1	.046	7	.105	8	.093	7	.071	8
434			...	0	1	.013	1	-.008	7	-.105	8	-.046	7	-.071	8	-.093	7
435		3	...	-.002	1	.017	6	-.002	1	.058	7	.095	8	.087	7	.073	8
436			...	-.002	1	.013	1	-.009	7	-.095	8	-.058	7	-.073	8	-.087	7
437		4	...	-.003	1	.017	8	-.002	8	.068	7	.084	8	.081	7	.075	8
438			...	-.003	1	.013	1	-.01	7	-.084	8	-.068	7	-.075	8	-.081	7
439		5	...	-.004	1	.018	8	-.001	8	.078	6	.073	9	.074	9	.076	6
440			...	-.004	1	.013	1	-.011	7	-.073	9	-.078	6	-.076	6	-.074	9
441	M45	1	...	.017	1	.036	6	.011	9	-.176	9	.28	6	.104	6	-.034	1
442			...	.017	2	-.003	9	-.023	6	-.28	6	.176	9	.034	1	-.104	6
443		2	...	.013	1	.032	6	.006	9	-.145	1	.184	6	.107	7	-.027	1
444			...	.013	2	.001	9	-.019	6	-.184	6	.145	1	.027	1	-.107	7
445		3	...	.008	1	.027	6	.002	9	-.098	7	.171	8	.116	7	.014	8
446			...	.008	2	.005	9	-.015	6	-.171	8	.098	7	-.014	8	-.116	7
447		4	...	.004	1	.023	6	-.002	9	-.026	7	.149	8	.113	7	.047	8
448			...	.004	2	.01	9	-.01	6	-.149	8	.026	7	-.047	8	-.113	7
449		5	...	0	1	.019	6	-.002	1	.034	7	.115	8	.098	7	.068	8
450			...	0	1	.013	1	-.007	7	-.115	8	-.034	7	-.068	8	-.098	7
451	M46	1	...	.062	6	.068	1	.1	8	-.439	9	.511	1	3.805	7	.004	1
452			...	-.003	9	.067	8	-.131	7	-.511	1	.439	9	-.004	1	-3.805	7
453		2	...	.062	6	.067	1	.099	8	-.407	9	.479	1	3.743	7	.004	1
454			...	-.003	9	.067	8	-.131	7	-.479	1	.407	9	-.004	1	-3.743	7
455		3	...	.062	6	.067	1	.099	8	-.375	9	.447	1	3.681	7	.004	1
456			...	-.003	9	.067	8	-.131	7	-.447	1	.375	9	-.004	1	-3.681	7
457		4	...	.062	6	.067	1	.099	8	-.343	9	.415	1	3.619	7	.004	1
458			...	-.003	9	.066	8	-.131	7	-.415	1	.343	9	-.004	1	-3.619	7
459		5	...	.062	6	.066	1	.099	8	-.312	9	.384	1	3.557	7	.004	1
460			...	-.003	9	.066	8	-.13	7	-.384	1	.312	9	-.004	1	-3.557	7
461	M47	1	...	.073	6	.066	1	.058	8	-.404	9	.461	1	3.557	7	.004	1
462			...	-.03	9	.066	8	-.145	7	-.461	1	.404	9	-.004	1	-3.557	7
463		2	...	.073	6	.066	1	.058	8	-.373	9	.429	1	3.488	7	.004	1
464			...	-.03	9	.066	8	-.145	7	-.429	1	.373	9	-.004	1	-3.488	7
465		3	...	.073	6	.066	1	.058	8	-.342	9	.398	1	3.425	6	.004	1
466			...	-.03	9	.065	8	-.144	7	-.398	1	.342	9	-.004	1	-3.425	6
467		4	...	.073	6	.065	1	.058	8	-.311	9	.367	1	3.429	6	.004	1
468			...	-.03	9	.065	8	-.144	7	-.367	1	.311	9	-.004	1	-3.429	6
469		5	...	.073	6	.065	1	.058	8	-.28	9	.336	1	3.433	6	.004	1
470			...	-.03	9	.065	8	-.144	7	-.336	1	.28	9	-.004	1	-3.433	6
471	M48	1	...	.065	6	.065	1	.002	8	-.281	9	.306	1	3.433	6	.004	1
472			...	-.049	9	.065	8	-.12	7	-.306	1	.281	9	-.004	1	-3.433	6
473		2	...	.065	6	.065	1	.001	8	-.25	9	.275	1	3.401	6	.004	1
474			...	-.049	9	.064	8	-.119	7	-.275	1	.25	9	-.004	1	-3.401	6
475		3	...	.065	6	.064	1	.001	8	-.219	9	.245	1	3.37	6	.003	1
476			...	-.049	9	.064	8	-.119	7	-.245	1	.219	9	-.003	1	-3.37	6
477		4	...	.065	6	.064	1	.001	8	-.189	9	.214	1	3.339	6	.003	1
478			...	-.049	9	.064	8	-.119	7	-.214	1	.189	9	-.003	1	-3.339	6
479		5	...	.065	6	.064	1	0	8	-.158	9	.184	1	3.307	6	.003	1
480			...	-.049	9	.063	8	-.119	7	-.184	1	.158	9	-.003	1	-3.307	6
481	M49	1	...	.054	6	.064	1	0	1	-.133	7	.142	8	3.307	6	.003	1
482			...	-.054	7	.063	8	-.097	6	-.142	8	.133	7	-.003	1	-3.307	6
483		2	...	.053	6	.06	1	0	1	.174	7	-.164	8	2.831	6	.003	1
484			...	-.053	7	.06	8	-.095	6	.164	8	-.174	7	-.003	1	-2.831	6
485		3	...	.052	6	.057	1	0	1	.464	7	-.453	8	2.363	6	.003	1
486			...	-.052	7	.056	8	-.093	6	.453	8	-.464	7	-.003	1	-2.363	6
487		4	...	.051	6	.053	1	0	1	.736	7	-.724	8	2.196	8	.003	1

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

Mar 24, 2006
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
488			...	-.051	7	.053	8	-.092	6	.724	8	-.736	7	-.003	1	-2.196	8
489		5	...	.051	6	.05	1	0	1	.992	7	-.978	8	2.027	8	.002	1
490			...	-.051	7	.049	8	-.09	6	.978	8	-.992	7	-.002	1	-2.027	8
491	M50	1	...	0	1	.015	8	.067	8	.04	8	.089	7	.047	8	.122	7
492			...	-.011	8	.011	7	0	1	-.089	7	-.04	8	-.122	7	-.047	8
493		2	...	0	1	.015	8	.067	8	.046	8	.084	7	.075	8	.101	7
494			...	-.011	8	.011	7	0	1	-.084	7	-.046	8	-.101	7	-.075	8
495		3	...	0	1	.015	8	.066	8	.052	8	.079	7	.102	8	.079	7
496			...	-.011	8	.011	7	0	1	-.079	7	-.052	8	-.079	7	-.102	8
497		4	...	0	1	.014	8	.066	8	.058	8	.075	7	.13	8	.057	7
498			...	-.011	8	.01	7	0	1	-.075	7	-.058	8	-.057	7	-.13	8
499		5	...	0	1	.014	8	.066	8	.064	8	.071	7	.158	8	.035	7
500			...	-.011	8	.01	7	0	1	-.071	7	-.064	8	-.035	7	-.158	8
501	M51	1	...	0	1	.014	8	.05	9	.024	8	.078	7	.158	8	.035	7
502			...	-.026	8	.01	7	0	1	-.078	7	-.024	8	-.035	7	-.158	8
503		2	...	0	1	.014	8	.05	9	.03	8	.074	7	.177	8	.018	7
504			...	-.026	8	.01	7	0	1	-.074	7	-.03	8	-.018	7	-.177	8
505		3	...	0	1	.013	8	.05	9	.036	8	.07	7	.196	8	0	7
506			...	-.026	8	.009	7	0	1	-.07	7	-.036	8	0	7	-.196	8
507		4	...	0	1	.013	8	.05	9	.041	8	.067	7	.215	8	0	1
508			...	-.026	8	.009	7	0	1	-.067	7	-.041	8	0	1	-.215	8
509		5	...	0	1	.013	8	.05	9	.046	8	.063	7	.234	8	0	1
510			...	-.026	8	.009	7	0	1	-.063	7	-.046	8	0	1	-.234	8
511	M52	1	...	.008	6	.003	1	.003	8	-.003	8	.058	1	.234	8	0	1
512			...	-.009	9	-.029	8	-.007	7	-.058	1	.003	8	0	1	-.234	8
513		2	...	.008	6	.002	1	.002	8	-.015	8	.06	7	.235	8	0	1
514			...	-.009	9	-.03	8	-.007	7	-.06	7	.015	8	0	1	-.235	8
515		3	...	.008	6	.002	1	.002	8	-.028	8	.07	7	.236	8	0	1
516			...	-.008	9	-.03	8	-.007	7	-.07	7	.028	8	0	1	-.236	8
517		4	...	.008	6	.002	1	.002	8	-.038	6	.081	9	.237	8	0	1
518			...	-.008	9	-.03	8	-.007	7	-.081	9	.038	6	0	1	-.237	8
519		5	...	.008	6	.001	1	.002	8	-.048	6	.093	9	.238	8	0	1
520			...	-.008	9	-.031	8	-.006	7	-.093	9	.048	6	0	1	-.238	8
521	M53	1	...	.124	8	.141	6	.005	7	-.039	7	6.301	8	.115	7	.14	8
522			...	.016	1	-.06	9	-.006	8	-6.3...	8	.039	7	-.14	8	-.115	7
523		2	...	.124	8	.141	6	.005	7	.016	7	6.325	8	.117	7	.142	8
524			...	.016	1	-.06	9	-.005	8	-6.3...	8	-.016	7	-.142	8	-.117	7
525		3	...	.124	8	.141	6	.005	7	.072	7	6.349	8	.119	7	.145	8
526			...	.015	1	-.06	9	-.005	8	-6.3...	8	-.072	7	-.145	8	-.119	7
527		4	...	.123	8	.14	6	.005	7	.127	7	6.372	8	.121	7	.147	8
528			...	.015	1	-.06	9	-.005	8	-6.3...	8	-.127	7	-.147	8	-.121	7
529		5	...	.123	8	.14	6	.005	7	.183	7	6.396	8	.123	7	.149	8
530			...	.015	1	-.06	9	-.005	8	-6.3...	8	-.183	7	-.149	8	-.123	7
531	M54	1	...	.122	8	.148	6	.005	7	.183	7	6.396	8	.209	7	.224	8
532			...	-.012	7	.022	1	-.005	8	-6.3...	8	-.183	7	-.224	8	-.209	7
533		2	...	.121	8	.148	6	.005	7	.242	7	6.368	8	.211	7	.226	8
534			...	-.012	7	.022	1	-.005	8	-6.3...	8	-.242	7	-.226	8	-.211	7
535		3	...	.121	8	.148	6	.004	7	.3	7	6.339	8	.213	7	.228	8
536			...	-.012	7	.022	1	-.005	8	-6.3...	8	-.3	7	-.228	8	-.213	7
537		4	...	.121	8	.147	6	.004	7	.358	7	6.311	8	.214	7	.229	8
538			...	-.012	7	.021	1	-.004	8	-6.3...	8	-.358	7	-.229	8	-.214	7
539		5	...	.121	8	.147	6	.004	7	.417	7	6.283	8	.216	7	.231	8
540			...	-.012	7	.021	1	-.004	8	-6.2...	8	-.417	7	-.231	8	-.216	7
541	M55	1	...	.087	8	.182	8	.004	7	.417	7	6.283	8	.245	7	.245	8
542			...	-.047	7	.029	1	-.004	8	-6.2...	8	-.417	7	-.245	8	-.245	7
543		2	...	.087	8	.182	8	.004	7	.462	7	6.211	8	.246	7	.247	8
544			...	-.047	7	.029	1	-.004	8	-6.2...	8	-.462	7	-.247	8	-.246	7

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

Mar 24, 2006
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
545		3	...	.087	8	.182	8	.004	7	.508	7	6.139	8	.248	7	.249	8
546			...	-.047	7	.028	1	-.004	8	-6.1...	8	-.508	7	-.249	8	-.248	7
547		4	...	.087	8	.182	8	.004	7	.553	7	6.067	8	.249	7	.25	8
548			...	-.047	7	.028	1	-.004	8	-6.0...	8	-.553	7	-.25	8	-.249	7
549		5	...	.086	8	.181	8	.003	7	.598	7	5.996	8	.25	7	.252	8
550			...	-.047	7	.028	1	-.004	8	-5.9...	8	-.598	7	-.252	8	-.25	7
551	M56	1	...	-.021	8	-.052	1	.079	7	-.756	1	1.493	6	2.146	6	.412	1
552			...	-.092	1	-.07	8	.06	8	-1.4...	6	.756	1	-.412	1	-2.146	6
553		2	...	-.021	8	-.053	1	.079	7	-.775	1	1.519	6	2.173	6	.389	1
554			...	-.092	1	-.07	8	.06	8	-1.5...	6	.775	1	-.389	1	-2.173	6
555		3	...	-.021	8	-.053	1	.079	7	-.795	1	1.545	6	2.199	6	.366	1
556			...	-.092	1	-.071	8	.06	8	-1.5...	6	.795	1	-.366	1	-2.199	6
557		4	...	-.021	8	-.053	1	.079	7	-.815	1	1.571	6	2.225	6	.343	1
558			...	-.092	1	-.071	8	.06	8	-1.5...	6	.815	1	-.343	1	-2.225	6
559		5	...	-.021	8	-.053	1	.078	7	-.834	1	1.597	6	2.251	6	.32	1
560			...	-.092	1	-.071	8	.06	8	-1.5...	6	.834	1	-.32	1	-2.251	6
561	M57	1	...	0	8	-.082	9	.125	1	-.552	1	1.784	6	1.938	6	.429	1
562			...	-.062	1	-.097	1	.052	8	-1.7...	6	.552	1	-.429	1	-1.938	6
563		2	...	0	8	-.082	9	.125	1	-.589	1	1.819	6	1.971	7	.382	1
564			...	-.062	1	-.097	1	.052	8	-1.8...	6	.589	1	-.382	1	-1.971	7
565		3	...	0	8	-.083	9	.125	1	-.625	1	1.854	6	2.009	7	.335	1
566			...	-.062	1	-.097	1	.052	8	-1.8...	6	.625	1	-.335	1	-2.009	7
567		4	...	0	8	-.083	9	.125	1	-.662	1	1.889	6	2.047	7	.288	1
568			...	-.062	1	-.098	1	.052	8	-1.8...	6	.662	1	-.288	1	-2.047	7
569		5	...	0	8	-.083	9	.125	1	-.699	1	1.925	6	2.086	7	.24	1
570			...	-.062	1	-.098	1	.052	8	-1.9...	6	.699	1	-.24	1	-2.086	7
571	M58	1	...	.02	8	-.089	8	.15	1	-.327	1	1.648	6	2.111	7	.137	1
572			...	-.016	1	-.131	1	.032	8	-1.6...	6	.327	1	-.137	1	-2.111	7
573		2	...	.02	8	-.089	8	.15	1	-.377	1	1.686	6	2.148	7	.081	1
574			...	-.016	1	-.132	1	.032	8	-1.6...	6	.377	1	-.081	1	-2.148	7
575		3	...	.02	8	-.089	8	.15	1	-.427	1	1.724	6	2.186	7	.024	1
576			...	-.017	1	-.132	1	.032	8	-1.7...	6	.427	1	-.024	1	-2.186	7
577		4	...	.02	8	-.09	8	.15	1	-.477	1	1.762	6	2.223	7	-.033	1
578			...	-.017	1	-.132	1	.032	8	-1.7...	6	.477	1	.033	1	-2.223	7
579		5	...	.02	8	-.09	8	.15	1	-.528	1	1.8	6	2.26	7	-.09	1
580			...	-.017	1	-.132	1	.032	8	-1.8	6	.528	1	.09	1	-2.26	7
581	M59	1	...	-.018	9	-.022	8	-.027	9	-.363	1	1.121	6	-1.073	1	2.607	6
582			...	-.052	6	-.071	1	-.142	1	-1.1...	6	.363	1	-2.607	6	1.073	1
583		2	...	-.018	9	-.022	8	-.027	9	-.39	1	1.131	6	-1.127	1	2.627	6
584			...	-.052	6	-.072	1	-.142	1	-1.1...	6	.39	1	-2.627	6	1.127	1
585		3	...	-.018	9	-.022	8	-.028	9	-.417	1	1.141	6	-1.18	1	2.647	6
586			...	-.052	6	-.072	1	-.142	1	-1.1...	6	.417	1	-2.647	6	1.18	1
587		4	...	-.018	9	-.023	8	-.028	9	-.444	1	1.151	6	-1.234	1	2.667	6
588			...	-.052	6	-.072	1	-.142	1	-1.1...	6	.444	1	-2.667	6	1.234	1
589		5	...	-.018	9	-.023	8	-.028	9	-.472	1	1.162	6	-1.288	1	2.687	6
590			...	-.052	6	-.072	1	-.142	1	-1.1...	6	.472	1	-2.687	6	1.288	1
591	M60	1	...	-.025	9	.001	6	.008	7	.092	9	.468	6	-1.427	1	2.952	6
592			...	-.066	1	-.037	1	-.102	1	-.468	6	-.092	9	-2.952	6	1.427	1
593		2	...	-.026	9	0	6	.008	7	.086	9	.467	6	-1.465	1	2.952	6
594			...	-.066	1	-.037	1	-.102	1	-.467	6	-.086	9	-2.952	6	1.465	1
595		3	...	-.026	9	0	6	.007	7	.079	9	.467	6	-1.504	1	2.952	6
596			...	-.066	1	-.037	1	-.102	1	-.467	6	-.079	9	-2.952	6	1.504	1
597		4	...	-.026	9	0	6	.007	7	.073	9	.467	6	-1.542	1	2.953	6
598			...	-.066	1	-.038	1	-.102	1	-.467	6	-.073	9	-2.953	6	1.542	1
599		5	...	-.026	9	0	6	.007	7	.066	9	.467	6	-1.581	1	2.953	6
600			...	-.066	1	-.038	1	-.102	1	-.467	6	-.066	9	-2.953	6	1.581	1
601	M61	1	...	-.026	9	.009	6	.06	7	.73	8	-.358	1	-1.591	1	3.015	6

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[..	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
602			...	-.084	1	-.011	9	-.028	1	.358	1	-.73	8	-3.015	6	1.591	1
603		2	...	-.026	9	.008	6	.06	7	.73	8	-.358	1	-1.595	9	2.993	6
604			...	-.084	1	-.011	9	-.028	1	.358	1	-.73	8	-2.993	6	1.595	9
605		3	...	-.027	9	.008	6	.059	7	.729	8	-.357	1	-1.59	9	2.971	6
606			...	-.084	1	-.011	9	-.028	1	.357	1	-.729	8	-2.971	6	1.59	9
607		4	...	-.027	9	.008	6	.059	7	.729	8	-.356	1	-1.584	9	2.949	6
608			...	-.084	1	-.011	9	-.028	1	.356	1	-.729	8	-2.949	6	1.584	9
609		5	...	-.027	9	.007	6	.059	7	.728	8	-.355	1	-1.578	9	2.927	6
610			...	-.085	1	-.011	9	-.028	1	.355	1	-.728	8	-2.927	6	1.578	9
611	M62	1	...	.002	6	-.026	7	.078	8	-.377	8	.432	7	1.359	9	.001	1
612			...	-.002	7	-.03	8	0	1	-.432	7	.377	8	-.001	1	-1.359	9
613		2	...	.003	6	-.03	7	.079	8	-.519	6	.556	9	1.702	8	.001	1
614			...	-.003	7	-.034	8	0	1	-.556	9	.519	6	-.001	1	-1.702	8
615		3	...	.004	6	-.033	7	.081	8	-.677	6	.697	9	2.059	8	.001	1
616			...	-.004	7	-.037	8	0	1	-.697	9	.677	6	-.001	1	-2.059	8
617		4	...	.005	6	-.037	7	.083	8	-.845	1	.853	9	2.423	8	.002	1
618			...	-.005	7	-.041	8	0	1	-.853	9	.845	1	-.002	1	-2.423	8
619		5	...	.005	6	-.04	7	.085	8	-1.0...	1	1.041	8	2.795	8	.002	1
620			...	-.005	7	-.044	8	0	1	-1.0...	8	1.023	1	-.002	1	-2.795	8

Envelope Member Section Torsion

	Member	Sec		Torque[l...	Ic	Torsion Shear[ksi]	Ic	y-y Warp...	Ic	z-z Warp Shear[ksi]	Ic	z-Top W...	Ic	z-Bot Wa...	Ic
1	M1	1	max	9.788	8	.051	8	NC		NC		NC		NC	
2			min	-7.047	7	-.036	7	NC		NC		NC		NC	
3		2	max	9.788	8	.051	8	NC		NC		NC		NC	
4			min	-7.047	7	-.036	7	NC		NC		NC		NC	
5		3	max	9.788	8	.051	8	NC		NC		NC		NC	
6			min	-7.047	7	-.036	7	NC		NC		NC		NC	
7		4	max	9.788	8	.051	8	NC		NC		NC		NC	
8			min	-7.047	7	-.036	7	NC		NC		NC		NC	
9		5	max	9.788	8	.051	8	NC		NC		NC		NC	
10			min	-7.047	7	-.036	7	NC		NC		NC		NC	
11	M2	1	max	9.788	8	.041	8	NC		NC		NC		NC	
12			min	-7.047	7	-.029	7	NC		NC		NC		NC	
13		2	max	9.788	8	.041	8	NC		NC		NC		NC	
14			min	-7.047	7	-.029	7	NC		NC		NC		NC	
15		3	max	9.788	8	.041	8	NC		NC		NC		NC	
16			min	-7.047	7	-.029	7	NC		NC		NC		NC	
17		4	max	9.788	8	.041	8	NC		NC		NC		NC	
18			min	-7.047	7	-.029	7	NC		NC		NC		NC	
19		5	max	9.788	8	.041	8	NC		NC		NC		NC	
20			min	-7.047	7	-.029	7	NC		NC		NC		NC	
21	M3	1	max	9.713	1	.04	1	NC		NC		NC		NC	
22			min	5.892	9	.024	9	NC		NC		NC		NC	
23		2	max	9.713	1	.04	1	NC		NC		NC		NC	
24			min	5.892	9	.024	9	NC		NC		NC		NC	
25		3	max	9.713	1	.04	1	NC		NC		NC		NC	
26			min	5.892	9	.024	9	NC		NC		NC		NC	
27		4	max	9.713	1	.04	1	NC		NC		NC		NC	
28			min	5.892	9	.024	9	NC		NC		NC		NC	
29		5	max	9.713	1	.04	1	NC		NC		NC		NC	
30			min	5.892	9	.024	9	NC		NC		NC		NC	
31	M4	1	max	9.713	1	.04	1	NC		NC		NC		NC	
32			min	5.892	9	.024	9	NC		NC		NC		NC	
33		2	max	9.713	1	.04	1	NC		NC		NC		NC	
34			min	5.892	9	.024	9	NC		NC		NC		NC	

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
35		3	max	9.713	1	.04	1	NC		NC		NC		NC	
36			min	5.892	9	.024	9	NC		NC		NC		NC	
37		4	max	9.713	1	.04	1	NC		NC		NC		NC	
38			min	5.892	9	.024	9	NC		NC		NC		NC	
39		5	max	9.713	1	.04	1	NC		NC		NC		NC	
40			min	5.892	9	.024	9	NC		NC		NC		NC	
41	M5	1	max	65.102	7	.057	7	NC		NC		NC		NC	
42			min	.863	1	0	1	NC		NC		NC		NC	
43		2	max	65.102	7	.057	7	NC		NC		NC		NC	
44			min	.863	1	0	1	NC		NC		NC		NC	
45		3	max	65.102	7	.057	7	NC		NC		NC		NC	
46			min	.863	1	0	1	NC		NC		NC		NC	
47		4	max	65.102	7	.057	7	NC		NC		NC		NC	
48			min	.863	1	0	1	NC		NC		NC		NC	
49		5	max	65.102	7	.057	7	NC		NC		NC		NC	
50			min	.863	1	0	1	NC		NC		NC		NC	
51	M6	1	max	65.102	7	.057	7	NC		NC		NC		NC	
52			min	.863	1	0	1	NC		NC		NC		NC	
53		2	max	65.102	7	.057	7	NC		NC		NC		NC	
54			min	.863	1	0	1	NC		NC		NC		NC	
55		3	max	65.102	7	.057	7	NC		NC		NC		NC	
56			min	.863	1	0	1	NC		NC		NC		NC	
57		4	max	65.102	7	.057	7	NC		NC		NC		NC	
58			min	.863	1	0	1	NC		NC		NC		NC	
59		5	max	65.102	7	.057	7	NC		NC		NC		NC	
60			min	.863	1	0	1	NC		NC		NC		NC	
61	M7	1	max	-19.661	7	-.186	7	NC		NC		NC		NC	
62			min	-20.094	1	-.19	1	NC		NC		NC		NC	
63		2	max	-19.661	7	-.186	7	NC		NC		NC		NC	
64			min	-20.094	1	-.19	1	NC		NC		NC		NC	
65		3	max	-19.661	7	-.186	7	NC		NC		NC		NC	
66			min	-20.094	1	-.19	1	NC		NC		NC		NC	
67		4	max	.207	1	.002	1	NC		NC		NC		NC	
68			min	.041	7	0	7	NC		NC		NC		NC	
69		5	max	.207	1	.002	1	NC		NC		NC		NC	
70			min	.041	7	0	7	NC		NC		NC		NC	
71	M8	1	max	.207	1	.002	1	NC		NC		NC		NC	
72			min	.041	7	0	7	NC		NC		NC		NC	
73		2	max	.207	1	.002	1	NC		NC		NC		NC	
74			min	.041	7	0	7	NC		NC		NC		NC	
75		3	max	.207	1	.002	1	NC		NC		NC		NC	
76			min	.041	7	0	7	NC		NC		NC		NC	
77		4	max	.207	1	.002	1	NC		NC		NC		NC	
78			min	.041	7	0	7	NC		NC		NC		NC	
79		5	max	.207	1	.002	1	NC		NC		NC		NC	
80			min	.041	7	0	7	NC		NC		NC		NC	
81	M9	1	max	25.554	7	.022	7	NC		NC		NC		NC	
82			min	-159.847	1	-.14	1	NC		NC		NC		NC	
83		2	max	25.554	7	.022	7	NC		NC		NC		NC	
84			min	-159.847	1	-.14	1	NC		NC		NC		NC	
85		3	max	25.554	7	.022	7	NC		NC		NC		NC	
86			min	-159.847	1	-.14	1	NC		NC		NC		NC	
87		4	max	25.554	7	.022	7	NC		NC		NC		NC	
88			min	-159.847	1	-.14	1	NC		NC		NC		NC	
89		5	max	25.554	7	.022	7	NC		NC		NC		NC	
90			min	-159.847	1	-.14	1	NC		NC		NC		NC	
91	M10	1	max	25.554	7	.022	7	NC		NC		NC		NC	

Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
92			min	-159.847	1	-.14	1	NC		NC		NC		NC	
93		2	max	25.554	7	.022	7	NC		NC		NC		NC	
94			min	-159.847	1	-.14	1	NC		NC		NC		NC	
95		3	max	25.554	7	.022	7	NC		NC		NC		NC	
96			min	-159.847	1	-.14	1	NC		NC		NC		NC	
97		4	max	25.554	7	.022	7	NC		NC		NC		NC	
98			min	-159.847	1	-.14	1	NC		NC		NC		NC	
99		5	max	25.554	7	.022	7	NC		NC		NC		NC	
100			min	-159.847	1	-.14	1	NC		NC		NC		NC	
101	M11	1	max	77.526	8	.065	8	NC		NC		NC		NC	
102			min	50.057	1	.042	1	NC		NC		NC		NC	
103		2	max	77.526	8	.065	8	NC		NC		NC		NC	
104			min	50.057	1	.042	1	NC		NC		NC		NC	
105		3	max	77.526	8	.065	8	NC		NC		NC		NC	
106			min	50.057	1	.042	1	NC		NC		NC		NC	
107		4	max	77.526	8	.065	8	NC		NC		NC		NC	
108			min	50.057	1	.042	1	NC		NC		NC		NC	
109		5	max	77.526	8	.065	8	NC		NC		NC		NC	
110			min	50.057	1	.042	1	NC		NC		NC		NC	
111	M12	1	max	9.713	1	.04	1	NC		NC		NC		NC	
112			min	5.892	9	.024	9	NC		NC		NC		NC	
113		2	max	9.713	1	.04	1	NC		NC		NC		NC	
114			min	5.892	9	.024	9	NC		NC		NC		NC	
115		3	max	9.713	1	.04	1	NC		NC		NC		NC	
116			min	5.892	9	.024	9	NC		NC		NC		NC	
117		4	max	9.713	1	.04	1	NC		NC		NC		NC	
118			min	5.892	9	.024	9	NC		NC		NC		NC	
119		5	max	9.713	1	.04	1	NC		NC		NC		NC	
120			min	5.892	9	.024	9	NC		NC		NC		NC	
121	M13	1	max	65.102	7	.057	7	NC		NC		NC		NC	
122			min	.863	1	0	1	NC		NC		NC		NC	
123		2	max	65.102	7	.057	7	NC		NC		NC		NC	
124			min	.863	1	0	1	NC		NC		NC		NC	
125		3	max	65.102	7	.057	7	NC		NC		NC		NC	
126			min	.863	1	0	1	NC		NC		NC		NC	
127		4	max	65.102	7	.057	7	NC		NC		NC		NC	
128			min	.863	1	0	1	NC		NC		NC		NC	
129		5	max	65.102	7	.057	7	NC		NC		NC		NC	
130			min	.863	1	0	1	NC		NC		NC		NC	
131	M14	1	max	25.554	7	.022	7	NC		NC		NC		NC	
132			min	-159.847	1	-.14	1	NC		NC		NC		NC	
133		2	max	25.554	7	.022	7	NC		NC		NC		NC	
134			min	-159.847	1	-.14	1	NC		NC		NC		NC	
135		3	max	25.554	7	.022	7	NC		NC		NC		NC	
136			min	-159.847	1	-.14	1	NC		NC		NC		NC	
137		4	max	25.554	7	.022	7	NC		NC		NC		NC	
138			min	-159.847	1	-.14	1	NC		NC		NC		NC	
139		5	max	25.554	7	.022	7	NC		NC		NC		NC	
140			min	-159.847	1	-.14	1	NC		NC		NC		NC	
141	M15	1	max	25.554	7	.022	7	NC		NC		NC		NC	
142			min	-159.847	1	-.14	1	NC		NC		NC		NC	
143		2	max	25.554	7	.022	7	NC		NC		NC		NC	
144			min	-159.847	1	-.14	1	NC		NC		NC		NC	
145		3	max	25.554	7	.022	7	NC		NC		NC		NC	
146			min	-159.847	1	-.14	1	NC		NC		NC		NC	
147		4	max	25.554	7	.022	7	NC		NC		NC		NC	
148			min	-159.847	1	-.14	1	NC		NC		NC		NC	

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
149		5	max	25.554	7	.022	7	NC		NC		NC		NC	
150			min	-159.847	1	-.14	1	NC		NC		NC		NC	
151	M16	1	max	53.44	8	.506	8	NC		NC		NC		NC	
152			min	31.057	1	.294	1	NC		NC		NC		NC	
153		2	max	53.44	8	.506	8	NC		NC		NC		NC	
154			min	31.057	1	.294	1	NC		NC		NC		NC	
155		3	max	53.44	8	.506	8	NC		NC		NC		NC	
156			min	31.057	1	.294	1	NC		NC		NC		NC	
157		4	max	53.44	8	.506	8	NC		NC		NC		NC	
158			min	31.057	1	.294	1	NC		NC		NC		NC	
159		5	max	53.44	8	.506	8	NC		NC		NC		NC	
160			min	31.057	1	.294	1	NC		NC		NC		NC	
161	M17	1	max	77.526	8	.734	8	NC		NC		NC		NC	
162			min	50.057	1	.474	1	NC		NC		NC		NC	
163		2	max	77.526	8	.734	8	NC		NC		NC		NC	
164			min	50.057	1	.474	1	NC		NC		NC		NC	
165		3	max	77.526	8	.734	8	NC		NC		NC		NC	
166			min	50.057	1	.474	1	NC		NC		NC		NC	
167		4	max	77.526	8	.734	8	NC		NC		NC		NC	
168			min	50.057	1	.474	1	NC		NC		NC		NC	
169		5	max	77.526	8	.734	8	NC		NC		NC		NC	
170			min	50.057	1	.474	1	NC		NC		NC		NC	
171	M18	1	max	1.88	9	.018	9	NC		NC		NC		NC	
172			min	-3.051	1	-.029	1	NC		NC		NC		NC	
173		2	max	1.88	9	.018	9	NC		NC		NC		NC	
174			min	-3.051	1	-.029	1	NC		NC		NC		NC	
175		3	max	1.88	9	.018	9	NC		NC		NC		NC	
176			min	-3.051	1	-.029	1	NC		NC		NC		NC	
177		4	max	1.88	9	.018	9	NC		NC		NC		NC	
178			min	-3.051	1	-.029	1	NC		NC		NC		NC	
179		5	max	1.88	9	.018	9	NC		NC		NC		NC	
180			min	-3.051	1	-.029	1	NC		NC		NC		NC	
181	M19	1	max	77.526	8	.734	8	NC		NC		NC		NC	
182			min	50.057	1	.474	1	NC		NC		NC		NC	
183		2	max	77.526	8	.734	8	NC		NC		NC		NC	
184			min	50.057	1	.474	1	NC		NC		NC		NC	
185		3	max	77.526	8	.734	8	NC		NC		NC		NC	
186			min	50.057	1	.474	1	NC		NC		NC		NC	
187		4	max	77.526	8	.734	8	NC		NC		NC		NC	
188			min	50.057	1	.474	1	NC		NC		NC		NC	
189		5	max	77.526	8	.734	8	NC		NC		NC		NC	
190			min	50.057	1	.474	1	NC		NC		NC		NC	
191	M20	1	max	77.526	8	.065	8	NC		NC		NC		NC	
192			min	50.057	1	.042	1	NC		NC		NC		NC	
193		2	max	77.526	8	.065	8	NC		NC		NC		NC	
194			min	50.057	1	.042	1	NC		NC		NC		NC	
195		3	max	77.526	8	.065	8	NC		NC		NC		NC	
196			min	50.057	1	.042	1	NC		NC		NC		NC	
197		4	max	77.526	8	.065	8	NC		NC		NC		NC	
198			min	50.057	1	.042	1	NC		NC		NC		NC	
199		5	max	77.526	8	.065	8	NC		NC		NC		NC	
200			min	50.057	1	.042	1	NC		NC		NC		NC	
201	M21	1	max	77.526	8	.065	8	NC		NC		NC		NC	
202			min	50.057	1	.042	1	NC		NC		NC		NC	
203		2	max	77.526	8	.065	8	NC		NC		NC		NC	
204			min	50.057	1	.042	1	NC		NC		NC		NC	
205		3	max	77.526	8	.065	8	NC		NC		NC		NC	

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
206			min	50.057	1	.042	1	NC		NC		NC		NC	
207		4	max	77.526	8	.065	8	NC		NC		NC		NC	
208			min	50.057	1	.042	1	NC		NC		NC		NC	
209		5	max	77.526	8	.065	8	NC		NC		NC		NC	
210			min	50.057	1	.042	1	NC		NC		NC		NC	
211	M22	1	max	77.526	8	.065	8	NC		NC		NC		NC	
212			min	50.057	1	.042	1	NC		NC		NC		NC	
213		2	max	77.526	8	.065	8	NC		NC		NC		NC	
214			min	50.057	1	.042	1	NC		NC		NC		NC	
215		3	max	77.526	8	.065	8	NC		NC		NC		NC	
216			min	50.057	1	.042	1	NC		NC		NC		NC	
217		4	max	77.526	8	.065	8	NC		NC		NC		NC	
218			min	50.057	1	.042	1	NC		NC		NC		NC	
219		5	max	77.526	8	.065	8	NC		NC		NC		NC	
220			min	50.057	1	.042	1	NC		NC		NC		NC	
221	M23	1	max	77.526	8	.065	8	NC		NC		NC		NC	
222			min	50.057	1	.042	1	NC		NC		NC		NC	
223		2	max	77.526	8	.065	8	NC		NC		NC		NC	
224			min	50.057	1	.042	1	NC		NC		NC		NC	
225		3	max	77.526	8	.065	8	NC		NC		NC		NC	
226			min	50.057	1	.042	1	NC		NC		NC		NC	
227		4	max	77.526	8	.065	8	NC		NC		NC		NC	
228			min	50.057	1	.042	1	NC		NC		NC		NC	
229		5	max	77.526	8	.065	8	NC		NC		NC		NC	
230			min	50.057	1	.042	1	NC		NC		NC		NC	
231	M24	1	max	77.526	8	0	1	NC		NC		NC		NC	
232			min	50.057	1	0	1	NC		NC		NC		NC	
233		2	max	77.526	8	0	1	NC		NC		NC		NC	
234			min	50.057	1	0	1	NC		NC		NC		NC	
235		3	max	77.526	8	0	1	NC		NC		NC		NC	
236			min	50.057	1	0	1	NC		NC		NC		NC	
237		4	max	77.526	8	0	1	NC		NC		NC		NC	
238			min	50.057	1	0	1	NC		NC		NC		NC	
239		5	max	77.526	8	0	1	NC		NC		NC		NC	
240			min	50.057	1	0	1	NC		NC		NC		NC	
241	M25	1	max	77.526	8	.065	8	NC		NC		NC		NC	
242			min	50.057	1	.042	1	NC		NC		NC		NC	
243		2	max	77.526	8	.065	8	NC		NC		NC		NC	
244			min	50.057	1	.042	1	NC		NC		NC		NC	
245		3	max	77.526	8	.065	8	NC		NC		NC		NC	
246			min	50.057	1	.042	1	NC		NC		NC		NC	
247		4	max	77.526	8	.065	8	NC		NC		NC		NC	
248			min	50.057	1	.042	1	NC		NC		NC		NC	
249		5	max	77.526	8	.065	8	NC		NC		NC		NC	
250			min	50.057	1	.042	1	NC		NC		NC		NC	
251	M26	1	max	78.875	8	.066	8	NC		NC		NC		NC	
252			min	51.989	1	.044	1	NC		NC		NC		NC	
253		2	max	78.875	8	.066	8	NC		NC		NC		NC	
254			min	51.989	1	.044	1	NC		NC		NC		NC	
255		3	max	78.875	8	.066	8	NC		NC		NC		NC	
256			min	51.989	1	.044	1	NC		NC		NC		NC	
257		4	max	78.875	8	.066	8	NC		NC		NC		NC	
258			min	51.989	1	.044	1	NC		NC		NC		NC	
259		5	max	78.875	8	.066	8	NC		NC		NC		NC	
260			min	51.989	1	.044	1	NC		NC		NC		NC	
261	M27	1	max	74.78	8	.063	8	NC		NC		NC		NC	
262			min	50.861	1	.043	1	NC		NC		NC		NC	

Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
263		2	max	74.78	8	.063	8	NC		NC		NC		NC	
264			min	50.861	1	.043	1	NC		NC		NC		NC	
265		3	max	74.78	8	.063	8	NC		NC		NC		NC	
266			min	50.861	1	.043	1	NC		NC		NC		NC	
267		4	max	74.78	8	.063	8	NC		NC		NC		NC	
268			min	50.861	1	.043	1	NC		NC		NC		NC	
269		5	max	74.78	8	.063	8	NC		NC		NC		NC	
270			min	50.861	1	.043	1	NC		NC		NC		NC	
271	M28	1	max	62.057	8	.052	8	NC		NC		NC		NC	
272			min	43.297	1	.036	1	NC		NC		NC		NC	
273		2	max	62.057	8	.052	8	NC		NC		NC		NC	
274			min	43.297	1	.036	1	NC		NC		NC		NC	
275		3	max	62.057	8	.052	8	NC		NC		NC		NC	
276			min	43.297	1	.036	1	NC		NC		NC		NC	
277		4	max	62.057	8	.052	8	NC		NC		NC		NC	
278			min	43.297	1	.036	1	NC		NC		NC		NC	
279		5	max	62.057	8	.052	8	NC		NC		NC		NC	
280			min	43.297	1	.036	1	NC		NC		NC		NC	
281	M29	1	max	41.631	8	.035	8	NC		NC		NC		NC	
282			min	29.712	1	.025	1	NC		NC		NC		NC	
283		2	max	41.631	8	.035	8	NC		NC		NC		NC	
284			min	29.712	1	.025	1	NC		NC		NC		NC	
285		3	max	41.631	8	.035	8	NC		NC		NC		NC	
286			min	29.712	1	.025	1	NC		NC		NC		NC	
287		4	max	41.631	8	.035	8	NC		NC		NC		NC	
288			min	29.712	1	.025	1	NC		NC		NC		NC	
289		5	max	41.631	8	.035	8	NC		NC		NC		NC	
290			min	29.712	1	.025	1	NC		NC		NC		NC	
291	M30	1	max	15.118	8	.013	8	NC		NC		NC		NC	
292			min	11.068	1	.009	1	NC		NC		NC		NC	
293		2	max	15.118	8	.013	8	NC		NC		NC		NC	
294			min	11.068	1	.009	1	NC		NC		NC		NC	
295		3	max	15.118	8	.013	8	NC		NC		NC		NC	
296			min	11.068	1	.009	1	NC		NC		NC		NC	
297		4	max	15.118	8	.013	8	NC		NC		NC		NC	
298			min	11.068	1	.009	1	NC		NC		NC		NC	
299		5	max	15.118	8	.013	8	NC		NC		NC		NC	
300			min	11.068	1	.009	1	NC		NC		NC		NC	
301	M31	1	max	0	1	0	1	NC		NC		NC		NC	
302			min	0	1	0	1	NC		NC		NC		NC	
303		2	max	0	1	0	1	NC		NC		NC		NC	
304			min	0	1	0	1	NC		NC		NC		NC	
305		3	max	0	1	0	1	NC		NC		NC		NC	
306			min	0	1	0	1	NC		NC		NC		NC	
307		4	max	0	1	0	1	NC		NC		NC		NC	
308			min	0	1	0	1	NC		NC		NC		NC	
309		5	max	0	1	0	1	NC		NC		NC		NC	
310			min	0	1	0	1	NC		NC		NC		NC	
311	M32	1	max	.207	1	.002	1	NC		NC		NC		NC	
312			min	.041	7	0	7	NC		NC		NC		NC	
313		2	max	.207	1	.002	1	NC		NC		NC		NC	
314			min	.041	7	0	7	NC		NC		NC		NC	
315		3	max	.207	1	.002	1	NC		NC		NC		NC	
316			min	.041	7	0	7	NC		NC		NC		NC	
317		4	max	.207	1	.002	1	NC		NC		NC		NC	
318			min	.041	7	0	7	NC		NC		NC		NC	
319		5	max	.207	1	.002	1	NC		NC		NC		NC	

Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
320			min	.041	7	0	7	NC		NC		NC		NC	
321	M33	1	max	22.002	7	.114	7	NC		NC		NC		NC	
322			min	-21.324	8	-.11	8	NC		NC		NC		NC	
323		2	max	22.002	7	.114	7	NC		NC		NC		NC	
324			min	-21.324	8	-.11	8	NC		NC		NC		NC	
325		3	max	22.002	7	.114	7	NC		NC		NC		NC	
326			min	-21.324	8	-.11	8	NC		NC		NC		NC	
327		4	max	22.002	7	.114	7	NC		NC		NC		NC	
328			min	-21.324	8	-.11	8	NC		NC		NC		NC	
329		5	max	22.002	7	.114	7	NC		NC		NC		NC	
330			min	-21.324	8	-.11	8	NC		NC		NC		NC	
331	M34	1	max	.207	1	.002	1	NC		NC		NC		NC	
332			min	.041	7	0	7	NC		NC		NC		NC	
333		2	max	.207	1	.002	1	NC		NC		NC		NC	
334			min	.041	7	0	7	NC		NC		NC		NC	
335		3	max	.207	1	.002	1	NC		NC		NC		NC	
336			min	.041	7	0	7	NC		NC		NC		NC	
337		4	max	.207	1	.002	1	NC		NC		NC		NC	
338			min	.041	7	0	7	NC		NC		NC		NC	
339		5	max	.207	1	.002	1	NC		NC		NC		NC	
340			min	.041	7	0	7	NC		NC		NC		NC	
341	M35	1	max	.207	1	.002	1	NC		NC		NC		NC	
342			min	.041	7	0	7	NC		NC		NC		NC	
343		2	max	.207	1	.002	1	NC		NC		NC		NC	
344			min	.041	7	0	7	NC		NC		NC		NC	
345		3	max	.207	1	.002	1	NC		NC		NC		NC	
346			min	.041	7	0	7	NC		NC		NC		NC	
347		4	max	.207	1	.002	1	NC		NC		NC		NC	
348			min	.041	7	0	7	NC		NC		NC		NC	
349		5	max	.207	1	.002	1	NC		NC		NC		NC	
350			min	.041	7	0	7	NC		NC		NC		NC	
351	M36	1	max	.207	1	.002	1	NC		NC		NC		NC	
352			min	.041	7	0	7	NC		NC		NC		NC	
353		2	max	.207	1	.002	1	NC		NC		NC		NC	
354			min	.041	7	0	7	NC		NC		NC		NC	
355		3	max	.207	1	.002	1	NC		NC		NC		NC	
356			min	.041	7	0	7	NC		NC		NC		NC	
357		4	max	.207	1	.002	1	NC		NC		NC		NC	
358			min	.041	7	0	7	NC		NC		NC		NC	
359		5	max	.207	1	.002	1	NC		NC		NC		NC	
360			min	.041	7	0	7	NC		NC		NC		NC	
361	M37	1	max	9.788	8	.051	8	NC		NC		NC		NC	
362			min	-7.047	7	-.036	7	NC		NC		NC		NC	
363		2	max	9.788	8	.051	8	NC		NC		NC		NC	
364			min	-7.047	7	-.036	7	NC		NC		NC		NC	
365		3	max	9.788	8	.051	8	NC		NC		NC		NC	
366			min	-7.047	7	-.036	7	NC		NC		NC		NC	
367		4	max	9.788	8	.051	8	NC		NC		NC		NC	
368			min	-7.047	7	-.036	7	NC		NC		NC		NC	
369		5	max	9.788	8	.051	8	NC		NC		NC		NC	
370			min	-7.047	7	-.036	7	NC		NC		NC		NC	
371	M38	1	max	9.788	8	.051	8	NC		NC		NC		NC	
372			min	-7.047	7	-.036	7	NC		NC		NC		NC	
373		2	max	9.788	8	.051	8	NC		NC		NC		NC	
374			min	-7.047	7	-.036	7	NC		NC		NC		NC	
375		3	max	9.788	8	.051	8	NC		NC		NC		NC	
376			min	-7.047	7	-.036	7	NC		NC		NC		NC	

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
377		4	max	9.788	8	.051	8	NC		NC		NC		NC	
378			min	-7.047	7	-.036	7	NC		NC		NC		NC	
379		5	max	9.788	8	.051	8	NC		NC		NC		NC	
380			min	-7.047	7	-.036	7	NC		NC		NC		NC	
381	M39	1	max	9.788	8	.051	8	NC		NC		NC		NC	
382			min	-7.047	7	-.036	7	NC		NC		NC		NC	
383		2	max	9.788	8	.051	8	NC		NC		NC		NC	
384			min	-7.047	7	-.036	7	NC		NC		NC		NC	
385		3	max	9.788	8	.051	8	NC		NC		NC		NC	
386			min	-7.047	7	-.036	7	NC		NC		NC		NC	
387		4	max	9.788	8	.051	8	NC		NC		NC		NC	
388			min	-7.047	7	-.036	7	NC		NC		NC		NC	
389		5	max	9.788	8	.051	8	NC		NC		NC		NC	
390			min	-7.047	7	-.036	7	NC		NC		NC		NC	
391	M40	1	max	9.788	8	.041	8	NC		NC		NC		NC	
392			min	-7.047	7	-.029	7	NC		NC		NC		NC	
393		2	max	9.788	8	.041	8	NC		NC		NC		NC	
394			min	-7.047	7	-.029	7	NC		NC		NC		NC	
395		3	max	9.788	8	.041	8	NC		NC		NC		NC	
396			min	-7.047	7	-.029	7	NC		NC		NC		NC	
397		4	max	9.788	8	.041	8	NC		NC		NC		NC	
398			min	-7.047	7	-.029	7	NC		NC		NC		NC	
399		5	max	9.788	8	.041	8	NC		NC		NC		NC	
400			min	-7.047	7	-.029	7	NC		NC		NC		NC	
401	M41	1	max	9.788	8	.041	8	NC		NC		NC		NC	
402			min	-7.047	7	-.029	7	NC		NC		NC		NC	
403		2	max	9.788	8	.041	8	NC		NC		NC		NC	
404			min	-7.047	7	-.029	7	NC		NC		NC		NC	
405		3	max	9.788	8	.041	8	NC		NC		NC		NC	
406			min	-7.047	7	-.029	7	NC		NC		NC		NC	
407		4	max	9.788	8	.041	8	NC		NC		NC		NC	
408			min	-7.047	7	-.029	7	NC		NC		NC		NC	
409		5	max	9.788	8	.041	8	NC		NC		NC		NC	
410			min	-7.047	7	-.029	7	NC		NC		NC		NC	
411	M42	1	max	9.788	8	.041	8	NC		NC		NC		NC	
412			min	-7.047	7	-.029	7	NC		NC		NC		NC	
413		2	max	9.788	8	.041	8	NC		NC		NC		NC	
414			min	-7.047	7	-.029	7	NC		NC		NC		NC	
415		3	max	9.788	8	.041	8	NC		NC		NC		NC	
416			min	-7.047	7	-.029	7	NC		NC		NC		NC	
417		4	max	9.788	8	.041	8	NC		NC		NC		NC	
418			min	-7.047	7	-.029	7	NC		NC		NC		NC	
419		5	max	9.788	8	.041	8	NC		NC		NC		NC	
420			min	-7.047	7	-.029	7	NC		NC		NC		NC	
421	M43	1	max	25.554	7	.022	7	NC		NC		NC		NC	
422			min	-159.847	1	-.14	1	NC		NC		NC		NC	
423		2	max	25.554	7	.022	7	NC		NC		NC		NC	
424			min	-159.847	1	-.14	1	NC		NC		NC		NC	
425		3	max	25.554	7	.022	7	NC		NC		NC		NC	
426			min	-159.847	1	-.14	1	NC		NC		NC		NC	
427		4	max	25.554	7	.022	7	NC		NC		NC		NC	
428			min	-159.847	1	-.14	1	NC		NC		NC		NC	
429		5	max	25.554	7	.022	7	NC		NC		NC		NC	
430			min	-159.847	1	-.14	1	NC		NC		NC		NC	
431	M44	1	max	65.102	7	.057	7	NC		NC		NC		NC	
432			min	.863	1	0	1	NC		NC		NC		NC	
433		2	max	65.102	7	.057	7	NC		NC		NC		NC	

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
434			min	.863	1	0	1	NC		NC		NC		NC	
435		3	max	65.102	7	.057	7	NC		NC		NC		NC	
436			min	.863	1	0	1	NC		NC		NC		NC	
437		4	max	65.102	7	.057	7	NC		NC		NC		NC	
438			min	.863	1	0	1	NC		NC		NC		NC	
439		5	max	65.102	7	.057	7	NC		NC		NC		NC	
440			min	.863	1	0	1	NC		NC		NC		NC	
441	M45	1	max	65.102	7	.057	7	NC		NC		NC		NC	
442			min	.863	1	0	1	NC		NC		NC		NC	
443		2	max	65.102	7	.057	7	NC		NC		NC		NC	
444			min	.863	1	0	1	NC		NC		NC		NC	
445		3	max	65.102	7	.057	7	NC		NC		NC		NC	
446			min	.863	1	0	1	NC		NC		NC		NC	
447		4	max	65.102	7	.057	7	NC		NC		NC		NC	
448			min	.863	1	0	1	NC		NC		NC		NC	
449		5	max	65.102	7	.057	7	NC		NC		NC		NC	
450			min	.863	1	0	1	NC		NC		NC		NC	
451	M46	1	max	-13.576	1	-.129	1	NC		NC		NC		NC	
452			min	-14.513	8	-.137	8	NC		NC		NC		NC	
453		2	max	-13.576	1	-.129	1	NC		NC		NC		NC	
454			min	-14.513	8	-.137	8	NC		NC		NC		NC	
455		3	max	-13.576	1	-.129	1	NC		NC		NC		NC	
456			min	-14.513	8	-.137	8	NC		NC		NC		NC	
457		4	max	-13.576	1	-.129	1	NC		NC		NC		NC	
458			min	-14.513	8	-.137	8	NC		NC		NC		NC	
459		5	max	-13.576	1	-.129	1	NC		NC		NC		NC	
460			min	-14.513	8	-.137	8	NC		NC		NC		NC	
461	M47	1	max	-1.625	1	-.015	1	NC		NC		NC		NC	
462			min	-4.21	8	-.04	8	NC		NC		NC		NC	
463		2	max	-1.625	1	-.015	1	NC		NC		NC		NC	
464			min	-4.21	8	-.04	8	NC		NC		NC		NC	
465		3	max	-1.625	1	-.015	1	NC		NC		NC		NC	
466			min	-4.21	8	-.04	8	NC		NC		NC		NC	
467		4	max	-1.625	1	-.015	1	NC		NC		NC		NC	
468			min	-4.21	8	-.04	8	NC		NC		NC		NC	
469		5	max	-1.625	1	-.015	1	NC		NC		NC		NC	
470			min	-4.21	8	-.04	8	NC		NC		NC		NC	
471	M48	1	max	7.459	1	.071	1	NC		NC		NC		NC	
472			min	3.863	9	.037	9	NC		NC		NC		NC	
473		2	max	7.459	1	.071	1	NC		NC		NC		NC	
474			min	3.863	9	.037	9	NC		NC		NC		NC	
475		3	max	7.459	1	.071	1	NC		NC		NC		NC	
476			min	3.863	9	.037	9	NC		NC		NC		NC	
477		4	max	7.459	1	.071	1	NC		NC		NC		NC	
478			min	3.863	9	.037	9	NC		NC		NC		NC	
479		5	max	7.459	1	.071	1	NC		NC		NC		NC	
480			min	3.863	9	.037	9	NC		NC		NC		NC	
481	M49	1	max	9.713	1	.092	1	NC		NC		NC		NC	
482			min	5.892	9	.056	9	NC		NC		NC		NC	
483		2	max	9.713	1	.092	1	NC		NC		NC		NC	
484			min	5.892	9	.056	9	NC		NC		NC		NC	
485		3	max	9.713	1	.092	1	NC		NC		NC		NC	
486			min	5.892	9	.056	9	NC		NC		NC		NC	
487		4	max	9.713	1	.092	1	NC		NC		NC		NC	
488			min	5.892	9	.056	9	NC		NC		NC		NC	
489		5	max	9.713	1	.092	1	NC		NC		NC		NC	
490			min	5.892	9	.056	9	NC		NC		NC		NC	

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
491	M50	1	max	8.693	1	.036	1	NC		NC		NC		NC	
492			min	3.408	9	.014	9	NC		NC		NC		NC	
493		2	max	8.693	1	.036	1	NC		NC		NC		NC	
494			min	3.408	9	.014	9	NC		NC		NC		NC	
495		3	max	8.693	1	.036	1	NC		NC		NC		NC	
496			min	3.408	9	.014	9	NC		NC		NC		NC	
497		4	max	8.693	1	.036	1	NC		NC		NC		NC	
498			min	3.408	9	.014	9	NC		NC		NC		NC	
499		5	max	8.693	1	.036	1	NC		NC		NC		NC	
500			min	3.408	9	.014	9	NC		NC		NC		NC	
501	M51	1	max	10.699	6	.044	6	NC		NC		NC		NC	
502			min	-1	9	-.004	9	NC		NC		NC		NC	
503		2	max	10.699	6	.044	6	NC		NC		NC		NC	
504			min	-1	9	-.004	9	NC		NC		NC		NC	
505		3	max	10.699	6	.044	6	NC		NC		NC		NC	
506			min	-1	9	-.004	9	NC		NC		NC		NC	
507		4	max	10.699	6	.044	6	NC		NC		NC		NC	
508			min	-1	9	-.004	9	NC		NC		NC		NC	
509		5	max	10.699	6	.044	6	NC		NC		NC		NC	
510			min	-1	9	-.004	9	NC		NC		NC		NC	
511	M52	1	max	11.845	8	.049	8	NC		NC		NC		NC	
512			min	-4.445	7	-.018	7	NC		NC		NC		NC	
513		2	max	11.845	8	.049	8	NC		NC		NC		NC	
514			min	-4.445	7	-.018	7	NC		NC		NC		NC	
515		3	max	11.845	8	.049	8	NC		NC		NC		NC	
516			min	-4.445	7	-.018	7	NC		NC		NC		NC	
517		4	max	11.845	8	.049	8	NC		NC		NC		NC	
518			min	-4.445	7	-.018	7	NC		NC		NC		NC	
519		5	max	11.845	8	.049	8	NC		NC		NC		NC	
520			min	-4.445	7	-.018	7	NC		NC		NC		NC	
521	M53	1	max	19.786	7	.102	7	NC		NC		NC		NC	
522			min	-18.438	8	-.095	8	NC		NC		NC		NC	
523		2	max	19.786	7	.102	7	NC		NC		NC		NC	
524			min	-18.438	8	-.095	8	NC		NC		NC		NC	
525		3	max	19.786	7	.102	7	NC		NC		NC		NC	
526			min	-18.438	8	-.095	8	NC		NC		NC		NC	
527		4	max	19.786	7	.102	7	NC		NC		NC		NC	
528			min	-18.438	8	-.095	8	NC		NC		NC		NC	
529		5	max	19.786	7	.102	7	NC		NC		NC		NC	
530			min	-18.438	8	-.095	8	NC		NC		NC		NC	
531	M54	1	max	11.167	9	.058	9	NC		NC		NC		NC	
532			min	-8.776	6	-.045	6	NC		NC		NC		NC	
533		2	max	11.167	9	.058	9	NC		NC		NC		NC	
534			min	-8.776	6	-.045	6	NC		NC		NC		NC	
535		3	max	11.167	9	.058	9	NC		NC		NC		NC	
536			min	-8.776	6	-.045	6	NC		NC		NC		NC	
537		4	max	11.167	9	.058	9	NC		NC		NC		NC	
538			min	-8.776	6	-.045	6	NC		NC		NC		NC	
539		5	max	11.167	9	.058	9	NC		NC		NC		NC	
540			min	-8.776	6	-.045	6	NC		NC		NC		NC	
541	M55	1	max	3.607	8	.019	8	NC		NC		NC		NC	
542			min	-.799	7	-.004	7	NC		NC		NC		NC	
543		2	max	3.607	8	.019	8	NC		NC		NC		NC	
544			min	-.799	7	-.004	7	NC		NC		NC		NC	
545		3	max	3.607	8	.019	8	NC		NC		NC		NC	
546			min	-.799	7	-.004	7	NC		NC		NC		NC	
547		4	max	3.607	8	.019	8	NC		NC		NC		NC	

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
548			min	-.799	7	-.004	7	NC		NC		NC		NC	
549		5	max	3.607	8	.019	8	NC		NC		NC		NC	
550			min	-.799	7	-.004	7	NC		NC		NC		NC	
551	M56	1	max	17.438	9	.165	9	NC		NC		NC		NC	
552			min	8.566	1	.081	1	NC		NC		NC		NC	
553		2	max	17.438	9	.165	9	NC		NC		NC		NC	
554			min	8.566	1	.081	1	NC		NC		NC		NC	
555		3	max	17.438	9	.165	9	NC		NC		NC		NC	
556			min	8.566	1	.081	1	NC		NC		NC		NC	
557		4	max	17.438	9	.165	9	NC		NC		NC		NC	
558			min	8.566	1	.081	1	NC		NC		NC		NC	
559		5	max	17.438	9	.165	9	NC		NC		NC		NC	
560			min	8.566	1	.081	1	NC		NC		NC		NC	
561	M57	1	max	49.979	8	.473	8	NC		NC		NC		NC	
562			min	30.609	1	.29	1	NC		NC		NC		NC	
563		2	max	49.979	8	.473	8	NC		NC		NC		NC	
564			min	30.609	1	.29	1	NC		NC		NC		NC	
565		3	max	49.979	8	.473	8	NC		NC		NC		NC	
566			min	30.609	1	.29	1	NC		NC		NC		NC	
567		4	max	49.979	8	.473	8	NC		NC		NC		NC	
568			min	30.609	1	.29	1	NC		NC		NC		NC	
569		5	max	49.979	8	.473	8	NC		NC		NC		NC	
570			min	30.609	1	.29	1	NC		NC		NC		NC	
571	M58	1	max	72.103	8	.683	8	NC		NC		NC		NC	
572			min	45.895	1	.435	1	NC		NC		NC		NC	
573		2	max	72.103	8	.683	8	NC		NC		NC		NC	
574			min	45.895	1	.435	1	NC		NC		NC		NC	
575		3	max	72.103	8	.683	8	NC		NC		NC		NC	
576			min	45.895	1	.435	1	NC		NC		NC		NC	
577		4	max	72.103	8	.683	8	NC		NC		NC		NC	
578			min	45.895	1	.435	1	NC		NC		NC		NC	
579		5	max	72.103	8	.683	8	NC		NC		NC		NC	
580			min	45.895	1	.435	1	NC		NC		NC		NC	
581	M59	1	max	51.499	8	.488	8	NC		NC		NC		NC	
582			min	29.524	1	.28	1	NC		NC		NC		NC	
583		2	max	51.499	8	.488	8	NC		NC		NC		NC	
584			min	29.524	1	.28	1	NC		NC		NC		NC	
585		3	max	51.499	8	.488	8	NC		NC		NC		NC	
586			min	29.524	1	.28	1	NC		NC		NC		NC	
587		4	max	51.499	8	.488	8	NC		NC		NC		NC	
588			min	29.524	1	.28	1	NC		NC		NC		NC	
589		5	max	51.499	8	.488	8	NC		NC		NC		NC	
590			min	29.524	1	.28	1	NC		NC		NC		NC	
591	M60	1	max	38.325	9	.363	9	NC		NC		NC		NC	
592			min	20.588	1	.195	1	NC		NC		NC		NC	
593		2	max	38.325	9	.363	9	NC		NC		NC		NC	
594			min	20.588	1	.195	1	NC		NC		NC		NC	
595		3	max	38.325	9	.363	9	NC		NC		NC		NC	
596			min	20.588	1	.195	1	NC		NC		NC		NC	
597		4	max	38.325	9	.363	9	NC		NC		NC		NC	
598			min	20.588	1	.195	1	NC		NC		NC		NC	
599		5	max	38.325	9	.363	9	NC		NC		NC		NC	
600			min	20.588	1	.195	1	NC		NC		NC		NC	
601	M61	1	max	15.572	9	.147	9	NC		NC		NC		NC	
602			min	5.789	1	.055	1	NC		NC		NC		NC	
603		2	max	15.572	9	.147	9	NC		NC		NC		NC	
604			min	5.789	1	.055	1	NC		NC		NC		NC	

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
605		3	max	15.572	9	.147	9	NC		NC		NC		NC	
606			min	5.789	1	.055	1	NC		NC		NC		NC	
607		4	max	15.572	9	.147	9	NC		NC		NC		NC	
608			min	5.789	1	.055	1	NC		NC		NC		NC	
609		5	max	15.572	9	.147	9	NC		NC		NC		NC	
610			min	5.789	1	.055	1	NC		NC		NC		NC	
611	M62	1	max	9.713	1	.04	1	NC		NC		NC		NC	
612			min	5.892	9	.024	9	NC		NC		NC		NC	
613		2	max	9.713	1	.04	1	NC		NC		NC		NC	
614			min	5.892	9	.024	9	NC		NC		NC		NC	
615		3	max	9.713	1	.04	1	NC		NC		NC		NC	
616			min	5.892	9	.024	9	NC		NC		NC		NC	
617		4	max	9.713	1	.04	1	NC		NC		NC		NC	
618			min	5.892	9	.024	9	NC		NC		NC		NC	
619		5	max	9.713	1	.04	1	NC		NC		NC		NC	
620			min	5.892	9	.024	9	NC		NC		NC		NC	

amec

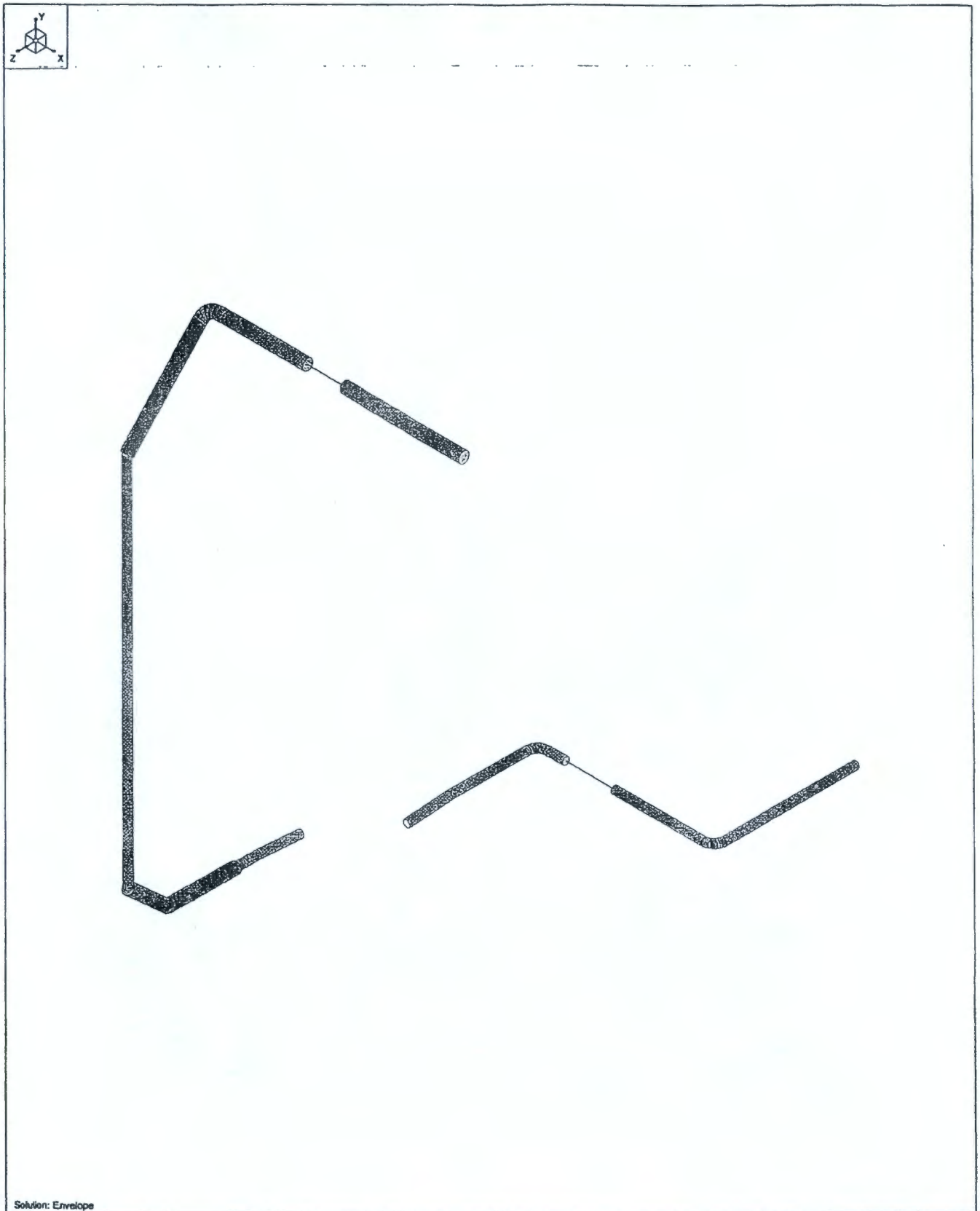
CALCULATION SHEET

CALC. NO.:	145579-V-CA-005	REV:	1	DATE:	March 26, 2006
CALC. TITLE:	Off-Gas Treatment System Pipe Stress Analysis				
PROJECT NO.:	145579	PROJECT TITLE:	Final DBVS Design		

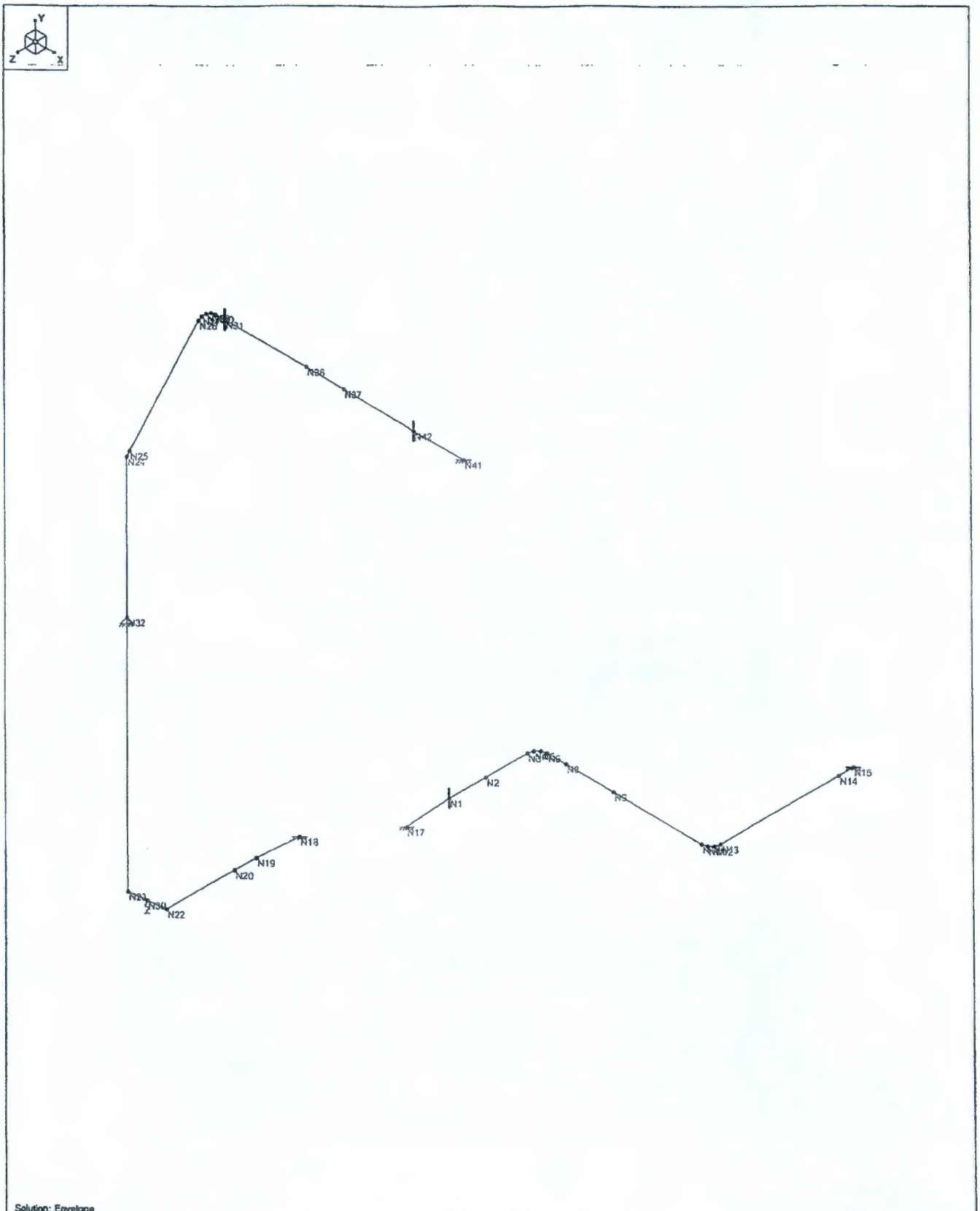
Attachment 6: Model 3 RISA 3D Analysis Input and Output Data

NOTE: This cover sheet represents the approval signatures of the originator and checker for all pages of this attachment

ORIGINATOR:	DATE:	CHECKER:	DATE:
Kevin M. Jones KMJ	3/26/06	J. Van Corbach JVC	3/26/06

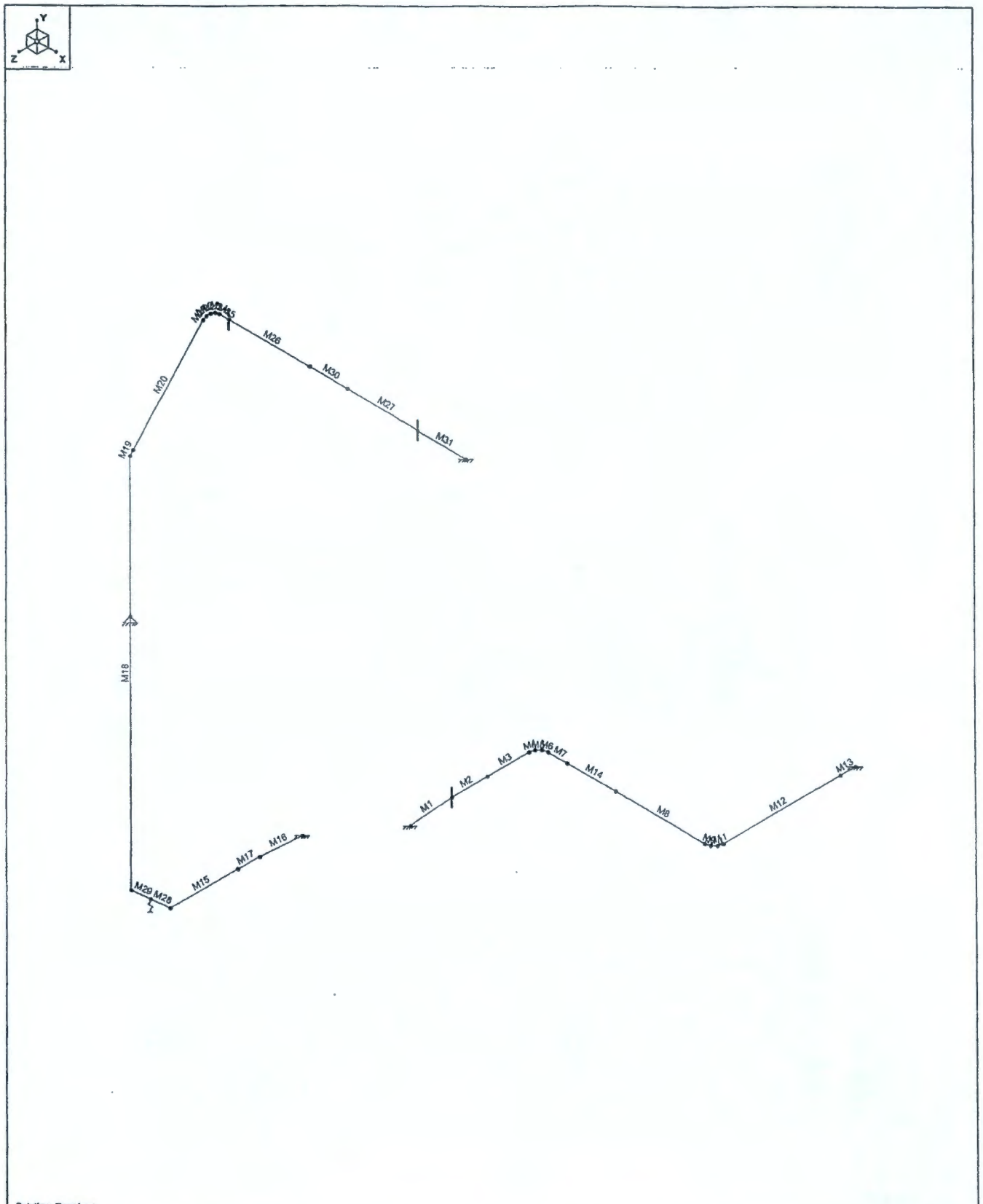


DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 13, 2006 at 4:57 PM
145579-V-CA-005	Rendered Model Geometry	145579-V-CA-005 Model 3.r3d



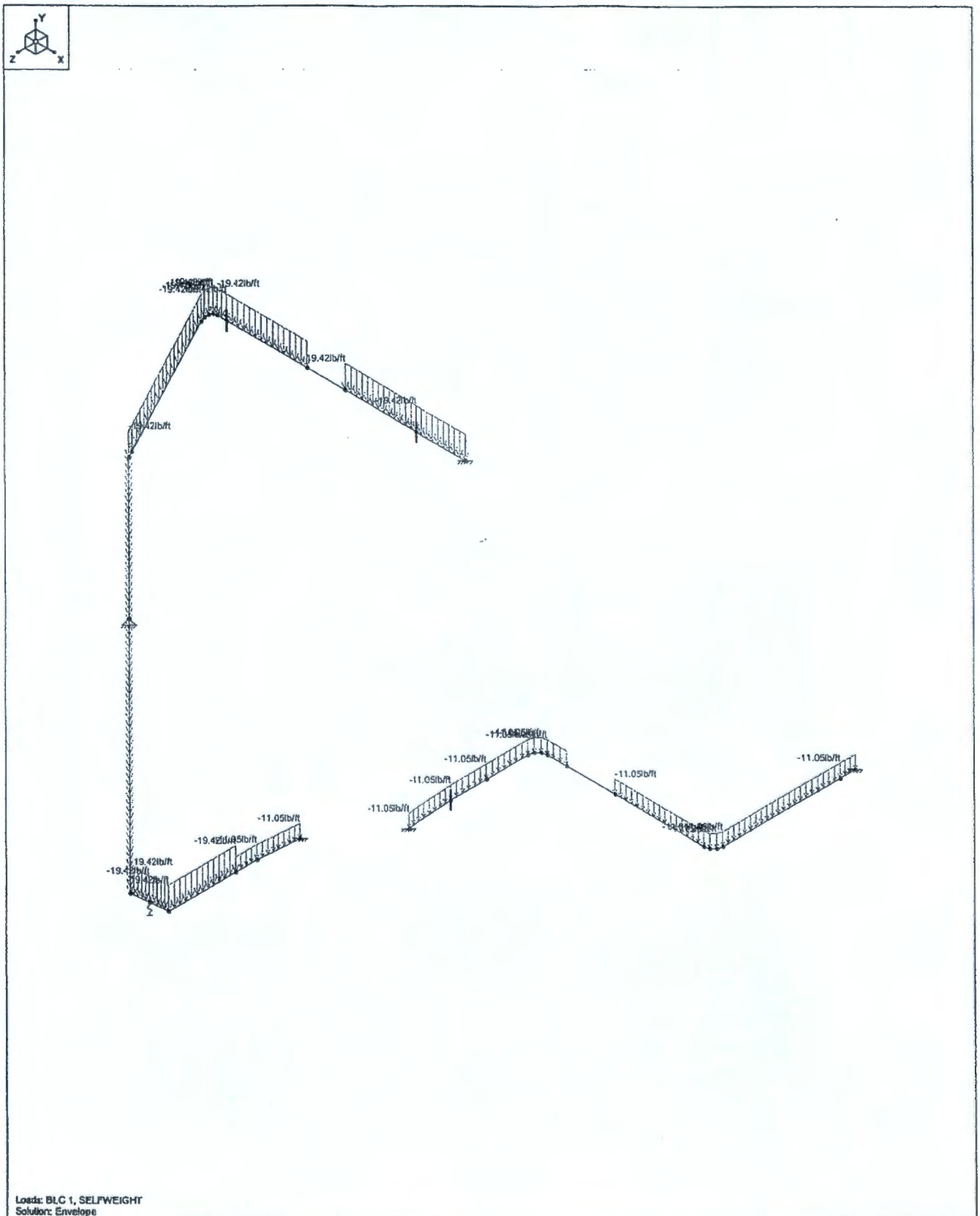
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 13, 2006 at 4:58 PM
145579-V-CA-005	Nodes and Supports	145579-V-CA-005 Model 3.r3d



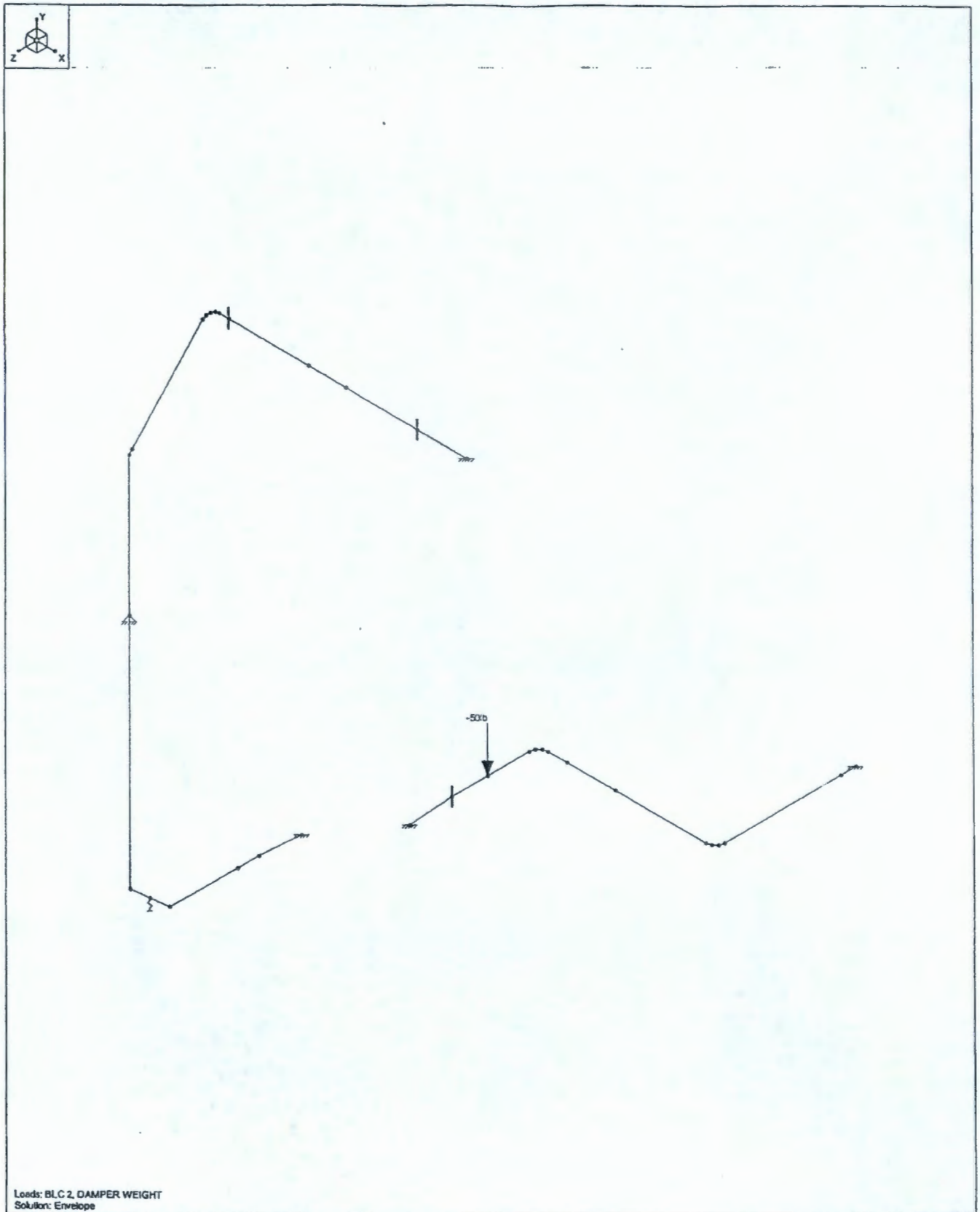
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 13, 2006 at 4:58 PM
145579-V-CA-005	Members	145579-V-CA-005 Model 3.r3d



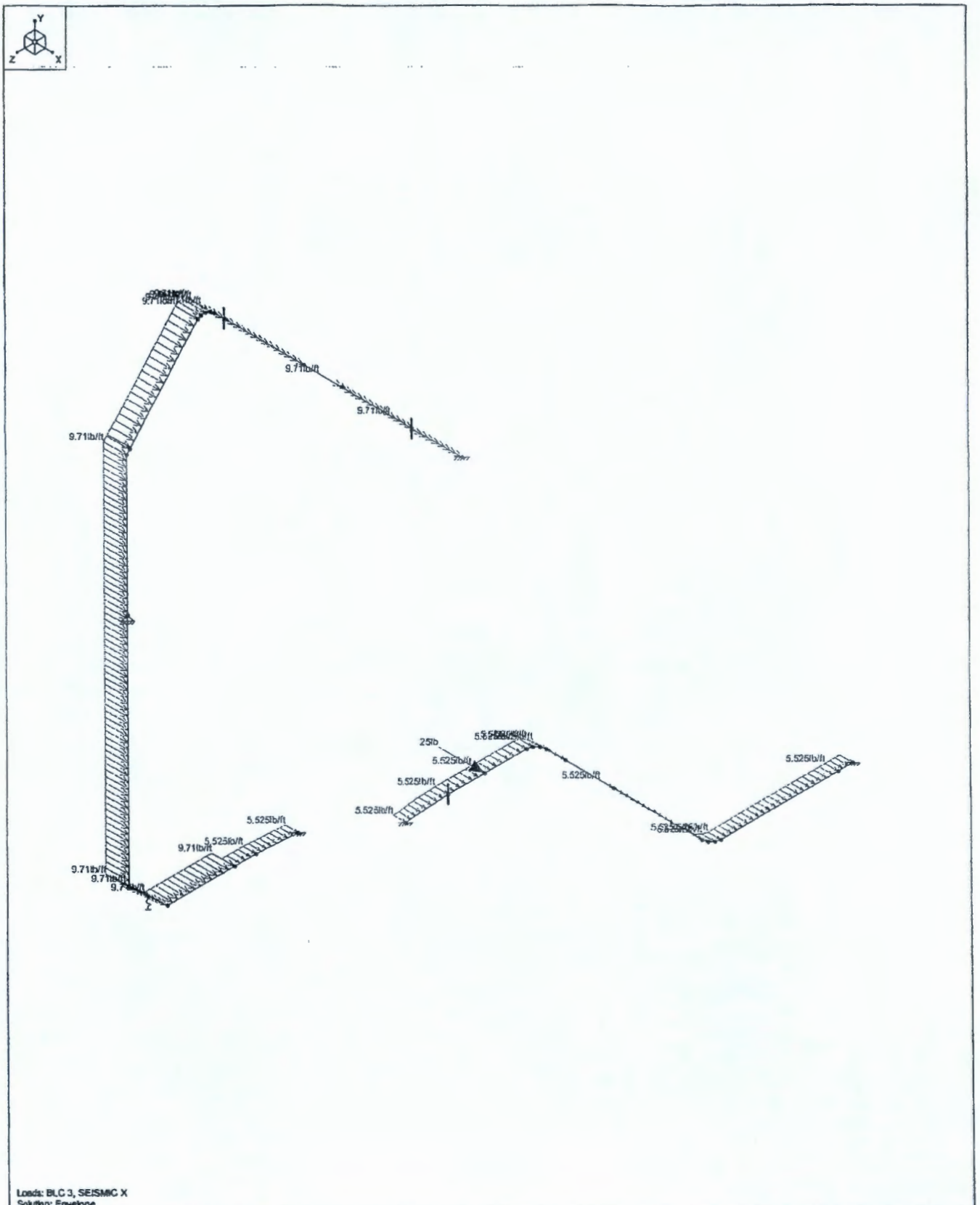
Loads: BLC 1, SELFWEIGHT
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 13, 2006 at 4:59 PM
145579-V-CA-005	Basic Load Case - Selfweight	145579-V-CA-005 Model 3.r3d



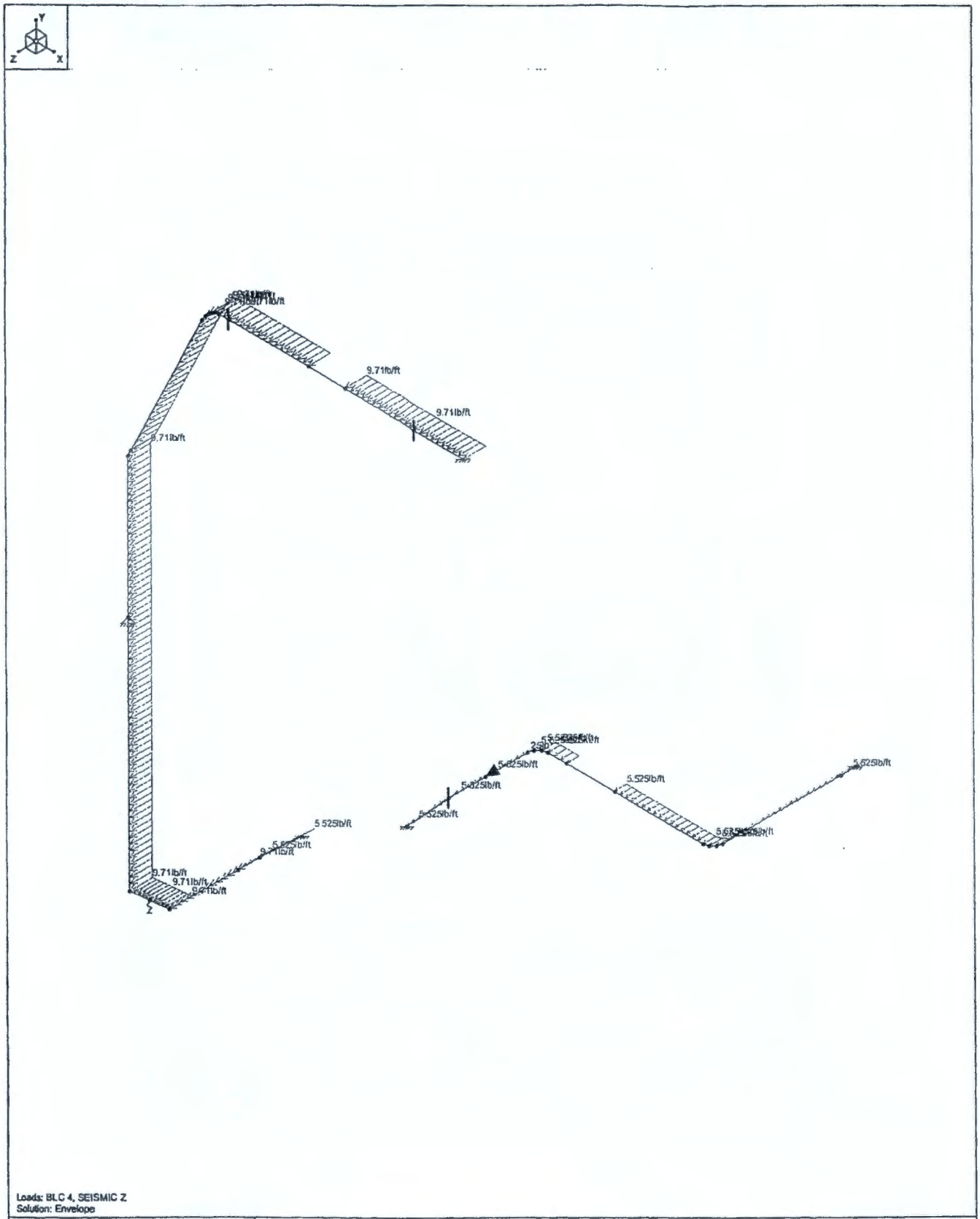
Loads: BLC 2, DAMPER WEIGHT
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 13, 2006 at 4:59 PM
145579-V-CA-005	Basic Load Case - Dampers	145579-V-CA-005 Model 3.r3d



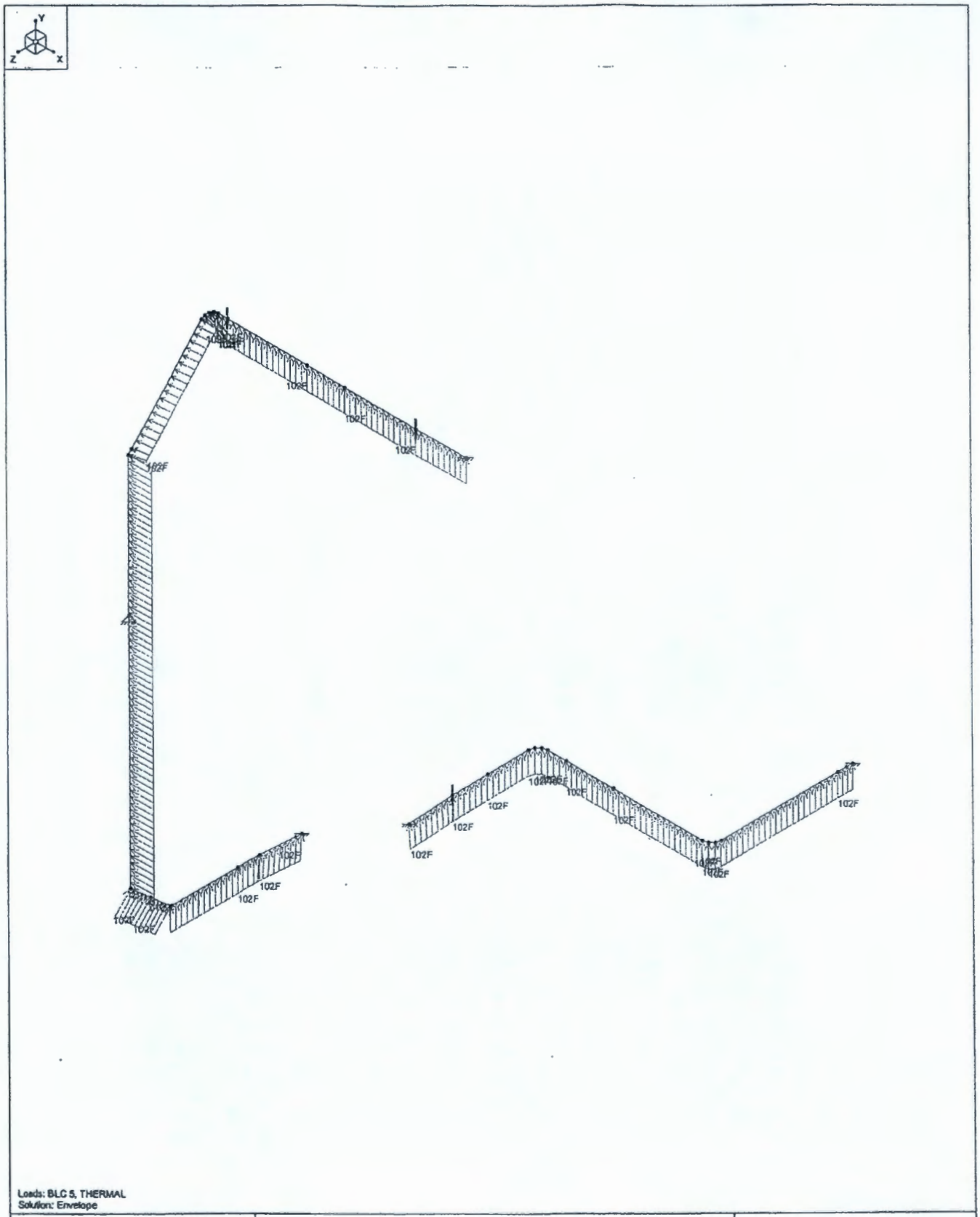
Loads: BLC 3, SEISMIC X
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 13, 2006 at 4:59 PM
145579-V-CA-005	Basic Load Case - Seismic X	145579-V-CA-005 Model 3.r3d

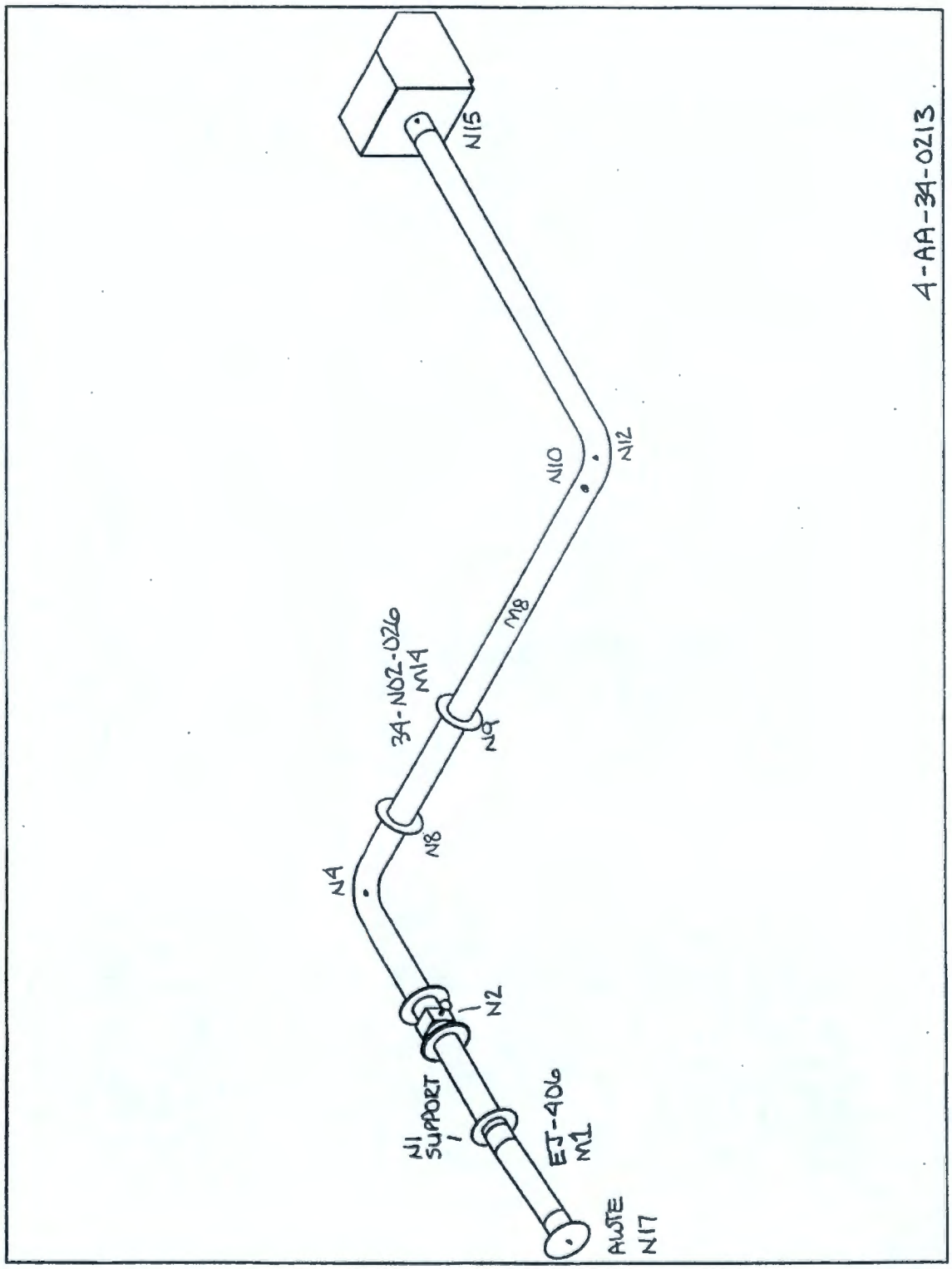


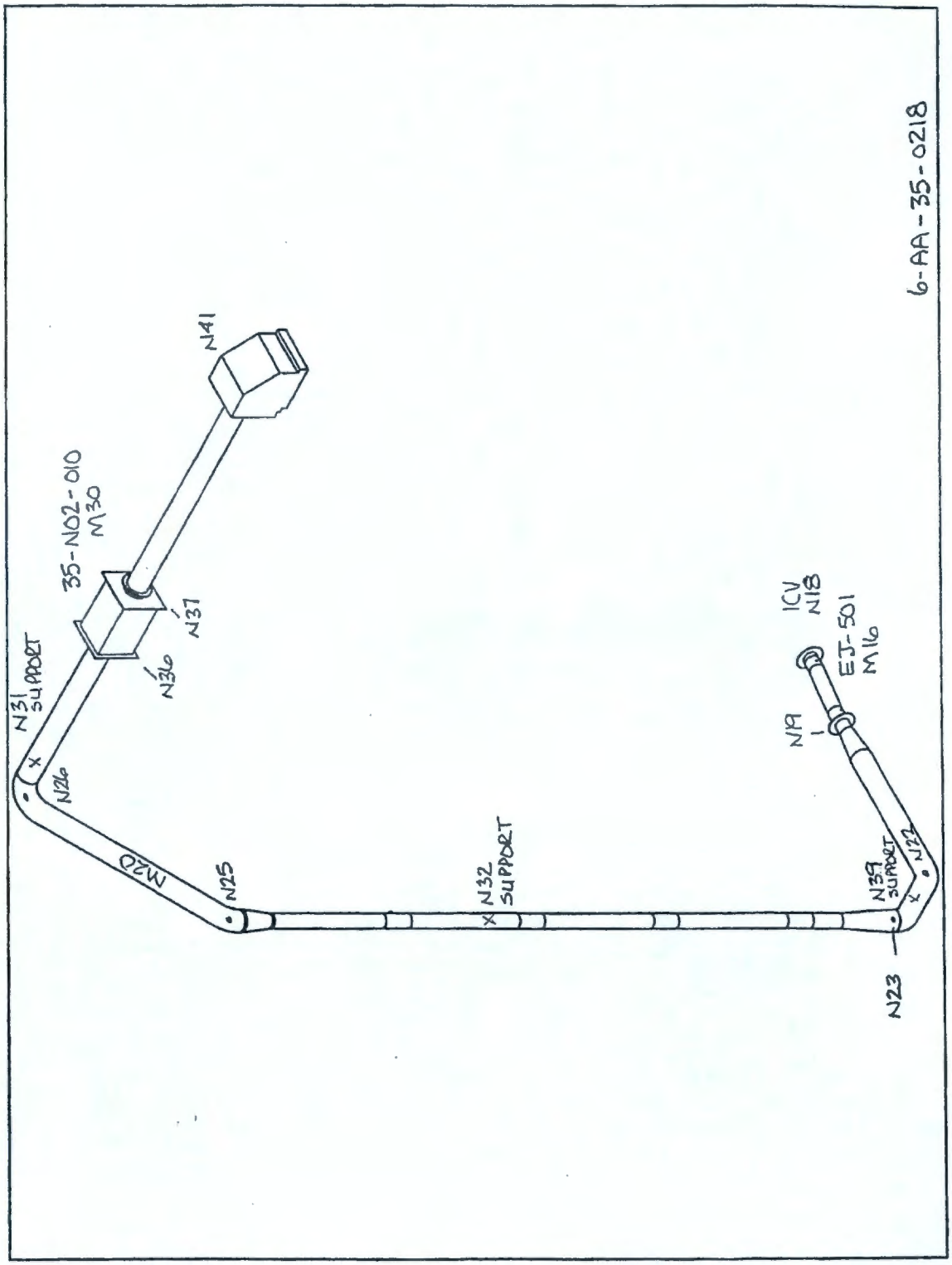
Loads: BLC 4, SEISMIC Z
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 13, 2006 at 4:59 PM
145579-V-CA-005	Basic Load Case - Seismic Z	145579-V-CA-005 Model 3.r3d



DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 13, 2006 at 5:00 PM
145579-V-CA-005	Basic Load Case - Thermal	145579-V-CA-005 Model 3.r3d


N15
N12
N10
N18
34-N02-0216
M14
N9
N8
N4
N2
N1
SUPPORT
EJ-406
M1
AWSTE
N17
4-AA-34-0213


6-AA-35-0218
N41
35-N02-010
M30
N37
N36
N31
SUPPORT
N26
M20
N25
N32
SUPPORT
ICV
N18
EJ-501
M16
N19
N39
SUPPORT
N22
N23

Global

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation	Yes
Include Warping	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Vertical Axis	Y

Hot Rolled Steel Code	AISC: ASD 9th
Cold Formed Steel Code	AISI 99: ASD
NDS Wood Code	NDS 91: ASD
NDS Temperature	< 100F
Concrete Code	ACI 1999

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections	Yes
Bad Framing Warnings	No
Unused Force Warnings	Yes

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diaphragm
1	N1	28.875	0	-66.25	0	
2	N2	28.875	0	-88.875	0	
3	N3	28.875	0	-115.125	0	
4	N4	29.678848	0	-118.125	0	
5	N5	31.875001	0	-120.321152	0	
6	N6	34.875001	0	-121.125	0	
7	N8	46.625	0	-121.125	0	
8	N9	71.000001	0	-121.124999	0	
9	N10	133.250001	0	-121.124999	0	
10	N11	136.250001	0	-121.928846	0	
11	N12	138.446153	0	-124.124999	0	
12	N13	139.250001	0	-127.124999	0	
13	N14	139.250002	0	-191.874999	0	
14	N15	139.250002	0	-201.124999	0	
15	N17	28.875	-2	-39.5	0	
16	N18	0	-2	0	0	
17	N19	0	0	26.75	0	
18	N20	0	0	40.25	0	
19	N22	0	0	82.5625	0	
20	N23	0	21.6875	106.625	0	
21	N24	0	255.875	106.625	0	
22	N25	0	258.142767	104.857233	0	
23	N26	0	306.137359	60.987641	0	
24	N27	0.456723	307.760948	59.364052	0	
25	N28	1.757359	309.137359	57.987641	0	
26	N29	3.703899	310.057048	57.067952	0	
27	N30	6	310.38	56.745	0	
28	N31	12	310.38	56.745	0	
29	N32	0	169.25	106.625	0	
30	N36	62.125	310.38	56.745	0	
31	N37	85.875	310.38	56.745	0	

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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9:33 AM
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Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diaphragm
32	N41	162	310.38	56.745	0	
33	N42	131.125	310.38	56.745	0	
34	N39	0	10.844	94.594	0	

Joint Boundary Conditions

	Joint Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1		Reaction				
2	N17	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N18	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N19						
5	N20						
6	N22						
7	N23						
8	N24						
9	N25						
10	N26						
11	N27						
12	N28						
13	N29						
14	N30						
15	N31		Reaction				
16	N36						
17	N37						
18	N42		Reaction				
19	N15	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
20	N32	Reaction	Reaction	Reaction			
21	N41	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
22	N39		S23				

General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[lb/in^3]
1	gen_Conc3NW	3155	1372	.15	.6	.084
2	gen_Conc4NW	3644	1584	.15	.6	.084
3	gen_Conc3LW	2085	906	.15	.6	.064
4	gen_Conc4LW	2408	1047	.15	.6	.064
5	gen_Alum	10600	4077	.3	1.29	.1
6	gen_Steel	29000	11154	.3	.65	.284
7	RIGID	1e+7		0	0	0

General Section Sets

	Label	Shape	Type	Material	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	GEN1A	RE4X4	Beam	gen_Conc3NW	16	21.333	21.333	36.053
2	RIGID		None	RIGID	1e+6	1e+8	1e+8	1e+6

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[lb/in^3]	Yield[ksi]
1	A36	29000	11154	.3	.779	.283	36
2	A312TP316L	29000	11154	.3	1.013	.29	25
3	A312TP316	29000	11154	.3	1.013	.29	30

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Mar 22, 2006
9:33 AM
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Hot Rolled Steel Section Sets

	Label	Shape	Design List	Type	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	3DIADUCT	3 in Sch 40...	Pipe	Beam	A312TP316L	Typical	1.86	2.572	2.572	5.145
2	4DIADUCT	4 in Sch 40...	Pipe	Beam	A312TP316L	Typical	2.644	6.136	6.136	12.272
3	6DIADUCT	6 in Sch 40...	Pipe	Beam	A312TP316L	Typical	4.64	23.744	23.744	47.488

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Design List	Type	Material	Design Rules
1	M1	N17	N1			4DIADUCT	Pipe	Beam	A312TP3...	Typical
2	M2	N1	N2			4DIADUCT	Pipe	Beam	A312TP3...	Typical
3	M3	N2	N3			4DIADUCT	Pipe	Beam	A312TP3...	Typical
4	M4	N3	N4			4DIADUCT	Pipe	Beam	A312TP3...	Typical
5	M5	N4	N5			4DIADUCT	Pipe	Beam	A312TP3...	Typical
6	M6	N5	N6			4DIADUCT	Pipe	Beam	A312TP3...	Typical
7	M7	N6	N8			4DIADUCT	Pipe	Beam	A312TP3...	Typical
8	M8	N9	N10			4DIADUCT	Pipe	Beam	A312TP3...	Typical
9	M9	N10	N11			4DIADUCT	Pipe	Beam	A312TP3...	Typical
10	M10	N11	N12			4DIADUCT	Pipe	Beam	A312TP3...	Typical
11	M11	N12	N13			4DIADUCT	Pipe	Beam	A312TP3...	Typical
12	M12	N13	N14			4DIADUCT	Pipe	Beam	A312TP3...	Typical
13	M13	N14	N15			4DIADUCT	Pipe	Beam	A312TP3...	Typical
14	M14	N8	N9			RIGID	None	None	RIGID	Typical
15	M15	N20	N22			6DIADUCT	Pipe	Beam	A312TP3...	Typical
16	M16	N18	N19			4DIADUCT	Pipe	Beam	A312TP3...	Typical
17	M17	N19	N20			4DIADUCT	Pipe	Beam	A312TP3...	Typical
18	M18	N23	N24			4DIADUCT	Pipe	Beam	A312TP3...	Typical
19	M19	N24	N25			6DIADUCT	Pipe	Beam	A312TP3...	Typical
20	M20	N24	N26			6DIADUCT	Pipe	Beam	A312TP3...	Typical
21	M21	N26	N27			6DIADUCT	Pipe	Beam	A312TP3...	Typical
22	M22	N27	N28			6DIADUCT	Pipe	Beam	A312TP3...	Typical
23	M23	N28	N29			6DIADUCT	Pipe	Beam	A312TP3...	Typical
24	M24	N29	N30			6DIADUCT	Pipe	Beam	A312TP3...	Typical
25	M25	N30	N31			6DIADUCT	Pipe	Beam	A312TP3...	Typical
26	M26	N31	N36			6DIADUCT	Pipe	Beam	A312TP3...	Typical
27	M27	N37	N42			6DIADUCT	Pipe	Beam	A312TP3...	Typical
28	M28	N22	N39			6DIADUCT	Pipe	Beam	A312TP3...	Typical
29	M29	N39	N23			6DIADUCT	Pipe	Beam	A312TP3...	Typical
30	M30	N36	N37			RIGID	None	None	RIGID	Typical
31	M31	N42	N41			6DIADUCT	Pipe	Beam	A312TP3...	Typical

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area (Me...	Surface (...
1	SELFWEIGHT	DL						29		
2	DAMPER WEIGHT	DL				1				
3	SEISMIC X	ELX				1		29		
4	SEISMIC Z	ELZ				1		29		
5	THERMAL	None						31		
6	WIND X	WLX								
7	WIND Z	WLZ								

Joint Loads and Enforced Displacements (BLC 2 : DAMPER WEIGHT)

	Joint Label	L,D,M	Direction	Magnitude[lb,k-ft,in,rad lb*s^2/in]
1	N2	L	Y	-50

Joint Loads and Enforced Displacements (BLC 3 : SEISMIC X)

	Joint Label	L,D,M	Direction	Magnitude[lb,k-ft in,rad lb*s^2/in]
1	N2	L	X	25

Joint Loads and Enforced Displacements (BLC 4 : SEISMIC Z)

	Joint Label	L,D,M	Direction	Magnitude[lb,k-ft in,rad lb*s^2/in]
1	N2	L	Z	25

Member Distributed Loads (BLC 1 : SELFWEIGHT)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M1	Y	-11.05	-11.05	0	0
2	M2	Y	-11.05	-11.05	0	0
3	M3	Y	-11.05	-11.05	0	0
4	M4	Y	-11.05	-11.05	0	0
5	M5	Y	-11.05	-11.05	0	0
6	M6	Y	-11.05	-11.05	0	0
7	M7	Y	-11.05	-11.05	0	0
8	M8	Y	-11.05	-11.05	0	0
9	M9	Y	-11.05	-11.05	0	0
10	M10	Y	-11.05	-11.05	0	0
11	M11	Y	-11.05	-11.05	0	0
12	M12	Y	-11.05	-11.05	0	0
13	M13	Y	-11.05	-11.05	0	0
14	M16	Y	-11.05	-11.05	0	0
15	M17	Y	-11.05	-11.05	0	0
16	M15	Y	-19.42	-19.42	0	0
17	M18	Y	-19.42	-19.42	0	0
18	M19	Y	-19.42	-19.42	0	0
19	M20	Y	-19.42	-19.42	0	0
20	M21	Y	-19.42	-19.42	0	0
21	M22	Y	-19.42	-19.42	0	0
22	M23	Y	-19.42	-19.42	0	0
23	M24	Y	-19.42	-19.42	0	0
24	M25	Y	-19.42	-19.42	0	0
25	M26	Y	-19.42	-19.42	0	0
26	M27	Y	-19.42	-19.42	0	0
27	M31	Y	-19.42	-19.42	0	0
28	M28	Y	-19.42	-19.42	0	0
29	M29	Y	-19.42	-19.42	0	16.197

Member Distributed Loads (BLC 3 : SEISMIC X)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M1	X	5.525	5.525	0	0
2	M2	X	5.525	5.525	0	0
3	M3	X	5.525	5.525	0	0
4	M4	X	5.525	5.525	0	0
5	M5	X	5.525	5.525	0	0
6	M6	X	5.525	5.525	0	0
7	M7	X	5.525	5.525	0	0
8	M8	X	5.525	5.525	0	0
9	M9	X	5.525	5.525	0	0
10	M10	X	5.525	5.525	0	0
11	M11	X	5.525	5.525	0	0
12	M12	X	5.525	5.525	0	0
13	M13	X	5.525	5.525	0	0
14	M16	X	5.525	5.525	0	0
15	M17	X	5.525	5.525	0	0

Member Distributed Loads (BLC 3 : SEISMIC X) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
16	M15	X	9.71	9.71	0	0
17	M18	X	9.71	9.71	0	0
18	M19	X	9.71	9.71	0	0
19	M20	X	9.71	9.71	0	0
20	M21	X	9.71	9.71	0	0
21	M22	X	9.71	9.71	0	0
22	M23	X	9.71	9.71	0	0
23	M24	X	9.71	9.71	0	0
24	M25	X	9.71	9.71	0	0
25	M26	X	9.71	9.71	0	0
26	M27	X	9.71	9.71	0	0
27	M31	X	9.71	9.71	0	0
28	M28	X	9.71	9.71	0	0
29	M29	X	9.71	9.71	0	16.197

Member Distributed Loads (BLC 4 : SEISMIC Z)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M1	Z	5.525	5.525	0	0
2	M2	Z	5.525	5.525	0	0
3	M3	Z	5.525	5.525	0	0
4	M4	Z	5.525	5.525	0	0
5	M5	Z	5.525	5.525	0	0
6	M6	Z	5.525	5.525	0	0
7	M7	Z	5.525	5.525	0	0
8	M8	Z	5.525	5.525	0	0
9	M9	Z	5.525	5.525	0	0
10	M10	Z	5.525	5.525	0	0
11	M11	Z	5.525	5.525	0	0
12	M12	Z	5.525	5.525	0	0
13	M13	Z	5.525	5.525	0	0
14	M16	Z	5.525	5.525	0	0
15	M17	Z	5.525	5.525	0	0
16	M15	Z	9.71	9.71	0	0
17	M18	Z	9.71	9.71	0	0
18	M19	Z	9.71	9.71	0	0
19	M20	Z	9.71	9.71	0	0
20	M21	Z	9.71	9.71	0	0
21	M22	Z	9.71	9.71	0	0
22	M23	Z	9.71	9.71	0	0
23	M24	Z	9.71	9.71	0	0
24	M25	Z	9.71	9.71	0	0
25	M26	Z	9.71	9.71	0	0
26	M27	Z	9.71	9.71	0	0
27	M31	Z	9.71	9.71	0	0
28	M28	Z	9.71	9.71	0	0
29	M29	Z	9.71	9.71	0	16.197

Member Distributed Loads (BLC 5 : THERMAL)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M1	T	102	102	0	0
2	M2	T	102	102	0	0
3	M3	T	102	102	0	0
4	M4	T	102	102	0	0
5	M5	T	102	102	0	0
6	M6	T	102	102	0	0
7	M7	T	102	102	0	0
8	M8	T	102	102	0	0

Member Distributed Loads (BLC 5 : THERMAL) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i..,End Location[i...	
9	M9	T	102	102	0	0
10	M10	T	102	102	0	0
11	M11	T	102	102	0	0
12	M12	T	102	102	0	0
13	M13	T	102	102	0	0
14	M14	T	102	102	0	0
15	M15	T	102	102	0	0
16	M18	T	102	102	0	0
17	M19	T	102	102	0	0
18	M20	T	102	102	0	0
19	M21	T	102	102	0	0
20	M22	T	102	102	0	0
21	M23	T	102	102	0	0
22	M24	T	102	102	0	0
23	M25	T	102	102	0	0
24	M26	T	102	102	0	0
25	M27	T	102	102	0	0
26	M16	T	102	102	0	0
27	M17	T	102	102	0	0
28	M30	T	102	102	0	0
29	M31	T	102	102	0	0
30	M28	T	102	102	0	0
31	M29	T	102	102	0	16.197

Member Point Loads

Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
No Data to Print ...			

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	Normal Load	Yes			DL	1														
2	Normal + Wind (+X) + Thermal	Yes			DL	1	WLX	1	5	1										
3	Normal + Wind (-X) + Thermal	Yes			DL	1	WLX	-1	5	1										
4	Normal + Wind (+Z) + Thermal	Yes			DL	1	WLZ	1	5	1										
5	Normal + Wind (-Z) + Thermal	Yes			DL	1	WLZ	-1	5	1										
6	Normal + Seismic (+X)(+Z) + ..	Yes			DL	1	ELX	1	ELZ	1	5	1								
7	Normal + Seismic (+X)(-Z) + ..	Yes			DL	1	ELX	1	ELZ	-1	5	1								
8	Normal + Seismic (-X)(+Z) + ..	Yes			DL	1	ELX	-1	ELZ	1	5	1								
9	Normal + Seismic (-X)(-Z) + ...	Yes			DL	1	ELX	-1	ELZ	-1	5	1								

Envelope Joint Reactions

	Joint		X [lb]	lc	Y [lb]	lc	Z [lb]	lc	MX [k-ft]	lc	MY [k-ft]	lc	MZ [k-ft]	lc
1	N1	max	0	1	909.145	8	0	1	0	1	0	1	0	1
2		min	0	1	292.636	1	0	1	0	1	0	1	0	1
3	N17	max	230.098	9	-131.145	1	-9.805	1	-.058	1	-.007	6	.1	6
4		min	-54.406	6	-735.78	8	-55.012	8	-1.29	8	-.774	9	.027	9
5	N18	max	72.667	9	288.331	8	-.4	7	-.104	1	.378	9	.099	8
6		min	-135.752	6	5.347	7	-21.557	8	-1.175	8	-.789	6	0	1
7	N31	max	0	1	151.731	1	0	1	0	1	0	1	0	1
8		min	0	1	-706.465	6	0	1	0	1	0	1	0	1
9	N42	max	0	1	147.077	1	0	1	0	1	0	1	0	1
10		min	0	1	20.062	9	0	1	0	1	0	1	0	1
11	N15	max	41.28	8	111.657	1	166.598	9	-.376	8	-.024	1	.055	8

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

Mar 22, 2006
9:33 AM
Checked By:_____

Envelope Joint Reactions (Continued)

	Joint		X [lb]	lc	Y [lb]	lc	Z [lb]	lc	MX [k-ft]	lc	MY [k-ft]	lc	MZ [k-ft]	lc
12		min	-216.972	7	99.785	8	-81.812	6	-.386	1	-.762	7	.002	1
13	N32	max	343.962	8	1194.508	6	215.004	9	0	1	0	1	0	1
14		min	-41.839	7	530.005	1	-532.917	6	0	1	0	1	0	1
15	N41	max	38.626	9	53.481	9	239.246	7	.924	6	1.843	9	.021	1
16		min	-277.657	6	-18.582	1	-1.264	1	-.009	1	-.017	1	-.031	9
17	N39	max	0	1	3.327	6	0	1	0	1	0	1	0	1
18		min	0	1	.027	1	0	1	0	1	0	1	0	1
19	Totals:	max	576.943	8	1153.877	8	576.937	9						
20		min	-576.934	7	1153.875	1	-576.942	6						

Envelope Joint Displacements

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
1	N1	max	0	1	0	1	.257	8	8.253e-4	8	9.477e-4	9	-8.545e-5	1
2		min	-.015	9	0	8	-.011	1	-1.768e-4	1	1.856e-5	1	-2.281e-4	6
3	N2	max	0	1	.013	8	.233	8	4.399e-4	8	1.059e-3	9	-1.59e-4	1
4		min	-.039	9	-.007	1	-.011	1	-3.915e-4	1	1.58e-6	1	-4.109e-4	6
5	N3	max	0	1	.023	8	.206	8	3.528e-4	8	1.129e-3	8	-2.442e-4	1
6		min	-.061	9	-.017	1	-.011	1	-3.233e-4	1	-5.415e-5	1	-6.23e-4	6
7	N4	max	0	1	.024	8	.202	8	3.596e-4	8	1.136e-3	8	-2.553e-4	1
8		min	-.062	9	-.018	1	-.011	1	-3.018e-4	1	-6.323e-5	1	-6.476e-4	6
9	N5	max	0	1	.023	8	.197	8	3.71e-4	8	1.141e-3	8	-2.661e-4	1
10		min	-.06	9	-.02	1	-.011	1	-2.751e-4	1	-1.205e-4	7	-6.69e-4	6
11	N6	max	0	1	.021	8	.194	6	3.834e-4	8	1.146e-3	8	-2.728e-4	1
12		min	-.058	8	-.021	1	-.011	1	-2.45e-4	1	-2.034e-4	7	-6.855e-4	6
13	N8	max	0	1	.013	8	.184	6	4.282e-4	8	1.155e-3	8	-2.762e-4	1
14		min	-.046	8	-.024	1	-.009	1	-1.293e-4	1	-4.745e-4	7	-7.234e-4	6
15	N9	max	0	1	-.005	8	.161	6	4.282e-4	8	1.155e-3	8	-2.762e-4	1
16		min	-.046	8	-.031	1	-.007	1	-1.293e-4	1	-4.745e-4	7	-7.234e-4	6
17	N10	max	.059	7	-.039	1	.09	6	6.671e-4	6	1.24e-3	6	-1.444e-5	1
18		min	0	1	-.04	6	0	1	4.836e-4	1	-1.238e-4	9	-3.952e-4	8
19	N11	max	.062	7	-.039	1	.086	6	6.777e-4	6	1.235e-3	6	-1.259e-5	1
20		min	0	1	-.041	6	0	1	5.131e-4	1	-5.113e-5	1	-3.821e-4	8
21	N12	max	.063	7	-.037	1	.081	6	6.854e-4	6	1.228e-3	6	-1.384e-5	1
22		min	0	1	-.04	6	0	1	5.384e-4	1	-4.283e-5	1	-3.69e-4	8
23	N13	max	.062	7	-.036	1	.077	6	6.917e-4	6	1.217e-3	6	-1.44e-5	1
24		min	0	1	-.038	6	0	1	5.592e-4	1	-3.473e-5	1	-3.546e-4	8
25	N14	max	.002	7	-.001	8	.01	6	2.148e-4	1	4.234e-4	7	-1.8e-6	1
26		min	0	1	-.001	1	0	1	2.112e-4	8	1.248e-5	1	-4.433e-5	8
27	N15	max	0	7	0	8	0	6	0	1	0	7	0	1
28		min	0	8	0	1	0	9	0	8	0	1	0	8
29	N17	max	0	6	0	8	0	8	0	8	0	9	0	9
30		min	0	9	0	1	0	1	0	1	0	6	0	6
31	N18	max	0	6	0	7	0	8	0	8	0	6	0	1
32		min	0	9	0	8	0	7	0	1	0	9	0	8
33	N19	max	.017	6	-.002	1	-.007	1	1.559e-3	8	1.163e-3	6	5.661e-7	1
34		min	-.008	9	-.062	7	-.695	7	-6.174e-5	1	-5.511e-4	9	-2.573e-4	8
35	N20	max	.036	6	-.003	1	-.007	1	1.934e-3	8	1.556e-3	6	8.363e-7	1
36		min	-.017	9	-.075	7	-.681	7	-1.63e-5	1	-7.307e-4	9	-3.871e-4	8
37	N22	max	.105	6	-.002	1	-.002	8	1.835e-3	8	1.687e-3	6	1.055e-6	1
38		min	-.049	9	-.135	6	-.637	7	-4.972e-5	1	-7.974e-4	9	-4.923e-4	8
39	N23	max	.148	6	0	1	.059	8	2.006e-3	9	1.651e-3	6	1.245e-6	1
40		min	-.058	9	-.153	7	-.574	7	-6.091e-5	1	-8.226e-4	9	-5.721e-4	8
41	N24	max	0	1	.089	9	.02	7	-1.392e-5	1	2.082e-5	1	1.409e-3	8
42		min	-.17	8	0	1	-.006	8	-2.737e-3	9	-1.419e-3	8	-1.035e-5	1
43	N25	max	0	1	.086	6	.012	7	-1.393e-5	1	2.082e-5	1	1.409e-3	8
44		min	-.171	8	0	1	-.014	8	-2.737e-3	9	-1.419e-3	8	-1.035e-5	1

Envelope Joint Displacements (Continued)

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
45	N26	max	0	1	.007	6	.002	1	2.773e-5	1	2.183e-5	1	4.133e-4	9
46		min	-.149	8	0	1	-.201	8	-2.931e-3	6	-1.64e-3	8	-1.507e-5	1
47	N27	max	0	1	.004	6	.002	1	2.802e-5	1	2.185e-5	1	3.702e-4	9
48		min	-.146	8	0	1	-.206	8	-2.899e-3	6	-1.654e-3	8	-1.532e-5	1
49	N28	max	0	1	.001	6	.002	1	2.807e-5	1	2.187e-5	1	3.272e-4	9
50		min	-.143	8	0	9	-.209	8	-2.861e-3	6	-1.668e-3	8	-1.573e-5	1
51	N29	max	0	1	0	1	.002	1	2.788e-5	1	2.185e-5	1	2.878e-4	9
52		min	-.139	8	-.001	9	-.21	8	-2.816e-3	6	-1.682e-3	8	-1.645e-5	1
53	N30	max	0	1	0	1	.002	1	2.749e-5	1	2.181e-5	1	2.547e-4	9
54		min	-.137	9	-.001	9	-.207	8	-2.768e-3	6	-1.697e-3	8	-1.76e-5	1
55	N31	max	0	1	0	6	.002	1	2.624e-5	1	2.166e-5	1	1.915e-4	9
56		min	-.13	9	0	1	-.197	8	-2.642e-3	6	-1.733e-3	8	-2.302e-5	1
57	N32	max	0	7	0	1	0	6	2.917e-3	7	8.014e-5	7	2.01e-3	6
58		min	0	8	0	6	0	9	7.115e-5	1	-1.191e-3	8	-6.475e-7	1
59	N36	max	0	1	.002	9	.001	1	1.582e-5	1	1.788e-5	1	4.769e-6	1
60		min	-.079	9	-.001	1	-.109	8	-1.593e-3	6	-1.644e-3	8	-4.054e-5	9
61	N37	max	0	1	.001	9	0	1	1.582e-5	1	1.788e-5	1	4.769e-6	1
62		min	-.079	9	0	1	-.071	9	-1.593e-3	6	-1.644e-3	8	-4.054e-5	9
63	N41	max	0	6	0	1	0	1	0	1	0	1	0	9
64		min	0	9	0	9	0	7	0	6	0	9	0	1
65	N42	max	0	1	0	9	0	1	6.417e-6	1	8.534e-6	1	1.322e-5	1
66		min	-.032	9	0	1	-.014	9	-6.462e-4	6	-8.411e-4	9	-8.646e-6	9
67	N39	max	.127	6	-.001	1	.029	8	1.788e-3	9	1.679e-3	6	1.157e-6	1
68		min	-.054	9	-.145	6	-.607	7	-6.332e-5	1	-8.11e-4	9	-5.316e-4	8

Envelope Member Section Stresses

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
1	M1	1	...	0	1	-.099	1	.174	9	5.6...	8	-.257	1	0	6	3.387	9
2			...	0	1	-.558	8	-.041	6	.257	1	-5.675	8	-3.387	9	0	6
3		2	...	0	7	-.104	1	.172	9	3.8...	8	.074	1	-.054	1	2.825	9
4			...	-.001	8	-.563	8	-.039	6	-.074	1	-3.853	8	-2.825	9	.054	1
5		3	...	.002	7	-.109	1	.169	9	2.0...	8	.42	1	-.03	1	2.27	9
6			...	-.003	8	-.567	8	-.036	6	-.42	1	-2.017	8	-2.27	9	.03	1
7		4	...	.003	7	-.113	1	.167	9	.166	8	.781	1	-.005	1	1.723	9
8			...	-.004	8	-.572	8	-.034	6	-.781	1	-.166	8	-1.723	9	.005	1
9		5	...	.004	7	-.118	1	.165	9	-1.1...	1	1.699	8	.02	1	1.184	9
10			...	-.005	8	-.576	8	-.032	6	-1.6...	8	1.158	1	-1.184	9	-.02	1
11	M2	1	...	.016	8	.112	8	.165	9	-1.1...	1	1.699	8	.008	1	1.213	8
12			...	.004	1	.103	1	-.032	6	-1.6...	8	1.158	1	-1.213	8	-.008	1
13		2	...	.017	9	.109	8	.163	9	-.879	1	1.396	8	.028	1	1.043	8
14			...	.004	1	.1	1	-.03	6	-1.3...	8	.879	1	-1.043	8	-.028	1
15		3	...	.018	9	.105	8	.161	9	-.612	1	1.104	8	.049	1	.879	8
16			...	.004	1	.096	1	-.028	6	-1.1...	8	.612	1	-.879	8	-.049	1
17		4	...	.019	9	.101	8	.159	9	-.355	1	.823	8	.122	9	.743	6
18			...	.004	1	.092	1	-.026	6	-.823	8	.355	1	-.743	6	-.122	9
19		5	...	.02	9	.097	8	.157	9	-.109	1	.552	8	.555	9	.811	6
20			...	.004	1	.088	1	-.024	6	-.552	8	.109	1	-.811	6	-.555	9
21	M3	1	...	.029	9	.059	8	.138	9	-.109	1	.552	8	.555	9	.811	6
22			...	.003	6	.05	1	-.005	6	-.552	8	.109	1	-.811	6	-.555	9
23		2	...	.031	9	.054	8	.136	9	.042	1	.372	8	.99	9	.824	6
24			...	.002	6	.045	1	-.003	6	-.372	8	.042	1	-.824	6	-.99	9
25		3	...	.032	9	.05	8	.133	9	.179	1	.207	8	1.418	9	.829	6
26			...	0	6	.041	1	0	6	-.207	8	.179	1	-.829	6	-1.418	9
27		4	...	.033	9	.045	8	.131	9	.302	1	.056	8	1.838	9	.826	6
28			...	0	6	.036	1	.002	6	-.056	8	-.302	1	-.826	6	-1.838	9
29		5	...	.034	9	.041	8	.129	9	.409	1	-.081	8	2.252	9	.817	6

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
30			...	-.002	6	.032	1	.004	6	.081	8	-.409	1	-.817	6	-2.252	9
31	M4	1	...	.05	9	.041	8	.107	9	.353	1	.029	8	2.252	9	.817	6
32			...	-.001	6	.032	1	.005	6	-.029	8	-.353	1	-.817	6	-2.252	9
33		2	...	.05	9	.04	8	.106	9	.365	1	.014	8	2.292	9	.815	6
34			...	-.001	6	.031	1	.005	6	-.014	8	-.365	1	-.815	6	-2.292	9
35		3	...	.05	9	.04	8	.106	9	.377	1	-.001	8	2.332	9	.813	6
36			...	-.002	6	.031	1	.005	1	.001	8	-.377	1	-.813	6	-2.332	9
37		4	...	.05	9	.039	8	.106	9	.388	1	-.016	8	2.372	9	.811	6
38			...	-.002	6	.03	1	.005	1	.016	8	-.388	1	-.811	6	-2.372	9
39		5	...	.05	9	.038	8	.105	9	.399	1	-.031	8	2.411	9	.809	6
40			...	-.002	6	.029	1	.005	1	.031	8	-.399	1	-.809	6	-2.411	9
41	M5	1	...	.07	9	.038	8	.041	9	.214	1	.183	8	2.411	9	.809	6
42			...	0	6	.029	1	0	1	-.183	8	-.214	1	-.809	6	-2.411	9
43		2	...	.07	9	.038	8	.041	9	.225	1	.169	8	2.427	9	.806	6
44			...	0	6	.029	1	0	1	-.169	8	-.225	1	-.806	6	-2.427	9
45		3	...	.07	9	.037	8	.041	9	.236	1	.155	8	2.442	9	.803	6
46			...	0	6	.028	1	0	1	-.155	8	-.236	1	-.803	6	-2.442	9
47		4	...	.07	9	.037	8	.04	9	.246	1	.141	8	2.457	9	.8	6
48			...	0	6	.028	1	0	1	-.141	8	-.246	1	-.8	6	-2.457	9
49		5	...	.07	9	.036	8	.04	9	.257	1	.127	8	2.473	9	.797	6
50			...	0	6	.027	1	0	1	-.127	8	-.257	1	-.797	6	-2.473	9
51	M6	1	...	.07	9	.036	8	.012	8	.008	1	.299	8	2.473	9	.797	6
52			...	.002	6	.027	1	-.04	7	-.299	8	-.008	1	-.797	6	-2.473	9
53		2	...	.07	9	.036	8	.012	8	.019	1	.286	8	2.459	9	.794	6
54			...	.002	6	.027	1	-.04	7	-.286	8	-.019	1	-.794	6	-2.459	9
55		3	...	.07	9	.035	8	.012	8	.029	1	.273	8	2.446	9	.791	6
56			...	.002	6	.026	1	-.04	7	-.273	8	-.029	1	-.791	6	-2.446	9
57		4	...	.07	9	.035	8	.013	8	.038	1	.259	8	2.433	9	.788	6
58			...	.003	6	.026	1	-.04	7	-.259	8	-.038	1	-.788	6	-2.433	9
59		5	...	.07	9	.034	8	.013	8	.048	1	.246	8	2.419	9	.784	6
60			...	.003	6	.025	1	-.04	7	-.246	8	-.048	1	-.784	6	-2.419	9
61	M7	1	...	.063	9	.034	8	.007	6	-.083	1	.306	8	2.419	9	.784	6
62			...	.004	6	.025	1	-.071	9	-.306	8	.083	1	-.784	6	-2.419	9
63		2	...	.062	9	.032	8	.008	6	-.049	1	.259	8	2.317	9	.774	6
64			...	.004	1	.023	1	-.072	9	-.259	8	.049	1	-.774	6	-2.317	9
65		3	...	.062	9	.03	8	.009	6	-.017	1	.215	8	2.213	9	.761	6
66			...	.004	1	.021	1	-.073	9	-.215	8	.017	1	-.761	6	-2.213	9
67		4	...	.061	9	.028	8	.01	6	.011	1	.174	8	2.108	9	.748	6
68			...	.004	1	.019	1	-.074	9	-.174	8	-.011	1	-.748	6	-2.108	9
69		5	...	.061	9	.026	8	.011	6	.037	1	.136	8	2.002	9	.732	6
70			...	.004	1	.017	1	-.075	9	-.136	8	-.037	1	-.732	6	-2.002	9
71	M8	1	...	.061	9	.026	8	.011	6	.237	1	-.171	8	1.111	9	.6	6
72			...	.004	1	.017	1	-.075	9	.171	8	-.237	1	-.6	6	-1.111	9
73		2	...	.059	7	.015	8	.017	6	.328	6	-.32	9	.523	9	.495	6
74			...	.004	1	.006	1	-.081	9	.32	9	-.328	6	-.495	6	-.523	9
75		3	...	.062	7	.004	8	.022	6	.4	6	-.329	1	.351	8	.808	7
76			...	.004	1	-.005	1	-.086	9	.329	1	.4	6	-.808	7	-.351	8
77		4	...	.065	7	-.007	8	.027	6	.39	6	-.252	1	.537	8	1.477	7
78			...	.002	8	-.016	1	-.092	9	.252	1	-.39	6	-1.477	7	-.537	8
79		5	...	.068	7	-.017	8	.033	6	.298	8	-.094	1	.763	8	2.187	7
80			...	-.001	8	-.026	1	-.097	9	.094	1	-.298	8	-2.187	7	-.763	8
81	M9	1	...	.078	7	-.017	8	.04	6	.338	6	-.218	1	.763	8	2.187	7
82			...	-.005	8	-.026	1	-.068	9	.218	1	-.338	6	-2.187	7	-.763	8
83		2	...	.078	7	-.018	8	.041	6	.331	6	-.208	1	.774	8	2.209	7
84			...	-.005	8	-.027	1	-.068	9	.208	1	-.331	6	-2.209	7	-.774	8
85		3	...	.078	7	-.019	8	.041	6	.324	8	-.198	1	.786	8	2.231	7
86			...	-.006	8	-.028	1	-.069	9	.198	1	-.324	8	-2.231	7	-.786	8

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
87		4	...	.078	7	-.019	8	.041	6	.317	8	-.188	1	.798	8	2.253	7
88			...	-.006	8	-.028	1	-.069	9	.188	1	-.317	8	-2.253	7	-.798	8
89		5	...	.078	7	-.02	8	.042	6	.31	8	-.177	1	.81	8	2.275	7
90			...	-.006	8	-.029	1	-.069	9	.177	1	-.31	8	-2.275	7	-.81	8
91	M10	1	...	.083	7	-.02	8	.048	6	.38	1	-.322	8	.81	8	2.275	7
92			...	-.013	8	-.029	1	0	1	.322	8	-.38	1	-2.275	7	-.81	8
93		2	...	.083	7	-.02	8	.049	6	.369	1	-.315	8	.818	8	2.265	7
94			...	-.013	8	-.029	1	0	9	.315	8	-.369	1	-2.265	7	-.818	8
95		3	...	.083	7	-.021	8	.049	6	.358	1	-.307	8	.826	8	2.255	7
96			...	-.013	8	-.03	1	0	9	.307	8	-.358	1	-2.255	7	-.826	8
97		4	...	.083	7	-.021	8	.049	6	.347	1	-.299	8	.834	8	2.245	7
98			...	-.014	8	-.03	1	0	9	.299	8	-.347	1	-2.245	7	-.834	8
99		5	...	.084	7	-.022	8	.05	6	.335	1	-.291	8	.842	8	2.235	7
100			...	-.014	8	-.031	1	-.001	9	.291	8	-.335	1	-2.235	7	-.842	8
101	M11	1	...	.066	7	-.022	8	.107	7	.442	1	-.221	8	.842	8	2.235	7
102			...	-.017	8	-.031	1	.005	8	.221	8	-.442	1	-2.235	7	-.842	8
103		2	...	.066	7	-.022	8	.107	7	.43	1	-.213	8	.844	8	2.194	7
104			...	-.018	8	-.031	1	.005	8	.213	8	-.43	1	-2.194	7	-.844	8
105		3	...	.066	7	-.023	8	.107	7	.419	1	-.205	8	.846	8	2.154	7
106			...	-.018	8	-.032	1	.004	8	.205	8	-.419	1	-2.154	7	-.846	8
107		4	...	.066	7	-.023	8	.108	7	.407	1	-.196	8	.847	8	2.114	7
108			...	-.018	8	-.032	1	.004	8	.196	8	-.407	1	-2.114	7	-.847	8
109		5	...	.066	7	-.024	8	.108	7	.394	1	-.187	8	.849	8	2.073	7
110			...	-.018	8	-.033	1	.004	8	.187	8	-.394	1	-2.073	7	-.849	8
111	M12	1	...	.05	9	-.024	8	.138	7	.406	1	-.129	8	.849	8	2.073	7
112			...	-.018	6	-.033	1	-.005	8	.129	8	-.406	1	-2.073	7	-.849	8
113		2	...	.053	9	-.035	8	.144	7	.103	1	.103	8	.784	8	.965	7
114			...	-.021	6	-.044	1	-.011	8	-.103	8	-.103	1	-.965	7	-.784	8
115		3	...	.056	9	-.046	8	.15	7	-.288	1	.425	6	.926	6	.064	9
116			...	-.024	6	-.055	1	-.017	8	-.425	6	.288	1	-.064	9	-.926	6
117		4	...	.059	9	-.058	8	.155	7	-.768	1	.835	6	1.383	7	-.012	1
118			...	-.027	6	-.067	1	-.022	8	-.835	6	.768	1	.012	1	-1.383	7
119		5	...	.061	9	-.069	8	.161	7	-1.3...	9	1.336	1	2.624	7	-.071	1
120			...	-.029	6	-.078	1	-.028	8	-1.3...	1	1.328	9	.071	1	-2.624	7
121	M13	1	...	.061	9	-.069	8	.161	7	-1.3...	9	1.336	1	2.624	7	-.071	1
122			...	-.029	6	-.078	1	-.028	8	-1.3...	1	1.328	9	.071	1	-2.624	7
123		2	...	.062	9	-.071	8	.162	7	-1.4...	8	1.424	1	2.804	7	-.08	1
124			...	-.03	6	-.08	1	-.029	8	-1.4...	1	1.408	8	.08	1	-2.804	7
125		3	...	.062	9	-.072	8	.163	7	-1.4...	8	1.514	1	2.986	7	-.088	1
126			...	-.03	6	-.081	1	-.03	8	-1.5	1	1.489	8	.088	1	-2.986	7
127		4	...	.063	9	-.074	8	.163	7	-1.57	8	1.606	1	3.169	7	-.097	1
128			...	-.031	6	-.083	1	-.03	8	-1.6...	1	1.57	8	.097	1	-3.169	7
129		5	...	.063	9	-.075	8	.164	7	-1.6...	8	1.7	1	3.352	7	-.105	1
130			...	-.031	6	-.084	1	-.031	8	-1.7	1	1.654	8	.105	1	-3.352	7
131	M14	1	...	0	9	0	1	0	1	0	1	0	1	0	1	0	1
132			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
133		2	...	0	9	0	1	0	1	0	1	0	1	0	1	0	1
134			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
135		3	...	0	9	0	1	0	1	0	1	0	1	0	1	0	1
136			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
137		4	...	0	9	0	1	0	1	0	1	0	1	0	1	0	1
138			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
139		5	...	0	9	0	1	0	1	0	1	0	1	0	1	0	1
140			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
141	M15	1	...	0	6	.108	8	.051	6	.119	1	.772	7	.277	9	.611	6
142			...	-.004	9	-.014	7	-.023	9	-.772	7	-.119	1	-.611	6	-.277	9
143		2	...	.001	6	.101	8	.047	6	.155	1	.832	7	.204	9	.444	6

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

Mar 22, 2006
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[..	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
144			...	-.006	9	-.021	7	-.02	9	-.832	7	-.155	1	-.444	6	-.204	9
145		3	...	.003	6	.094	8	.043	6	.242	8	.917	7	.143	9	.29	6
146			...	-.008	9	-.028	7	-.016	9	-.917	7	-.242	8	-.29	6	-.143	9
147		4	...	.005	6	.086	8	.039	6	.55	8	1.027	7	.097	8	.151	7
148			...	-.01	9	-.036	7	-.012	9	-1.0...	7	-.55	8	-.151	7	-.097	8
149		5	...	.007	6	.079	8	.036	6	.832	8	1.162	7	.065	8	.026	7
150			...	-.012	9	-.043	7	-.009	9	-1.1...	7	-.832	8	-.026	7	-.065	8
151	M16	1	...	0	1	.219	8	.103	6	-.457	1	5.173	8	1.629	9	3.476	6
152			...	0	1	.004	7	-.055	9	-5.1...	8	.457	1	-3.476	6	-1.629	9
153		2	...	0	8	.214	8	.1	6	-.291	1	4.47	8	1.455	9	3.146	6
154			...	-.001	9	0	7	-.053	9	-4.47	8	.291	1	-3.146	6	-1.455	9
155		3	...	.002	8	.209	8	.098	6	-.14	1	3.782	8	1.287	9	2.824	6
156			...	-.003	9	-.005	7	-.05	9	-3.7...	8	.14	1	-2.824	6	-1.287	9
157		4	...	.003	8	.204	8	.096	6	-.004	1	3.11	8	1.128	9	2.509	6
158			...	-.004	9	-.009	7	-.048	9	-3.11	8	.004	1	-2.509	6	-1.128	9
159		5	...	.004	8	.199	8	.093	6	.117	1	2.454	8	.975	9	2.202	6
160			...	-.005	9	-.014	7	-.046	9	-2.4...	8	-.117	1	-2.202	6	-.975	9
161	M17	1	...	-.002	1	.199	8	.093	6	.117	1	2.454	8	1.013	9	2.201	6
162			...	-.005	9	-.015	7	-.046	9	-2.4...	8	-.117	1	-2.201	6	-1.013	9
163		2	...	-.002	1	.197	8	.092	6	.171	1	2.13	8	.939	9	2.049	6
164			...	-.006	9	-.017	7	-.044	9	-2.13	8	-.171	1	-2.049	6	-.939	9
165		3	...	-.002	1	.195	8	.091	6	.222	1	1.966	9	.867	9	1.899	6
166			...	-.006	9	-.019	7	-.043	9	-1.9...	9	-.222	1	-1.899	6	-.867	9
167		4	...	-.002	6	.192	8	.09	6	.269	1	1.995	9	.797	9	1.751	6
168			...	-.007	9	-.022	7	-.042	9	-1.9...	9	-.269	1	-1.751	6	-.797	9
169		5	...	-.001	6	.19	8	.089	6	.312	1	2.03	7	.729	9	1.605	6
170			...	-.007	9	-.024	7	-.041	9	-2.03	7	-.312	1	-1.605	6	-.729	9
171	M18	1	...	.051	8	.043	6	.044	6	.465	7	.517	8	3.629	7	3.229	8
172			...	-.057	7	0	1	-.06	9	-.517	8	-.465	7	-3.229	8	-3.629	7
173		2	...	.015	8	.042	8	.079	6	1.1...	6	0	1	1.415	7	1.487	8
174			...	-.092	7	0	1	-.096	9	0	1	-1.171	6	-1.487	8	-1.415	7
175		3	...	-.021	8	.078	8	.115	6	1.8...	8	.002	1	1.363	6	1.907	9
176			...	-.128	7	-.031	7	-.132	9	-.002	1	-1.895	8	-1.907	9	-1.363	6
177		4	...	.394	6	0	1	0	1	1.0...	8	.184	7	-.071	1	3.988	7
178			...	.06	1	-.146	8	-.252	6	-.184	7	-1.085	8	-3.988	7	.071	1
179		5	...	.358	6	0	1	0	1	-.012	1	2.551	8	-.044	1	6.985	6
180			...	.024	1	-.11	8	-.216	6	-2.5...	8	.012	1	-6.985	6	.044	1
181	M19	1	...	.001	6	.002	9	.001	8	0	6	0	7	0	7	0	8
182			...	0	7	0	8	-.001	6	0	7	0	6	0	8	0	7
183		2	...	0	6	.002	9	0	8	0	6	0	7	0	7	0	8
184			...	0	7	0	8	0	6	0	7	0	6	0	8	0	7
185		3	...	0	6	.001	9	0	8	0	6	0	7	0	7	0	8
186			...	0	7	0	8	0	6	0	7	0	6	0	8	0	7
187		4	...	0	6	0	9	0	8	0	6	0	7	0	7	0	9
188			...	0	7	0	8	0	6	0	7	0	6	0	9	0	7
189		5	...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
190			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
191	M20	1	...	.191	6	.182	6	.062	8	-.016	1	2.657	6	.753	8	-.002	1
192			...	.009	1	.017	1	0	1	-2.6...	6	.016	1	.002	1	-.753	8
193		2	...	.185	6	.179	6	.056	8	.058	1	1.666	6	1.076	8	-.003	1
194			...	.005	1	.009	1	0	1	-1.6...	6	-.058	1	.003	1	-1.076	8
195		3	...	.178	6	.175	6	.058	6	.088	1	.694	6	1.367	8	-.004	1
196			...	0	1	.002	1	0	1	-.694	6	-.088	1	.004	1	-1.367	8
197		4	...	.172	6	.172	6	.064	6	.614	9	-.075	1	1.625	8	-.005	1
198			...	-.004	1	-.006	1	0	1	.075	1	-.614	9	.005	1	-1.625	8
199		5	...	.166	6	.168	6	.07	6	1.2...	9	-.017	1	1.976	6	-.005	1
200			...	-.008	1	-.014	1	0	1	.017	1	-1.266	9	.005	1	-1.976	6

Company : **DMJM H&N**
Designer : **Kevin M. Jones - DMJMH&N**
Job Number : **145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[..	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
201	M21	1	...	.165	6	.179	6	.048	7	.804	7	-.015	1	2.129	6	-.008	1
202			...	-.008	1	-.016	1	0	1	.015	1	-.804	7	.008	1	-2.129	6
203		2	...	.165	6	.179	6	.048	7	.827	7	-.012	1	2.137	6	-.008	1
204			...	-.008	1	-.016	1	0	1	.012	1	-.827	7	.008	1	-2.137	6
205		3	...	.165	6	.179	6	.048	7	.85	7	-.009	1	2.145	6	-.008	1
206			...	-.008	1	-.016	1	0	1	.009	1	-.85	7	.008	1	-2.145	6
207		4	...	.165	6	.179	6	.048	7	.872	7	-.006	1	2.153	6	-.008	1
208			...	-.008	1	-.016	1	0	1	.006	1	-.872	7	.008	1	-2.153	6
209		5	...	.164	6	.178	6	.049	7	.895	7	-.003	1	2.16	6	-.008	1
210			...	-.008	1	-.017	1	0	1	.003	1	-.895	7	.008	1	-2.16	6
211	M22	1	...	.153	6	.223	8	.01	7	-.003	1	.236	8	2.142	6	-.007	1
212			...	-.007	1	-.019	1	-.036	8	-.236	8	.003	1	.007	1	-2.142	6
213		2	...	.153	6	.223	8	.01	7	-.007	1	.194	8	2.139	6	-.007	1
214			...	-.007	1	-.019	1	-.036	8	-.194	8	.007	1	.007	1	-2.139	6
215		3	...	.153	6	.222	8	.01	7	.004	7	.152	8	2.136	6	-.007	1
216			...	-.007	1	-.02	1	-.036	8	-.152	8	-.004	7	.007	1	-2.136	6
217		4	...	.153	6	.222	8	.01	7	.03	7	.11	8	2.134	6	-.008	1
218			...	-.007	1	-.02	1	-.036	8	-.11	8	-.03	7	.008	1	-2.134	6
219		5	...	.153	6	.222	8	.01	7	.055	7	.068	8	2.131	6	-.008	1
220			...	-.008	1	-.02	1	-.036	8	-.068	8	-.055	7	.008	1	-2.131	6
221	M23	1	...	.119	6	.285	8	0	1	-.021	1	.853	8	1.777	6	-.003	1
222			...	-.005	1	-.023	1	-.067	8	-.853	8	.021	1	.003	1	-1.777	6
223		2	...	.119	6	.285	8	0	1	-.025	1	.799	8	1.767	6	-.003	1
224			...	-.005	1	-.024	1	-.067	8	-.799	8	.025	1	.003	1	-1.767	6
225		3	...	.119	6	.285	8	0	1	-.03	1	.745	8	1.756	6	-.003	1
226			...	-.005	1	-.024	1	-.067	8	-.745	8	.03	1	.003	1	-1.756	6
227		4	...	.119	6	.284	8	0	1	-.034	1	.691	8	1.745	6	-.003	1
228			...	-.005	1	-.024	1	-.067	8	-.691	8	.034	1	.003	1	-1.745	6
229		5	...	.119	6	.284	8	0	1	-.039	1	.638	8	1.735	6	-.003	1
230			...	-.005	1	-.025	1	-.066	8	-.638	8	.039	1	.003	1	-1.735	6
231	M24	1	...	.067	6	.338	6	0	1	-.039	1	1.197	8	1.275	6	0	1
232			...	-.002	1	-.027	1	-.085	6	-1.1...	8	.039	1	0	1	-1.275	6
233		2	...	.067	6	.338	6	0	1	-.044	1	1.134	8	1.259	6	0	1
234			...	-.002	1	-.027	1	-.085	6	-1.1...	8	.044	1	0	1	-1.259	6
235		3	...	.067	6	.337	6	0	1	-.049	1	1.076	9	1.243	6	0	1
236			...	-.002	1	-.027	1	-.084	6	-1.0...	9	.049	1	0	1	-1.243	6
237		4	...	.067	6	.337	6	0	1	-.054	1	1.037	9	1.227	6	0	1
238			...	-.002	1	-.028	1	-.084	6	-1.0...	9	.054	1	0	1	-1.227	6
239		5	...	.067	6	.337	6	0	1	-.059	1	.998	9	1.211	6	0	1
240			...	-.002	1	-.028	1	-.084	6	-.998	9	.059	1	0	1	-1.211	6
241	M25	1	...	.037	6	.352	6	0	1	-.058	1	1.218	9	.988	6	-.002	1
242			...	0	1	-.029	1	-.095	6	-1.2...	9	.058	1	.002	1	-.988	6
243		2	...	.037	6	.351	6	0	1	-.072	1	1.115	9	.942	6	-.002	1
244			...	0	1	-.03	1	-.095	6	-1.1...	9	.072	1	.002	1	-.942	6
245		3	...	.037	6	.35	6	0	1	-.087	1	1.012	9	.911	7	-.002	1
246			...	0	1	-.031	1	-.094	6	-1.0...	9	.087	1	.002	1	-.911	7
247		4	...	.038	6	.349	6	0	1	-.102	1	.909	9	.883	7	-.003	1
248			...	0	1	-.032	1	-.094	6	-.909	9	.102	1	.003	1	-.883	7
249		5	...	.038	6	.348	6	0	1	-.117	1	.807	9	.854	7	-.003	1
250			...	0	1	-.033	1	-.093	6	-.807	9	.117	1	.003	1	-.854	7
251	M26	1	...	.038	6	.056	9	0	1	-.117	1	.807	9	.854	7	-.003	1
252			...	0	1	.033	1	-.093	6	-.807	9	.117	1	.003	1	-.854	7
253		2	...	.04	6	.048	9	0	1	-.002	1	.596	9	.606	7	-.005	1
254			...	0	1	.024	1	-.089	6	-.596	9	.002	1	.005	1	-.606	7
255		3	...	.042	6	.039	9	0	1	.077	1	.421	9	.339	7	.182	8
256			...	0	1	.015	1	-.084	6	-.421	9	-.077	1	-.182	8	-.339	7
257		4	...	.044	6	.03	9	0	1	.121	1	.281	9	.055	7	.493	8

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[..	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
258			...	0	1	.006	1	-.08	6	-.281	9	-.121	1	-.493	8	-.055	7
259		5	...	.047	6	.021	9	0	1	.129	1	.176	9	.012	1	.785	8
260			...	0	1	-.002	1	-.077	7	-.176	9	-.129	1	-.785	8	-.012	1
261	M27	1	...	.047	6	.021	9	0	1	.112	1	.012	9	.016	1	1.322	8
262			...	0	1	-.002	1	-.077	7	-.012	9	-.112	1	-1.322	8	-.016	1
263		2	...	.049	6	.014	9	0	1	.089	1	-.052	9	.018	1	1.571	8
264			...	0	1	-.01	1	-.081	7	.052	9	-.089	1	-1.571	8	-.018	1
265		3	...	.051	6	.006	9	0	1	.087	9	-.037	1	.02	1	1.806	8
266			...	0	1	-.018	1	-.084	7	.037	1	-.087	9	-1.806	8	-.02	1
267		4	...	.052	6	-.002	9	0	1	.093	9	.043	1	.022	1	2.026	8
268			...	0	9	-.026	1	-.088	7	-.043	1	-.093	9	-2.026	8	-.022	1
269		5	...	.054	6	-.01	9	0	1	.07	9	.153	1	.024	1	2.231	8
270			...	-.003	9	-.034	1	-.092	7	-.153	1	-.07	9	-2.231	8	-.024	1
271	M28	1	...	.031	8	.049	8	.036	6	.832	8	1.162	7	0	1	.075	8
272			...	-.023	7	-.017	7	-.009	9	-1.1...	7	-.832	8	-.075	8	0	1
273		2	...	.031	8	.046	8	.034	6	.895	8	1.185	7	.007	7	.084	8
274			...	-.024	7	-.018	7	-.007	9	-1.1...	7	-.895	8	-.084	8	-.007	7
275		3	...	.031	8	.043	8	.033	6	.954	8	1.209	7	.051	6	.092	9
276			...	-.026	7	-.019	7	-.006	9	-1.2...	7	-.954	8	-.092	9	-.051	6
277		4	...	.03	8	.04	8	.032	6	1.0...	8	1.235	7	.093	6	.098	9
278			...	-.027	7	-.02	7	-.004	9	-1.2...	7	-1.008	8	-.098	9	-.093	6
279		5	...	.03	8	.037	8	.03	6	1.0...	8	1.262	7	.134	6	.103	9
280			...	-.029	7	-.021	7	-.003	9	-1.2...	7	-1.059	8	-.103	9	-.134	6
281	M29	1	...	.03	8	.038	8	.03	6	1.0...	8	1.262	7	.134	6	.103	9
282			...	-.028	7	-.02	7	-.003	9	-1.2...	7	-1.059	8	-.103	9	-.134	6
283		2	...	.03	8	.035	8	.029	6	1.1...	8	1.289	7	.172	6	.106	9
284			...	-.03	7	-.021	7	-.002	9	-1.2...	7	-1.108	8	-.106	9	-.172	6
285		3	...	.029	8	.032	8	.027	6	1.1...	8	1.318	7	.209	6	.107	9
286			...	-.031	7	-.023	7	0	9	-1.3...	7	-1.152	8	-.107	9	-.209	6
287		4	...	.029	8	.029	8	.026	6	1.1...	8	1.349	7	.244	6	.106	9
288			...	-.033	7	-.024	1	0	1	-1.3...	7	-1.192	8	-.106	9	-.244	6
289		5	...	.028	8	.026	8	.024	6	1.2...	8	1.381	7	.277	6	.104	9
290			...	-.034	7	-.027	1	0	1	-1.3...	7	-1.229	8	-.104	9	-.277	6
291	M30	1	...	0	6	0	1	0	1	0	1	0	1	0	1	0	1
292			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
293		2	...	0	6	0	1	0	1	0	1	0	1	0	1	0	1
294			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
295		3	...	0	6	0	1	0	1	0	1	0	1	0	1	0	1
296			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
297		4	...	0	6	0	1	0	1	0	1	0	1	0	1	0	1
298			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
299		5	...	0	6	0	1	0	1	0	1	0	1	0	1	0	1
300			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
301	M31	1	...	.054	6	.03	1	0	1	.07	9	.153	1	.024	1	2.231	8
302			...	-.003	9	-.002	9	-.092	7	-.153	1	-.07	9	-2.231	8	-.024	1
303		2	...	.056	6	.024	1	0	1	.06	9	.086	1	.025	1	2.386	9
304			...	-.004	9	-.007	9	-.095	7	.086	1	-.06	9	-2.386	9	-.025	1
305		3	...	.057	6	.019	1	0	1	.036	9	.032	1	.027	1	2.613	9
306			...	-.006	9	-.012	9	-.098	7	-.032	1	-.036	9	-2.613	9	-.027	1
307		4	...	.058	6	.013	1	0	1	.008	1	.002	9	.028	1	2.846	9
308			...	-.007	9	-.018	9	-.1	7	-.002	9	-.008	1	-2.846	9	-.028	1
309		5	...	.06	6	.008	1	0	1	.035	1	.052	9	.029	1	3.086	9
310			...	-.008	9	-.023	9	-.103	7	-.052	9	-.035	1	-3.086	9	-.029	1

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Torsion

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
1	M1	1	max	-.037	1	-.081	1	NC		NC		NC		NC	
2			min	-.114	8	-.251	8	NC		NC		NC		NC	
3		2	max	-.037	1	-.081	1	NC		NC		NC		NC	
4			min	-.114	8	-.251	8	NC		NC		NC		NC	
5		3	max	-.037	1	-.081	1	NC		NC		NC		NC	
6			min	-.114	8	-.251	8	NC		NC		NC		NC	
7		4	max	-.037	1	-.081	1	NC		NC		NC		NC	
8			min	-.114	8	-.251	8	NC		NC		NC		NC	
9		5	max	-.037	1	-.081	1	NC		NC		NC		NC	
10			min	-.114	8	-.251	8	NC		NC		NC		NC	
11	M2	1	max	-.037	1	-.082	1	NC		NC		NC		NC	
12			min	-.094	8	-.206	8	NC		NC		NC		NC	
13		2	max	-.037	1	-.082	1	NC		NC		NC		NC	
14			min	-.094	8	-.206	8	NC		NC		NC		NC	
15		3	max	-.037	1	-.082	1	NC		NC		NC		NC	
16			min	-.094	8	-.206	8	NC		NC		NC		NC	
17		4	max	-.037	1	-.082	1	NC		NC		NC		NC	
18			min	-.094	8	-.206	8	NC		NC		NC		NC	
19		5	max	-.037	1	-.082	1	NC		NC		NC		NC	
20			min	-.094	8	-.206	8	NC		NC		NC		NC	
21	M3	1	max	-.037	1	-.082	1	NC		NC		NC		NC	
22			min	-.094	8	-.206	8	NC		NC		NC		NC	
23		2	max	-.037	1	-.082	1	NC		NC		NC		NC	
24			min	-.094	8	-.206	8	NC		NC		NC		NC	
25		3	max	-.037	1	-.082	1	NC		NC		NC		NC	
26			min	-.094	8	-.206	8	NC		NC		NC		NC	
27		4	max	-.037	1	-.082	1	NC		NC		NC		NC	
28			min	-.094	8	-.206	8	NC		NC		NC		NC	
29		5	max	-.037	1	-.082	1	NC		NC		NC		NC	
30			min	-.094	8	-.206	8	NC		NC		NC		NC	
31	M4	1	max	-.06	1	-.132	1	NC		NC		NC		NC	
32			min	-.095	8	-.21	8	NC		NC		NC		NC	
33		2	max	-.06	1	-.132	1	NC		NC		NC		NC	
34			min	-.095	8	-.21	8	NC		NC		NC		NC	
35		3	max	-.06	1	-.132	1	NC		NC		NC		NC	
36			min	-.095	8	-.21	8	NC		NC		NC		NC	
37		4	max	-.06	1	-.132	1	NC		NC		NC		NC	
38			min	-.095	8	-.21	8	NC		NC		NC		NC	
39		5	max	-.06	1	-.132	1	NC		NC		NC		NC	
40			min	-.095	8	-.21	8	NC		NC		NC		NC	
41	M5	1	max	-.085	6	-.187	6	NC		NC		NC		NC	
42			min	-.097	1	-.214	1	NC		NC		NC		NC	
43		2	max	-.085	6	-.187	6	NC		NC		NC		NC	
44			min	-.097	1	-.214	1	NC		NC		NC		NC	
45		3	max	-.085	6	-.187	6	NC		NC		NC		NC	
46			min	-.097	1	-.214	1	NC		NC		NC		NC	
47		4	max	-.085	6	-.187	6	NC		NC		NC		NC	
48			min	-.097	1	-.214	1	NC		NC		NC		NC	
49		5	max	-.085	6	-.187	6	NC		NC		NC		NC	
50			min	-.097	1	-.214	1	NC		NC		NC		NC	
51	M6	1	max	-.06	6	-.132	6	NC		NC		NC		NC	
52			min	-.113	1	-.249	1	NC		NC		NC		NC	
53		2	max	-.06	6	-.132	6	NC		NC		NC		NC	
54			min	-.113	1	-.249	1	NC		NC		NC		NC	
55		3	max	-.06	6	-.132	6	NC		NC		NC		NC	
56			min	-.113	1	-.249	1	NC		NC		NC		NC	

Company : DMJM H&N
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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
57		4	max	-.06	6	-.132	6	NC		NC		NC		NC	
58			min	-.113	1	-.249	1	NC		NC		NC		NC	
59		5	max	-.06	6	-.132	6	NC		NC		NC		NC	
60			min	-.113	1	-.249	1	NC		NC		NC		NC	
61	M7	1	max	-.044	8	-.096	8	NC		NC		NC		NC	
62			min	-.112	1	-.247	1	NC		NC		NC		NC	
63		2	max	-.044	8	-.096	8	NC		NC		NC		NC	
64			min	-.112	1	-.247	1	NC		NC		NC		NC	
65		3	max	-.044	8	-.096	8	NC		NC		NC		NC	
66			min	-.112	1	-.247	1	NC		NC		NC		NC	
67		4	max	-.044	8	-.096	8	NC		NC		NC		NC	
68			min	-.112	1	-.247	1	NC		NC		NC		NC	
69		5	max	-.044	8	-.096	8	NC		NC		NC		NC	
70			min	-.112	1	-.247	1	NC		NC		NC		NC	
71	M8	1	max	-.044	8	-.096	8	NC		NC		NC		NC	
72			min	-.112	1	-.247	1	NC		NC		NC		NC	
73		2	max	-.044	8	-.096	8	NC		NC		NC		NC	
74			min	-.112	1	-.247	1	NC		NC		NC		NC	
75		3	max	-.044	8	-.096	8	NC		NC		NC		NC	
76			min	-.112	1	-.247	1	NC		NC		NC		NC	
77		4	max	-.044	8	-.096	8	NC		NC		NC		NC	
78			min	-.112	1	-.247	1	NC		NC		NC		NC	
79		5	max	-.044	8	-.096	8	NC		NC		NC		NC	
80			min	-.112	1	-.247	1	NC		NC		NC		NC	
81	M9	1	max	-.024	8	-.054	8	NC		NC		NC		NC	
82			min	-.103	1	-.227	1	NC		NC		NC		NC	
83		2	max	-.024	8	-.054	8	NC		NC		NC		NC	
84			min	-.103	1	-.227	1	NC		NC		NC		NC	
85		3	max	-.024	8	-.054	8	NC		NC		NC		NC	
86			min	-.103	1	-.227	1	NC		NC		NC		NC	
87		4	max	-.024	8	-.054	8	NC		NC		NC		NC	
88			min	-.103	1	-.227	1	NC		NC		NC		NC	
89		5	max	-.024	8	-.054	8	NC		NC		NC		NC	
90			min	-.103	1	-.227	1	NC		NC		NC		NC	
91	M10	1	max	.014	8	.031	8	NC		NC		NC		NC	
92			min	-.069	1	-.152	1	NC		NC		NC		NC	
93		2	max	.014	8	.031	8	NC		NC		NC		NC	
94			min	-.069	1	-.152	1	NC		NC		NC		NC	
95		3	max	.014	8	.031	8	NC		NC		NC		NC	
96			min	-.069	1	-.152	1	NC		NC		NC		NC	
97		4	max	.014	8	.031	8	NC		NC		NC		NC	
98			min	-.069	1	-.152	1	NC		NC		NC		NC	
99		5	max	.014	8	.031	8	NC		NC		NC		NC	
100			min	-.069	1	-.152	1	NC		NC		NC		NC	
101	M11	1	max	.045	8	.099	8	NC		NC		NC		NC	
102			min	-.022	1	-.048	1	NC		NC		NC		NC	
103		2	max	.045	8	.099	8	NC		NC		NC		NC	
104			min	-.022	1	-.048	1	NC		NC		NC		NC	
105		3	max	.045	8	.099	8	NC		NC		NC		NC	
106			min	-.022	1	-.048	1	NC		NC		NC		NC	
107		4	max	.045	8	.099	8	NC		NC		NC		NC	
108			min	-.022	1	-.048	1	NC		NC		NC		NC	
109		5	max	.045	8	.099	8	NC		NC		NC		NC	
110			min	-.022	1	-.048	1	NC		NC		NC		NC	
111	M12	1	max	.055	8	.12	8	NC		NC		NC		NC	
112			min	.002	1	.005	1	NC		NC		NC		NC	
113		2	max	.055	8	.12	8	NC		NC		NC		NC	

Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
114			min	.002	1	.005	1	NC		NC		NC		NC	
115		3	max	.055	8	.12	8	NC		NC		NC		NC	
116			min	.002	1	.005	1	NC		NC		NC		NC	
117		4	max	.055	8	.12	8	NC		NC		NC		NC	
118			min	.002	1	.005	1	NC		NC		NC		NC	
119		5	max	.055	8	.12	8	NC		NC		NC		NC	
120			min	.002	1	.005	1	NC		NC		NC		NC	
121	M13	1	max	.055	8	.12	8	NC		NC		NC		NC	
122			min	.002	1	.005	1	NC		NC		NC		NC	
123		2	max	.055	8	.12	8	NC		NC		NC		NC	
124			min	.002	1	.005	1	NC		NC		NC		NC	
125		3	max	.055	8	.12	8	NC		NC		NC		NC	
126			min	.002	1	.005	1	NC		NC		NC		NC	
127		4	max	.055	8	.12	8	NC		NC		NC		NC	
128			min	.002	1	.005	1	NC		NC		NC		NC	
129		5	max	.055	8	.12	8	NC		NC		NC		NC	
130			min	.002	1	.005	1	NC		NC		NC		NC	
131	M14	1	max	-.044	8	0	1	NC		NC		NC		NC	
132			min	-.112	1	0	1	NC		NC		NC		NC	
133		2	max	-.044	8	0	1	NC		NC		NC		NC	
134			min	-.112	1	0	1	NC		NC		NC		NC	
135		3	max	-.044	8	0	1	NC		NC		NC		NC	
136			min	-.112	1	0	1	NC		NC		NC		NC	
137		4	max	-.044	8	0	1	NC		NC		NC		NC	
138			min	-.112	1	0	1	NC		NC		NC		NC	
139		5	max	-.044	8	0	1	NC		NC		NC		NC	
140			min	-.112	1	0	1	NC		NC		NC		NC	
141	M15	1	max	.11	8	.092	8	NC		NC		NC		NC	
142			min	0	1	0	1	NC		NC		NC		NC	
143		2	max	.11	8	.092	8	NC		NC		NC		NC	
144			min	0	1	0	1	NC		NC		NC		NC	
145		3	max	.11	8	.092	8	NC		NC		NC		NC	
146			min	0	1	0	1	NC		NC		NC		NC	
147		4	max	.11	8	.092	8	NC		NC		NC		NC	
148			min	0	1	0	1	NC		NC		NC		NC	
149		5	max	.11	8	.092	8	NC		NC		NC		NC	
150			min	0	1	0	1	NC		NC		NC		NC	
151	M16	1	max	.126	8	.277	8	NC		NC		NC		NC	
152			min	-.021	7	-.045	7	NC		NC		NC		NC	
153		2	max	.126	8	.277	8	NC		NC		NC		NC	
154			min	-.021	7	-.045	7	NC		NC		NC		NC	
155		3	max	.126	8	.277	8	NC		NC		NC		NC	
156			min	-.021	7	-.045	7	NC		NC		NC		NC	
157		4	max	.126	8	.277	8	NC		NC		NC		NC	
158			min	-.021	7	-.045	7	NC		NC		NC		NC	
159		5	max	.126	8	.277	8	NC		NC		NC		NC	
160			min	-.021	7	-.045	7	NC		NC		NC		NC	
161	M17	1	max	.11	8	.241	8	NC		NC		NC		NC	
162			min	0	1	0	1	NC		NC		NC		NC	
163		2	max	.11	8	.241	8	NC		NC		NC		NC	
164			min	0	1	0	1	NC		NC		NC		NC	
165		3	max	.11	8	.241	8	NC		NC		NC		NC	
166			min	0	1	0	1	NC		NC		NC		NC	
167		4	max	.11	8	.241	8	NC		NC		NC		NC	
168			min	0	1	0	1	NC		NC		NC		NC	
169		5	max	.11	8	.241	8	NC		NC		NC		NC	
170			min	0	1	0	1	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
171	M18	1	max	.128	6	.282	6	NC		NC		NC		NC	
172			min	0	1	-.002	1	NC		NC		NC		NC	
173		2	max	.128	6	.282	6	NC		NC		NC		NC	
174			min	0	1	-.002	1	NC		NC		NC		NC	
175		3	max	.128	6	.282	6	NC		NC		NC		NC	
176			min	0	1	-.002	1	NC		NC		NC		NC	
177		4	max	.128	6	.282	6	NC		NC		NC		NC	
178			min	0	1	-.002	1	NC		NC		NC		NC	
179		5	max	.128	6	.282	6	NC		NC		NC		NC	
180			min	0	1	-.002	1	NC		NC		NC		NC	
181	M19	1	max	0	1	0	1	NC		NC		NC		NC	
182			min	0	1	0	1	NC		NC		NC		NC	
183		2	max	0	1	0	1	NC		NC		NC		NC	
184			min	0	1	0	1	NC		NC		NC		NC	
185		3	max	0	1	0	1	NC		NC		NC		NC	
186			min	0	1	0	1	NC		NC		NC		NC	
187		4	max	0	1	0	1	NC		NC		NC		NC	
188			min	0	1	0	1	NC		NC		NC		NC	
189		5	max	0	1	0	1	NC		NC		NC		NC	
190			min	0	1	0	1	NC		NC		NC		NC	
191	M20	1	max	-.003	1	-.002	1	NC		NC		NC		NC	
192			min	-.367	8	-.308	8	NC		NC		NC		NC	
193		2	max	-.003	1	-.002	1	NC		NC		NC		NC	
194			min	-.367	8	-.308	8	NC		NC		NC		NC	
195		3	max	-.003	1	-.002	1	NC		NC		NC		NC	
196			min	-.367	8	-.308	8	NC		NC		NC		NC	
197		4	max	-.003	1	-.002	1	NC		NC		NC		NC	
198			min	-.367	8	-.308	8	NC		NC		NC		NC	
199		5	max	-.003	1	-.002	1	NC		NC		NC		NC	
200			min	-.367	8	-.308	8	NC		NC		NC		NC	
201	M21	1	max	-.005	1	-.004	1	NC		NC		NC		NC	
202			min	-.552	8	-.462	8	NC		NC		NC		NC	
203		2	max	-.005	1	-.004	1	NC		NC		NC		NC	
204			min	-.552	8	-.462	8	NC		NC		NC		NC	
205		3	max	-.005	1	-.004	1	NC		NC		NC		NC	
206			min	-.552	8	-.462	8	NC		NC		NC		NC	
207		4	max	-.005	1	-.004	1	NC		NC		NC		NC	
208			min	-.552	8	-.462	8	NC		NC		NC		NC	
209		5	max	-.005	1	-.004	1	NC		NC		NC		NC	
210			min	-.552	8	-.462	8	NC		NC		NC		NC	
211	M22	1	max	-.005	1	-.004	1	NC		NC		NC		NC	
212			min	-.778	8	-.651	8	NC		NC		NC		NC	
213		2	max	-.005	1	-.004	1	NC		NC		NC		NC	
214			min	-.778	8	-.651	8	NC		NC		NC		NC	
215		3	max	-.005	1	-.004	1	NC		NC		NC		NC	
216			min	-.778	8	-.651	8	NC		NC		NC		NC	
217		4	max	-.005	1	-.004	1	NC		NC		NC		NC	
218			min	-.778	8	-.651	8	NC		NC		NC		NC	
219		5	max	-.005	1	-.004	1	NC		NC		NC		NC	
220			min	-.778	8	-.651	8	NC		NC		NC		NC	
221	M23	1	max	-.002	1	-.002	1	NC		NC		NC		NC	
222			min	-.916	8	-.767	8	NC		NC		NC		NC	
223		2	max	-.002	1	-.002	1	NC		NC		NC		NC	
224			min	-.916	8	-.767	8	NC		NC		NC		NC	
225		3	max	-.002	1	-.002	1	NC		NC		NC		NC	
226			min	-.916	8	-.767	8	NC		NC		NC		NC	
227		4	max	-.002	1	-.002	1	NC		NC		NC		NC	

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

Mar 22, 2006
9:33 AM
Checked By:_____

Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
228			min	-.916	8	-.767	8	NC		NC		NC		NC	
229		5	max	-.002	1	-.002	1	NC		NC		NC		NC	
230			min	-.916	8	-.767	8	NC		NC		NC		NC	
231	M24	1	max	.004	1	.004	1	NC		NC		NC		NC	
232			min	-.946	8	-.792	8	NC		NC		NC		NC	
233		2	max	.004	1	.004	1	NC		NC		NC		NC	
234			min	-.946	8	-.792	8	NC		NC		NC		NC	
235		3	max	.004	1	.004	1	NC		NC		NC		NC	
236			min	-.946	8	-.792	8	NC		NC		NC		NC	
237		4	max	.004	1	.004	1	NC		NC		NC		NC	
238			min	-.946	8	-.792	8	NC		NC		NC		NC	
239		5	max	.004	1	.004	1	NC		NC		NC		NC	
240			min	-.946	8	-.792	8	NC		NC		NC		NC	
241	M25	1	max	.009	1	.008	1	NC		NC		NC		NC	
242			min	-.924	6	-.773	6	NC		NC		NC		NC	
243		2	max	.009	1	.008	1	NC		NC		NC		NC	
244			min	-.924	6	-.773	6	NC		NC		NC		NC	
245		3	max	.009	1	.008	1	NC		NC		NC		NC	
246			min	-.924	6	-.773	6	NC		NC		NC		NC	
247		4	max	.009	1	.008	1	NC		NC		NC		NC	
248			min	-.924	6	-.773	6	NC		NC		NC		NC	
249		5	max	.009	1	.008	1	NC		NC		NC		NC	
250			min	-.924	6	-.773	6	NC		NC		NC		NC	
251	M26	1	max	.009	1	.008	1	NC		NC		NC		NC	
252			min	-.924	6	-.773	6	NC		NC		NC		NC	
253		2	max	.009	1	.008	1	NC		NC		NC		NC	
254			min	-.924	6	-.773	6	NC		NC		NC		NC	
255		3	max	.009	1	.008	1	NC		NC		NC		NC	
256			min	-.924	6	-.773	6	NC		NC		NC		NC	
257		4	max	.009	1	.008	1	NC		NC		NC		NC	
258			min	-.924	6	-.773	6	NC		NC		NC		NC	
259		5	max	.009	1	.008	1	NC		NC		NC		NC	
260			min	-.924	6	-.773	6	NC		NC		NC		NC	
261	M27	1	max	.009	1	.008	1	NC		NC		NC		NC	
262			min	-.924	6	-.773	6	NC		NC		NC		NC	
263		2	max	.009	1	.008	1	NC		NC		NC		NC	
264			min	-.924	6	-.773	6	NC		NC		NC		NC	
265		3	max	.009	1	.008	1	NC		NC		NC		NC	
266			min	-.924	6	-.773	6	NC		NC		NC		NC	
267		4	max	.009	1	.008	1	NC		NC		NC		NC	
268			min	-.924	6	-.773	6	NC		NC		NC		NC	
269		5	max	.009	1	.008	1	NC		NC		NC		NC	
270			min	-.924	6	-.773	6	NC		NC		NC		NC	
271	M28	1	max	.107	8	.09	8	NC		NC		NC		NC	
272			min	0	1	0	1	NC		NC		NC		NC	
273		2	max	.107	8	.09	8	NC		NC		NC		NC	
274			min	0	1	0	1	NC		NC		NC		NC	
275		3	max	.107	8	.09	8	NC		NC		NC		NC	
276			min	0	1	0	1	NC		NC		NC		NC	
277		4	max	.107	8	.09	8	NC		NC		NC		NC	
278			min	0	1	0	1	NC		NC		NC		NC	
279		5	max	.107	8	.09	8	NC		NC		NC		NC	
280			min	0	1	0	1	NC		NC		NC		NC	
281	M29	1	max	.107	8	.09	8	NC		NC		NC		NC	
282			min	0	1	0	1	NC		NC		NC		NC	
283		2	max	.107	8	.09	8	NC		NC		NC		NC	
284			min	0	1	0	1	NC		NC		NC		NC	

Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
285		3	max	.107	8	.09	8	NC		NC		NC		NC	
286			min	0	1	0	1	NC		NC		NC		NC	
287		4	max	.107	8	.09	8	NC		NC		NC		NC	
288			min	0	1	0	1	NC		NC		NC		NC	
289		5	max	.107	8	.09	8	NC		NC		NC		NC	
290			min	0	1	0	1	NC		NC		NC		NC	
291	M30	1	max	.009	1	0	1	NC		NC		NC		NC	
292			min	-.924	6	0	1	NC		NC		NC		NC	
293		2	max	.009	1	0	1	NC		NC		NC		NC	
294			min	-.924	6	0	1	NC		NC		NC		NC	
295		3	max	.009	1	0	1	NC		NC		NC		NC	
296			min	-.924	6	0	1	NC		NC		NC		NC	
297		4	max	.009	1	0	1	NC		NC		NC		NC	
298			min	-.924	6	0	1	NC		NC		NC		NC	
299		5	max	.009	1	0	1	NC		NC		NC		NC	
300			min	-.924	6	0	1	NC		NC		NC		NC	
301	M31	1	max	.009	1	.008	1	NC		NC		NC		NC	
302			min	-.924	6	-.773	6	NC		NC		NC		NC	
303		2	max	.009	1	.008	1	NC		NC		NC		NC	
304			min	-.924	6	-.773	6	NC		NC		NC		NC	
305		3	max	.009	1	.008	1	NC		NC		NC		NC	
306			min	-.924	6	-.773	6	NC		NC		NC		NC	
307		4	max	.009	1	.008	1	NC		NC		NC		NC	
308			min	-.924	6	-.773	6	NC		NC		NC		NC	
309		5	max	.009	1	.008	1	NC		NC		NC		NC	
310			min	-.924	6	-.773	6	NC		NC		NC		NC	

amec

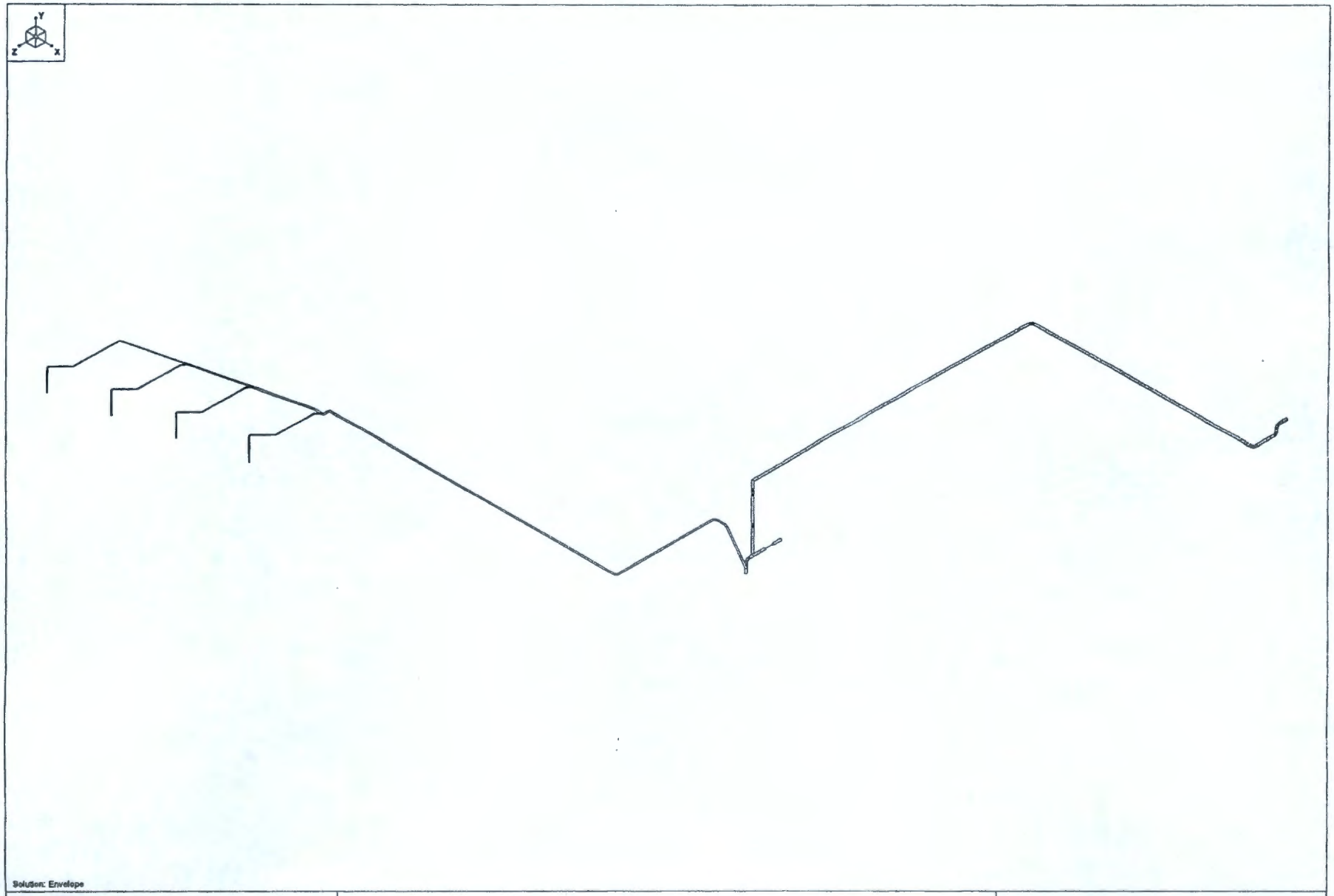
CALCULATION SHEET

CALC. NO.:	145579-V-CA-005	REV:	1	DATE:	March 26, 2006
CALC. TITLE:	Off-Gas Treatment System Pipe Stress Analysis				
PROJECT NO.:	145579	PROJECT TITLE:	Final DBVS Design		

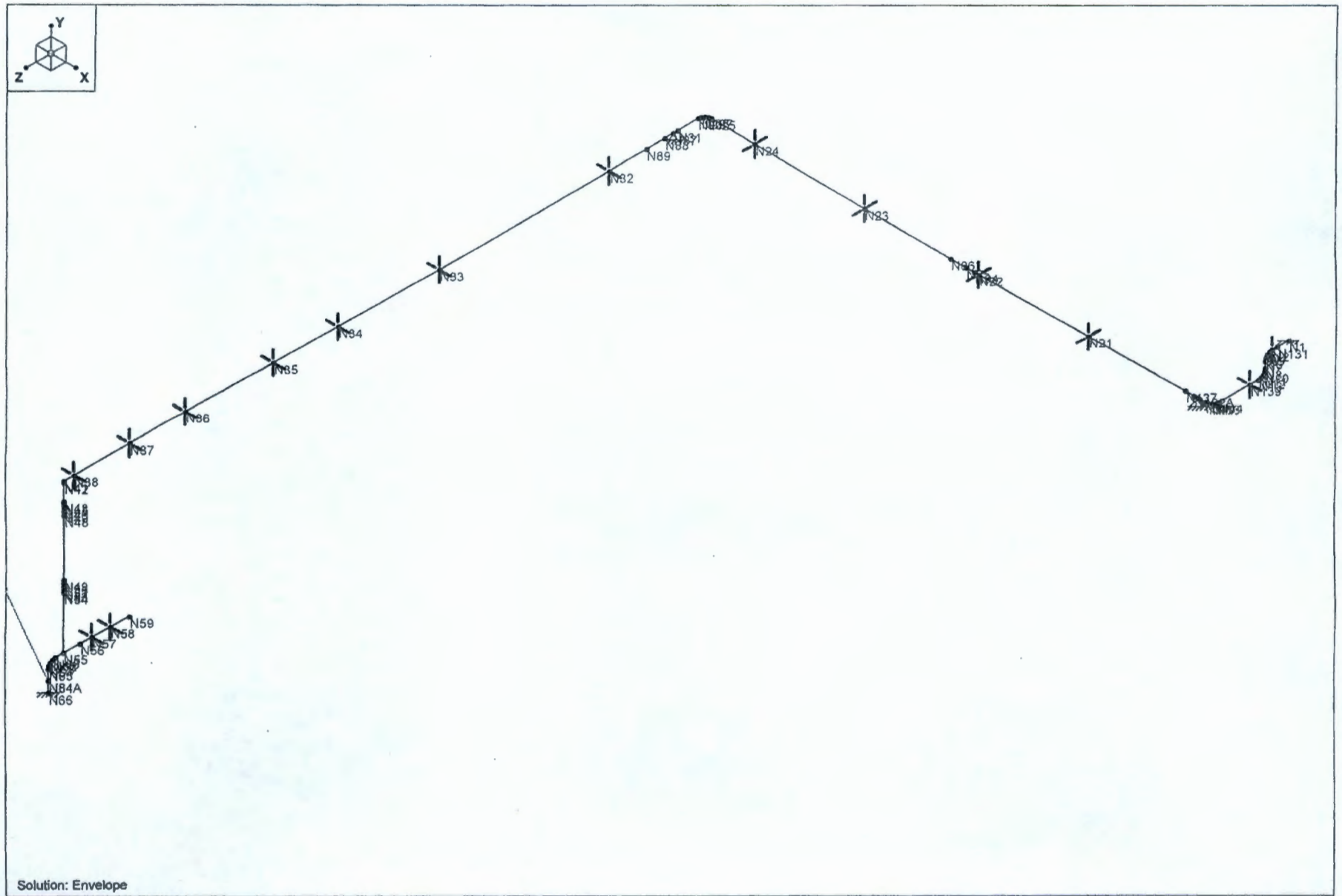
Attachment 7 Model 4 RISA 3D Analysis Input and Output Data

NOTE: This cover sheet represents the approval signatures of the originator and checker for all pages of this attachment

ORIGINATOR:	DATE:	CHECKER:	DATE:
Kevin M. Jones KMJ	3/26/06	J. Van Corbach JVC	3/26/06



DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 14, 2006 at 12:10 AM
145579-V-CA-005 - Model 4	Rendered Model Geometry	145579-V-CA-005 Model 4 today.r3d

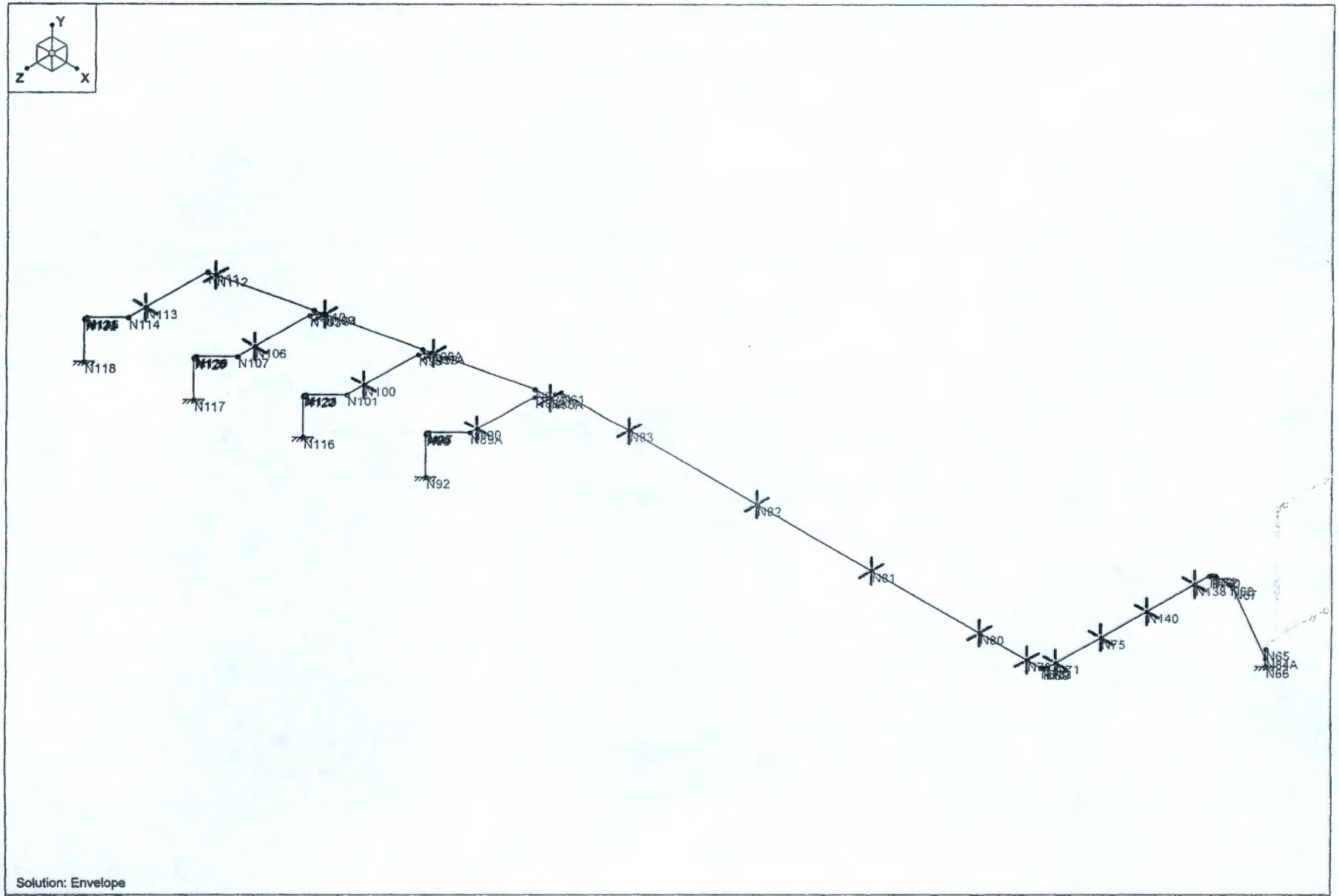


Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 14, 2006 at 7:30 AM
145579-V-CA-005 - Model 4	Nodes and Supports (6-VOG-33-0155)	145579-V-CA-005 Model 4.r3d

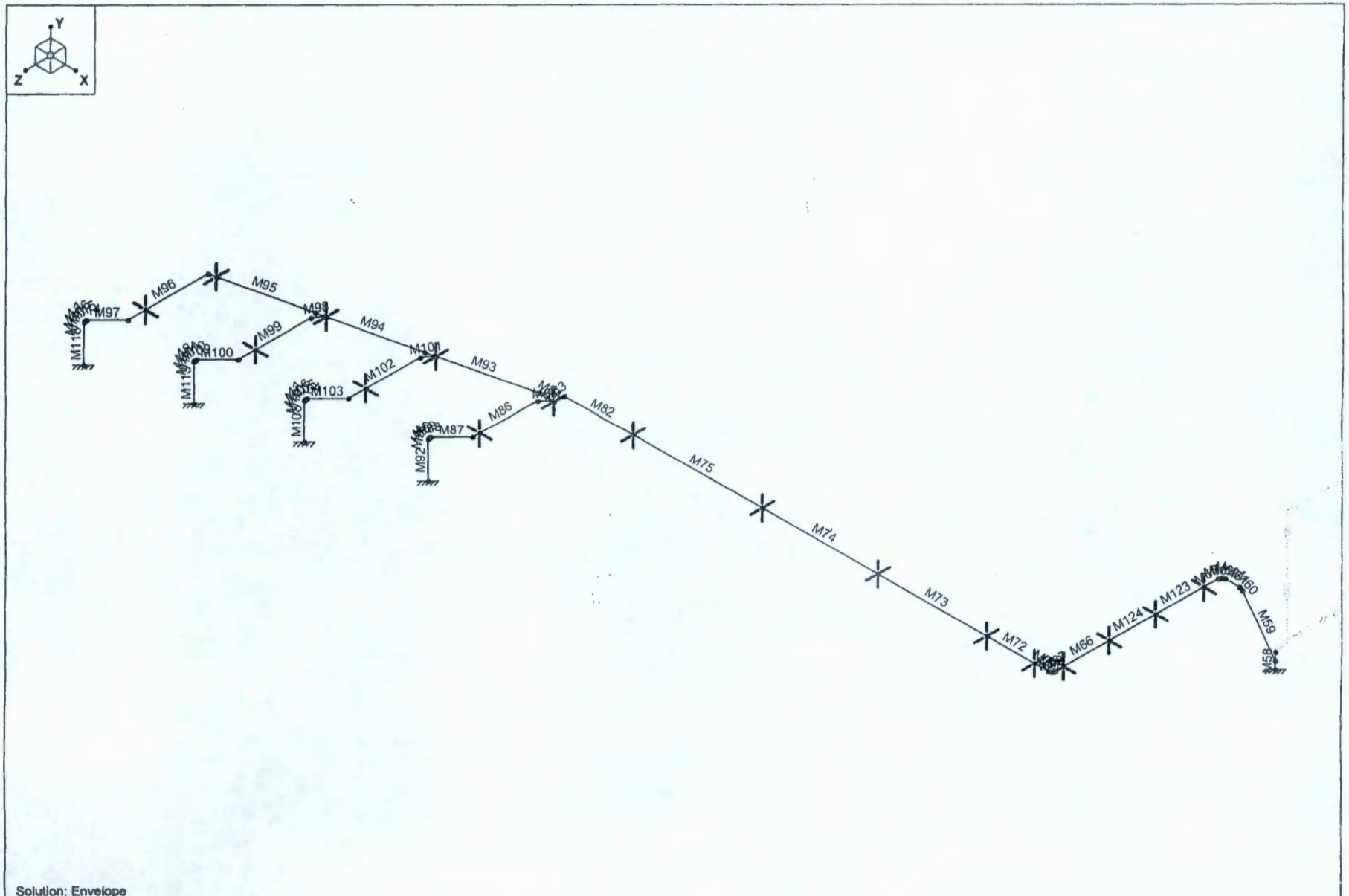
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 14, 2006 at 7:32 AM
145579-V-CA-005 - Model 4	Members (6-VOG-33-0155)	145579-V-CA-005 Model 4.r3d



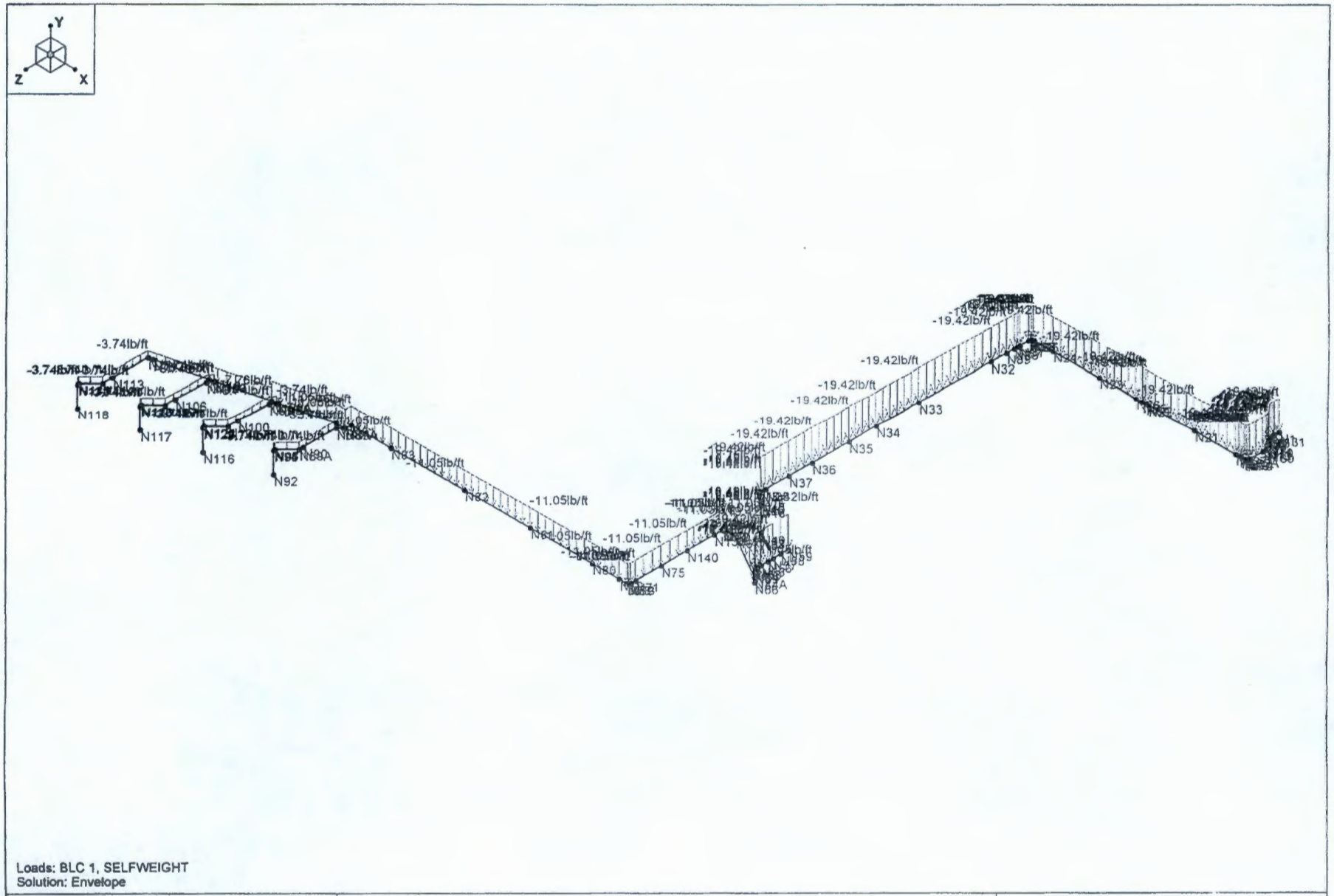
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 14, 2006 at 7:49 AM
145579-V-CA-005 - Model 4	Nodes and Supports (4-VOG-37-0370, etc)	145579-V-CA-005 Model 4.r3d



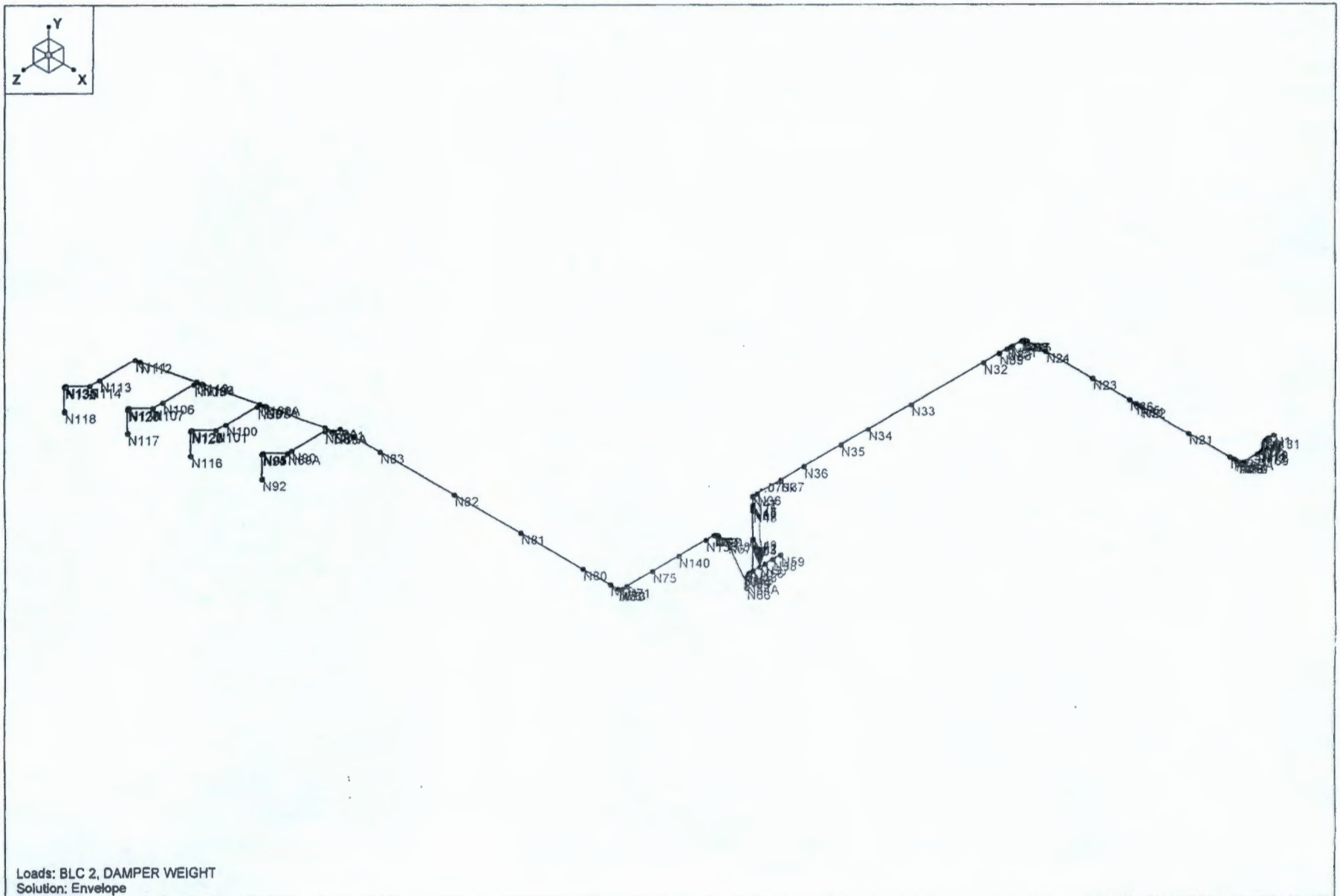
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 14, 2006 at 7:48 AM
145579-V-CA-005 - Model 4	Members (4-VOG-37-0370, etc)	145579-V-CA-005 Model 4.r3d



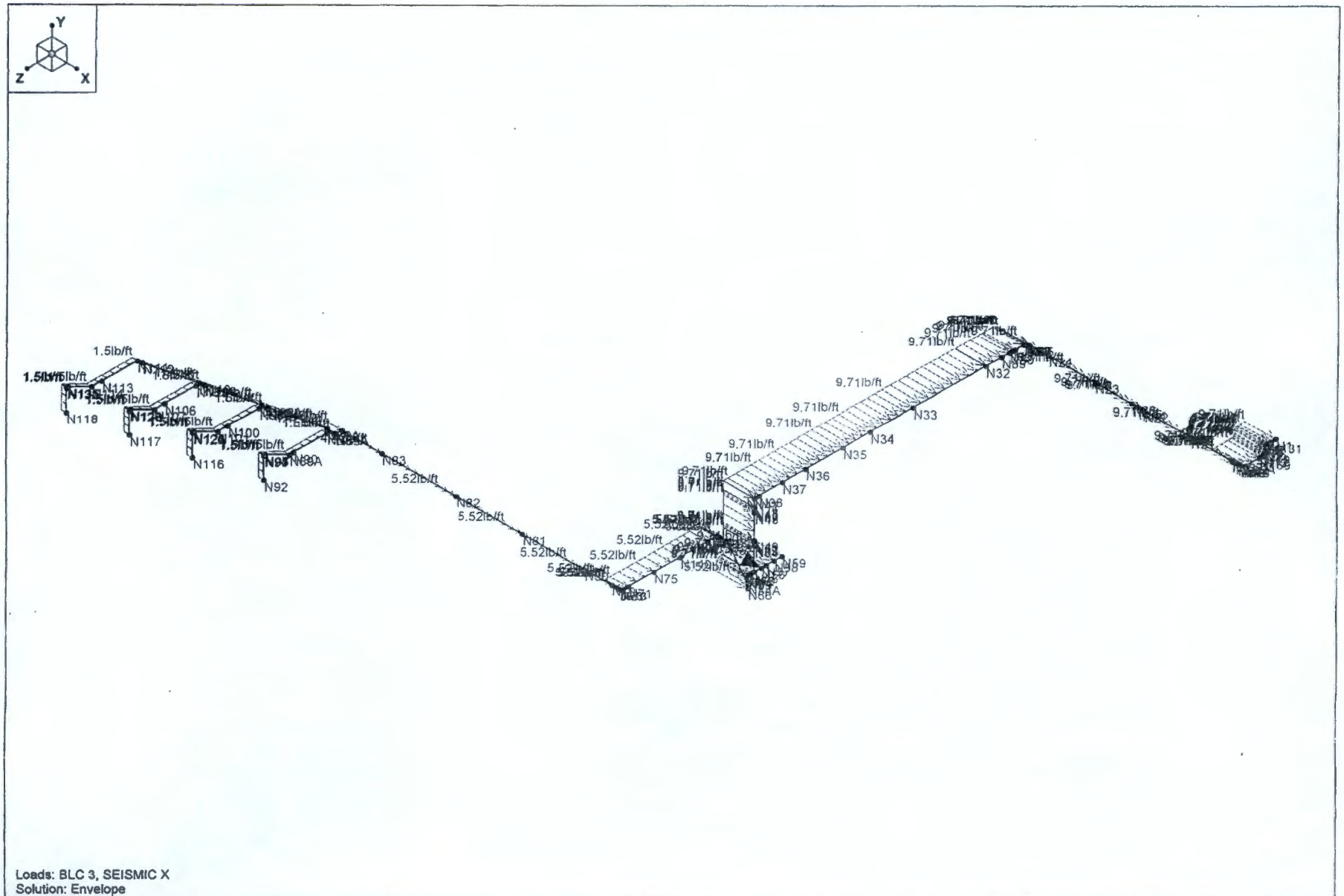
Loads: BLC 1, SELFWEIGHT
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 14, 2006 at 8:07 AM
145579-V-CA-005 - Model 4	BLC - Selfweight	145579-V-CA-005 Model 4.r3d



Loads: BLC 2, DAMPER WEIGHT
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 14, 2006 at 8:10 AM
145579-V-CA-005 - Model 4	BLC - Dampers	145579-V-CA-005 Model 4.r3d



DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 14, 2006 at 8:11 AM
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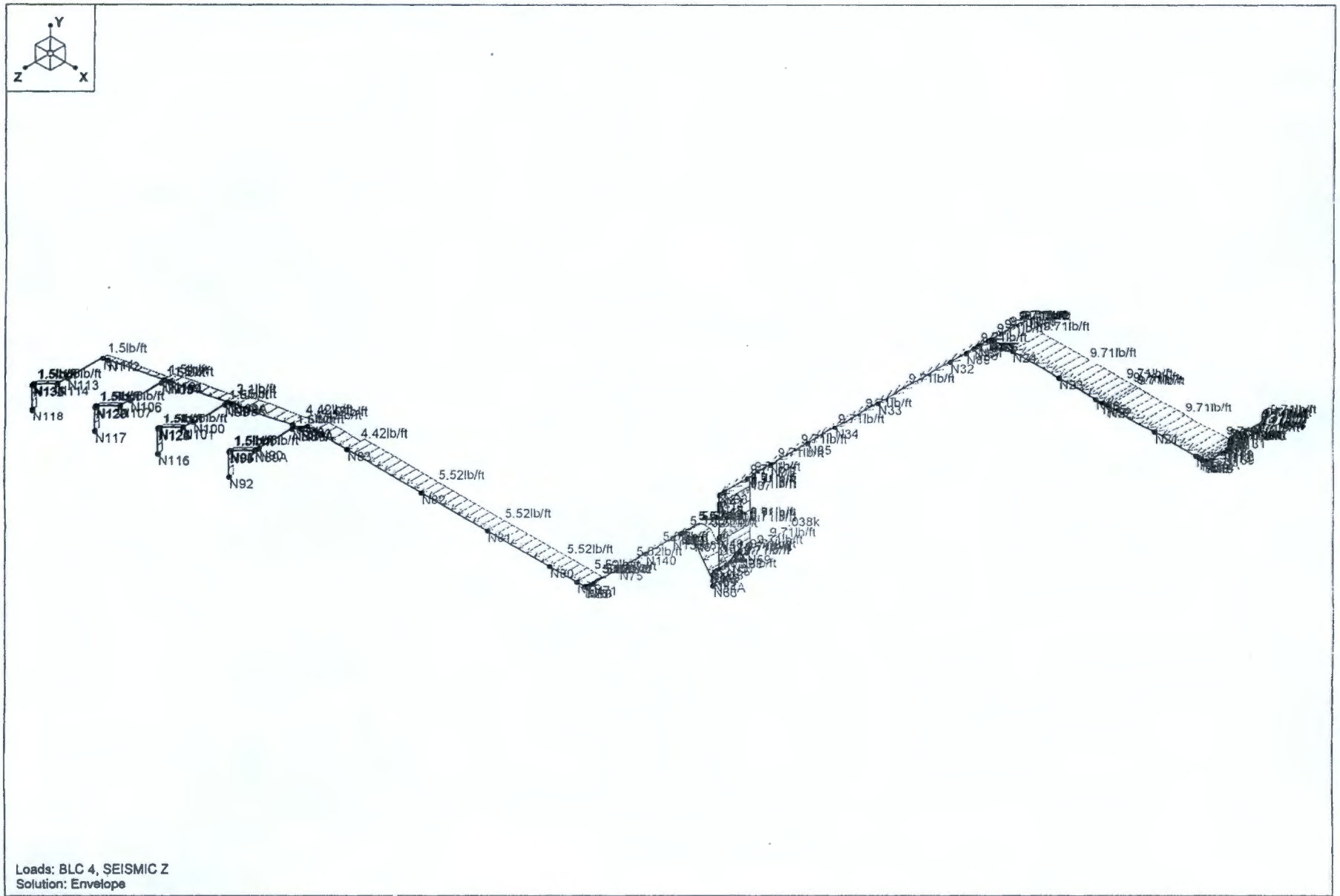
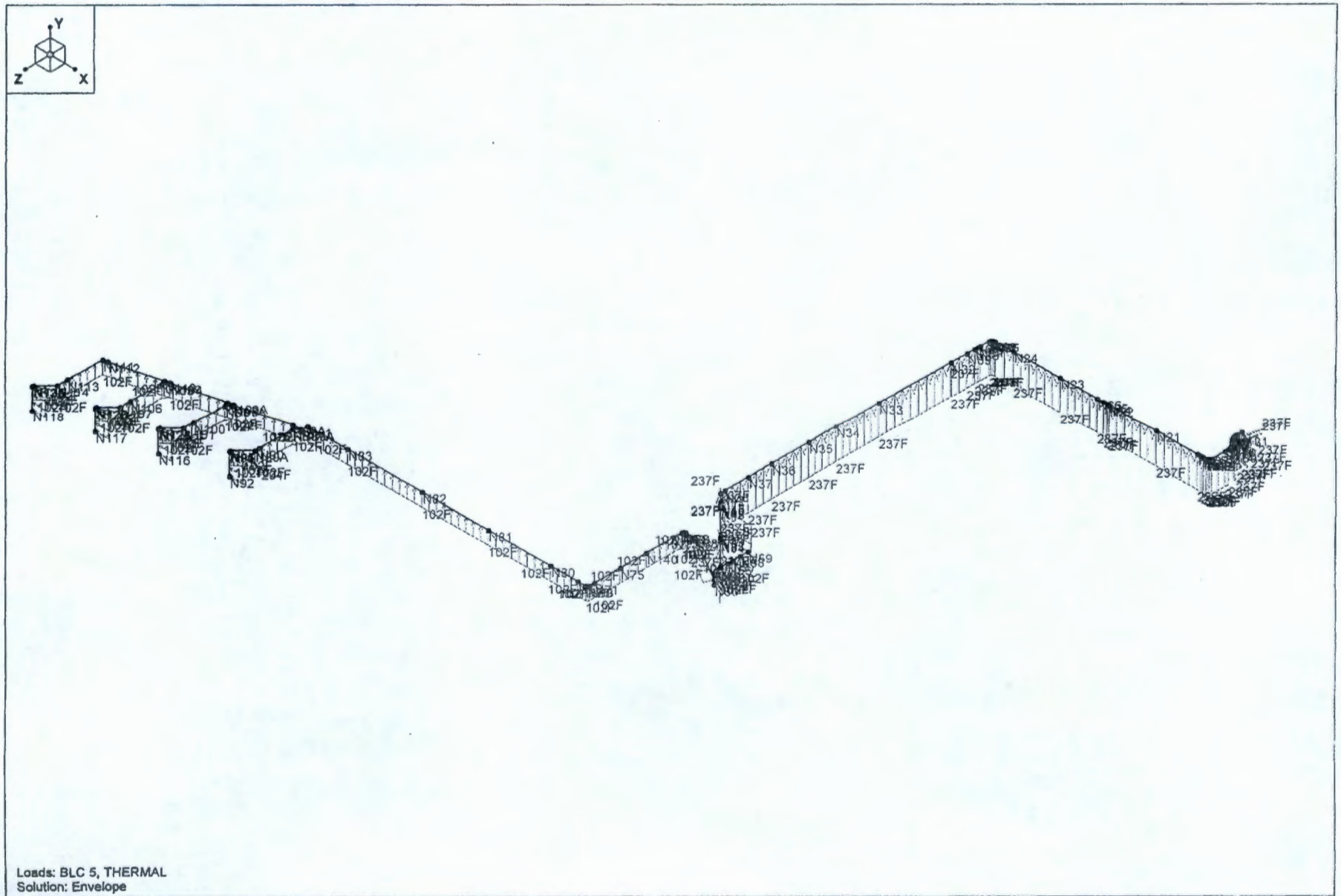


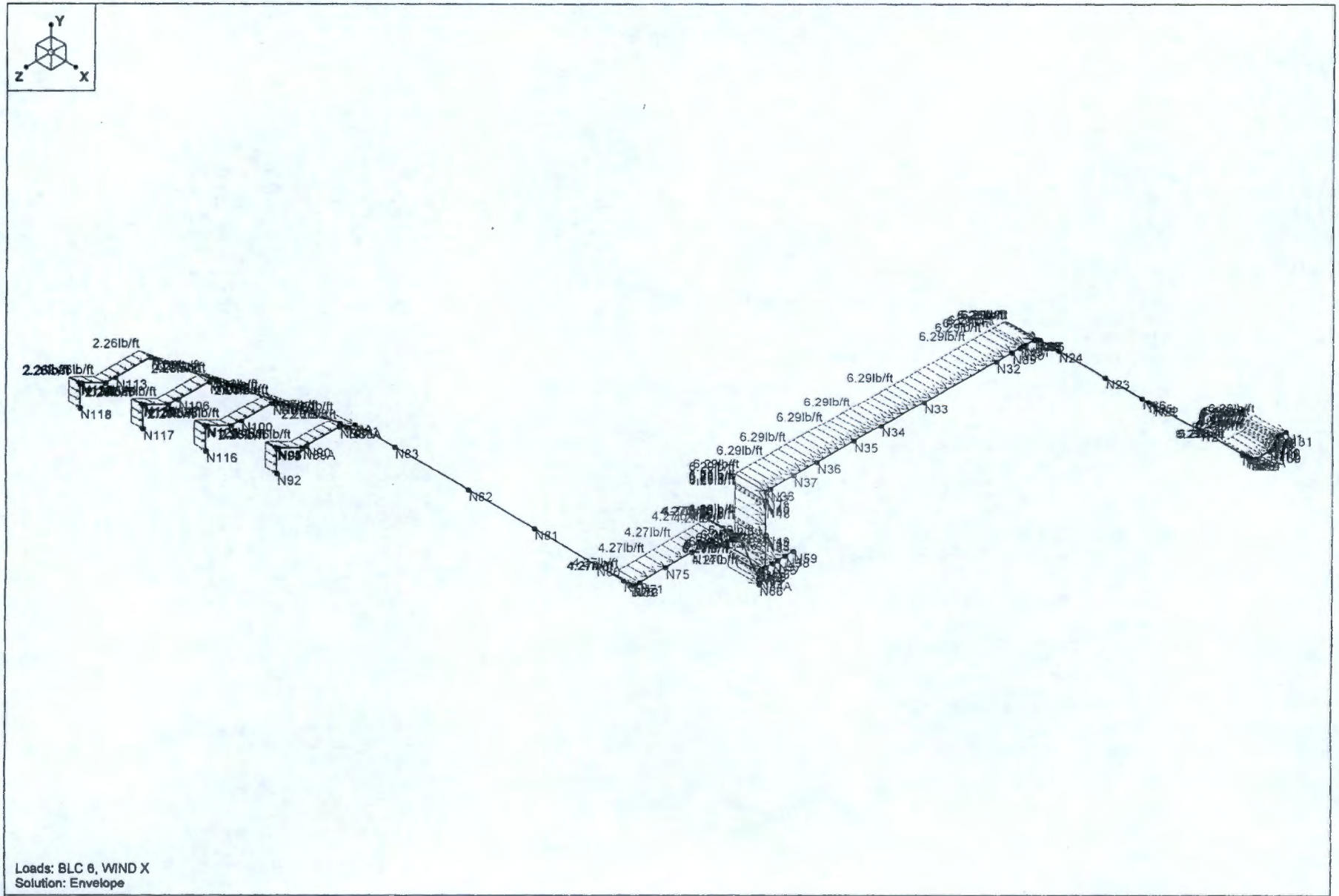
Loads: BLC 4, SEISMIC Z
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 14, 2006 at 8:12 AM
145579-V-CA-005 - Model 4	BLC - Seismic Z	145579-V-CA-005 Model 4.r3d

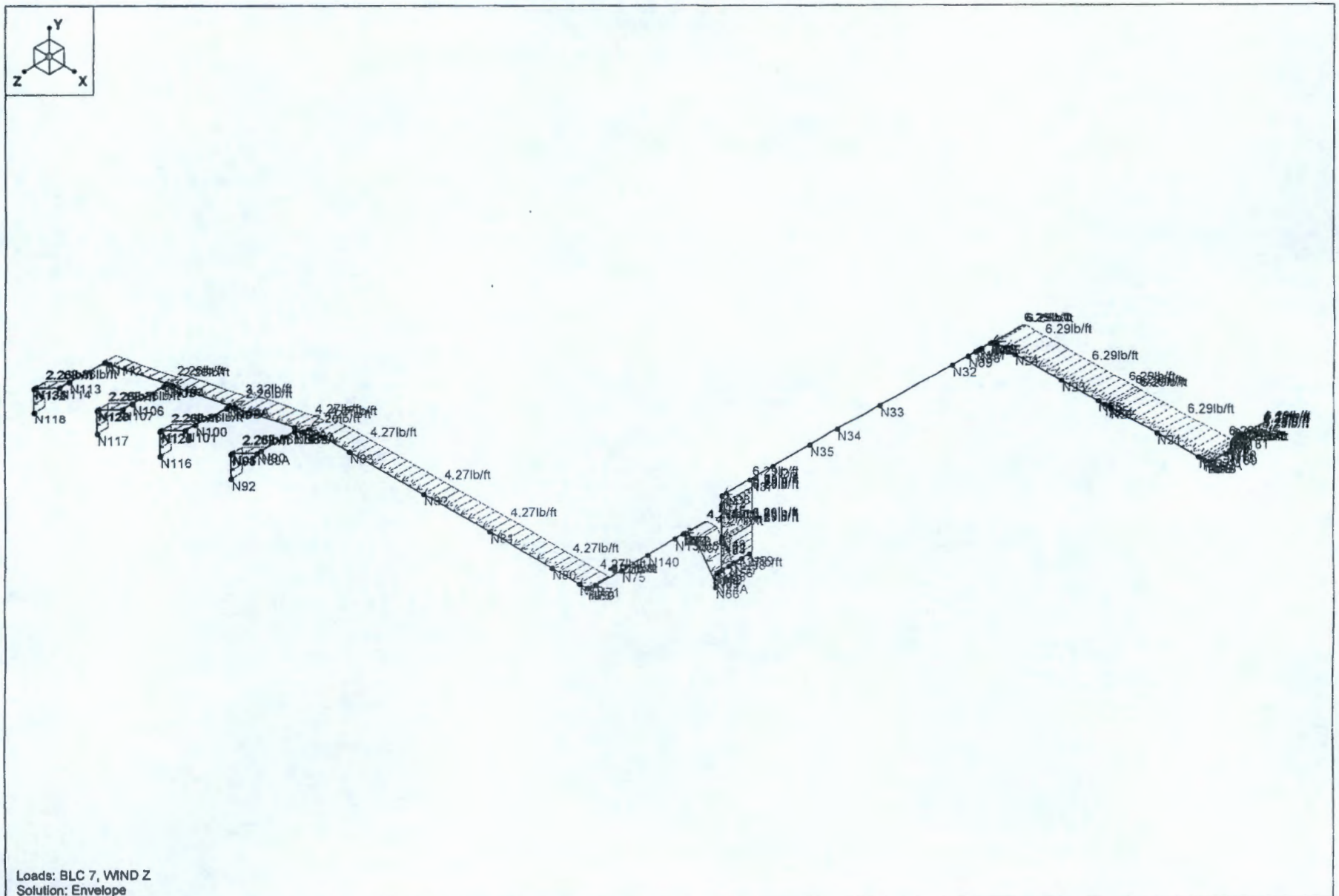


Loads: BLC 5, THERMAL
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 14, 2006 at 8:13 AM
145579-V-CA-005 - Model 4	BLC - Thermal	145579-V-CA-005 Model 4.r3d

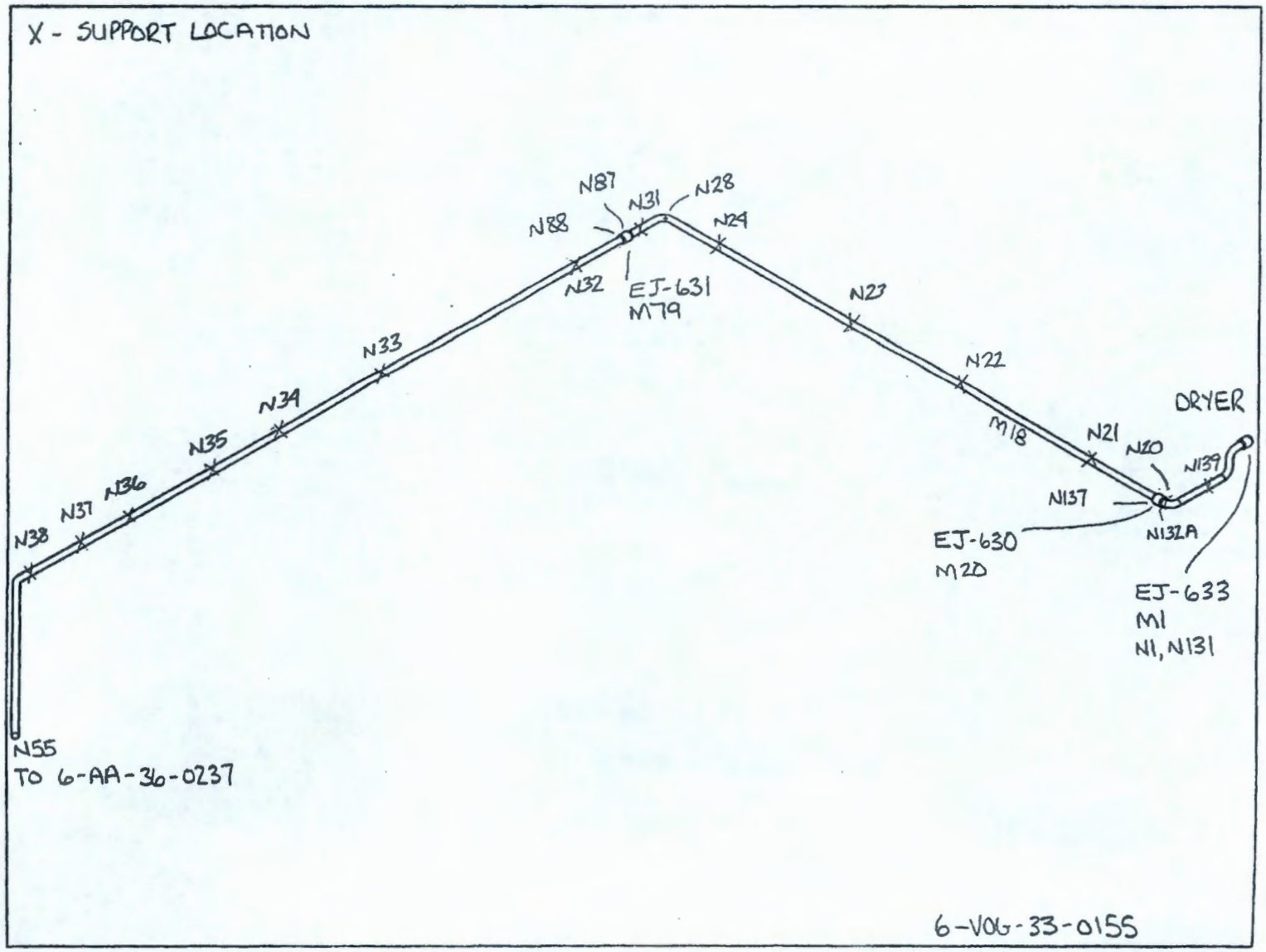


DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 14, 2006 at 8:14 AM
145579-V-CA-005 - Model 4	BLC - Wind X	145579-V-CA-005 Model 4.r3d



Loads: BLC 7, WIND Z
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones - DMJMH&N		Feb 14, 2006 at 8:17 AM
145579-V-CA-005 - Model 4	BLC - Wind Z	145579-V-CA-005 Model 4.r3d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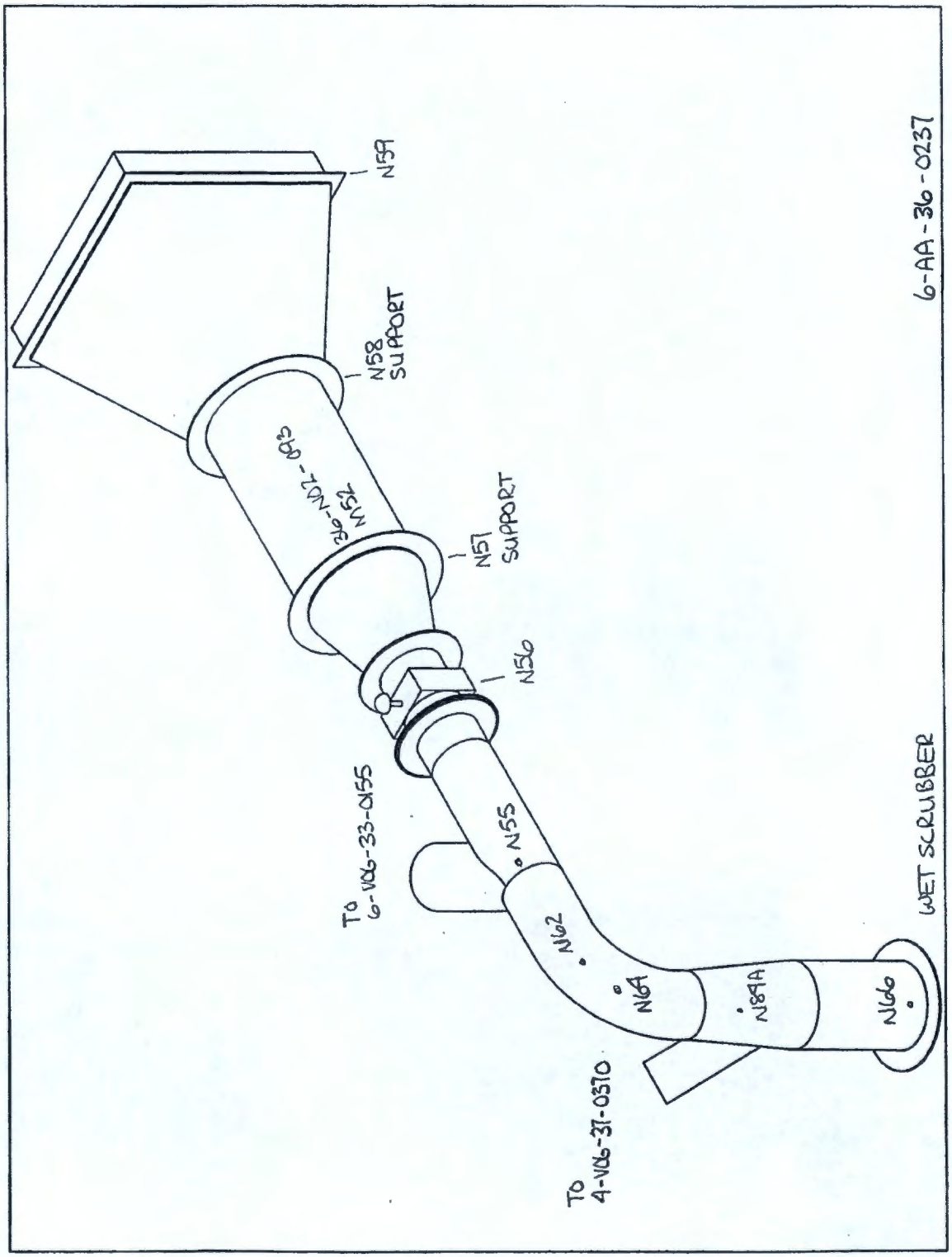
N87
N31
N28
N88
N29
N32
EJ-631
M79
N23
N33
N22
N34
DRYER
M18
N21
N35
N20
N1
N139
N36
N137
N37
N132A
N38
EJ-630
M20
EJ-633
M1
N1, N131
N55
TO 6-AA-36-0237
6-VOG-33-0155


N59
N58 SUPPORT
N57 SUPPORT
N56
N55
N62
N64
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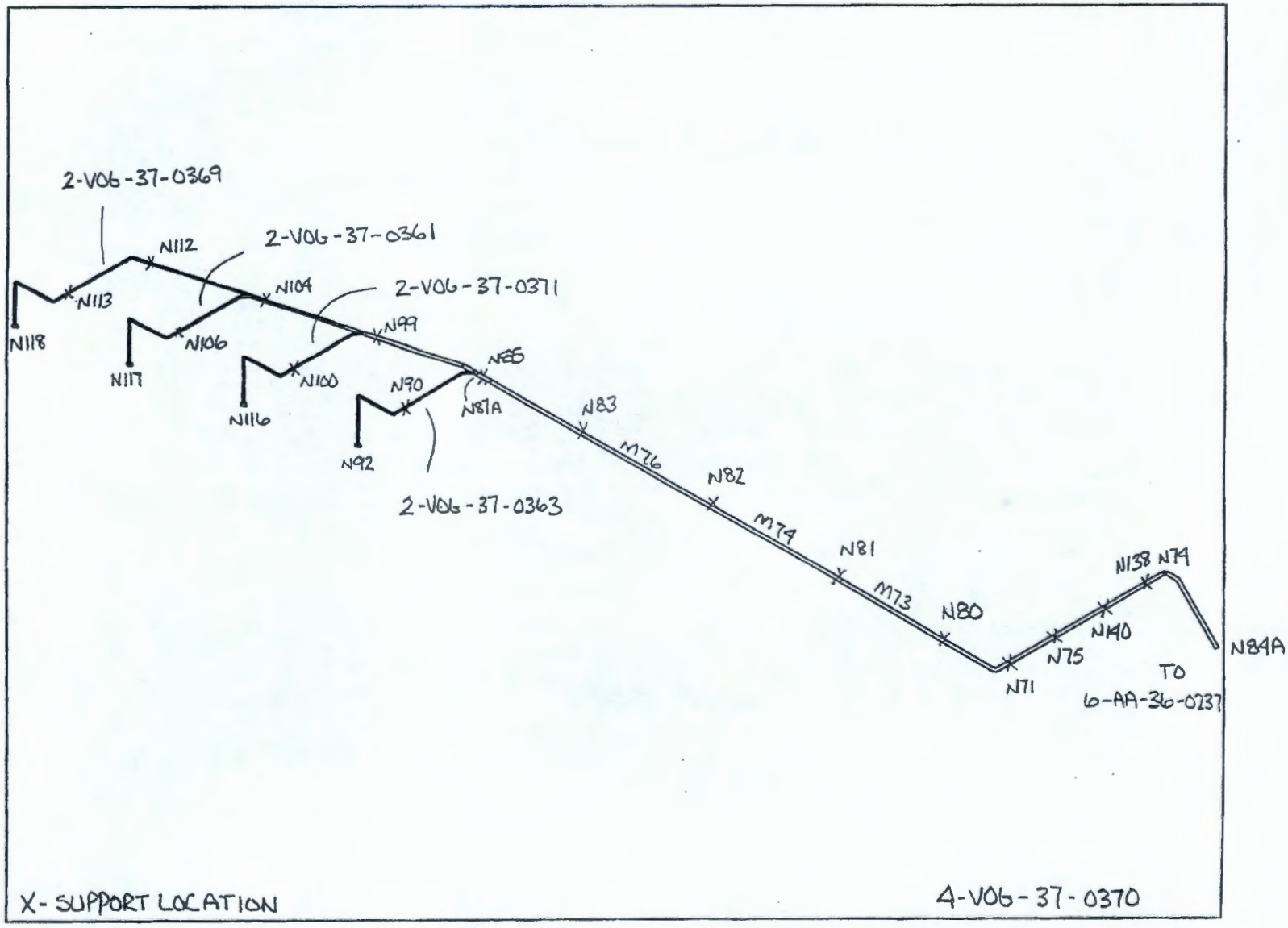
N66
TO 6-VAS-33-0155
TO 4-VAS-31-0370
WET SCRUBBER
6-AA-36-0237


2-V06-37-0369
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2-V06-37-0371
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N113
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N90
N85
N87A
N83
M76
N82
M74
N81
M73
N80
N71
N75
N140
N138
N79
N84A
TO
6-AA-36-0237
X- SUPPORT LOCATION
4-V06-37-0370

Global

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation	Yes
Include Warping	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Vertical Axis	Y

Hot Rolled Steel Code	AISC: ASD 9th
Cold Formed Steel Code	AISI 99: ASD
NDS Wood Code	NDS 91: ASD
NDS Temperature	< 100F
Concrete Code	ACI 1999

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections	Yes
Bad Framing Warnings	No
Unused Force Warnings	Yes

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diaphragm
1	N1	0	26	0	0	
2	N2	0	26	16.625	0	
3	N4	0	25.315	20.069	0	
4	N5	0	23.364	22.989	0	
5	N6	0	20.444	24.94	0	
6	N7	0	17	25.625	0	
7	N8	0	9	25.625	0	
8	N10	0	5.556	26.31	0	
9	N11	0	2.636	28.261	0	
10	N12	0	.685	31.181	0	
11	N13	0	0	34.625	0	
12	N14	0	0	91.125	0	
13	N16	-.685	0	94.569	0	
14	N17	-2.636	0	97.489	0	
15	N18	-5.556	0	99.44	0	
16	N19	-9	0	100.125	0	
17	N20	-17.75	0	100.125	0	
18	N21	-161.75	0	100.125	0	
19	N22	-305.75	0	100.125	0	
20	N23	-455.75	0	100.125	0	
21	N24	-599.75	0	100.125	0	
22	N25	-656.875	0	100.125	0	
23	N27	-660.319	0	100.81	0	
24	N28	-663.239	0	102.761	0	
25	N29	-665.19	0	105.681	0	
26	N30	-665.875	0	109.125	0	
27	N31	-665.875	0	136.125	0	
28	N32	-665.875	0	226.125	0	
29	N33	-665.875	0	448.125	0	
30	N34	-665.875	0	580.1875	0	
31	N35	-665.875	0	664.1875	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diaphragm
32	N36	-665.875	0	778.1875	0	
33	N37	-665.875	0	850.1875	0	
34	N38	-665.875	0	922.1875	0	
35	N41	-665.875	0	935.415	0	
36	N42	-664.196055	0	937.094691	0	
37	N43	-593.750067	0	1007.540048	0	
38	N45	-591.314686	-.685	1009.975718	0	
39	N46	-589.250139	-2.636	1012.039703	0	
40	N47	-587.870958	-5.556	1013.41977	0	
41	N48	-587.386165	-9	1013.903788	0	
42	N49	-587.386165	-75.125	1013.903788	0	
43	N51	-586.901372	-78.569	1014.387807	0	
44	N52	-585.522191	-81.489	1015.767874	0	
45	N53	-583.457386	-83.44	1017.832825	0	
46	N54	-581.022263	-84.125	1020.267528	0	
47	N55	-559.159	-84.125	1042.131	0	
48	N56	-559.159	-84.125	1020.438	0	
49	N57	-559.159	-84.125	1005.188	0	
50	N58	-559.159	-84.125	981.063	0	
51	N59	-559.159	-84.125	956.813	0	
52	N60	-559.159	-84.125	1052.563	0	
53	N61	-1523.6905	-30	1358.3125	0	
54	N62	-559.159	-84.81	1056.007	0	
55	N63	-559.159	-86.761	1058.927	0	
56	N64	-559.159	-89.681	1060.878	0	
57	N65	-559.159	-93.125	1061.563	0	
58	N66	-559.16	-120.125	1061.563	0	
59	N67	-630.346	-33	1061.563	0	
60	N68	-635.535	-30	1061.563	0	
61	N69	-652.839	-30	1355.3125	0	
62	N70	-646.035	-30	1061.563	0	
63	N71	-652.035	-30	1337.6835	0	
64	N72	-649.035	-30	1062.367	0	
65	N73	-652.035	-30	1352.3125	0	
66	N74	-651.231	-30	1064.563	0	
67	N75	-652.035	-30	1257.996	0	
68	N76	-652.035	-30	1067.564	0	
69	N77	-655.035	-30	1357.508652	0	
70	N78	-658.035	-30	1358.3125	0	
71	N79	-683.876	-30	1358.3125	0	
72	N80	-767.876	-30	1358.3125	0	
73	N81	-959.876	-30	1358.3125	0	
74	N82	-1163.876	-30	1358.3125	0	
75	N83	-1391.876	-30	1358.3125	0	
76	N84	-311.75	0	100.125	0	
77	N84A	-559.16	-106.6875	1061.563	0	
78	N85	-322.75	0	100.125	0	
79	N85A	-1541.6905	-48	1358.3125	0	
80	N86	-342.75	0	100.125	0	
81	N86A	-1569.6905	-48	1358.3125	0	
82	N87	-665.875	0	142.125	0	
83	N87A	-1544.9405	-48	1358.3125	0	
84	N88	-665.875	0	153.125	0	
85	N88A	-1557.503	-48	1370.875	0	
86	N89	-665.875	0	177.125	0	
87	N89A	-1557.503	-48	1484.875	0	
88	N90	-1557.503	-48	1472.375	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diaphragm
89	N92	-1596.503	-116.1875	1523.875	0	
90	N93	-1596.503	-51	1523.875	0	
91	N94	-1596.341524	-49.85195	1523.713524	0	
92	N95	-1595.88168	-48.87868	1523.25368	0	
93	N96	-1595.193474	-48.228361	1522.565474	0	
94	N97	-1594.38168	-48	1521.75368	0	
95	N97A	-1718.3155	-48	1392.1875	0	
96	N98	-1715.503	-48	1391.5625	0	
97	N99	-1727.503	-48	1406.9375	0	
98	N100	-1727.503	-48	1502.375	0	
99	N101	-1727.503	-48	1532.938	0	
100	N103	-1883.503	-48	1442.9375	0	
101	N104	-1871.503	-48	1427.5625	0	
102	N106	-1883.503	-48	1538.375	0	
103	N107	-1883.503	-48	1568.938	0	
104	N109	-1874.3155	-48	1428.1875	0	
105	N109A	-1731.503	-48	1395.25	0	
106	N110	-1887.503	-48	1431.25	0	
107	N111	-2039.503	-48	1466.3125	0	
108	N112	-2027.503	-48	1463.5625	0	
109	N113	-2039.503	-48	1574.375	0	
110	N114	-2039.503	-48	1604.938	0	
111	N116	-1754.509375	-116.1875	1559.943874	0	
112	N117	-1910.509728	-116.1875	1595.944227	0	
113	N118	-2066.509728	-116.1875	1631.944227	0	
114	N120	-1754.509375	-51	1559.943874	0	
115	N121	-1754.347898	-49.85195	1559.782398	0	
116	N122	-1753.888054	-48.87868	1559.322554	0	
117	N123	-1753.199848	-48.228361	1558.634348	0	
118	N124	-1752.388054	-48	1557.822554	0	
119	N126	-1910.509728	-51	1595.944227	0	
120	N127	-1910.348252	-49.85195	1595.782751	0	
121	N128	-1909.888408	-48.87868	1595.322907	0	
122	N129	-1909.200202	-48.228361	1594.634701	0	
123	N130	-1908.388408	-48	1593.822907	0	
124	N131	0	26	10	0	
125	N132	-2066.509728	-51	1631.944227	0	
126	N132A	-23.75	0	100.125	0	
127	N133	-2066.348252	-49.85195	1631.782751	0	
128	N134	-2065.888408	-48.87868	1631.322907	0	
129	N135	-2065.200202	-48.228361	1630.634701	0	
130	N136	-2064.388408	-48	1629.822907	0	
131	N137	-34.75	0	100.125	0	
132	N138	-652.035	-30	1092.748	0	
133	N139	0	0	45.625	0	
134	N140	-652.035	-30	1176.853	0	

Joint Boundary Conditions

	Joint Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N75	Reaction	Reaction				
2	N42						
3	N66	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N20	Reaction	Reaction	Reaction			
6	N21		Reaction	Reaction			
7	N22		Reaction	Reaction			

Joint Boundary Conditions (Continued)

	Joint Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
8	N23		Reaction	Reaction			
9	N24		Reaction	Reaction			
10	N31	Reaction	Reaction	Reaction			
11	N32	Reaction	Reaction				
12	N33	Reaction	Reaction				
13	N34	Reaction	Reaction				
14	N35	Reaction	Reaction				
15	N36	Reaction	Reaction				
16	N37	Reaction	Reaction				
17	N38	Reaction	Reaction				
18	N58	Reaction	Reaction				
19	N59						
20	N56						
21	N55						
22	N57	Reaction	Reaction				
23	N71	Reaction	Reaction				
24	N73						
25	N69						
26	N77						
27	N78						
28	N79		Reaction	Reaction			
29	N80		Reaction	Reaction			
30	N81		Reaction	Reaction			
31	N82		Reaction	Reaction			
32	N83		Reaction	Reaction			
33	N61						
34	N86						
35	N89						
36	N84A						
37	N85A		Reaction	Reaction			
38	N86A						
39	N87A						
40	N88A						
41	N89A						
42	N90	Reaction	Reaction				
43	N92	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
44	N93						
45	N94						
46	N95						
47	N96						
48	N97						
49	N97A						
50	N98		Reaction	Reaction			
51	N99						
52	N100	Reaction	Reaction				
53	N101						
54	N103						
55	N104		Reaction	Reaction			
56	N106	Reaction	Reaction				
57	N107						
58	N109						
59	N109A						
60	N110						
61	N111						
62	N112		Reaction	Reaction			
63	N113	Reaction	Reaction				
64	N114						

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Designer : **Kevin M. Jones - DMJMH&N**
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Joint Boundary Conditions (Continued)

	Joint Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
65	N116	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
66	N117	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
67	N118	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
68	N120						
69	N121						
70	N122						
71	N123						
72	N124						
73	N126						
74	N127						
75	N128						
76	N129						
77	N130						
78	N132						
79	N133						
80	N134						
81	N135						
82	N136						
83	N13						
84	N4						
85	N2		Reaction				
86	N7						
87	N131						
88	N139	Reaction	Reaction				
89	N140	Reaction	Reaction				
90	N138	Reaction	Reaction				

General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[lb/in^3]
1	gen_Conc3NW	3155	1372	.15	.6	.084
2	gen_Conc4NW	3644	1584	.15	.6	.084
3	gen_Conc3LW	2085	906	.15	.6	.064
4	gen_Conc4LW	2408	1047	.15	.6	.064
5	gen_Alum	10600	4077	.3	1.29	.1
6	gen_Steel	29000	11154	.3	.65	.284
7	RIGID	1e+7		0	0	0

General Section Sets

	Label	Shape	Type	Material	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	GEN1A	RE4X4	Beam	gen_Conc3NW	16	21.333	21.333	36.053
2	RIGID		None	RIGID	1e+6	1e+8	1e+8	1e+6

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[lb/in^3]	Yield[ksi]
1	A36	29000	11154	.3	.779	.283	36
2	A312TP316L	29000	11154	.3	1.013	.29	25
3	A312TP316	29000	11154	.3	1.013	.29	30

Hot Rolled Steel Section Sets

	Label	Shape	Design List	Type	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	2DIADUCT	2 in Sch 40...	Pipe	Beam	A36	Typical	.815	.522	.522	1.044
2	3DIADUCT	3 in Sch 40...	Pipe	Beam	A36	Typical	1.769	2.459	2.459	4.918

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Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Design List	Type	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
3	4DIADUCT	4 in Sch 40...	Pipe	Beam	A36	Typical	2.539	5.914	5.914	11.828
4	6DIADUCT	6 in Sch 40...	Pipe	Beam	A312TP316L	Typical	4.64	23.744	23.744	47.488

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Design List	Type	Material	Design Rules
1	M1	N1	N131			6DIADUCT	Pipe	Beam	A312TP3...	Typical
2	M2	N2	N4			6DIADUCT	Pipe	Beam	A312TP3...	Typical
3	M3	N4	N5			6DIADUCT	Pipe	Beam	A312TP3...	Typical
4	M4	N5	N6			6DIADUCT	Pipe	Beam	A312TP3...	Typical
5	M5	N6	N7			6DIADUCT	Pipe	Beam	A312TP3...	Typical
6	M6	N7	N8			6DIADUCT	Pipe	Beam	A312TP3...	Typical
7	M7	N8	N10			6DIADUCT	Pipe	Beam	A312TP3...	Typical
8	M8	N10	N11			6DIADUCT	Pipe	Beam	A312TP3...	Typical
9	M9	N11	N12			6DIADUCT	Pipe	Beam	A312TP3...	Typical
10	M10	N12	N13			6DIADUCT	Pipe	Beam	A312TP3...	Typical
11	M11	N13	N139			6DIADUCT	Pipe	Beam	A312TP3...	Typical
12	M12	N14	N16			6DIADUCT	Pipe	Beam	A312TP3...	Typical
13	M13	N16	N17			6DIADUCT	Pipe	Beam	A312TP3...	Typical
14	M14	N17	N18			6DIADUCT	Pipe	Beam	A312TP3...	Typical
15	M15	N18	N19			6DIADUCT	Pipe	Beam	A312TP3...	Typical
16	M16	N19	N20			6DIADUCT	Pipe	Beam	A312TP3...	Typical
17	M17	N20	N132A			6DIADUCT	Pipe	Beam	A312TP3...	Typical
18	M18	N21	N22			6DIADUCT	Pipe	Beam	A312TP3...	Typical
19	M19	N22	N84			6DIADUCT	Pipe	Beam	A312TP3...	Typical
20	M20	N23	N24			6DIADUCT	Pipe	Beam	A312TP3...	Typical
21	M21	N24	N25			6DIADUCT	Pipe	Beam	A312TP3...	Typical
22	M22	N25	N27			6DIADUCT	Pipe	Beam	A312TP3...	Typical
23	M23	N27	N28			6DIADUCT	Pipe	Beam	A312TP3...	Typical
24	M24	N28	N29			6DIADUCT	Pipe	Beam	A312TP3...	Typical
25	M25	N29	N30			6DIADUCT	Pipe	Beam	A312TP3...	Typical
26	M26	N30	N31			6DIADUCT	Pipe	Beam	A312TP3...	Typical
27	M27	N31	N87			6DIADUCT	Pipe	Beam	A312TP3...	Typical
28	M28	N32	N33			6DIADUCT	Pipe	Beam	A312TP3...	Typical
29	M29	N33	N34			6DIADUCT	Pipe	Beam	A312TP3...	Typical
30	M30	N34	N35			6DIADUCT	Pipe	Beam	A312TP3...	Typical
31	M31	N35	N36			6DIADUCT	Pipe	Beam	A312TP3...	Typical
32	M32	N36	N37			6DIADUCT	Pipe	Beam	A312TP3...	Typical
33	M33	N37	N38			6DIADUCT	Pipe	Beam	A312TP3...	Typical
34	M36	N38	N41			6DIADUCT	Pipe	Beam	A312TP3...	Typical
35	M37	N41	N42			6DIADUCT	Pipe	Beam	A312TP3...	Typical
36	M38	N42	N43			6DIADUCT	Pipe	Beam	A312TP3...	Typical
37	M39	N43	N45			6DIADUCT	Pipe	Beam	A312TP3...	Typical
38	M40	N45	N46			6DIADUCT	Pipe	Beam	A312TP3...	Typical
39	M41	N46	N47			6DIADUCT	Pipe	Beam	A312TP3...	Typical
40	M42	N47	N48			6DIADUCT	Pipe	Beam	A312TP3...	Typical
41	M43	N48	N49			6DIADUCT	Pipe	Beam	A312TP3...	Typical
42	M44	N49	N51			6DIADUCT	Pipe	Beam	A312TP3...	Typical
43	M45	N51	N52			6DIADUCT	Pipe	Beam	A312TP3...	Typical
44	M46	N52	N53			6DIADUCT	Pipe	Beam	A312TP3...	Typical
45	M47	N53	N54			6DIADUCT	Pipe	Beam	A312TP3...	Typical
46	M48	N54	N55			6DIADUCT	Pipe	Beam	A312TP3...	Typical
47	M49	N55	N56			6DIADUCT	Pipe	Beam	A312TP3...	Typical
48	M50	N56	N57			6DIADUCT	Pipe	Beam	A312TP3...	Typical
49	M51	N58	N59			6DIADUCT	Pipe	Beam	A312TP3...	Typical
50	M52	N57	N58			RIGID	None	None	RIGID	Typical
51	M53	N55	N60			6DIADUCT	Pipe	Beam	A312TP3...	Typical

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Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Design List	Type	Material	Design Rules
52	M54	N60	N62			6DIADUCT	Pipe	Beam	A312TP3...	Typical
53	M55	N62	N63			6DIADUCT	Pipe	Beam	A312TP3...	Typical
54	M56	N63	N64			6DIADUCT	Pipe	Beam	A312TP3...	Typical
55	M57	N64	N65			6DIADUCT	Pipe	Beam	A312TP3...	Typical
56	M58	N65	N66			6DIADUCT	Pipe	Beam	A312TP3...	Typical
57	M59	N84A	N67			4DIADUCT	Pipe	Beam	A36	Typical
58	M60	N67	N68			4DIADUCT	Pipe	Beam	A36	Typical
59	M61	N68	N70			4DIADUCT	Pipe	Beam	A36	Typical
60	M62	N70	N72			4DIADUCT	Pipe	Beam	A36	Typical
61	M63	N72	N74			4DIADUCT	Pipe	Beam	A36	Typical
62	M64	N74	N76			4DIADUCT	Pipe	Beam	A36	Typical
63	M65	N76	N138			4DIADUCT	Pipe	Beam	A36	Typical
64	M66	N75	N71			4DIADUCT	Pipe	Beam	A36	Typical
65	M67	N71	N73			4DIADUCT	Pipe	Beam	A36	Typical
66	M68	N73	N69			4DIADUCT	Pipe	Beam	A36	Typical
67	M69	N69	N77			4DIADUCT	Pipe	Beam	A36	Typical
68	M70	N77	N78			4DIADUCT	Pipe	Beam	A36	Typical
69	M71	N78	N79			4DIADUCT	Pipe	Beam	A36	Typical
70	M72	N79	N80			4DIADUCT	Pipe	Beam	A36	Typical
71	M73	N80	N81			4DIADUCT	Pipe	Beam	A36	Typical
72	M74	N81	N82			4DIADUCT	Pipe	Beam	A36	Typical
73	M75	N82	N83			4DIADUCT	Pipe	Beam	A36	Typical
74	M76	N84	N85			6DIADUCT	Pipe	Beam	A312TP3...	Typical
75	M77	N85	N86			6DIADUCT	Pipe	Beam	A312TP3...	Typical
76	M78	N86	N23			6DIADUCT	Pipe	Beam	A312TP3...	Typical
77	M79	N87	N88			6DIADUCT	Pipe	Beam	A312TP3...	Typical
78	M80	N88	N89			6DIADUCT	Pipe	Beam	A312TP3...	Typical
79	M81	N89	N32			6DIADUCT	Pipe	Beam	A312TP3...	Typical
80	M82	N83	N61			4DIADUCT	Pipe	Beam	A36	Typical
81	M83	N61	N85A			4DIADUCT	Pipe	Beam	A36	Typical
82	M84	N85A	N86A			4DIADUCT	Pipe	Beam	A36	Typical
83	M85	N87A	N88A			2DIADUCT	Pipe	Beam	A36	Typical
84	M86	N88A	N89A			2DIADUCT	Pipe	Beam	A36	Typical
85	M87	N89A	N97			2DIADUCT	Pipe	Beam	A36	Typical
86	M88	N97	N96			2DIADUCT	Pipe	Beam	A36	Typical
87	M89	N96	N95			2DIADUCT	Pipe	Beam	A36	Typical
88	M90	N95	N94			2DIADUCT	Pipe	Beam	A36	Typical
89	M91	N94	N93			2DIADUCT	Pipe	Beam	A36	Typical
90	M92	N93	N92			2DIADUCT	Pipe	Beam	A36	Typical
91	M93	N86A	N109A			4DIADUCT	Pipe	Beam	A36	Typical
92	M94	N109A	N110			3DIADUCT	Pipe	Beam	A36	Typical
93	M95	N110	N111			2DIADUCT	Pipe	Beam	A36	Typical
94	M96	N111	N114			2DIADUCT	Pipe	Beam	A36	Typical
95	M97	N114	N136			2DIADUCT	Pipe	Beam	A36	Typical
96	M98	N109	N103			2DIADUCT	Pipe	Beam	A36	Typical
97	M99	N103	N107			2DIADUCT	Pipe	Beam	A36	Typical
98	M100	N107	N130			2DIADUCT	Pipe	Beam	A36	Typical
99	M101	N97A	N99			2DIADUCT	Pipe	Beam	A36	Typical
100	M102	N99	N101			2DIADUCT	Pipe	Beam	A36	Typical
101	M103	N101	N124			2DIADUCT	Pipe	Beam	A36	Typical
102	M104	N124	N123			2DIADUCT	Pipe	Beam	A36	Typical
103	M105	N123	N122			2DIADUCT	Pipe	Beam	A36	Typical
104	M106	N122	N121			2DIADUCT	Pipe	Beam	A36	Typical
105	M107	N121	N120			2DIADUCT	Pipe	Beam	A36	Typical
106	M108	N120	N116			2DIADUCT	Pipe	Beam	A36	Typical
107	M109	N130	N129			2DIADUCT	Pipe	Beam	A36	Typical
108	M110	N129	N128			2DIADUCT	Pipe	Beam	A36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Design List	Type	Material	Design Rules
109	M111	N128	N127			2DIADUCT	Pipe	Beam	A36	Typical
110	M112	N127	N126			2DIADUCT	Pipe	Beam	A36	Typical
111	M113	N126	N117			2DIADUCT	Pipe	Beam	A36	Typical
112	M114	N136	N135			2DIADUCT	Pipe	Beam	A36	Typical
113	M115	N135	N134			2DIADUCT	Pipe	Beam	A36	Typical
114	M116	N134	N133			2DIADUCT	Pipe	Beam	A36	Typical
115	M117	N133	N132			2DIADUCT	Pipe	Beam	A36	Typical
116	M118	N132	N118			2DIADUCT	Pipe	Beam	A36	Typical
117	M119	N131	N2			6DIADUCT	Pipe	Beam	A312TP3...	Typical
118	M120	N132A	N137			6DIADUCT	Pipe	Beam	A312TP3...	Typical
119	M121	N137	N21			6DIADUCT	Pipe	Beam	A312TP3...	Typical
120	M122	N139	N14			6DIADUCT	Pipe	Beam	A312TP3...	Typical
121	M123	N138	N140			4DIADUCT	Pipe	Beam	A36	Typical
122	M124	N140	N75			4DIADUCT	Pipe	Beam	A36	Typical

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area (Me...	Surface (...
1	SELFWEIGHT	DL						121		
2	DAMPER WEIGHT	DL				1				
3	SEISMIC X	ELX				1		121		
4	SEISMIC Z	ELZ				1		121		
5	THERMAL	None						122		
6	WIND X	WLX						99		
7	WIND Z	WLZ						81		

Joint Loads and Enforced Displacements (BLC 2 : DAMPER WEIGHT)

	Joint Label	L,D,M	Direction	Magnitude[lb,k-ft in,rad lb*s^2/in]
1	N56	L	Y	-76

Joint Loads and Enforced Displacements (BLC 3 : SEISMIC X)

	Joint Label	L,D,M	Direction	Magnitude[lb,k-ft in,rad lb*s^2/in]
1	N56	L	X	38

Joint Loads and Enforced Displacements (BLC 4 : SEISMIC Z)

	Joint Label	L,D,M	Direction	Magnitude[lb,k-ft in,rad lb*s^2/in]
1	N56	L	Z	38

Member Distributed Loads (BLC 1 : SELFWEIGHT)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M59	Y	-11.05	-11.05	0	0
2	M60	Y	-11.05	-11.05	0	0
3	M61	Y	-11.05	-11.05	0	0
4	M62	Y	-11.05	-11.05	0	0
5	M63	Y	-11.05	-11.05	0	0
6	M64	Y	-11.05	-11.05	0	0
7	M65	Y	-11.05	-11.05	0	0
8	M1	Y	-19.42	-19.42	0	0
9	M2	Y	-19.42	-19.42	0	0
10	M3	Y	-19.42	-19.42	0	0
11	M4	Y	-19.42	-19.42	0	0
12	M5	Y	-19.42	-19.42	0	0
13	M6	Y	-19.42	-19.42	0	0

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Member Distributed Loads (BLC 1 : SELFWEIGHT) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
14	M7	Y	-19.42	-19.42	0	0
15	M8	Y	-19.42	-19.42	0	0
16	M9	Y	-19.42	-19.42	0	0
17	M10	Y	-19.42	-19.42	0	0
18	M11	Y	-19.42	-19.42	0	0
19	M12	Y	-19.42	-19.42	0	0
20	M13	Y	-19.42	-19.42	0	0
21	M14	Y	-19.42	-19.42	0	0
22	M15	Y	-19.42	-19.42	0	0
23	M16	Y	-19.42	-19.42	0	0
24	M17	Y	-19.42	-19.42	0	0
25	M18	Y	-19.42	-19.42	0	0
26	M19	Y	-19.42	-19.42	0	0
27	M20	Y	-19.42	-19.42	0	0
28	M21	Y	-19.42	-19.42	0	0
29	M22	Y	-19.42	-19.42	0	0
30	M23	Y	-19.42	-19.42	0	0
31	M24	Y	-19.42	-19.42	0	0
32	M25	Y	-19.42	-19.42	0	0
33	M26	Y	-19.42	-19.42	0	0
34	M27	Y	-19.42	-19.42	0	0
35	M28	Y	-19.42	-19.42	0	0
36	M29	Y	-19.42	-19.42	0	0
37	M30	Y	-19.42	-19.42	0	0
38	M31	Y	-19.42	-19.42	0	0
39	M32	Y	-19.42	-19.42	0	0
40	M33	Y	-19.42	-19.42	0	0
41	M36	Y	-19.42	-19.42	0	0
42	M37	Y	-19.42	-19.42	0	0
43	M38	Y	-19.42	-19.42	0	0
44	M39	Y	-19.42	-19.42	0	0
45	M40	Y	-19.42	-19.42	0	0
46	M41	Y	-19.42	-19.42	0	0
47	M42	Y	-19.42	-19.42	0	0
48	M43	Y	-19.42	-19.42	0	0
49	M44	Y	-19.42	-19.42	0	0
50	M45	Y	-19.42	-19.42	0	0
51	M46	Y	-19.42	-19.42	0	0
52	M47	Y	-19.42	-19.42	0	0
53	M48	Y	-19.42	-19.42	0	0
54	M49	Y	-19.42	-19.42	0	0
55	M50	Y	-19.42	-19.42	0	0
56	M51	Y	-19.42	-19.42	0	0
57	M53	Y	-19.42	-19.42	0	0
58	M54	Y	-19.42	-19.42	0	0
59	M55	Y	-19.42	-19.42	0	0
60	M56	Y	-19.42	-19.42	0	0
61	M57	Y	-19.42	-19.42	0	0
62	M58	Y	-19.42	-19.42	0	0
63	M76	Y	-19.42	-19.42	0	0
64	M77	Y	-19.42	-19.42	0	0
65	M78	Y	-19.42	-19.42	0	0
66	M79	Y	-19.42	-19.42	0	0
67	M80	Y	-19.42	-19.42	0	0
68	M81	Y	-19.42	-19.42	0	0
69	M66	Y	-11.05	-11.05	0	0
70	M67	Y	-11.05	-11.05	0	0

Company : DMJM H&N
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Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Member Distributed Loads (BLC 1 : SELFWEIGHT) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
71	M68	Y	-11.05	-11.05	0	0
72	M69	Y	-11.05	-11.05	0	0
73	M70	Y	-11.05	-11.05	0	0
74	M71	Y	-11.05	-11.05	0	0
75	M72	Y	-11.05	-11.05	0	0
76	M73	Y	-11.05	-11.05	0	0
77	M74	Y	-11.05	-11.05	0	0
78	M75	Y	-11.05	-11.05	0	0
79	M82	Y	-11.05	-11.05	0	0
80	M93	Y	-11.05	-11.05	0	0
81	M84	Y	-11.05	-11.05	0	0
82	M83	Y	-11.05	-11.05	0	0
83	M94	Y	-7.76	-7.76	0	0
84	M85	Y	-3.74	-3.74	0	0
85	M86	Y	-3.74	-3.74	0	0
86	M87	Y	-3.74	-3.74	0	0
87	M101	Y	-3.74	-3.74	0	0
88	M102	Y	-3.74	-3.74	0	0
89	M103	Y	-3.74	-3.74	0	0
90	M92	Y	-3.74	-3.74	0	0
91	M108	Y	-3.74	-3.74	0	0
92	M98	Y	-3.74	-3.74	0	0
93	M99	Y	-3.74	-3.74	0	0
94	M100	Y	-3.74	-3.74	0	0
95	M95	Y	-3.74	-3.74	0	0
96	M96	Y	-3.74	-3.74	0	0
97	M97	Y	-3.74	-3.74	0	0
98	M118	Y	-3.74	-3.74	0	0
99	M113	Y	-3.74	-3.74	0	0
100	M117	Y	-3.74	-3.74	0	0
101	M116	Y	-3.74	-3.74	0	0
102	M115	Y	-3.74	-3.74	0	0
103	M114	Y	-3.74	-3.74	0	0
104	M112	Y	-3.74	-3.74	0	0
105	M111	Y	-3.74	-3.74	0	0
106	M110	Y	-3.74	-3.74	0	0
107	M109	Y	-3.74	-3.74	0	0
108	M107	Y	-3.74	-3.74	0	0
109	M106	Y	-3.74	-3.74	0	0
110	M105	Y	-3.74	-3.74	0	0
111	M104	Y	-3.74	-3.74	0	0
112	M91	Y	-3.74	-3.74	0	0
113	M90	Y	-3.74	-3.74	0	0
114	M89	Y	-3.74	-3.74	0	0
115	M88	Y	-3.74	-3.74	0	0
116	M119	Y	-19.42	-19.42	0	0
117	M120	Y	-19.42	-19.42	0	0
118	M121	Y	-19.42	-19.42	0	0
119	M122	Y	-19.42	-19.42	0	0
120	M123	Y	-11.05	-11.05	0	0
121	M124	Y	-11.05	-11.05	0	0

Member Distributed Loads (BLC 3 : SEISMIC X)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M59	X	5.525	5.525	0	0
2	M60	X	5.525	5.525	0	0
3	M61	X	5.525	5.525	0	0

Member Distributed Loads (BLC 3 : SEISMIC X) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
4	M62	X	5.525	5.525	0	0
5	M63	X	5.525	5.525	0	0
6	M64	X	5.525	5.525	0	0
7	M65	X	5.525	5.525	0	0
8	M1	X	9.71	9.71	0	0
9	M2	X	9.71	9.71	0	0
10	M3	X	9.71	9.71	0	0
11	M4	X	9.71	9.71	0	0
12	M5	X	9.71	9.71	0	0
13	M6	X	9.71	9.71	0	0
14	M7	X	9.71	9.71	0	0
15	M8	X	9.71	9.71	0	0
16	M9	X	9.71	9.71	0	0
17	M10	X	9.71	9.71	0	0
18	M11	X	9.71	9.71	0	0
19	M12	X	9.71	9.71	0	0
20	M13	X	9.71	9.71	0	0
21	M14	X	9.71	9.71	0	0
22	M15	X	9.71	9.71	0	0
23	M16	X	9.71	9.71	0	0
24	M17	X	9.71	9.71	0	0
25	M18	X	9.71	9.71	0	0
26	M19	X	9.71	9.71	0	0
27	M20	X	9.71	9.71	0	0
28	M21	X	9.71	9.71	0	0
29	M22	X	9.71	9.71	0	0
30	M23	X	9.71	9.71	0	0
31	M24	X	9.71	9.71	0	0
32	M25	X	9.71	9.71	0	0
33	M26	X	9.71	9.71	0	0
34	M27	X	9.71	9.71	0	0
35	M28	X	9.71	9.71	0	0
36	M29	X	9.71	9.71	0	0
37	M30	X	9.71	9.71	0	0
38	M31	X	9.71	9.71	0	0
39	M32	X	9.71	9.71	0	0
40	M33	X	9.71	9.71	0	0
41	M36	X	9.71	9.71	0	0
42	M37	X	9.71	9.71	0	0
43	M38	X	9.71	9.71	0	0
44	M39	X	9.71	9.71	0	0
45	M40	X	9.71	9.71	0	0
46	M41	X	9.71	9.71	0	0
47	M42	X	9.71	9.71	0	0
48	M43	X	9.71	9.71	0	0
49	M44	X	9.71	9.71	0	0
50	M45	X	9.71	9.71	0	0
51	M46	X	9.71	9.71	0	0
52	M47	X	9.71	9.71	0	0
53	M48	X	9.71	9.71	0	0
54	M49	X	9.71	9.71	0	0
55	M50	X	9.71	9.71	0	0
56	M51	X	9.71	9.71	0	0
57	M53	X	9.71	9.71	0	0
58	M54	X	9.71	9.71	0	0
59	M55	X	9.71	9.71	0	0
60	M56	X	9.71	9.71	0	0

Member Distributed Loads (BLC 3 : SEISMIC X) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
61	M57	X	9.71	9.71	0	0
62	M58	X	9.71	9.71	0	0
63	M76	X	9.71	9.71	0	0
64	M77	X	9.71	9.71	0	0
65	M78	X	9.71	9.71	0	0
66	M79	X	9.71	9.71	0	0
67	M80	X	9.71	9.71	0	0
68	M81	X	9.71	9.71	0	0
69	M66	X	5.525	5.525	0	0
70	M67	X	5.525	5.525	0	0
71	M68	X	5.525	5.525	0	0
72	M69	X	5.525	5.525	0	0
73	M70	X	5.525	5.525	0	0
74	M71	X	5.525	5.525	0	0
75	M72	X	5.525	5.525	0	0
76	M73	X	5.525	5.525	0	0
77	M74	X	5.525	5.525	0	0
78	M75	X	5.525	5.525	0	0
79	M82	X	5.525	5.525	0	0
80	M93	X	5.525	5.525	0	0
81	M84	X	5.525	5.525	0	0
82	M83	X	5.525	5.525	0	0
83	M94	X	3.88	3.88	0	0
84	M85	X	1.87	1.87	0	0
85	M86	X	1.87	1.87	0	0
86	M87	X	1.87	1.87	0	0
87	M101	X	1.87	1.87	0	0
88	M102	X	1.87	1.87	0	0
89	M103	X	1.87	1.87	0	0
90	M92	X	1.87	1.87	0	0
91	M108	X	1.87	1.87	0	0
92	M98	X	1.87	1.87	0	0
93	M99	X	1.87	1.87	0	0
94	M100	X	1.87	1.87	0	0
95	M95	X	1.87	1.87	0	0
96	M96	X	1.87	1.87	0	0
97	M97	X	1.87	1.87	0	0
98	M118	X	1.87	1.87	0	0
99	M113	X	1.87	1.87	0	0
100	M117	X	1.87	1.87	0	0
101	M116	X	1.87	1.87	0	0
102	M115	X	1.87	1.87	0	0
103	M114	X	1.87	1.87	0	0
104	M112	X	1.87	1.87	0	0
105	M111	X	1.87	1.87	0	0
106	M110	X	1.87	1.87	0	0
107	M109	X	1.87	1.87	0	0
108	M107	X	1.87	1.87	0	0
109	M106	X	1.87	1.87	0	0
110	M105	X	1.87	1.87	0	0
111	M104	X	1.87	1.87	0	0
112	M91	X	1.87	1.87	0	0
113	M90	X	1.87	1.87	0	0
114	M89	X	1.87	1.87	0	0
115	M88	X	1.87	1.87	0	0
116	M119	X	9.71	9.71	0	0
117	M120	X	9.71	9.71	0	0

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Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Member Distributed Loads (BLC 3 : SEISMIC X) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
118	M121	X	9.71	9.71	0	0
119	M122	X	9.71	9.71	0	0
120	M123	X	5.525	5.525	0	0
121	M124	X	5.525	5.525	0	0

Member Distributed Loads (BLC 4 : SEISMIC Z)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M59	Z	5.525	5.525	0	0
2	M60	Z	5.525	5.525	0	0
3	M61	Z	5.525	5.525	0	0
4	M62	Z	5.525	5.525	0	0
5	M63	Z	5.525	5.525	0	0
6	M64	Z	5.525	5.525	0	0
7	M65	Z	5.525	5.525	0	0
8	M1	Z	9.71	9.71	0	0
9	M2	Z	9.71	9.71	0	0
10	M3	Z	9.71	9.71	0	0
11	M4	Z	9.71	9.71	0	0
12	M5	Z	9.71	9.71	0	0
13	M6	Z	9.71	9.71	0	0
14	M7	Z	9.71	9.71	0	0
15	M8	Z	9.71	9.71	0	0
16	M9	Z	9.71	9.71	0	0
17	M10	Z	9.71	9.71	0	0
18	M11	Z	9.71	9.71	0	0
19	M12	Z	9.71	9.71	0	0
20	M13	Z	9.71	9.71	0	0
21	M14	Z	9.71	9.71	0	0
22	M15	Z	9.71	9.71	0	0
23	M16	Z	9.71	9.71	0	0
24	M17	Z	9.71	9.71	0	0
25	M18	Z	9.71	9.71	0	0
26	M19	Z	9.71	9.71	0	0
27	M20	Z	9.71	9.71	0	0
28	M21	Z	9.71	9.71	0	0
29	M22	Z	9.71	9.71	0	0
30	M23	Z	9.71	9.71	0	0
31	M24	Z	9.71	9.71	0	0
32	M25	Z	9.71	9.71	0	0
33	M26	Z	9.71	9.71	0	0
34	M27	Z	9.71	9.71	0	0
35	M28	Z	9.71	9.71	0	0
36	M29	Z	9.71	9.71	0	0
37	M30	Z	9.71	9.71	0	0
38	M31	Z	9.71	9.71	0	0
39	M32	Z	9.71	9.71	0	0
40	M33	Z	9.71	9.71	0	0
41	M36	Z	9.71	9.71	0	0
42	M37	Z	9.71	9.71	0	0
43	M38	Z	9.71	9.71	0	0
44	M39	Z	9.71	9.71	0	0
45	M40	Z	9.71	9.71	0	0
46	M41	Z	9.71	9.71	0	0
47	M42	Z	9.71	9.71	0	0
48	M43	Z	9.71	9.71	0	0
49	M44	Z	9.71	9.71	0	0
50	M45	Z	9.71	9.71	0	0

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Member Distributed Loads (BLC 4 : SEISMIC Z) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
51	M46	Z	9.71	9.71	0	0
52	M47	Z	9.71	9.71	0	0
53	M48	Z	9.71	9.71	0	0
54	M49	Z	9.71	9.71	0	0
55	M50	Z	9.71	9.71	0	0
56	M51	Z	9.71	9.71	0	0
57	M53	Z	9.71	9.71	0	0
58	M54	Z	9.71	9.71	0	0
59	M55	Z	9.71	9.71	0	0
60	M56	Z	9.71	9.71	0	0
61	M57	Z	9.71	9.71	0	0
62	M58	Z	9.71	9.71	0	0
63	M76	Z	9.71	9.71	0	0
64	M77	Z	9.71	9.71	0	0
65	M78	Z	9.71	9.71	0	0
66	M79	Z	9.71	9.71	0	0
67	M80	Z	9.71	9.71	0	0
68	M81	Z	9.71	9.71	0	0
69	M66	Z	5.525	5.525	0	0
70	M67	Z	5.525	5.525	0	0
71	M68	Z	5.525	5.525	0	0
72	M69	Z	5.525	5.525	0	0
73	M70	Z	5.525	5.525	0	0
74	M71	Z	5.525	5.525	0	0
75	M72	Z	5.525	5.525	0	0
76	M73	Z	5.525	5.525	0	0
77	M74	Z	5.525	5.525	0	0
78	M75	Z	5.525	5.525	0	0
79	M82	Z	5.525	5.525	0	0
80	M93	Z	5.525	5.525	0	0
81	M84	Z	5.525	5.525	0	0
82	M83	Z	5.525	5.525	0	0
83	M94	Z	3.88	3.88	0	0
84	M85	Z	1.87	1.87	0	0
85	M86	Z	1.87	1.87	0	0
86	M87	Z	1.87	1.87	0	0
87	M101	Z	1.87	1.87	0	0
88	M102	Z	1.87	1.87	0	0
89	M103	Z	1.87	1.87	0	0
90	M92	Z	1.87	1.87	0	0
91	M108	Z	1.87	1.87	0	0
92	M98	Z	1.87	1.87	0	0
93	M99	Z	1.87	1.87	0	0
94	M100	Z	1.87	1.87	0	0
95	M95	Z	1.87	1.87	0	0
96	M96	Z	1.87	1.87	0	0
97	M97	Z	1.87	1.87	0	0
98	M118	Z	1.87	1.87	0	0
99	M113	Z	1.87	1.87	0	0
100	M117	Z	1.87	1.87	0	0
101	M116	Z	1.87	1.87	0	0
102	M115	Z	1.87	1.87	0	0
103	M114	Z	1.87	1.87	0	0
104	M112	Z	1.87	1.87	0	0
105	M111	Z	1.87	1.87	0	0
106	M110	Z	1.87	1.87	0	0
107	M109	Z	1.87	1.87	0	0

Member Distributed Loads (BLC 4 : SEISMIC Z) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
108	M107	Z	1.87	1.87	0	0
109	M106	Z	1.87	1.87	0	0
110	M105	Z	1.87	1.87	0	0
111	M104	Z	1.87	1.87	0	0
112	M91	Z	1.87	1.87	0	0
113	M90	Z	1.87	1.87	0	0
114	M89	Z	1.87	1.87	0	0
115	M88	Z	1.87	1.87	0	0
116	M119	Z	9.71	9.71	0	0
117	M120	Z	9.71	9.71	0	0
118	M121	Z	9.71	9.71	0	0
119	M122	Z	9.71	9.71	0	0
120	M123	Z	5.525	5.525	0	0
121	M124	Z	5.525	5.525	0	0

Member Distributed Loads (BLC 5 : THERMAL)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M1	T	237	237	0	0
2	M2	T	237	237	0	0
3	M3	T	237	237	0	0
4	M4	T	237	237	0	0
5	M5	T	237	237	0	0
6	M6	T	237	237	0	0
7	M7	T	237	237	0	0
8	M8	T	237	237	0	0
9	M9	T	237	237	0	0
10	M10	T	237	237	0	0
11	M11	T	237	237	0	0
12	M12	T	237	237	0	0
13	M13	T	237	237	0	0
14	M14	T	237	237	0	0
15	M15	T	237	237	0	0
16	M16	T	237	237	0	0
17	M17	T	237	237	0	0
18	M18	T	237	237	0	0
19	M19	T	237	237	0	0
20	M20	T	237	237	0	0
21	M21	T	237	237	0	0
22	M22	T	237	237	0	0
23	M23	T	237	237	0	0
24	M24	T	237	237	0	0
25	M25	T	237	237	0	0
26	M26	T	237	237	0	0
27	M27	T	237	237	0	0
28	M28	T	237	237	0	0
29	M29	T	237	237	0	0
30	M30	T	237	237	0	0
31	M31	T	237	237	0	0
32	M32	T	237	237	0	0
33	M33	T	237	237	0	0
34	M36	T	237	237	0	0
35	M37	T	237	237	0	0
36	M38	T	237	237	0	0
37	M39	T	237	237	0	0
38	M40	T	237	237	0	0
39	M41	T	237	237	0	0
40	M42	T	237	237	0	0

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Member Distributed Loads (BLC 5 : THERMAL) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
41	M43	T	237	237	0	0
42	M44	T	237	237	0	0
43	M45	T	237	237	0	0
44	M46	T	237	237	0	0
45	M47	T	237	237	0	0
46	M48	T	237	237	0	0
47	M49	T	102	102	0	0
48	M50	T	102	102	0	0
49	M51	T	102	102	0	0
50	M52	T	102	102	0	0
51	M53	T	102	102	0	0
52	M54	T	102	102	0	0
53	M55	T	102	102	0	0
54	M56	T	102	102	0	0
55	M57	T	102	102	0	0
56	M58	T	102	102	0	0
57	M59	T	102	102	0	0
58	M60	T	102	102	0	0
59	M61	T	102	102	0	0
60	M62	T	102	102	0	0
61	M63	T	102	102	0	0
62	M64	T	102	102	0	0
63	M65	T	102	102	0	0
64	M76	T	237	237	0	0
65	M77	T	237	237	0	0
66	M78	T	237	237	0	89
67	M79	T	237	237	0	0
68	M80	T	237	237	0	0
69	M81	T	237	237	0	46
70	M66	T	102	102	0	0
71	M67	T	102	102	0	0
72	M68	T	102	102	0	0
73	M69	T	102	102	0	0
74	M70	T	102	102	0	0
75	M71	T	102	102	0	0
76	M72	T	102	102	0	0
77	M73	T	102	102	0	0
78	M74	T	102	102	0	0
79	M75	T	102	102	0	0
80	M82	T	102	102	0	0
81	M83	T	102	102	0	0
82	M84	T	102	102	0	0
83	M85	T	102	102	0	0
84	M86	T	102	102	0	0
85	M93	T	102	102	0	0
86	M87	T	102	102	0	0
87	M92	T	102	102	0	0
88	M101	T	102	102	0	0
89	M102	T	102	102	0	0
90	M94	T	102	102	0	0
91	M88	T	102	102	0	0
92	M89	T	102	102	0	0
93	M90	T	102	102	0	0
94	M90	T	102	102	0	0
95	M104	T	102	102	0	0
96	M105	T	102	102	0	0
97	M106	T	102	102	0	0

Member Distributed Loads (BLC 5 : THERMAL) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
98	M107	T	102	102	0	0
99	M108	T	102	102	0	0
100	M103	T	102	102	0	0
101	M95	T	102	102	0	0
102	M98	T	102	102	0	0
103	M99	T	102	102	0	0
104	M113	T	102	102	0	0
105	M100	T	102	102	0	0
106	M109	T	102	102	0	0
107	M110	T	102	102	0	0
108	M111	T	102	102	0	0
109	M112	T	102	102	0	0
110	M96	T	102	102	0	0
111	M117	T	102	102	0	0
112	M116	T	102	102	0	0
113	M115	T	102	102	0	0
114	M114	T	102	102	0	0
115	M97	T	102	102	0	0
116	M118	T	102	102	0	0
117	M119	T	237	237	0	6.625
118	M120	T	237	237	0	0
119	M121	T	237	237	0	127
120	M122	T	237	237	0	40.5
121	M123	T	102	102	0	0
122	M124	T	102	102	0	75.12

Member Distributed Loads (BLC 6 : WIND X)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M1	X	9.16	9.16	0	0
2	M2	X	9.16	9.16	0	0
3	M3	X	9.16	9.16	0	0
4	M4	X	9.16	9.16	0	0
5	M5	X	9.16	9.16	0	0
6	M6	X	9.16	9.16	0	0
7	M7	X	9.16	9.16	0	0
8	M8	X	9.16	9.16	0	0
9	M9	X	9.16	9.16	0	0
10	M10	X	9.16	9.16	0	0
11	M11	X	9.16	9.16	0	0
12	M12	X	9.16	9.16	0	0
13	M13	X	9.16	9.16	0	0
14	M14	X	9.16	9.16	0	0
15	M23	X	9.16	9.16	0	0
16	M24	X	9.16	9.16	0	0
17	M25	X	9.16	9.16	0	0
18	M26	X	9.16	9.16	0	0
19	M27	X	9.16	9.16	0	0
20	M28	X	9.16	9.16	0	0
21	M29	X	9.16	9.16	0	0
22	M30	X	9.16	9.16	0	0
23	M31	X	9.16	9.16	0	0
24	M32	X	9.16	9.16	0	0
25	M33	X	9.16	9.16	0	0
26	M36	X	9.16	9.16	0	0
27	M37	X	9.16	9.16	0	0
28	M38	X	9.16	9.16	0	0
29	M39	X	9.16	9.16	0	0

Member Distributed Loads (BLC 6 : WIND X) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
30	M40	X	9.16	9.16	0	0
31	M41	X	9.16	9.16	0	0
32	M42	X	9.16	9.16	0	0
33	M43	X	9.16	9.16	0	0
34	M44	X	9.16	9.16	0	0
35	M45	X	9.16	9.16	0	0
36	M46	X	9.16	9.16	0	0
37	M47	X	9.16	9.16	0	0
38	M48	X	9.16	9.16	0	0
39	M49	X	9.16	9.16	0	0
40	M50	X	9.16	9.16	0	0
41	M51	X	9.16	9.16	0	0
42	M52	X	9.16	9.16	0	0
43	M53	X	9.16	9.16	0	0
44	M54	X	9.16	9.16	0	0
45	M55	X	9.16	9.16	0	0
46	M56	X	9.16	9.16	0	0
47	M57	X	9.16	9.16	0	0
48	M58	X	9.16	9.16	0	0
49	M59	X	6.22	6.22	0	0
50	M60	X	6.22	6.22	0	0
51	M63	X	6.22	6.22	0	0
52	M64	X	6.22	6.22	0	0
53	M65	X	6.22	6.22	0	0
54	M66	X	6.22	6.22	0	0
55	M67	X	6.22	6.22	0	0
56	M68	X	6.22	6.22	0	0
57	M69	X	6.22	6.22	0	0
58	M79	X	9.16	9.16	0	0
59	M80	X	9.16	9.16	0	0
60	M81	X	9.16	9.16	0	0
61	M83	X	6.22	6.22	0	0
62	M85	X	3.28	3.28	0	0
63	M86	X	3.28	3.28	0	0
64	M87	X	3.28	3.28	0	0
65	M88	X	3.28	3.28	0	0
66	M89	X	3.28	3.28	0	0
67	M90	X	3.28	3.28	0	0
68	M91	X	3.28	3.28	0	0
69	M92	X	3.28	3.28	0	0
70	M93	X	6.22	6.22	0	0
71	M94	X	4.84	4.84	0	0
72	M95	X	3.28	3.28	0	0
73	M96	X	3.28	3.28	0	0
74	M97	X	3.28	3.28	0	0
75	M98	X	3.28	3.28	0	0
76	M99	X	3.28	3.28	0	0
77	M100	X	3.28	3.28	0	0
78	M101	X	3.28	3.28	0	0
79	M102	X	3.28	3.28	0	0
80	M103	X	3.28	3.28	0	0
81	M104	X	3.28	3.28	0	0
82	M105	X	3.28	3.28	0	0
83	M106	X	3.28	3.28	0	0
84	M107	X	3.28	3.28	0	0
85	M108	X	3.28	3.28	0	0
86	M109	X	3.28	3.28	0	0

Member Distributed Loads (BLC 6 : WIND X) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
87	M110	X	3.28	3.28	0	0
88	M111	X	3.28	3.28	0	0
89	M112	X	3.28	3.28	0	0
90	M113	X	3.28	3.28	0	0
91	M114	X	3.28	3.28	0	0
92	M115	X	3.28	3.28	0	0
93	M116	X	3.28	3.28	0	0
94	M117	X	3.28	3.28	0	0
95	M118	X	3.28	3.28	0	0
96	M119	X	9.16	9.16	0	0
97	M122	X	9.16	9.16	0	0
98	M123	X	6.22	6.22	0	0
99	M124	X	6.22	6.22	0	0

Member Distributed Loads (BLC 7 : WIND Z)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M63	Z	6.22	6.22	0	0
2	M62	Z	6.22	6.22	0	0
3	M61	Z	6.22	6.22	0	0
4	M60	Z	6.22	6.22	0	0
5	M59	Z	6.22	6.22	0	0
6	M48	Z	9.16	9.16	0	0
7	M47	Z	9.16	9.16	0	0
8	M46	Z	9.16	9.16	0	0
9	M45	Z	9.16	9.16	0	0
10	M44	Z	9.16	9.16	0	0
11	M43	Z	9.16	9.16	0	0
12	M42	Z	9.16	9.16	0	0
13	M41	Z	9.16	9.16	0	0
14	M40	Z	9.16	9.16	0	0
15	M39	Z	9.16	9.16	0	0
16	M38	Z	9.16	9.16	0	0
17	M24	Z	9.16	9.16	0	0
18	M23	Z	9.16	9.16	0	0
19	M21	Z	9.16	9.16	0	0
20	M22	Z	9.16	9.16	0	0
21	M20	Z	9.16	9.16	0	0
22	M19	Z	9.16	9.16	0	0
23	M18	Z	9.16	9.16	0	0
24	M17	Z	9.16	9.16	0	0
25	M16	Z	9.16	9.16	0	0
26	M15	Z	9.16	9.16	0	0
27	M14	Z	9.16	9.16	0	0
28	M13	Z	9.16	9.16	0	0
29	M9	Z	9.16	9.16	0	0
30	M8	Z	9.16	9.16	0	0
31	M7	Z	9.16	9.16	0	0
32	M6	Z	9.16	9.16	0	0
33	M5	Z	9.16	9.16	0	0
34	M4	Z	9.16	9.16	0	0
35	M3	Z	9.16	9.16	0	0
36	M76	Z	9.16	9.16	0	0
37	M77	Z	9.16	9.16	0	0
38	M78	Z	9.16	9.16	0	0
39	M75	Z	6.22	6.22	0	0
40	M74	Z	6.22	6.22	0	0
41	M73	Z	6.22	6.22	0	0

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Member Distributed Loads (BLC 7 : WIND Z) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
42	M72	Z	6.22	6.22	0	0
43	M68	Z	6.22	6.22	0	0
44	M69	Z	6.22	6.22	0	0
45	M70	Z	6.22	6.22	0	0
46	M71	Z	6.22	6.22	0	0
47	M97	Z	3.28	3.28	0	0
48	M114	Z	3.28	3.28	0	0
49	M115	Z	3.28	3.28	0	0
50	M116	Z	3.28	3.28	0	0
51	M117	Z	3.28	3.28	0	0
52	M118	Z	3.28	3.28	0	0
53	M95	Z	3.28	3.28	0	0
54	M98	Z	3.28	3.28	0	0
55	M100	Z	3.28	3.28	0	0
56	M109	Z	3.28	3.28	0	0
57	M110	Z	3.28	3.28	0	0
58	M111	Z	3.28	3.28	0	0
59	M112	Z	3.28	3.28	0	0
60	M113	Z	3.28	3.28	0	0
61	M101	Z	3.28	3.28	0	0
62	M108	Z	3.28	3.28	0	0
63	M107	Z	3.28	3.28	0	0
64	M105	Z	3.28	3.28	0	0
65	M106	Z	3.28	3.28	0	0
66	M104	Z	3.28	3.28	0	0
67	M103	Z	3.28	3.28	0	0
68	M85	Z	3.28	3.28	0	0
69	M88	Z	3.28	3.28	0	0
70	M89	Z	3.28	3.28	0	0
71	M90	Z	3.28	3.28	0	0
72	M91	Z	3.28	3.28	0	0
73	M92	Z	3.28	3.28	0	0
74	M87	Z	3.28	3.28	0	0
75	M94	Z	4.84	4.84	0	0
76	M93	Z	6.22	6.22	0	0
77	M84	Z	6.22	6.22	0	0
78	M83	Z	6.22	6.22	0	0
79	M82	Z	6.22	6.22	0	0
80	M120	Z	9.16	9.16	0	0
81	M121	Z	9.16	9.16	0	0

Member Point Loads

Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
No Data to Print ...			

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	Normal Load	Yes			DL	1														
2	Normal + Wind (+X) + Thermal	Yes			DL	1	WLX	1	5	1										
3	Normal + Wind (-X) + Thermal	Yes			DL	1	WLX	-1	5	1										
4	Normal + Wind (+Z) + Thermal	Yes			DL	1	WLZ	1	5	1										
5	Normal + Wind (-Z) + Thermal	Yes			DL	1	WLZ	-1	5	1										
6	Normal + Seismic (+X)(+Z) +...	Yes			DL	1	ELX	1	ELZ	1	5	1								
7	Normal + Seismic (+X)(-Z) + ...	Yes			DL	1	ELX	1	ELZ	-1	5	1								
8	Normal + Seismic (-X)(+Z) + ...	Yes			DL	1	ELX	-1	ELZ	1	5	1								

Company : **DMJM H&N**
Designer : **Kevin M. Jones - DMJMH&N**
Job Number : **145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis**

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Load Combinations (Continued)

	Description	Sol.	PD	SR	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
9	Normal + Seismic (-X)(-Z) + ...	Yes			DL	1	ELX	-1	ELZ	-1	5	1								

Envelope Joint Reactions

	Joint		X [lb]	lc	Y [lb]	lc	Z [lb]	lc	MX [k-ft]	lc	MY [k-ft]	lc	MZ [k-ft]	lc
1	N75	max	203.242	7	73.544	1	0	1	0	1	0	1	0	1
2		min	-122.632	8	32.945	6	0	1	0	1	0	1	0	1
3	N66	max	-77.488	1	2579.157	6	1309.856	7	4.088	7	.938	7	2.064	6
4		min	-1018.607	6	219.977	1	-713.441	8	.091	1	.061	1	-.883	9
5	N1	max	0	1	0	1	0	1	4.414	7	.008	1	.25	1
6		min	0	1	0	1	0	1	.098	1	-.613	8	-.536	8
7	N20	max	280.991	8	-32.213	1	111.677	9	0	1	0	1	0	1
8		min	-1.777	1	-908.681	6	-111.677	8	0	1	0	1	0	1
9	N21	max	0	1	413.96	1	217.885	7	0	1	0	1	0	1
10		min	0	1	354.815	8	-186.797	8	0	1	0	1	0	1
11	N22	max	0	1	218.63	8	97.219	9	0	1	0	1	0	1
12		min	0	1	144.545	1	-70.168	6	0	1	0	1	0	1
13	N23	max	0	1	264.9	1	-.011	1	0	1	0	1	0	1
14		min	0	1	245.529	8	-322.351	8	0	1	0	1	0	1
15	N24	max	0	1	214.878	7	885.044	9	0	1	0	1	0	1
16		min	0	1	179.16	8	.005	1	0	1	0	1	0	1
17	N31	max	486.245	8	129.595	8	-.003	1	0	1	0	1	0	1
18		min	-822.371	7	77.5	7	-679.2	8	0	1	0	1	0	1
19	N32	max	327.249	3	303.172	7	0	1	0	1	0	1	0	1
20		min	.009	1	285.853	8	0	1	0	1	0	1	0	1
21	N33	max	154.398	8	328.837	6	0	1	0	1	0	1	0	1
22		min	-194.678	7	326.658	1	0	1	0	1	0	1	0	1
23	N34	max	76.488	3	126.119	1	0	1	0	1	0	1	0	1
24		min	-44.151	2	119.552	6	0	1	0	1	0	1	0	1
25	N35	max	65.282	8	189.972	6	0	1	0	1	0	1	0	1
26		min	-112.987	7	170.612	1	0	1	0	1	0	1	0	1
27	N36	max	238.496	9	170.131	1	0	1	0	1	0	1	0	1
28		min	4.185	6	55.786	6	0	1	0	1	0	1	0	1
29	N37	max	-28.088	1	579.849	6	0	1	0	1	0	1	0	1
30		min	-657.419	9	64.895	1	0	1	0	1	0	1	0	1
31	N38	max	1420.606	8	222.269	1	0	1	0	1	0	1	0	1
32		min	39.584	1	-829.739	6	0	1	0	1	0	1	0	1
33	N58	max	902.912	6	1284.919	8	0	1	0	1	0	1	0	1
34		min	-72.874	1	-135.279	1	0	1	0	1	0	1	0	1
35	N57	max	100.27	1	528.651	1	0	1	0	1	0	1	0	1
36		min	-1962.144	6	-1981.397	8	0	1	0	1	0	1	0	1
37	N71	max	572.818	8	71.095	1	0	1	0	1	0	1	0	1
38		min	-1002.669	7	-50.237	6	0	1	0	1	0	1	0	1
39	N79	max	0	1	43.562	8	-2.553	1	0	1	0	1	0	1
40		min	0	1	24.894	1	-604.561	8	0	1	0	1	0	1
41	N80	max	0	1	154.774	7	146.428	9	0	1	0	1	0	1
42		min	0	1	148.97	1	-25.578	6	0	1	0	1	0	1
43	N81	max	0	1	182.365	1	98.286	5	0	1	0	1	0	1
44		min	0	1	178.9	2	-109.579	4	0	1	0	1	0	1
45	N82	max	0	1	216.44	2	117.151	5	0	1	0	1	0	1
46		min	0	1	206.565	1	-113.157	4	0	1	0	1	0	1
47	N83	max	0	1	181.128	3	101.767	5	0	1	0	1	0	1
48		min	0	1	127.065	2	-105.346	4	0	1	0	1	0	1
49	N85A	max	0	1	193.16	7	242.018	7	0	1	0	1	0	1
50		min	0	1	161.632	1	-15.851	8	0	1	0	1	0	1
51	N90	max	83.07	3	33.257	1	0	1	0	1	0	1	0	1
52		min	343	1	4.823	7	0	1	0	1	0	1	0	1

Envelope Joint Reactions (Continued)

	Joint		X [lb]	lc	Y [lb]	lc	Z [lb]	lc	MX [k-ft]	lc	MY [k-ft]	lc	MZ [k-ft]	lc
53	N92	max	17.876	3	52.949	7	-.762	1	0	1	.007	3	.063	2
54		min	-12.16	2	27.903	1	-70.429	4	-.241	4	-.005	2	-.003	1
55	N98	max	0	1	186.393	2	164.475	9	0	1	0	1	0	1
56		min	0	1	160.073	3	-69.199	6	0	1	0	1	0	1
57	N100	max	115.692	3	34.929	1	0	1	0	1	0	1	0	1
58		min	-.415	1	8.931	7	0	1	0	1	0	1	0	1
59	N104	max	0	1	98.428	9	117.77	9	0	1	0	1	0	1
60		min	0	1	93.628	6	-43.65	6	0	1	0	1	0	1
61	N106	max	125.998	3	35.909	1	0	1	0	1	0	1	0	1
62		min	-.156	1	15.126	5	0	1	0	1	0	1	0	1
63	N112	max	0	1	37.985	1	72.617	9	0	1	0	1	0	1
64		min	0	1	34.748	4	-20.443	6	0	1	0	1	0	1
65	N113	max	101.832	3	35.623	1	0	1	0	1	0	1	0	1
66		min	-.866	1	8.482	5	0	1	0	1	0	1	0	1
67	N116	max	.258	1	49.178	7	-.052	1	0	1	.002	3	.153	2
68		min	-32.178	2	26.739	1	-63.566	4	-.217	4	-.012	2	0	1
69	N117	max	.031	1	46.9	5	-.032	1	0	1	.001	3	.173	2
70		min	-37.184	2	26.498	1	-66.603	4	-.231	4	-.013	2	0	1
71	N118	max	3.236	3	52.78	5	.042	1	0	1	.004	3	.154	2
72		min	-30.182	2	26.37	1	-74.221	4	-.261	6	-.01	2	0	1
73	N2	max	0	1	-155.533	1	0	1	0	1	0	1	0	1
74		min	0	1	-3607.697	6	0	1	0	1	0	1	0	1
75	N139	max	9.005	9	4739.731	6	0	1	0	1	0	1	0	1
76		min	-342.917	6	411.099	1	0	1	0	1	0	1	0	1
77	N140	max	-14.115	1	258.77	6	0	1	0	1	0	1	0	1
78		min	-316.745	7	70.477	1	0	1	0	1	0	1	0	1
79	N138	max	1156.227	9	86.928	1	0	1	0	1	0	1	0	1
80		min	44.287	1	-778.096	7	0	1	0	1	0	1	0	1
81	Totals:	max	2541.985	9	5083.97	6	2541.987	7						
82		min	-2541.985	6	5083.97	7	-2541.983	8						

Envelope Joint Displacements

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
1	N1	max	0	1	0	1	0	1	0	1	0	8	0	8
2		min	0	1	0	1	0	1	0	7	0	1	0	1
3	N2	max	.005	1	0	6	0	1	-2.665e-5	1	1.768e-4	8	2.017e-4	8
4		min	-.024	8	0	1	-.258	7	-1.277e-3	7	-2.249e-6	1	-9.412e-5	1
5	N4	max	.005	1	.004	7	0	1	-2.99e-5	1	2.121e-4	8	2.418e-4	8
6		min	-.023	8	0	1	-.249	7	-1.515e-3	7	-1.851e-6	1	-1.138e-4	1
7	N5	max	.004	1	.004	7	0	1	-3.01e-5	1	2.476e-4	8	2.761e-4	8
8		min	-.022	8	0	1	-.239	7	-1.694e-3	7	-2.512e-7	1	-1.322e-4	1
9	N6	max	.004	1	0	7	0	1	-2.789e-5	1	2.869e-4	8	3.065e-4	8
10		min	-.02	8	0	1	-.229	7	-1.828e-3	7	1.295e-6	1	-1.488e-4	1
11	N7	max	.003	1	0	1	0	1	-2.435e-5	1	3.317e-4	8	3.368e-4	8
12		min	-.019	8	-.006	8	-.221	7	-1.937e-3	7	1.56e-6	1	-1.643e-4	1
13	N8	max	.002	1	0	1	0	1	-1.549e-5	1	4.388e-4	8	4.081e-4	8
14		min	-.016	8	-.025	8	-.204	7	-2.171e-3	7	1.534e-7	1	-1.991e-4	1
15	N10	max	.001	1	0	1	0	1	-1.121e-5	1	4.835e-4	8	4.368e-4	8
16		min	-.014	8	-.032	8	-.195	7	-2.266e-3	7	4.191e-7	1	-2.146e-4	1
17	N11	max	0	1	0	1	0	1	-5.42e-6	1	5.227e-4	8	4.644e-4	8
18		min	-.012	8	-.034	8	-.183	7	-2.337e-3	7	1.965e-6	1	-2.312e-4	1
19	N12	max	0	1	0	1	0	1	3.223e-6	1	5.573e-4	8	4.951e-4	9
20		min	-.009	8	-.032	8	-.171	7	-2.362e-3	9	3.565e-6	1	-2.496e-4	1
21	N13	max	0	1	0	1	0	1	1.568e-5	1	5.908e-4	8	5.307e-4	9
22		min	-.007	8	-.025	8	-.162	7	-2.329e-3	8	3.962e-6	1	-2.693e-4	1
23	N14	max	.036	8	.024	8	0	1	2.609e-4	1	8.789e-4	7	1.138e-3	8

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Joint Displacements (Continued)

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
24		min	0	1	-.009	1	-.038	7	1.954e-4	8	-1.008e-6	1	-5.891e-4	1
25	N16	max	.037	6	.022	8	0	1	2.628e-4	1	8.906e-4	7	1.172e-3	8
26		min	0	1	-.01	1	-.029	7	2.274e-4	8	-1.055e-6	1	-6.091e-4	1
27	N17	max	.034	6	.019	8	0	1	2.649e-4	1	9.004e-4	7	1.195e-3	8
28		min	0	1	-.009	1	-.02	7	2.44e-4	8	-1.073e-6	1	-6.283e-4	1
29	N18	max	.029	6	.015	8	0	1	2.682e-4	7	9.082e-4	7	1.204e-3	8
30		min	0	1	-.008	1	-.013	7	2.502e-4	8	-1.069e-6	1	-6.464e-4	1
31	N19	max	.021	7	.01	8	0	1	2.687e-4	7	9.14e-4	7	1.198e-3	8
32		min	0	1	-.006	1	-.008	7	2.504e-4	8	-1.053e-6	1	-6.643e-4	1
33	N20	max	0	1	0	6	0	8	2.64e-4	7	9.204e-4	9	1.112e-3	8
34		min	0	8	0	1	0	9	2.45e-4	8	-1.006e-6	1	-7.127e-4	1
35	N21	max	1.2	7	0	8	0	8	1.876e-4	7	4.22e-4	9	-1.155e-4	8
36		min	0	1	0	1	0	7	1.554e-4	8	-3.06e-5	6	-5.275e-4	1
37	N22	max	.854	7	0	1	0	6	1.111e-4	7	6.1e-8	1	1.501e-4	1
38		min	0	1	0	8	0	9	6.576e-5	8	-1.877e-4	9	3.934e-5	8
39	N23	max	.551	7	0	8	0	8	3.142e-5	7	3.217e-4	9	-1.541e-5	9
40		min	0	1	0	1	0	1	-2.758e-5	8	-1.537e-8	1	-4.393e-5	1
41	N24	max	.205	7	0	8	0	1	-4.506e-5	7	0	1	4.396e-6	1
42		min	0	1	0	7	0	9	-1.172e-4	8	-1.115e-3	8	-2.488e-6	7
43	N25	max	.068	7	-.003	7	0	1	-7.539e-5	7	0	1	1.331e-4	8
44		min	0	1	-.004	8	-.078	9	-1.527e-4	8	-1.475e-3	7	4.464e-5	7
45	N27	max	.058	7	-.003	7	0	1	-7.709e-5	7	0	1	1.411e-4	8
46		min	0	1	-.005	8	-.08	9	-1.553e-4	8	-1.473e-3	7	4.164e-5	7
47	N28	max	.048	7	-.003	7	0	1	-7.843e-5	7	0	1	1.505e-4	8
48		min	0	1	-.005	8	-.078	9	-1.582e-4	8	-1.464e-3	7	3.844e-5	7
49	N29	max	.039	7	-.002	7	0	1	-7.957e-5	7	0	1	1.613e-4	8
50		min	0	1	-.005	8	-.072	9	-1.604e-4	8	-1.445e-3	7	3.491e-5	7
51	N30	max	.033	7	-.002	7	0	1	-8.073e-5	7	0	1	1.731e-4	8
52		min	0	1	-.004	8	-.065	7	-1.612e-4	8	-1.416e-3	7	3.105e-5	7
53	N31	max	0	7	0	7	0	8	-7.538e-5	7	0	1	2.654e-4	8
54		min	0	8	0	8	0	1	-1.259e-4	8	-8.764e-4	7	-7.791e-7	7
55	N32	max	0	1	0	8	-.025	1	1.994e-4	8	3.875e-4	7	5.731e-4	8
56		min	0	3	0	7	-2.664	9	1.816e-4	7	-1.364e-5	8	-1.001e-4	7
57	N33	max	0	7	0	1	-.025	1	-1.634e-4	7	6.84e-5	9	1.332e-3	8
58		min	0	8	0	6	-2.13	9	-1.665e-4	8	-1.403e-4	6	-3.491e-4	7
59	N34	max	0	2	0	6	-.025	1	-1.47e-7	1	9.19e-6	6	1.783e-3	8
60		min	0	3	0	1	-1.813	9	-3.759e-6	6	-2.181e-6	9	-4.971e-4	7
61	N35	max	0	7	0	1	-.025	1	3.165e-5	6	2.089e-5	7	2.071e-3	8
62		min	0	8	0	6	-1.611	9	1.843e-5	1	7.305e-7	1	-5.913e-4	7
63	N36	max	0	6	0	6	-.025	1	-1.885e-5	1	-3.174e-6	1	2.46e-3	8
64		min	0	9	0	1	-1.337	9	-7.701e-5	6	-7.516e-5	7	-7.192e-4	7
65	N37	max	0	9	0	1	-.025	1	1.84e-4	6	2.6e-4	9	2.706e-3	8
66		min	0	1	0	6	-1.164	9	-7.378e-6	1	1.044e-5	1	-7.999e-4	7
67	N38	max	0	1	0	6	-.025	1	4.968e-5	1	-4.046e-5	1	2.953e-3	8
68		min	0	8	0	1	-.991	9	-6.92e-4	6	-1.018e-3	9	-8.806e-4	7
69	N41	max	0	1	.012	6	-.025	1	7.975e-5	1	-6.329e-5	1	2.998e-3	8
70		min	-.018	9	0	1	-.959	9	-1.039e-3	6	-1.661e-3	9	-8.954e-4	7
71	N42	max	0	1	.019	6	-.025	1	8.244e-5	1	-6.696e-5	1	2.997e-3	8
72		min	-.017	9	-.002	1	-.952	9	-1.095e-3	6	-1.776e-3	9	-9.048e-4	7
73	N43	max	.09	6	.244	6	-.017	1	-8.88e-5	1	-1.321e-4	1	9.553e-5	8
74		min	-.07	9	-.015	1	-.572	7	-4.09e-3	7	-3.539e-3	9	-4.097e-4	7
75	N45	max	.093	6	.242	6	-.016	1	-1.079e-5	8	-1.313e-4	1	5.989e-6	1
76		min	-.073	9	-.014	1	-.555	7	-4.23e-3	7	-3.489e-3	9	-4.019e-4	6
77	N46	max	.095	6	.237	6	-.016	1	1.32e-4	8	-1.305e-4	1	1.459e-5	1
78		min	-.076	9	-.014	1	-.535	7	-4.366e-3	7	-3.424e-3	9	-6.306e-4	6
79	N47	max	.095	6	.229	6	-.015	1	2.747e-4	8	-1.294e-4	1	2.264e-5	1
80		min	-.077	9	-.014	1	-.515	7	-4.488e-3	7	-3.348e-3	9	-8.51e-4	6

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Joint Displacements (Continued)

	Joint		X [in]	Ic	Y [in]	Ic	Z [in]	Ic	X Rotation ...	Ic	Y Rotation ...	Ic	Z Rotation ...	Ic
81	N48	max	.092	6	.22	6	-.015	1	4.127e-4	8	-1.278e-4	1	7.253e-5	9
82		min	-.077	9	-.014	1	-.496	7	-4.593e-3	7	-3.267e-3	9	-1.057e-3	6
83	N49	max	-.001	1	.062	6	-.005	1	5.461e-4	8	-9.595e-5	1	6.455e-4	9
84		min	-.047	9	-.05	9	-.183	7	-4.017e-3	7	-1.746e-3	9	-1.909e-3	6
85	N51	max	0	1	.053	6	-.004	1	4.156e-4	8	-9.463e-5	1	6.412e-4	9
86		min	-.05	8	-.057	9	-.168	7	-3.851e-3	7	-1.672e-3	9	-1.793e-3	6
87	N52	max	0	1	.043	6	-.004	1	2.732e-4	8	-9.39e-5	1	6.364e-4	9
88		min	-.051	8	-.058	9	-.151	7	-3.667e-3	7	-1.609e-3	9	-1.667e-3	6
89	N53	max	0	1	.035	6	-.003	1	1.266e-4	8	-9.318e-5	1	6.386e-4	9
90		min	-.049	8	-.054	9	-.136	7	-3.461e-3	7	-1.549e-3	9	-1.537e-3	6
91	N54	max	0	1	.03	6	-.003	1	-1.493e-5	8	-9.183e-5	1	6.504e-4	9
92		min	-.044	8	-.046	9	-.124	7	-3.237e-3	7	-1.478e-3	9	-1.409e-3	6
93	N55	max	.011	6	.021	8	0	1	-5.38e-5	1	1.994e-4	6	7.496e-4	9
94		min	-.006	9	-.001	1	-.049	7	-1.159e-3	7	-4.757e-4	9	-7.26e-4	6
95	N56	max	.003	6	.005	8	0	1	4.537e-5	1	3.233e-4	6	7.496e-4	9
96		min	0	9	0	1	-.072	7	-5.294e-4	8	-1.083e-4	9	-7.26e-4	6
97	N57	max	0	6	0	8	0	1	0	1	0	6	7.496e-4	9
98		min	0	1	0	1	-.087	7	0	8	0	9	-7.26e-4	6
99	N58	max	0	1	0	1	0	1	0	1	0	6	7.496e-4	9
100		min	0	6	0	8	-.087	7	0	8	0	1	-7.26e-4	6
101	N59	max	0	7	0	1	0	1	-5.586e-6	1	2.793e-6	8	7.496e-4	9
102		min	0	8	0	8	-.113	7	-5.586e-6	8	-2.793e-6	7	-7.26e-4	6
103	N60	max	.013	6	.03	8	0	1	-5.276e-5	1	1.166e-4	6	6.681e-4	9
104		min	-.01	9	0	1	-.038	7	-1.086e-3	7	-3.323e-4	9	-6.14e-4	6
105	N61	max	0	1	.034	2	.017	8	1.244e-3	8	2.382e-4	8	8.616e-4	2
106		min	-.738	8	.002	1	-.003	7	-3.369e-4	7	-1.162e-4	7	-9.962e-5	3
107	N62	max	.013	6	.032	8	0	1	-5.058e-5	1	8.711e-5	6	6.38e-4	9
108		min	-.01	9	0	1	-.034	7	-1.077e-3	7	-3.052e-4	9	-5.75e-4	6
109	N63	max	.012	6	.032	8	0	1	-4.741e-5	1	5.32e-5	6	6.038e-4	9
110		min	-.01	9	0	1	-.029	7	-1.07e-3	7	-2.852e-4	9	-5.361e-4	6
111	N64	max	.01	6	.031	9	0	1	-4.342e-5	1	1.638e-5	6	5.649e-4	9
112		min	-.009	9	0	1	-.024	7	-1.058e-3	7	-2.721e-4	9	-5.003e-4	6
113	N65	max	.009	6	.028	7	0	1	-3.894e-5	1	-2.013e-5	6	5.189e-4	9
114		min	-.007	9	0	1	-.019	7	-1.034e-3	7	-2.663e-4	9	-4.688e-4	6
115	N66	max	0	6	0	1	0	8	0	1	0	1	0	9
116		min	0	1	0	6	0	7	0	7	0	7	0	6
117	N67	max	-.005	1	.092	6	-.002	1	-1.05e-4	1	1.217e-4	9	1.42e-3	6
118		min	-.048	9	-.004	1	-.265	7	-8.261e-4	7	-6.2e-4	6	-5.69e-5	1
119	N68	max	-.005	1	.085	6	-.002	1	-2.273e-5	8	4.953e-4	9	1.803e-3	6
120		min	-.056	9	-.004	1	-.268	7	-3.547e-4	7	-2.463e-4	6	-6.323e-5	1
121	N69	max	.025	7	.002	7	.067	8	4.749e-5	1	1.376e-3	7	1.464e-4	7
122		min	-.036	8	0	1	-.028	7	-1.061e-4	7	-2.338e-3	8	-1.686e-5	1
123	N70	max	-.004	1	.063	6	0	1	8.224e-4	8	1.311e-3	9	2.222e-3	6
124		min	-.064	9	-.003	1	-.264	7	-1.091e-4	1	1.424e-4	1	-6.97e-5	1
125	N71	max	0	7	0	6	.055	8	1.369e-5	1	1.17e-3	7	2.671e-4	7
126		min	0	8	0	1	-.043	7	-1.053e-4	7	-1.542e-3	8	-1.978e-5	1
127	N72	max	-.004	1	.056	6	0	1	1.079e-3	6	1.577e-3	9	2.246e-3	6
128		min	-.066	9	-.003	1	-.26	7	-1.095e-4	1	1.472e-4	1	-7.05e-5	1
129	N73	max	.021	7	.002	7	.067	8	4.463e-5	1	1.447e-3	7	1.672e-4	7
130		min	-.029	8	0	1	-.031	7	-1.064e-4	7	-2.252e-3	8	-1.705e-5	1
131	N74	max	-.004	1	.048	6	0	1	1.301e-3	6	1.83e-3	9	2.224e-3	6
132		min	-.063	9	-.003	1	-.256	7	-1.094e-4	1	1.513e-4	1	-7.067e-5	1
133	N75	max	0	8	0	6	0	1	1.113e-4	7	5.142e-4	8	8.336e-4	6
134		min	0	7	0	1	-.106	7	-7.06e-6	1	-2.019e-4	7	-3.47e-5	1
135	N76	max	-.004	1	.042	6	0	1	1.466e-3	6	2.045e-3	9	2.197e-3	6
136		min	-.058	9	-.002	1	-.252	7	-1.085e-4	1	1.538e-4	1	-7.034e-5	1
137	N77	max	.026	7	.002	7	.064	8	4.983e-5	1	1.27e-3	7	1.278e-4	7

Envelope Joint Displacements (Continued)

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
138		min	-.043	8	0	1	-.023	7	-1.046e-4	7	-2.394e-3	8	-1.733e-5	1
139	N78	max	.025	7	.001	7	.057	8	5.197e-5	1	1.149e-3	7	1.115e-4	7
140		min	-.048	8	0	1	-.019	7	-1.042e-4	7	-2.42e-3	8	-1.827e-5	1
141	N79	max	.005	7	0	1	0	8	6.854e-5	1	4.363e-4	7	1.066e-5	7
142		min	-.068	8	0	8	0	1	-1.112e-4	7	-1.652e-3	8	-3.426e-5	1
143	N80	max	0	1	0	1	0	6	1.224e-4	1	6.913e-4	8	2.179e-4	1
144		min	-.136	8	0	7	0	9	-1.338e-4	7	-2.584e-4	7	2.055e-4	9
145	N81	max	0	1	0	2	0	4	4.038e-4	8	7.118e-5	7	-5.925e-5	3
146		min	-.289	8	0	1	0	5	-1.854e-4	7	-1.861e-4	8	-8.85e-5	2
147	N82	max	0	1	0	1	0	4	7.078e-4	8	1.444e-4	8	3.627e-4	2
148		min	-.451	8	0	2	0	5	-2.402e-4	7	-1.289e-4	7	2.365e-4	1
149	N83	max	0	1	0	2	0	4	1.048e-3	8	2.148e-4	5	-4.05e-4	1
150		min	-.633	8	0	3	0	5	-3.015e-4	7	-1.521e-4	4	-9.088e-4	2
151	N84	max	.84	7	0	8	0	1	1.079e-4	7	5.275e-8	1	1.536e-4	1
152		min	0	1	0	1	-.001	9	6.203e-5	8	-1.942e-4	9	5.78e-5	8
153	N84A	max	.003	6	.014	9	0	1	-2.115e-5	1	-1.865e-5	1	2.333e-4	9
154		min	-.001	9	0	1	-.006	7	-7.861e-4	7	-2.856e-4	7	-3.502e-4	6
155	N85	max	.813	7	-.001	8	0	1	1.021e-4	7	3.877e-8	1	1.479e-4	1
156		min	0	1	-.003	1	-.003	9	5.518e-5	8	-1.955e-4	9	7.742e-5	8
157	N85A	max	.002	1	0	1	0	8	1.256e-3	8	3.647e-4	8	1.175e-3	2
158		min	-.751	8	0	7	0	7	-3.203e-4	7	-2.516e-4	7	8.076e-5	3
159	N86	max	.765	7	-.003	8	0	1	9.144e-5	7	1.706e-8	1	1.061e-4	1
160		min	0	1	-.005	1	-.007	9	4.274e-5	8	-1.669e-4	9	7.494e-5	9
161	N86A	max	.002	1	-.005	3	.008	8	1.222e-3	8	1.333e-4	8	8.768e-4	2
162		min	-.773	8	-.029	2	-.011	7	-2.972e-4	7	-4.567e-4	7	2.288e-4	3
163	N87	max	0	1	0	8	.014	8	-6.966e-5	7	0	1	2.859e-4	8
164		min	-.005	7	0	7	0	1	-1.098e-4	8	-7.003e-4	7	-5.949e-6	7
165	N87A	max	.002	1	0	3	.001	8	1.249e-3	8	3.842e-4	8	1.151e-3	2
166		min	-.754	8	-.004	2	0	7	-3.085e-4	7	-2.659e-4	7	1.149e-4	3
167	N88	max	0	1	.002	8	-.025	1	-6.029e-5	7	0	1	3.236e-4	8
168		min	-.011	7	.001	7	-2.832	9	-8.344e-5	8	-4.142e-4	7	-1.828e-5	7
169	N88A	max	.003	1	-.008	9	.036	8	9.811e-4	8	3.539e-3	8	8.299e-4	2
170		min	-.739	8	-.023	6	0	1	1.243e-4	7	2.3e-5	1	-3.615e-5	3
171	N89	max	0	1	.003	8	-.025	1	-2.729e-5	8	5.816e-5	3	4.056e-4	8
172		min	-.014	7	.002	7	-2.774	9	-3.137e-5	7	0	1	-4.519e-5	7
173	N89A	max	.059	4	.006	3	.126	8	-1.08e-4	2	3.957e-3	2	5.123e-4	1
174		min	-.001	1	.003	2	0	1	-3.447e-4	1	-1.067e-4	1	-2.282e-3	4
175	N90	max	0	1	0	7	.117	8	-4.053e-4	2	5.552e-3	8	5.005e-4	1
176		min	0	3	0	1	0	1	-5.759e-4	3	-8.907e-5	1	-1.994e-3	4
177	N92	max	0	2	0	1	0	4	0	4	0	2	0	1
178		min	0	3	0	7	0	1	0	1	0	3	0	2
179	N93	max	.082	2	.052	8	.206	4	3.413e-3	2	3.297e-4	2	1.747e-4	1
180		min	-.005	1	0	1	-.004	1	-1.489e-4	1	-4.558e-4	3	-2.408e-3	4
181	N94	max	.085	2	.052	8	.21	4	3.323e-3	4	3.341e-4	2	1.786e-4	1
182		min	-.006	1	0	1	-.004	1	-1.536e-4	1	-4.65e-4	3	-2.448e-3	4
183	N95	max	.088	2	.054	5	.212	4	3.229e-3	4	3.363e-4	2	1.831e-4	1
184		min	-.006	1	0	1	-.004	1	-1.586e-4	1	-4.746e-4	3	-2.484e-3	4
185	N96	max	.09	2	.055	5	.213	4	3.13e-3	4	3.401e-4	2	1.884e-4	1
186		min	-.006	1	0	1	-.004	1	-1.638e-4	1	-4.815e-4	3	-2.516e-3	4
187	N97	max	.091	2	.055	5	.213	4	3.028e-3	4	3.495e-4	2	1.943e-4	1
188		min	-.006	1	0	1	-.004	1	-1.689e-4	1	-4.826e-4	3	-2.543e-3	4
189	N97A	max	.002	1	.001	2	.001	7	9.843e-4	8	3.027e-4	7	-2.936e-4	9
190		min	-.899	8	0	3	0	1	2.637e-5	7	-1.537e-5	1	-5.957e-4	6
191	N98	max	.002	1	0	3	0	6	9.785e-4	8	2.934e-4	7	-3.248e-4	9
192		min	-.897	8	0	2	0	9	5.915e-6	7	-1.575e-5	1	-6.347e-4	6
193	N99	max	.002	1	.004	7	.034	8	8.086e-4	8	4.426e-3	8	-2.01e-4	1
194		min	-.872	8	-.008	8	0	1	3.37e-4	7	-2.164e-5	1	-8.874e-4	6

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Joint Displacements (Continued)

	Joint		X [in]	Ic	Y [in]	Ic	Z [in]	Ic	X Rotation ...	Ic	Y Rotation ...	Ic	Z Rotation ...	Ic
195	N100	max	0	1	0	7	.11	8	-7.752e-5	2	7.32e-3	8	-5.784e-5	1
196		min	0	3	0	1	0	1	-4.325e-4	3	1.788e-8	1	-3.161e-3	2
197	N101	max	.161	2	.003	3	.134	8	7.655e-4	2	3.399e-3	2	-1.199e-5	1
198		min	0	1	-.009	2	0	1	7.282e-5	1	1.413e-5	1	-3.897e-3	2
199	N103	max	.002	1	-.009	7	.045	8	7.691e-4	8	5.535e-3	8	8.191e-5	1
200		min	-.987	8	-.011	8	0	1	5.717e-4	7	-6.475e-6	1	-4.499e-4	8
201	N104	max	.002	1	0	6	0	6	9.575e-4	8	8.676e-4	4	5.018e-5	7
202		min	-1.027	8	0	9	0	9	5.682e-4	7	5.128e-6	1	-1.74e-4	8
203	N106	max	0	1	0	5	.121	8	-1.698e-4	2	8.101e-3	8	9.982e-5	1
204		min	0	3	0	1	0	1	-3.936e-4	3	-2.413e-5	1	-3.075e-3	2
205	N107	max	.177	2	.002	1	.145	8	8.532e-4	2	3.679e-3	2	1.056e-4	1
206		min	0	1	-.009	2	0	1	3.e-5	1	-1.871e-5	1	-3.961e-3	2
207	N109	max	.002	1	0	3	.003	4	9.65e-4	8	9.93e-4	4	8.73e-5	7
208		min	-1.029	8	0	2	0	1	5.85e-4	7	4.813e-6	1	-1.341e-4	8
209	N109A	max	.002	1	.007	2	.006	7	1.01e-3	8	1.425e-4	2	-1.749e-4	9
210		min	-.909	8	.002	3	0	1	7.68e-5	7	-1.32e-5	1	-4.401e-4	6
211	N110	max	.002	1	-.003	3	.017	4	1.01e-3	8	8.129e-4	4	2.449e-4	7
212		min	-1.037	8	-.005	2	0	1	6.347e-4	7	5.309e-6	1	3.444e-5	8
213	N111	max	.002	1	.02	2	.072	8	9.656e-4	3	6.882e-3	8	-8.951e-4	1
214		min	-1.151	8	.009	1	0	1	6.959e-4	1	-2.894e-5	1	-1.903e-3	2
215	N112	max	.002	1	0	4	0	6	9.477e-4	3	4.914e-3	5	-1.016e-3	1
216		min	-1.157	8	0	1	0	9	6.515e-4	1	-2.255e-5	1	-1.798e-3	2
217	N113	max	0	1	0	5	.157	8	-9.725e-5	2	7.747e-3	4	-3.569e-4	1
218		min	0	3	0	1	0	1	-3.563e-4	3	3.003e-5	1	-3.904e-3	2
219	N114	max	.171	2	0	3	.181	8	9.404e-4	2	3.522e-3	2	-2.047e-4	1
220		min	.001	1	-.011	2	0	1	1.452e-4	1	6.133e-5	1	-4.47e-3	2
221	N116	max	0	2	0	1	0	4	0	4	0	2	0	1
222		min	0	1	0	7	0	1	0	1	0	3	0	2
223	N117	max	0	2	0	1	0	4	0	4	0	2	0	1
224		min	0	1	0	5	0	1	0	1	0	3	0	2
225	N118	max	0	2	0	1	0	4	0	6	0	2	0	1
226		min	0	3	0	5	0	1	0	1	0	3	0	2
227	N120	max	.174	2	.052	8	.193	2	3.343e-3	2	8.147e-4	2	-3.013e-5	1
228		min	0	1	0	1	0	1	3.52e-6	1	-1.406e-4	3	-4.247e-3	2
229	N121	max	.179	2	.053	3	.196	2	3.264e-3	2	8.276e-4	2	-3.131e-5	1
230		min	0	1	0	1	0	1	3.502e-6	1	-1.444e-4	3	-4.271e-3	2
231	N122	max	.183	2	.053	3	.199	2	3.179e-3	2	8.377e-4	2	-3.242e-5	1
232		min	0	1	0	1	0	1	3.682e-6	1	-1.495e-4	3	-4.292e-3	2
233	N123	max	.186	2	.053	3	.199	2	3.089e-3	2	8.492e-4	2	-3.336e-5	1
234		min	0	1	0	1	0	1	4.176e-6	1	-1.518e-4	3	-4.307e-3	2
235	N124	max	.187	2	.052	3	.199	2	2.994e-3	2	8.67e-4	2	-3.404e-5	1
236		min	0	1	0	1	0	1	5.014e-6	1	-1.473e-4	3	-4.317e-3	2
237	N126	max	.192	2	.052	4	.203	2	3.579e-3	2	8.429e-4	2	2.892e-5	1
238		min	0	1	0	1	0	1	-1.329e-5	1	-8.227e-5	3	-4.569e-3	2
239	N127	max	.198	2	.052	3	.207	2	3.499e-3	2	8.559e-4	2	2.941e-5	1
240		min	-.001	1	0	1	0	1	-1.359e-5	1	-8.527e-5	3	-4.586e-3	2
241	N128	max	.202	2	.053	3	.21	2	3.413e-3	2	8.66e-4	2	3.007e-5	1
242		min	-.001	1	0	1	0	1	-1.379e-5	1	-8.969e-5	3	-4.599e-3	2
243	N129	max	.205	2	.053	3	.211	2	3.32e-3	2	8.776e-4	2	3.102e-5	1
244		min	-.001	1	0	1	0	1	-1.379e-5	1	-9.114e-5	3	-4.606e-3	2
245	N130	max	.206	2	.052	3	.21	2	3.223e-3	2	8.963e-4	2	3.228e-5	1
246		min	-.001	1	0	1	0	1	-1.352e-5	1	-8.513e-5	3	-4.607e-3	2
247	N131	max	.005	1	0	1	0	1	-1.672e-5	1	1.067e-4	8	1.213e-4	8
248		min	-.025	8	-.007	7	-.274	7	-7.689e-4	7	-1.353e-6	1	-5.661e-5	1
249	N132	max	.182	2	.052	4	.232	2	4.03e-3	2	6.964e-4	2	-1.138e-4	1
250		min	.003	1	0	1	.001	1	4.079e-5	1	-2.707e-4	3	-4.568e-3	2
251	N132A	max	0	1	.004	1	.006	9	2.609e-4	7	9.21e-4	9	1.019e-3	8

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Joint Displacements (Continued)

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
252		min	-.014	8	-.006	8	0	1	2.412e-4	8	-9.736e-7	1	-7.477e-4	1
253	N133	max	.187	2	.053	5	.236	2	3.935e-3	2	7.07e-4	2	-1.174e-4	1
254		min	.003	1	0	1	.001	1	4.172e-5	1	-2.77e-4	3	-4.603e-3	2
255	N134	max	.191	2	.053	5	.239	2	3.834e-3	2	7.15e-4	2	-1.21e-4	1
256		min	.003	1	0	1	.001	1	4.302e-5	1	-2.844e-4	3	-4.635e-3	2
257	N135	max	.195	2	.053	5	.24	2	3.727e-3	2	7.249e-4	2	-1.247e-4	1
258		min	.003	1	0	1	.001	1	4.48e-5	1	-2.884e-4	3	-4.661e-3	2
259	N136	max	.196	2	.053	5	.24	2	3.614e-3	2	7.419e-4	2	-1.283e-4	1
260		min	.003	1	0	1	.001	1	4.702e-5	1	-2.847e-4	3	-4.68e-3	2
261	N137	max	1.505	7	.016	8	0	1	2.55e-4	7	9.22e-4	9	8.466e-4	8
262		min	0	1	-.115	1	-.101	9	2.344e-4	8	-9.141e-7	1	-8.117e-4	1
263	N138	max	0	1	0	7	0	1	1.373e-3	6	1.865e-3	9	2.016e-3	6
264		min	0	9	0	1	-.232	7	-4.608e-5	1	1.06e-4	1	-6.563e-5	1
265	N139	max	0	6	0	1	0	1	8.297e-5	1	6.944e-4	8	6.489e-4	8
266		min	0	9	0	6	-.135	7	-1.807e-3	8	2.474e-6	1	-3.316e-4	1
267	N140	max	0	7	0	1	0	1	1.063e-5	1	-2.782e-5	1	1.414e-3	6
268		min	0	1	0	6	-.166	7	-3.623e-4	6	-5.414e-4	9	-4.989e-5	1

Envelope Member Section Stresses

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
1	M1	1	...	0	1	0	1	0	1	7.39	7	-.164	1	.013	1	1.027	8
2			...	0	1	0	1	0	1	.164	1	-7.39	7	-1.027	8	-.013	1
3		2	...	0	6	-.002	1	0	8	7.3...	7	-.164	1	.013	1	1.026	8
4			...	0	7	-.002	1	0	6	.164	1	-7.389	7	-1.026	8	-.013	1
5		3	...	0	6	-.003	1	.002	8	7.3...	7	-.162	1	.013	1	1.025	8
6			...	0	7	-.003	1	-.002	6	.162	1	-7.387	7	-1.025	8	-.013	1
7		4	...	.001	6	-.005	1	.003	8	7.3...	7	-.158	1	.013	1	1.023	8
8			...	-.001	7	-.005	1	-.003	6	.158	1	-7.383	7	-1.023	8	-.013	1
9		5	...	.002	6	-.007	1	.003	8	7.3...	7	-.153	1	.013	1	1.021	8
10			...	-.002	7	-.007	1	-.003	6	.153	1	-7.378	7	-1.021	8	-.013	1
11	M2	1	...	.156	6	-.077	1	.006	8	7.3...	7	-.133	1	.094	1	1.166	8
12			...	.008	1	-1.535	6	-.006	6	.133	1	-7.358	7	-1.166	8	-.094	1
13		2	...	.156	6	-.078	1	.006	8	6.9...	7	-.111	1	.094	1	1.165	8
14			...	.008	1	-1.536	6	-.006	6	.111	1	-6.927	7	-1.165	8	-.094	1
15		3	...	.156	6	-.078	1	.006	8	6.4...	7	-.089	1	.094	1	1.163	8
16			...	.008	1	-1.536	6	-.006	6	.089	1	-6.496	7	-1.163	8	-.094	1
17		4	...	.156	6	-.079	1	.007	8	6.0...	7	-.067	1	.094	1	1.161	8
18			...	.008	1	-1.537	6	-.007	6	.067	1	-6.065	7	-1.161	8	-.094	1
19		5	...	.156	6	-.08	1	.007	8	5.6...	7	-.044	1	.094	1	1.159	8
20			...	.008	1	-1.538	6	-.007	6	.044	1	-5.633	7	-1.159	8	-.094	1
21	M3	1	...	.439	6	-.067	1	.007	8	5.6...	7	-.044	1	.243	1	1.332	8
22			...	.023	1	-1.301	6	-.007	6	.044	1	-5.633	7	-1.332	8	-.243	1
23		2	...	.439	6	-.068	1	.007	8	5.2...	7	-.025	1	.243	1	1.33	8
24			...	.023	1	-1.301	6	-.007	6	.025	1	-5.266	7	-1.33	8	-.243	1
25		3	...	.439	6	-.068	1	.008	8	4.8...	7	-.006	1	.243	1	1.328	8
26			...	.023	1	-1.301	6	-.008	6	.006	1	-4.899	7	-1.328	8	-.243	1
27		4	...	.44	6	-.069	1	.008	8	4.5...	9	.014	1	.243	1	1.326	8
28			...	.023	1	-1.302	6	-.008	6	.014	1	-4.533	9	-1.326	8	-.243	1
29		5	...	.44	6	-.069	1	.008	8	4.1...	9	.034	1	.243	1	1.323	8
30			...	.023	1	-1.302	6	-.008	6	.034	1	-4.167	9	-1.323	8	-.243	1
31	M4	1	...	.656	6	-.046	1	.008	9	4.1...	9	.034	1	.355	1	1.294	8
32			...	.035	1	-.868	7	-.008	7	.034	1	-4.167	9	-1.294	8	-.355	1
33		2	...	.656	6	-.047	1	.009	9	3.9...	9	.047	1	.355	1	1.292	8
34			...	.035	1	-.869	7	-.009	7	.047	1	-3.921	9	-1.292	8	-.355	1
35		3	...	.656	6	-.047	1	.009	9	3.6...	9	.06	1	.355	1	1.289	8
36			...	.035	1	-.869	7	-.009	7	.06	1	-3.675	9	-1.289	8	-.355	1

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

Mar 25, 2006
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[..	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
37		4	...	.657	6	-.047	1	.009	9	3.4...	9	.074	1	.355	1	1.287	8
38			...	.035	1	-.87	7	-.009	7	-.074	1	-3.429	9	-1.287	8	-.355	1
39		5	...	.657	6	-.048	1	.009	9	3.1...	9	.087	1	.355	1	1.284	8
40			...	.036	1	-.87	7	-.009	7	-.087	1	-3.182	9	-1.284	8	-.355	1
41	M5	1	...	.773	6	-.017	1	.009	9	3.1...	9	.087	1	.413	1	1.058	8
42			...	.042	1	-.312	7	-.009	6	-.087	1	-3.182	9	-1.058	8	-.413	1
43		2	...	.773	6	-.017	1	.01	9	3.0...	9	.092	1	.413	1	1.056	8
44			...	.042	1	-.313	7	-.01	6	-.092	1	-3.094	9	-1.056	8	-.413	1
45		3	...	.773	6	-.017	1	.01	9	3.0...	9	.097	1	.413	1	1.053	8
46			...	.043	1	-.313	7	-.01	6	-.097	1	-3.005	9	-1.053	8	-.413	1
47		4	...	.774	6	-.017	1	.01	9	2.9...	9	.102	1	.413	1	1.05	8
48			...	.043	1	-.313	7	-.01	6	-.102	1	-2.916	9	-1.05	8	-.413	1
49		5	...	.774	6	-.017	1	.011	9	2.8...	9	.106	1	.413	1	1.047	8
50			...	.043	1	-.314	7	-.011	6	-.106	1	-2.828	9	-1.047	8	-.413	1
51	M6	1	...	.788	6	.011	9	.011	9	.418	1	.871	8	.106	1	2.828	9
52			...	.044	1	-.011	6	-.011	6	-.871	8	-.418	1	-2.828	9	-.106	1
53		2	...	.789	6	.011	9	.011	9	.418	1	.864	8	.106	1	2.82	9
54			...	.045	1	-.011	6	-.011	6	-.864	8	-.418	1	-2.82	9	-.106	1
55		3	...	.79	6	.012	9	.012	9	.418	1	.856	8	.106	1	2.814	8
56			...	.046	1	-.012	6	-.012	6	-.856	8	-.418	1	-2.814	8	-.106	1
57		4	...	.79	6	.013	9	.013	9	.418	1	.848	8	.106	1	2.822	8
58			...	.046	1	-.013	6	-.013	6	-.848	8	-.418	1	-2.822	8	-.106	1
59		5	...	.791	6	.013	9	.013	9	.418	1	.839	8	.106	1	2.831	8
60			...	.047	1	-.013	6	-.013	6	-.839	8	-.418	1	-2.831	8	-.106	1
61	M7	1	...	.777	6	-.018	1	.013	9	2.8...	8	.106	1	.413	1	1.016	8
62			...	.046	1	-.318	7	-.013	7	-.106	1	-2.831	8	-1.016	8	-.413	1
63		2	...	.777	6	-.018	1	.014	9	2.7...	8	.112	1	.413	1	1.012	8
64			...	.046	1	-.318	7	-.014	7	-.112	1	-2.747	8	-1.012	8	-.413	1
65		3	...	.778	6	-.019	1	.014	9	2.6...	8	.117	1	.413	1	1.008	8
66			...	.047	1	-.318	7	-.014	7	-.117	1	-2.664	8	-1.008	8	-.413	1
67		4	...	.778	6	-.019	1	.014	9	2.58	8	.122	1	.413	1	1.004	8
68			...	.047	1	-.319	7	-.014	7	-.122	1	-2.58	8	-1.004	8	-.413	1
69		5	...	.778	6	-.019	1	.015	9	2.4...	8	.128	1	.413	1	1	8
70			...	.047	1	-.319	7	-.015	7	-.128	1	-2.497	8	-1	8	-.413	1
71	M8	1	...	.663	6	-.054	1	.015	9	2.4...	8	.128	1	.355	1	1.232	8
72			...	.04	1	-.881	7	-.015	7	-.128	1	-2.497	8	-1.232	8	-.355	1
73		2	...	.663	6	-.054	1	.015	9	2.2...	8	.143	1	.355	1	1.228	8
74			...	.04	1	-.881	7	-.015	7	-.143	1	-2.251	8	-1.228	8	-.355	1
75		3	...	.663	6	-.054	1	.015	9	2.0...	8	.158	1	.355	1	1.224	8
76			...	.041	1	-.882	7	-.015	7	-.158	1	-2.005	8	-1.224	8	-.355	1
77		4	...	.664	6	-.055	1	.016	9	1.7...	8	.174	1	.355	1	1.22	8
78			...	.041	1	-.882	7	-.016	7	-.174	1	-1.759	8	-1.22	8	-.355	1
79		5	...	.664	6	-.055	1	.016	9	1.5...	8	.189	1	.355	1	1.215	8
80			...	.041	1	-.883	7	-.016	7	-.189	1	-1.513	8	-1.215	8	-.355	1
81	M9	1	...	.447	6	-.082	1	.016	8	1.5...	8	.189	1	.243	1	1.261	8
82			...	.027	1	-1.311	6	-.016	6	-.189	1	-1.513	8	-1.261	8	-.243	1
83		2	...	.448	6	-.083	1	.016	8	1.1...	8	.213	1	.243	1	1.256	8
84			...	.028	1	-1.311	7	-.016	6	-.213	1	-1.142	8	-1.256	8	-.243	1
85		3	...	.448	6	-.083	1	.017	8	.771	8	.236	1	.243	1	1.256	6
86			...	.028	1	-1.312	7	-.017	6	-.236	1	-.771	8	-1.256	6	-.243	1
87		4	...	.448	6	-.084	1	.017	8	.4	8	.26	1	.243	1	1.261	6
88			...	.028	1	-1.313	7	-.017	6	-.26	1	-.4	8	-1.261	6	-.243	1
89		5	...	.449	6	-.084	1	.017	8	.028	8	.284	1	.243	1	1.265	6
90			...	.028	1	-1.313	7	-.017	6	-.284	1	-.028	8	-1.265	6	-.243	1
91	M10	1	...	.163	6	-.099	1	.017	8	.028	8	.284	1	.094	1	1.113	6
92			...	.01	1	-1.555	6	-.017	7	-.284	1	-.028	8	-1.113	6	-.094	1
93		2	...	.164	6	-.1	1	.017	8	-.312	1	.504	7	.094	1	1.118	6

Company : **DMJM H&N**
Designer : **Kevin M. Jones - DMJMH&N**
Job Number : **145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis**

Mar 25, 2006
12:05 PM
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Icy	Shear[..	Icz	Shear[k...	Icy-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
94			...	.01	1	-1.556	6	-.017	7 -.504	7	.312	1	-1.118	6	-.094	1
95		3	...	.164	6	-.101	1	.018	8 -.341	1	.942	7	.094	1	1.123	6
96			...	.01	1	-1.557	6	-.018	7 -.942	7	.341	1	-1.123	6	-.094	1
97		4	...	.164	6	-.101	1	.018	8 -.369	1	1.381	7	.094	1	1.128	6
98			...	.01	1	-1.557	6	-.018	7 -1.3	7	.369	1	-1.128	6	-.094	1
99		5	...	.164	6	-.102	1	.018	8 -.398	1	1.819	7	.094	1	1.133	6
100			...	.01	1	-1.558	6	-.018	7 -1.8	7	.398	1	-1.133	6	-.094	1
101	M11	1	...	.009	6	-.104	1	.018	9 -.398	1	1.819	7	.013	1	.991	6
102			...	-.009	7	-1.592	6	-.018	7 -1.8	7	.398	1	-.991	6	-.013	1
103		2	...	.01	6	-.106	1	.019	9 -.492	1	3.218	7	.013	1	1.008	6
104			...	-.01	7	-1.594	6	-.019	7 -3.2	7	.492	1	-1.008	6	-.013	1
105		3	...	.01	6	-.108	1	.02	9 -.587	1	4.618	7	.013	1	1.025	6
106			...	-.01	7	-1.596	6	-.02	7 -4.6	7	.587	1	-1.025	6	-.013	1
107		4	...	.011	6	-.11	1	.021	9 -.683	1	6.02	7	.013	1	1.044	6
108			...	-.011	7	-1.598	6	-.021	7 -6.02	7	.683	1	-1.044	6	-.013	1
109		5	...	.011	6	-.111	1	.022	9 -.782	1	7.439	6	.013	1	1.063	6
110			...	-.011	7	-1.599	6	-.022	7 -7.4	6	.782	1	-1.063	6	-.013	1
111	M12	1	...	.03	8	.412	6	.102	8 .035	1	1.284	7	.669	6	.36	9
112			...	-.015	7	.034	1	0	1 -1.2	7	-.035	1	-.36	9	-.669	6
113		2	...	.03	8	.411	6	.102	8 .045	1	1.168	7	.698	6	.348	9
114			...	-.016	7	.033	1	0	1 -1.1	7	-.045	1	-.348	9	-.698	6
115		3	...	.03	8	.411	6	.102	8 .054	1	1.051	7	.726	6	.336	9
116			...	-.016	7	.033	1	0	1 -1.0	7	-.054	1	-.336	9	-.726	6
117		4	...	.03	8	.41	6	.102	8 .063	1	.935	7	.754	6	.324	9
118			...	-.016	7	.032	1	0	1 -.935	7	-.063	1	-.324	9	-.754	6
119		5	...	.03	8	.409	6	.102	8 .072	1	.819	7	.782	6	.312	9
120			...	-.016	7	.032	1	0	1 -.819	7	-.072	1	-.312	9	-.782	6
121	M13	1	...	.048	8	.409	6	.077	4 .227	1	.98	7	.782	6	.312	9
122			...	-.008	7	.032	1	0	1 -.98	7	-.227	1	-.312	9	-.782	6
123		2	...	.048	8	.409	6	.077	4 .236	1	.865	7	.802	6	.298	9
124			...	-.008	7	.031	1	0	1 -.865	7	-.236	1	-.298	9	-.802	6
125		3	...	.048	8	.408	6	.077	4 .245	1	.749	7	.821	6	.283	9
126			...	-.008	7	.03	1	0	1 -.749	7	-.245	1	-.283	9	-.821	6
127		4	...	.048	8	.407	6	.077	4 .253	1	.633	7	.84	6	.268	9
128			...	-.008	7	.03	1	0	1 -.633	7	-.253	1	-.268	9	-.84	6
129		5	...	.048	8	.407	6	.077	4 .262	1	.518	7	.859	6	.253	9
130			...	-.008	7	.029	1	0	1 -.518	7	-.262	1	-.253	9	-.859	6
131	M14	1	...	.058	8	.407	6	.054	9 .38	1	.565	7	.859	6	.253	9
132			...	0	1	.029	1	0	1 -.565	7	-.38	1	-.253	9	-.859	6
133		2	...	.059	8	.406	6	.055	9 .388	1	.45	7	.867	6	.238	9
134			...	0	1	.028	1	0	1 -.45	7	-.388	1	-.238	9	-.867	6
135		3	...	.059	8	.406	6	.055	9 .396	1	.335	7	.874	6	.222	9
136			...	0	1	.028	1	0	1 -.335	7	-.396	1	-.222	9	-.874	6
137		4	...	.059	8	.405	6	.055	9 .404	1	.22	7	.881	6	.207	9
138			...	0	1	.027	1	0	1 -.22	7	-.404	1	-.207	9	-.881	6
139		5	...	.059	8	.404	6	.056	9 .411	1	.105	7	.888	6	.191	9
140			...	0	1	.027	1	0	1 -.105	7	-.411	1	-.191	9	-.888	6
141	M15	1	...	.06	8	.404	6	.048	9 .469	1	.103	6	.888	6	.191	9
142			...	0	1	.027	1	-.02	6 -.103	6	-.469	1	-.191	9	-.888	6
143		2	...	.061	8	.404	6	.049	9 .476	1	-.012	6	.882	6	.177	9
144			...	0	1	.026	1	-.021	6 .012	6	-.476	1	-.177	9	-.882	6
145		3	...	.061	8	.403	6	.049	9 .484	1	-.127	6	.876	6	.163	9
146			...	0	1	.025	1	-.021	6 .127	6	-.484	1	-.163	9	-.876	6
147		4	...	.061	8	.403	6	.049	9 .491	1	-.241	6	.87	6	.149	9
148			...	0	1	.025	1	-.021	6 .241	6	-.491	1	-.149	9	-.87	6
149		5	...	.061	8	.402	6	.05	9 .498	1	-.355	7	.864	6	.135	9
150			...	0	1	.024	1	-.022	6 .355	7	-.498	1	-.135	9	-.864	6

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

Mar 25, 2006
12:05 PM
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[..	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
151	M16	1	...	.058	8	.402	6	.043	9	.499	1	-.353	6	.864	6	.135	9
152			...	0	1	.024	1	-.043	8	.353	6	-.499	1	-.135	9	-.864	6
153		2	...	.058	8	.4	6	.044	9	.662	9	-.516	1	.833	6	.104	9
154			...	0	1	.023	1	-.044	8	.516	1	-.662	9	-.104	9	-.833	6
155		3	...	.059	8	.399	6	.045	9	.943	8	-.531	1	.802	6	.073	9
156			...	0	1	.021	1	-.045	8	.531	1	-.943	8	-.073	9	-.802	6
157		4	...	.059	8	.397	6	.045	9	1.2...	8	-.546	1	.77	6	.041	9
158			...	0	1	.02	1	-.045	8	.546	1	-1.223	8	-.041	9	-.77	6
159		5	...	.06	8	.396	6	.046	9	1.5...	8	-.559	1	.738	6	.009	9
160			...	0	1	.018	1	-.046	8	.559	1	-1.502	8	.009	9	-.738	6
161	M17	1	...	.001	6	.004	3	.002	6	1.5...	8	-.559	1	.738	6	.009	9
162			...	-.001	8	.004	1	-.002	7	.559	1	-1.502	8	-.009	9	-.738	6
163		2	...	0	6	.003	3	.002	6	1.5...	8	-.561	1	.739	6	.01	9
164			...	0	8	.003	1	-.002	7	.561	1	-1.504	8	-.01	9	-.739	6
165		3	...	0	6	.002	3	.001	6	1.5...	8	-.562	1	.739	6	.01	9
166			...	0	8	.002	1	-.001	7	.562	1	-1.505	8	-.01	9	-.739	6
167		4	...	0	6	.001	3	0	6	1.5...	8	-.563	1	.74	6	.011	9
168			...	0	8	.001	1	0	7	.563	1	-1.506	8	-.011	9	-.74	6
169		5	...	0	1	0	1	0	1	1.5...	8	-.563	1	.74	6	.011	9
170			...	0	1	0	1	0	1	.563	1	-1.506	8	-.011	9	-.74	6
171	M18	1	...	.024	8	.082	1	.032	8	-.644	8	1.587	1	1.068	7	.339	8
172			...	-.024	6	.057	8	-.046	7	-1.5...	1	.644	8	-.339	8	-1.068	7
173		2	...	.03	8	.057	1	.02	8	-.13	8	.775	1	.613	9	.041	6
174			...	-.03	6	.032	8	-.033	7	.775	1	.13	8	-.041	6	-.613	9
175		3	...	.037	8	.032	1	.007	8	.092	8	.257	1	.309	9	0	1
176			...	-.037	6	.006	8	-.021	7	-.257	1	-.092	8	0	1	-.309	9
177		4	...	.043	8	.007	1	0	1	.021	8	.031	1	.151	9	0	1
178			...	-.043	6	-.019	8	-.008	7	-.031	1	-.021	8	0	1	-.151	9
179		5	...	.049	8	-.018	1	.005	9	-.098	1	.343	8	.14	9	.035	6
180			...	-.049	6	-.044	8	-.019	6	-.343	8	.098	1	-.035	6	-.14	9
181	M19	1	...	.049	9	.05	8	.012	6	-.098	1	.343	8	.14	9	.035	6
182			...	-.049	6	.044	1	-.037	9	-.343	8	.098	1	-.035	6	-.14	9
183		2	...	.049	9	.049	8	.011	6	-.077	1	.319	8	.122	9	.03	6
184			...	-.049	6	.043	1	-.036	9	-.319	8	.077	1	-.03	6	-.122	9
185		3	...	.05	9	.048	8	.011	6	-.056	1	.295	8	.105	9	.025	6
186			...	-.05	6	.042	1	-.036	9	-.295	8	.056	1	-.025	6	-.105	9
187		4	...	.05	9	.047	8	.01	6	-.036	1	.272	8	.087	9	.02	6
188			...	-.05	6	.041	1	-.035	9	-.272	8	.036	1	-.02	6	-.087	9
189		5	...	.05	9	.046	8	.009	6	-.016	1	.249	8	.07	9	.015	6
190			...	-.05	6	.04	1	-.035	9	-.249	8	.016	1	-.015	6	-.07	9
191	M20	1	...	.075	9	.054	1	.095	8	-.433	8	.5	1	0	1	.878	8
192			...	-.075	6	.052	8	0	1	-.5	1	.433	8	-.878	8	0	1
193		2	...	.082	9	.028	1	.082	8	.023	9	.022	1	.162	9	0	1
194			...	-.082	6	.027	8	0	1	-.022	1	-.023	9	0	1	-.162	9
195		3	...	.088	9	.003	1	.07	8	.186	9	-.163	1	1.037	8	0	1
196			...	-.088	6	.001	8	0	1	.163	1	-.186	9	0	1	-1.037	8
197		4	...	.094	9	-.022	1	.077	9	.058	7	-.056	1	1.775	8	0	1
198			...	-.094	6	.024	8	0	1	.056	1	.058	7	0	1	-1.775	8
199		5	...	.1	9	-.047	1	.089	9	-.344	1	.366	8	2.632	9	0	1
200			...	-.1	6	-.049	8	0	1	-.366	8	.344	1	0	1	-2.632	9
201	M21	1	...	.1	9	.044	7	0	1	-.344	1	.366	8	2.632	9	0	1
202			...	-.1	7	.028	8	-.292	9	-.366	8	.344	1	0	1	-2.632	9
203		2	...	.103	9	.034	7	0	1	-.18	1	.258	8	1.559	7	0	1
204			...	-.103	7	.018	8	-.287	9	-.258	8	.18	1	0	1	-1.559	7
205		3	...	.105	9	.024	7	0	1	-.049	7	.195	8	1.025	7	.05	8
206			...	-.105	7	.009	8	-.282	9	-.195	8	.049	7	-.05	8	-1.025	7
207		4	...	.108	9	.014	7	0	1	.04	7	.179	8	.535	6	1.313	9

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

Mar 25, 2006
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
208			...	-.108	7	-.001	8	-.277	9	-.179	8	-.04	7	-1.313	9	-.535	6
209		5	...	.11	9	.004	7	0	1	.082	7	.209	8	.05	6	2.583	9
210			...	-.11	7	-.011	8	-.276	8	-.209	8	-.082	7	-2.583	9	-.05	6
211	M22	1	...	.135	8	.004	7	0	1	.088	7	.196	8	.05	6	2.583	9
212			...	-.098	7	-.011	8	-.228	8	-.196	8	-.088	7	-2.583	9	-.05	6
213		2	...	.135	8	.003	7	0	1	.089	7	.199	8	.008	6	2.646	9
214			...	-.098	7	-.012	8	-.228	8	-.199	8	-.089	7	-2.646	9	-.008	6
215		3	...	.136	8	.003	7	0	1	.09	7	.203	8	0	1	2.709	9
216			...	-.099	7	-.013	8	-.228	8	-.203	8	-.09	7	-2.709	9	0	1
217		4	...	.136	8	.002	7	0	1	.09	7	.206	8	0	1	2.773	9
218			...	-.099	7	-.013	8	-.229	8	-.206	8	-.09	7	-2.773	9	0	1
219		5	...	.136	8	.002	7	0	1	.091	7	.21	8	0	1	2.836	9
220			...	-.099	7	-.014	8	-.229	8	-.21	8	-.091	7	-2.836	9	0	1
221	M23	1	...	.169	8	.002	7	0	1	.093	7	.161	8	0	1	2.836	9
222			...	-.064	7	-.014	8	-.214	6	-.161	8	-.093	7	-2.836	9	0	1
223		2	...	.17	8	.001	7	0	1	.093	7	.165	8	0	1	2.865	9
224			...	-.064	7	-.014	8	-.214	6	-.165	8	-.093	7	-2.865	9	0	1
225		3	...	.17	8	0	7	0	1	.093	7	.17	8	0	1	2.894	9
226			...	-.064	7	-.015	8	-.214	6	-.17	8	-.093	7	-2.894	9	0	1
227		4	...	.17	8	0	7	0	1	.093	7	.174	8	0	1	2.922	9
228			...	-.065	7	-.016	8	-.215	6	-.174	8	-.093	7	-2.922	9	0	1
229		5	...	.17	8	0	7	0	1	.093	7	.178	8	0	1	2.951	9
230			...	-.065	7	-.016	8	-.215	6	-.178	8	-.093	7	-2.951	9	0	1
231	M24	1	...	.178	8	0	7	.036	9	.081	7	.104	8	0	1	2.951	9
232			...	-.02	7	-.016	8	-.247	6	-.104	8	-.081	7	-2.951	9	0	1
233		2	...	.178	8	-.001	7	.036	9	.08	7	.108	8	0	1	2.941	9
234			...	-.02	7	-.017	8	-.247	6	-.108	8	-.08	7	-2.941	9	0	1
235		3	...	.178	8	-.002	7	.037	9	.08	7	.113	8	0	1	2.93	9
236			...	-.021	7	-.018	8	-.247	6	-.113	8	-.08	7	-2.93	9	0	1
237		4	...	.179	8	-.003	7	.037	9	.079	7	.118	8	0	1	2.92	9
238			...	-.021	7	-.018	8	-.248	6	-.118	8	-.079	7	-2.92	9	0	1
239		5	...	.179	8	-.003	7	.038	9	.078	7	.124	8	0	1	2.909	9
240			...	-.021	7	-.019	8	-.248	6	-.124	8	-.078	7	-2.909	9	0	1
241	M25	1	...	.159	8	-.003	7	.168	9	.054	7	.032	8	0	1	2.909	9
242			...	0	1	-.019	8	-.242	6	-.032	8	-.054	7	-2.909	9	0	1
243		2	...	.159	8	-.004	7	.168	9	.053	7	.037	8	0	1	2.861	9
244			...	0	1	-.019	8	-.242	6	-.037	8	-.053	7	-2.861	9	0	1
245		3	...	.16	8	-.004	7	.169	9	.052	7	.043	8	0	1	2.814	9
246			...	0	1	-.02	8	-.243	6	-.043	8	-.052	7	-2.814	9	0	1
247		4	...	.16	8	-.005	7	.169	9	.05	7	.048	8	0	1	2.766	9
248			...	0	1	-.021	8	-.243	6	-.048	8	-.05	7	-2.766	9	0	1
249		5	...	.16	8	-.006	7	.169	9	.049	7	.054	8	0	1	2.718	9
250			...	0	1	-.021	8	-.243	6	-.054	8	-.049	7	-2.718	9	0	1
251	M26	1	...	.141	8	-.006	7	.226	9	.033	7	.005	8	0	1	2.718	9
252			...	0	1	-.021	8	-.226	7	-.005	8	-.033	7	-2.718	9	0	1
253		2	...	.142	8	-.01	7	.228	9	.016	7	.057	8	0	1	2.222	9
254			...	0	1	-.026	8	-.228	7	-.057	8	-.016	7	-2.222	9	0	1
255		3	...	.143	8	-.015	7	.23	9	-.012	7	.118	8	0	1	1.918	7
256			...	0	1	-.031	8	-.23	7	-.118	8	.012	7	-1.918	7	0	1
257		4	...	.144	8	-.02	7	.233	9	-.05	7	.19	8	0	1	2.424	7
258			...	0	1	-.035	8	-.233	7	-.19	8	.05	7	-2.424	7	0	1
259		5	...	.145	8	-.025	7	.235	9	-.099	7	.273	8	0	1	2.935	7
260			...	0	1	-.04	8	-.235	7	-.273	8	.099	7	-2.935	7	0	1
261	M27	1	...	.001	7	.016	8	.119	7	-.099	7	.273	8	0	1	2.935	7
262			...	-.001	6	.009	7	0	1	-.273	8	.099	7	-2.935	7	0	1
263		2	...	0	7	.015	8	.119	7	-.095	7	.265	8	0	1	2.877	7
264			...	0	6	.008	7	0	1	-.265	8	.095	7	-2.877	7	0	1

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[..	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
265		3	...	0	7	.014	8	.118	7	-.091	7	.258	8	0	1	2.819	7
266			...	0	6	.007	7	0	1	-.258	8	.091	7	-2.819	7	0	1
267		4	...	0	7	.013	8	.118	7	-.088	7	.252	8	0	1	2.762	7
268			...	0	6	.006	7	0	1	-.252	8	.088	7	-2.762	7	0	1
269		5	...	0	1	.012	8	.117	7	-.086	7	.246	8	0	1	2.705	7
270			...	0	1	.005	7	0	1	-.246	8	.086	7	-2.705	7	0	1
271	M28	1	...	.015	8	.077	7	.031	2	-.726	8	.755	7	.653	3	.071	2
272			...	-.015	9	.076	8	-.042	3	-.755	7	.726	8	-.071	2	-.653	3
273		2	...	.024	8	.038	7	.013	2	.295	8	-.277	7	.446	7	.058	8
274			...	-.024	9	.038	8	-.023	3	.277	7	-.295	8	-.058	8	-.446	7
275		3	...	.034	8	0	7	0	1	.622	8	-.613	7	.46	6	.267	9
276			...	-.034	9	-.001	8	-.009	7	.613	7	-.622	8	-.267	9	-.46	6
277		4	...	.044	8	-.039	7	.017	8	.254	1	-.253	6	.127	6	.129	9
278			...	-.044	9	-.04	8	-.028	7	.253	6	-.254	1	-.129	9	-.127	6
279		5	...	.053	8	-.078	7	.037	8	-.801	9	.811	6	.358	8	.555	7
280			...	-.053	9	-.079	8	-.048	7	-.811	6	.801	9	-.555	7	-.358	8
281	M29	1	...	.053	6	.063	6	.036	7	-.801	9	.811	6	.358	8	.555	7
282			...	-.053	7	.063	1	-.03	8	-.811	6	.801	9	-.555	7	-.358	8
283		2	...	.059	6	.04	6	.025	7	-.254	7	.26	8	.102	9	.229	6
284			...	-.059	7	.04	1	-.018	8	-.26	8	.254	7	-.229	6	-.102	9
285		3	...	.065	6	.017	6	.013	7	.047	7	-.044	1	0	1	.05	3
286			...	-.065	7	.017	1	-.007	8	.044	1	-.047	7	-.05	3	0	1
287		4	...	.071	6	-.006	6	.006	3	.105	6	-.098	1	.055	7	.043	8
288			...	-.071	7	-.006	1	0	1	.098	1	-.105	6	-.043	8	-.055	7
289		5	...	.076	6	-.029	6	.017	3	-.081	6	.094	1	.087	3	.005	2
290			...	-.076	7	-.029	1	-.011	2	-.094	1	.081	6	-.005	2	-.087	3
291	M30	1	...	.076	6	.025	1	.009	6	-.081	6	.094	1	.087	3	.005	2
292			...	-.076	7	.023	6	-.016	9	-.094	1	.081	6	-.005	2	-.087	3
293		2	...	.08	6	.01	1	.001	2	.025	1	-.022	6	.042	6	.01	9
294			...	-.08	7	.008	6	-.009	3	.022	6	-.025	1	-.01	9	-.042	6
295		3	...	.084	6	-.004	1	0	1	.045	1	-.026	6	.026	6	.045	9
296			...	-.084	7	-.007	6	-.007	7	.026	6	-.045	1	-.045	9	-.026	6
297		4	...	.087	6	-.019	1	.007	8	-.035	1	.07	6	-.002	1	.054	7
298			...	-.087	7	-.021	6	-.014	7	-.07	6	.035	1	-.054	7	.002	1
299		5	...	.091	6	-.034	1	.014	8	-.214	1	.265	6	.055	8	.175	7
300			...	-.091	7	-.036	6	-.022	7	-.265	6	.214	1	-.175	7	-.055	8
301	M31	1	...	.091	8	.046	6	.027	7	-.214	1	.265	6	.055	8	.175	7
302			...	-.091	9	.04	1	-.014	8	-.265	6	.214	1	-.175	7	-.055	8
303		2	...	.096	8	.026	6	.017	7	.066	6	-.061	1	.029	2	.028	3
304			...	-.096	9	.02	1	-.004	8	.061	1	-.066	6	-.028	3	-.029	2
305		3	...	.101	8	.006	6	.008	9	.214	6	-.154	1	.142	7	.02	8
306			...	-.101	9	0	1	0	1	.154	1	-.214	6	-.02	8	-.142	7
307		4	...	.106	8	-.014	6	.018	9	.178	6	-.062	1	.163	7	-.006	1
308			...	-.106	9	-.02	1	-.005	6	.062	1	-.178	6	.006	1	-.163	7
309		5	...	.111	8	-.034	6	.028	9	-.041	6	.212	1	.336	9	-.009	1
310			...	-.111	9	-.04	1	-.015	6	-.212	1	.041	6	.009	1	-.336	9
311	M32	1	...	.111	8	.034	1	-.002	1	-.041	6	.212	1	.336	9	-.009	1
312			...	-.111	9	-.01	6	-.075	9	-.212	1	.041	6	.009	1	-.336	9
313		2	...	.114	8	.021	1	-.002	1	-.053	1	.134	6	-.004	1	.117	7
314			...	-.114	9	-.022	6	-.069	9	-.134	6	.053	1	-.117	7	.004	1
315		3	...	.117	8	.009	1	-.002	1	.033	1	.3	6	-.018	1	.462	9
316			...	-.117	9	-.035	6	-.062	9	-.3	6	-.033	1	-.462	9	.018	1
317		4	...	.12	8	-.004	1	-.002	1	.047	1	.539	6	-.032	1	.807	9
318			...	-.12	9	-.047	6	-.056	9	-.539	6	-.047	1	-.807	9	.032	1
319		5	...	.123	8	-.017	1	-.002	1	-.014	1	.851	6	-.046	1	1.115	9
320			...	-.123	9	-.06	6	-.058	7	-.851	6	.014	1	-1.115	9	.046	1
321	M33	1	...	.123	6	.19	6	.234	9	-.014	1	.851	6	-.046	1	1.115	9

Company : **DMJM H&N**
Designer : **Kevin M. Jones - DMJMH&N**
Job Number : **145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[..	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
322			...	-.123	9	.011	1	.01	1	-.851	6	.014	1	-1.115	9	.046	1
323		2	...	.127	6	.178	6	.24	9	.22	6	-.016	1	.265	9	-.011	1
324			...	-.127	9	-.001	1	.01	1	.016	1	-.22	6	.011	1	-.265	9
325		3	...	.13	6	.165	6	.246	9	1.2...	6	.027	1	1.681	9	-.068	1
326			...	-.13	9	-.014	1	.01	1	-.027	1	-1.218	6	.068	1	-1.681	9
327		4	...	.133	6	.152	6	.252	9	2.1...	6	.144	1	3.134	9	-.125	1
328			...	-.133	9	-.026	1	.01	1	-.144	1	-2.142	6	.125	1	-3.134	9
329		5	...	.136	6	.14	6	.259	9	2.9...	6	.334	1	4.623	9	-.181	1
330			...	-.136	9	-.039	1	.01	1	-.334	1	-2.993	6	.181	1	-4.623	9
331	M36	1	...	.136	6	.121	9	.104	7	2.9...	6	.334	1	4.623	9	-.181	1
332			...	-.136	7	-.218	6	-.42	8	-.334	1	-2.993	6	.181	1	-4.623	9
333		2	...	.137	6	.119	9	.103	7	2.7...	6	.274	1	4.645	9	-.174	1
334			...	-.137	7	-.22	6	-.419	8	-.274	1	-2.759	6	.174	1	-4.645	9
335		3	...	.137	6	.117	9	.101	7	2.5...	6	.217	1	4.668	9	-.166	1
336			...	-.137	7	-.222	6	-.418	8	-.217	1	-2.522	6	.166	1	-4.668	9
337		4	...	.138	6	.115	9	.1	7	2.2...	6	.162	1	4.692	9	-.158	1
338			...	-.138	7	-.225	6	-.417	8	-.162	1	-2.283	6	.158	1	-4.692	9
339		5	...	.138	6	.112	9	.099	7	2.0...	7	.11	1	4.717	9	-.15	1
340			...	-.138	7	-.227	6	-.416	8	-.11	1	-2.064	7	.15	1	-4.717	9
341	M37	1	...	.245	8	.112	9	-.005	1	1.62	6	.099	1	4.717	9	-.15	1
342			...	-.133	7	-.227	6	-.179	9	-.099	1	-1.62	6	.15	1	-4.717	9
343		2	...	.245	8	.112	9	-.005	1	1.5...	6	.09	1	4.682	9	-.149	1
344			...	-.133	7	-.227	6	-.179	9	-.09	1	-1.576	6	.149	1	-4.682	9
345		3	...	.245	8	.111	9	-.005	1	1.5...	6	.081	1	4.648	9	-.148	1
346			...	-.133	7	-.228	6	-.179	9	-.081	1	-1.532	6	.148	1	-4.648	9
347		4	...	.245	8	.111	9	-.005	1	1.4...	6	.072	1	4.614	9	-.147	1
348			...	-.133	7	-.228	6	-.179	9	-.072	1	-1.488	6	.147	1	-4.614	9
349		5	...	.245	8	.111	9	-.005	1	1.4...	7	.063	1	4.579	9	-.146	1
350			...	-.133	7	-.229	6	-.179	9	-.063	1	-1.475	7	.146	1	-4.579	9
351	M38	1	...	.245	8	.111	9	-.005	1	1.4...	7	.063	1	4.579	9	-.146	1
352			...	-.133	7	-.229	6	-.179	9	-.063	1	-1.475	7	.146	1	-4.579	9
353		2	...	.245	8	.093	9	-.005	1	2.1...	7	.514	8	3.14	9	-.104	1
354			...	-.133	7	-.246	6	-.179	9	-.514	8	-2.178	7	.104	1	-3.14	9
355		3	...	.245	8	.076	9	-.005	1	2.8...	9	2.523	6	1.731	7	-.063	1
356			...	-.133	7	-.263	6	-.179	9	-2.5...	6	-2.815	9	.063	1	-1.731	7
357		4	...	.245	8	.058	9	-.005	1	3.3...	9	4.716	6	.462	7	.384	8
358			...	-.133	7	-.281	6	-.179	9	-4.7...	6	-3.356	9	-.384	8	-.462	7
359		5	...	.245	8	.041	9	-.005	1	3.7...	9	7.05	6	-.021	1	1.179	9
360			...	-.133	7	-.298	6	-.179	9	-7.05	6	-3.758	9	-1.179	9	.021	1
361	M39	1	...	.268	6	-.011	9	-.005	1	3.7...	9	7.05	6	-.031	1	.896	9
362			...	-.133	9	-.197	6	-.179	9	-7.05	6	-3.758	9	-.896	9	.031	1
363		2	...	.268	6	-.012	9	-.005	1	3.7...	9	7.106	6	-.033	1	.947	9
364			...	-.133	9	-.198	6	-.179	9	-7.1...	6	-3.755	9	-.947	9	.033	1
365		3	...	.268	6	-.012	9	-.005	1	3.7...	9	7.162	6	-.034	1	.997	9
366			...	-.133	9	-.199	6	-.179	9	-7.1...	6	-3.751	9	-.997	9	.034	1
367		4	...	.269	6	-.013	9	-.005	1	3.7...	9	7.219	6	-.036	1	1.048	9
368			...	-.133	9	-.199	6	-.179	9	-7.2...	6	-3.748	9	-1.048	9	.036	1
369		5	...	.269	6	-.014	9	-.005	1	3.7...	9	7.276	6	-.037	1	1.099	9
370			...	-.134	9	-.2	6	-.179	9	-7.2...	6	-3.744	9	-1.099	9	.037	1
371	M40	1	...	.287	6	.034	8	-.005	1	3.7...	9	7.276	6	.202	6	.425	9
372			...	-.121	9	-.128	7	-.179	9	-7.2...	6	-3.744	9	-.425	9	-.202	6
373		2	...	.287	6	.034	8	-.005	1	3.7...	9	7.27	6	.189	6	.475	9
374			...	-.121	9	-.128	7	-.179	9	-7.27	6	-3.711	9	-.475	9	-.189	6
375		3	...	.287	6	.033	8	-.005	1	3.6...	9	7.264	6	.176	6	.526	9
376			...	-.121	9	-.129	7	-.179	9	-7.2...	6	-3.678	9	-.526	9	-.176	6
377		4	...	.288	6	.033	8	-.005	1	3.6...	9	7.258	6	.163	6	.577	9
378			...	-.121	9	-.129	7	-.179	7	-7.2...	6	-3.645	9	-.577	9	-.163	6

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
379		5	...	.288	6	.032	8	-.005	1	3.6...	9	7.252	6	.15	6	.628	9
380			...	-.121	9	-.13	7	-.179	7	-7.2...	6	-3.611	9	-.628	9	-.15	6
381	M41	1	...	.262	6	.247	8	-.005	1	3.6...	9	7.251	6	.668	6	.068	1
382			...	-.089	9	-.209	7	-.179	7	-7.2...	6	-3.612	9	-.068	1	-.668	6
383		2	...	.263	6	.246	8	-.005	1	3.5...	9	7.183	6	.655	6	.069	1
384			...	-.089	9	-.209	7	-.18	7	-7.1...	6	-3.555	9	-.069	1	-.655	6
385		3	...	.263	6	.246	8	-.005	1	3.4...	9	7.115	6	.643	6	.071	1
386			...	-.089	9	-.21	7	-.18	7	-7.1...	6	-3.497	9	-.071	1	-.643	6
387		4	...	.263	6	.246	8	-.005	1	3.4...	9	7.047	6	.63	6	.072	1
388			...	-.089	9	-.21	7	-.181	7	-7.0...	6	-3.439	9	-.072	1	-.63	6
389		5	...	.264	6	.245	8	-.005	1	3.3...	9	6.979	6	.617	6	.078	9
390			...	-.089	9	-.21	7	-.181	7	-6.9...	6	-3.381	9	-.078	9	-.617	6
391	M42	1	...	.198	6	.423	8	-.005	1	3.38	9	6.981	6	1.027	6	.071	1
392			...	-.043	9	-.257	7	-.181	7	-6.9...	6	-3.38	9	-.071	1	-1.027	6
393		2	...	.198	6	.423	8	-.005	1	3.3...	9	6.861	6	1.015	6	.072	1
394			...	-.042	9	-.257	7	-.182	7	-6.8...	6	-3.307	9	-.072	1	-1.015	6
395		3	...	.198	6	.424	6	-.005	1	3.2...	9	6.74	6	1.002	6	.074	1
396			...	-.042	9	-.257	9	-.182	7	-6.74	6	-3.234	9	-.074	1	-1.002	6
397		4	...	.199	6	.424	6	-.005	1	3.1...	9	6.62	6	.989	6	.075	1
398			...	-.042	9	-.258	9	-.183	7	-6.62	6	-3.161	9	-.075	1	-.989	6
399		5	...	.199	6	.424	6	-.005	1	3.0...	9	6.499	6	.976	6	.077	1
400			...	-.042	9	-.258	9	-.183	7	-6.4...	6	-3.088	9	-.077	1	-.976	6
401	M43	1	...	.154	6	.065	9	.317	9	5.3...	6	1.606	9	3.792	6	2.762	9
402			...	-.016	9	-.381	6	-.317	8	-1.6...	9	-5.398	6	-2.762	9	-3.792	6
403		2	...	.16	6	.07	9	.323	9	3.3...	6	1.245	9	2.08	6	1.049	9
404			...	-.01	9	-.387	6	-.323	8	-1.2...	9	-3.344	6	-1.049	9	-2.08	6
405		3	...	.166	6	.076	9	.329	9	1.2...	6	.853	9	.816	7	.118	1
406			...	-.004	9	-.393	6	-.329	8	-.853	9	-1.259	6	-.118	1	-.816	7
407		4	...	.171	6	.082	9	.334	9	-.337	1	.857	6	2.59	7	1.56	8
408			...	.002	9	-.398	6	-.334	8	-.857	6	.337	1	-1.56	8	-2.59	7
409		5	...	.177	6	.088	9	.34	9	.023	9	3.004	6	4.395	7	3.365	8
410			...	.007	9	-.404	6	-.34	8	-3.0...	6	-.023	9	-3.365	8	-4.395	7
411	M44	1	...	.225	6	.447	6	-.005	1	4.4...	6	3.035	9	.242	8	3.486	7
412			...	-.022	9	-.299	9	-.216	7	-3.0...	9	-4.417	6	-3.486	7	-.242	8
413		2	...	.225	6	.447	6	-.005	1	4.5...	6	3.12	9	.239	8	3.547	7
414			...	-.022	9	-.3	9	-.216	7	-3.12	9	-4.544	6	-3.547	7	-.239	8
415		3	...	.226	6	.448	6	-.005	1	4.6...	6	3.206	9	.237	8	3.609	7
416			...	-.022	9	-.301	9	-.216	7	-3.2...	9	-4.671	6	-3.609	7	-.237	8
417		4	...	.226	6	.448	6	-.005	1	4.7...	6	3.291	9	.235	8	3.67	7
418			...	-.021	9	-.301	9	-.217	7	-3.2...	9	-4.798	6	-3.67	7	-.235	8
419		5	...	.226	6	.448	6	-.005	1	4.9...	6	3.377	9	.234	8	3.732	7
420			...	-.021	9	-.302	9	-.217	7	-3.3...	9	-4.926	6	-3.732	7	-.234	8
421	M45	1	...	.295	6	.241	6	-.005	1	4.9...	6	3.381	9	-.177	1	3.736	7
422			...	-.077	9	-.263	9	-.217	7	-3.3...	9	-4.926	6	-3.736	7	.177	1
423		2	...	.295	6	.241	6	-.005	1	4.9...	6	3.455	9	-.178	1	3.798	7
424			...	-.077	9	-.263	9	-.217	7	-3.4...	9	-4.994	6	-3.798	7	.178	1
425		3	...	.296	6	.241	6	-.005	1	5.0...	6	3.53	9	-.18	1	3.86	7
426			...	-.077	9	-.264	9	-.218	7	-3.53	9	-5.063	6	-3.86	7	.18	1
427		4	...	.296	6	.241	6	-.005	1	5.1...	6	3.605	9	-.181	1	3.922	7
428			...	-.077	9	-.265	9	-.218	7	-3.6...	9	-5.131	6	-3.922	7	.181	1
429		5	...	.296	6	.241	6	-.005	8	5.2	6	3.681	9	-.183	1	3.984	7
430			...	-.077	9	-.265	9	-.219	7	-3.6...	9	-5.2	6	-3.984	7	.183	1
431	M46	1	...	.32	6	-.004	6	-.005	8	5.2	6	3.68	9	-.14	1	3.414	9
432			...	-.122	9	-.186	9	-.219	7	-3.68	9	-5.2	6	-3.414	9	.14	1
433		2	...	.32	6	-.004	6	-.004	8	5.1...	6	3.733	9	-.142	1	3.467	7
434			...	-.122	9	-.187	9	-.219	7	-3.7...	9	-5.199	6	-3.467	7	.142	1
435		3	...	.321	6	-.005	6	-.004	8	5.1...	6	3.786	9	-.143	1	3.529	7

Company : DMJM H&N
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
436			...	-.122	9	-.188	9	-.22	7	-3.7...	9	-5.197	6	-3.529	7	.143	1
437		4	...	.321	6	-.005	6	-.004	8	5.1...	6	3.84	9	-.145	1	3.591	7
438			...	-.122	9	-.189	9	-.22	7	-3.84	9	-5.196	6	-3.591	7	.145	1
439		5	...	.321	6	-.005	6	-.003	8	5.1...	6	3.893	9	-.146	1	3.654	7
440			...	-.122	9	-.189	9	-.221	7	-3.8...	9	-5.194	6	-3.654	7	.146	1
441	M47	1	...	.296	6	-.082	9	-.003	8	5.1...	6	3.893	9	-.082	1	2.662	9
442			...	-.149	9	-.251	6	-.221	7	-3.8...	9	-5.194	6	-2.662	9	.082	1
443		2	...	.296	6	-.082	9	-.003	8	5.1...	6	3.916	9	-.084	1	2.713	9
444			...	-.149	9	-.251	6	-.221	7	-3.9...	9	-5.123	6	-2.713	9	.084	1
445		3	...	.296	6	-.083	9	-.002	8	5.0...	6	3.94	9	-.085	1	2.764	9
446			...	-.149	9	-.252	6	-.221	7	-3.94	9	-5.052	6	-2.764	9	.085	1
447		4	...	.297	6	-.084	9	-.002	8	4.98	6	3.963	9	-.087	1	2.814	9
448			...	-.149	9	-.252	6	-.222	7	-3.9...	9	-4.98	6	-2.814	9	.087	1
449		5	...	.297	6	-.084	9	-.001	8	4.9...	6	3.987	9	-.088	1	2.865	9
450			...	-.149	9	-.253	6	-.222	7	-3.9...	9	-4.908	6	-2.865	9	.088	1
451	M48	1	...	.267	6	-.025	9	-.001	8	4.9...	6	3.988	9	-.051	1	2.22	9
452			...	-.155	9	-.364	6	-.222	7	-3.9...	9	-4.908	6	-2.22	9	.051	1
453		2	...	.269	6	-.03	9	.002	8	3.9...	6	4.056	9	-.064	1	2.667	9
454			...	-.157	9	-.369	6	-.226	7	-4.0...	9	-3.991	6	-2.667	9	.064	1
455		3	...	.27	6	-.035	9	.006	8	3.06	6	4.138	9	-.077	1	3.198	7
456			...	-.159	9	-.375	6	-.23	7	-4.1...	9	-3.06	6	-3.198	7	.077	1
457		4	...	.272	6	-.041	9	.01	8	2.1...	6	4.233	9	-.09	1	3.778	7
458			...	-.16	9	-.38	6	-.234	7	-4.2...	9	-2.116	6	-3.778	7	.09	1
459		5	...	.274	6	-.046	9	.014	8	1.1...	6	4.342	9	-.102	1	4.368	7
460			...	-.162	9	-.385	6	-.238	7	-4.3...	9	-1.159	6	-4.368	7	.102	1
461	M49	1	...	.019	8	.376	8	.419	6	4.7...	7	.05	8	-.104	1	2.726	7
462			...	-.019	7	-.281	7	-.012	1	-.05	8	-4.778	7	-2.726	7	.104	1
463		2	...	.018	8	.372	8	.421	6	4.2...	7	-.606	8	-.125	1	2.256	7
464			...	-.018	7	-.285	7	-.012	1	.606	8	-4.282	7	-2.256	7	.125	1
465		3	...	.017	8	.368	8	.423	6	3.7...	7	-.444	1	-.146	1	1.783	7
466			...	-.017	7	-.288	7	.012	1	.444	1	-3.779	7	-1.783	7	.146	1
467		4	...	.016	8	.364	8	.425	6	3.2...	7	-.262	1	.193	6	1.332	9
468			...	-.016	7	-.292	7	-.012	1	.262	1	-3.269	7	-1.332	9	-.193	6
469		5	...	.015	8	.361	8	.426	6	2.7...	7	-.073	1	.939	6	1.042	9
470			...	-.015	7	-.296	7	-.012	1	.073	1	-2.753	7	-1.042	9	-.939	6
471	M50	1	...	.007	8	.328	8	.443	6	2.7...	7	-.073	1	.939	6	1.042	9
472			...	-.007	7	-.329	7	.012	1	.073	1	-2.753	7	-1.042	9	-.939	6
473		2	...	.006	8	.325	8	.444	6	2.9...	8	.103	1	1.487	6	.861	9
474			...	-.006	7	-.331	7	-.012	1	-.103	1	-2.937	8	-.861	9	-1.487	6
475		3	...	.006	8	.322	8	.445	6	3.3...	8	.284	1	2.036	6	.681	9
476			...	-.006	7	-.334	7	-.012	1	-.284	1	-3.337	8	-.681	9	-2.036	6
477		4	...	.005	8	.32	8	.447	6	3.7...	8	.467	1	2.586	6	.503	9
478			...	-.005	7	-.337	7	-.012	1	-.467	1	-3.733	8	-.503	9	-2.586	6
479		5	...	.004	8	.317	8	.448	6	4.1...	8	.654	1	3.138	6	.327	9
480			...	-.004	7	-.339	7	-.012	1	-.654	1	-4.126	8	-.327	9	-3.138	6
481	M51	1	...	.004	6	.017	9	.008	8	-.066	3	.066	1	.033	7	.033	8
482			...	-.004	9	.017	6	-.008	6	-.066	1	.066	3	-.033	8	-.033	7
483		2	...	.003	6	.013	9	.006	8	-.037	3	.037	9	.019	7	.019	8
484			...	-.003	9	.013	6	-.006	6	-.037	9	.037	3	-.019	8	-.019	7
485		3	...	.002	6	.008	9	.004	8	-.017	3	.017	1	.008	7	.008	8
486			...	-.002	9	.008	6	-.004	6	-.017	1	.017	3	-.008	8	-.008	7
487		4	...	.001	6	.004	9	.002	8	-.004	3	.004	6	.002	7	.002	8
488			...	-.001	9	.004	6	-.002	6	-.004	6	.004	3	-.002	8	-.002	7
489		5	...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
490			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
491	M52	1	...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
492			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1

Company : **DMJM H&N**
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Job Number : **145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
493		2	...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
494			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
495		3	...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
496			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
497		4	...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
498			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
499		5	...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
500			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
501	M53	1	...	.197	8	.22	7	.287	7	1.0...	8	1.041	7	.766	6	1.787	9
502			...	-.197	7	-.746	8	-.019	1	-1.0...	7	-1.052	8	-1.787	9	-.766	6
503		2	...	.197	8	.218	7	.286	7	.421	8	.856	7	.765	6	1.555	9
504			...	-.197	7	-.748	8	-.019	1	-.856	7	-.421	8	-1.555	9	-.765	6
505		3	...	.198	8	.216	7	.285	7	-.009	1	.673	7	.763	6	1.321	9
506			...	-.198	7	-.75	8	-.019	1	-.673	7	.009	1	-1.321	9	-.763	6
507		4	...	.198	8	.215	7	.284	7	-.026	1	.845	8	.76	6	1.087	9
508			...	-.198	7	-.752	8	-.019	1	-.845	8	.026	1	-1.087	9	-.76	6
509		5	...	.199	8	.213	7	.283	7	-.046	1	1.481	8	.757	6	.853	9
510			...	-.199	7	-.754	8	-.019	1	-1.4...	8	.046	1	-.853	9	-.757	6
511	M54	1	...	.268	8	.131	7	.283	7	-.046	1	1.481	8	.587	6	.724	9
512			...	-.216	7	-.662	8	-.019	1	-1.4...	8	.046	1	-.724	9	-.587	6
513		2	...	.269	8	.13	7	.283	7	-.053	1	1.669	8	.586	6	.645	9
514			...	-.216	7	-.662	8	-.019	1	-1.6...	8	.053	1	-.645	9	-.586	6
515		3	...	.269	8	.13	7	.282	7	-.06	1	1.857	8	.585	6	.565	9
516			...	-.216	7	-.663	8	-.019	1	-1.8...	8	.06	1	-.565	9	-.585	6
517		4	...	.269	8	.129	7	.282	7	-.067	1	2.045	8	.583	6	.486	9
518			...	-.216	7	-.663	8	-.019	1	-2.0...	8	.067	1	-.486	9	-.583	6
519		5	...	.269	8	.128	7	.282	7	-.074	1	2.234	8	.581	6	.406	9
520			...	-.216	7	-.664	8	-.019	1	-2.2...	8	.074	1	-.406	9	-.581	6
521	M55	1	...	.376	8	-.022	1	.282	7	-.074	1	2.234	8	.198	1	.103	7
522			...	-.224	7	-.407	8	-.019	1	-2.2...	8	.074	1	-.103	7	-.198	1
523		2	...	.376	8	-.022	1	.281	7	-.08	1	2.35	8	.192	1	.023	7
524			...	-.224	7	-.408	8	-.019	1	-2.35	8	.08	1	-.023	7	-.192	1
525		3	...	.376	8	-.023	1	.281	7	-.087	1	2.466	8	.187	8	-.057	7
526			...	-.224	7	-.408	8	-.019	1	-2.4...	8	.087	1	.057	7	-.187	8
527		4	...	.377	8	-.023	1	.281	7	-.093	1	2.582	8	.21	4	-.111	5
528			...	-.224	7	-.408	8	-.019	1	-2.5...	8	.093	1	.111	5	-.21	4
529		5	...	.377	8	-.024	1	.281	9	-.1	1	2.698	8	.241	4	-.158	5
530			...	-.224	7	-.409	8	-.019	1	-2.6...	8	.1	1	.158	5	-.241	4
531	M56	1	...	.426	8	-.016	1	.281	9	-.1	1	2.698	8	.525	9	.25	6
532			...	-.197	7	-.226	9	-.019	1	-2.6...	8	.1	1	-.25	6	-.525	9
533		2	...	.427	8	-.016	1	.281	9	-.104	1	2.723	8	.605	9	.252	6
534			...	-.197	7	-.227	9	-.019	1	-2.7...	8	.104	1	-.252	6	-.605	9
535		3	...	.427	8	-.017	1	.282	9	-.109	1	2.748	8	.685	9	.254	6
536			...	-.197	7	-.227	9	-.019	1	-2.7...	8	.109	1	-.254	6	-.685	9
537		4	...	.427	8	-.017	1	.282	9	-.114	1	2.774	8	.765	9	.256	6
538			...	-.197	7	-.228	9	-.019	1	-2.7...	8	.114	1	-.256	6	-.765	9
539		5	...	.428	8	-.017	1	.282	9	-.119	1	2.799	8	.845	9	.259	6
540			...	-.197	7	-.228	9	-.019	1	-2.7...	8	.119	1	-.259	6	-.845	9
541	M57	1	...	.412	8	.248	6	.282	9	-.119	1	2.799	8	1.042	9	.646	6
542			...	-.14	7	-.356	9	-.019	1	-2.7...	8	.119	1	-.646	6	-1.042	9
543		2	...	.413	8	.248	6	.282	9	-.121	1	2.73	8	1.123	9	.648	6
544			...	-.14	7	-.357	9	-.019	1	-2.73	8	.121	1	-.648	6	-1.123	9
545		3	...	.413	8	.248	6	.283	9	-.122	1	2.66	8	1.203	9	.651	6
546			...	-.139	7	-.357	9	-.019	1	-2.66	8	.122	1	-.651	6	-1.203	9
547		4	...	.413	8	.249	6	.283	9	-.124	1	2.59	8	1.283	9	.653	6
548			...	-.139	7	-.358	9	-.019	1	-2.59	8	.124	1	-.653	6	-1.283	9
549		5	...	.414	8	.249	6	.283	9	-.126	1	2.521	8	1.364	9	.656	6

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

Mar 25, 2006
12:05 PM
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[..	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
550			...	-.139	7	-.358	9	-.019	1	-2.5...	8	.126	1	-.656	6	-1.364	9
551	M58	1	...	.382	8	.283	9	.402	7	1.3...	9	.815	6	2.521	8	-.126	1
552			...	-.101	7	-.019	1	-.402	8	-.815	6	-1.398	9	.126	1	-2.521	8
553		2	...	.384	8	.286	9	.405	7	2.0...	9	.839	6	1.82	9	-.126	1
554			...	-.099	7	-.019	1	-.405	8	-.839	6	-2.019	9	.126	1	-1.82	9
555		3	...	.386	8	.288	9	.407	7	2.6...	9	.867	6	2.707	9	-.126	1
556			...	-.097	7	-.019	1	-.407	8	-.867	6	-2.646	9	.126	1	-2.707	9
557		4	...	.553	6	-.033	1	.562	7	1.6...	9	2.499	6	5.613	7	-.151	1
558			...	.045	1	-.437	6	-.305	8	-2.4...	6	-1.668	9	.151	1	-5.613	7
559		5	...	.556	6	-.033	1	.565	7	1.4...	9	3.455	6	6.844	7	-.153	1
560			...	.047	1	-.439	6	-.308	8	-3.4...	6	-1.479	9	.153	1	-6.844	7
561	M59	1	...	.512	7	.035	1	-.001	1	2.7...	7	.366	1	6.681	7	-.015	1
562			...	.037	1	-.132	7	-.28	7	-.366	1	-2.723	7	.015	1	-6.681	7
563		2	...	.502	7	.022	1	-.001	1	1.0...	7	.014	1	3.383	6	.003	1
564			...	.03	1	-.138	7	-.27	7	-.014	1	-1.051	7	-.003	1	-3.383	6
565		3	...	.492	7	.009	1	-.001	1	.179	1	1.076	6	.443	6	.293	9
566			...	.024	1	-.144	7	-.261	7	-1.0...	6	-.179	1	-.293	9	-.443	6
567		4	...	.482	7	-.004	1	-.001	1	.212	1	2.668	6	-.04	1	3.18	7
568			...	.017	1	-.151	7	-.252	7	-2.6...	6	-.212	1	-3.18	7	.04	1
569		5	...	.472	7	-.017	1	-.001	1	.086	1	4.427	7	-.058	1	6.238	7
570			...	.01	1	-.163	9	-.261	6	-4.4...	7	-.086	1	-6.238	7	.058	1
571	M60	1	...	.475	7	.117	6	-.001	1	.086	1	4.427	7	-.077	1	5.99	7
572			...	.012	1	-.01	1	-.261	6	-4.4...	7	-.086	1	-5.99	7	.077	1
573		2	...	.475	7	.116	6	-.001	1	.078	1	4.349	7	-.078	1	6.166	7
574			...	.012	1	-.011	1	-.261	6	-4.3...	7	-.078	1	-6.166	7	.078	1
575		3	...	.474	7	.116	6	-.001	1	.069	1	4.271	7	-.079	1	6.34	7
576			...	.012	1	-.012	1	-.262	6	-4.2...	7	-.069	1	-6.34	7	.079	1
577		4	...	.474	7	.115	6	-.001	1	.06	1	4.194	7	-.08	1	6.515	7
578			...	.011	1	-.013	1	-.262	6	-4.1...	7	-.06	1	-6.515	7	.08	1
579		5	...	.473	7	.114	6	-.001	1	.05	1	4.117	7	-.081	1	6.689	7
580			...	.011	1	-.014	1	-.263	6	-4.1...	7	-.05	1	-6.689	7	.081	1
581	M61	1	...	.383	7	.566	7	-.001	1	.05	1	4.117	7	-.099	1	4.92	7
582			...	.013	1	-.001	1	-.263	6	-4.1...	7	-.05	1	-4.92	7	.099	1
583		2	...	.383	7	.564	7	-.001	1	.047	1	3.401	7	-.101	1	5.224	7
584			...	.013	1	-.003	1	-.264	6	-3.4...	7	-.047	1	-5.224	7	.101	1
585		3	...	.382	7	.562	7	-.001	1	.042	1	2.687	7	-.102	1	5.527	7
586			...	.013	1	-.005	1	-.265	6	-2.6...	7	-.042	1	-5.527	7	.102	1
587		4	...	.382	7	.56	7	-.001	1	.034	1	1.976	7	-.104	1	5.829	7
588			...	.013	1	-.007	1	-.266	6	-1.9...	7	-.034	1	-5.829	7	.104	1
589		5	...	.381	7	.558	7	-.001	1	.024	1	1.267	7	-.106	1	6.129	7
590			...	.013	1	-.009	1	-.267	6	-1.2...	7	-.024	1	-6.129	7	.106	1
591	M62	1	...	.399	7	.558	7	.005	1	.025	1	2.48	7	-.106	1	6.129	7
592			...	.013	1	-.009	1	-.07	6	-2.48	7	-.025	1	-6.129	7	.106	1
593		2	...	.399	7	.557	7	.005	1	.022	1	2.271	7	-.104	1	6.141	7
594			...	.013	1	-.01	1	-.071	6	-2.2...	7	-.022	1	-6.141	7	.104	1
595		3	...	.399	7	.557	7	.005	1	.018	1	2.062	7	-.102	1	6.152	7
596			...	.013	1	-.01	1	-.071	6	-2.0...	7	-.018	1	-6.152	7	.102	1
597		4	...	.399	7	.556	7	.005	1	.014	1	1.854	7	-.1	1	6.164	7
598			...	.013	1	-.011	1	-.071	6	-1.8...	7	-.014	1	-6.164	7	.1	1
599		5	...	.398	7	.556	7	.005	1	.01	1	1.645	7	-.098	1	6.175	7
600			...	.013	1	-.011	1	-.072	6	-1.6...	7	-.01	1	-6.175	7	.098	1
601	M63	1	...	.353	7	.556	7	.377	9	.01	1	3.605	7	-.098	1	6.175	7
602			...	.01	1	-.011	1	.017	1	3.6...	7	-.01	1	-6.175	7	.098	1
603		2	...	.352	7	.555	7	.378	9	.006	1	3.396	7	-.092	1	6.035	7
604			...	.01	1	-.012	1	.017	1	3.3...	7	-.006	1	-6.035	7	.092	1
605		3	...	.352	7	.555	7	.378	9	.001	1	3.188	7	-.085	1	5.896	7
606			...	.01	1	-.012	1	.017	1	3.1...	7	-.001	1	-5.896	7	.085	1

Company : **DMJM H&N**
Designer : **Kevin M. Jones - DMJMH&N**
Job Number : **145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis**

Mar 25, 2006
12:05 PM
Checked By:_____

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
607		4	...	.352	7	.554	7	.378	9	-.003	1	2.98	7	-.079	1	5.756	7
608			...	.01	1	-.013	1	.017	1	-2.98	7	.003	1	-5.756	7	.079	1
609		5	...	.352	7	.554	7	.379	9	-.008	1	2.773	7	-.072	1	5.617	7
610			...	.01	1	-.013	1	.017	1	-2.7...	7	.008	1	-5.617	7	.072	1
611	M64	1	...	.223	6	.554	7	.674	7	-.009	1	3.878	7	-.072	1	5.617	7
612			...	.004	1	-.013	1	.025	1	-3.8...	7	.009	1	-5.617	7	.072	1
613		2	...	.224	6	.553	7	.674	7	-.014	1	3.671	7	-.063	1	5.374	6
614			...	.004	1	-.014	1	.025	1	-3.6...	7	.014	1	-5.374	6	.063	1
615		3	...	.224	6	.552	7	.674	7	-.019	1	3.463	7	-.054	1	5.139	6
616			...	.004	1	-.015	1	.025	1	-3.4...	7	.019	1	-5.139	6	.054	1
617		4	...	.224	6	.552	7	.674	7	-.025	1	3.256	7	-.044	1	4.903	6
618			...	.004	1	-.015	1	.025	1	-3.2...	7	.025	1	-4.903	6	.044	1
619		5	...	.224	6	.551	7	.673	7	-.031	1	3.049	7	-.035	1	4.668	6
620			...	.004	1	-.016	1	.025	1	-3.0...	7	.031	1	-4.668	6	.035	1
621	M65	1	...	.135	6	.551	7	.76	7	-.029	1	3.249	7	-.035	1	4.668	6
622			...	0	1	-.016	1	.026	1	-3.2...	7	.029	1	-4.668	6	.035	1
623		2	...	.136	6	.547	7	.757	7	-.084	1	1.579	7	.044	1	2.478	6
624			...	0	1	-.02	1	.026	1	-1.5...	7	.084	1	-2.478	6	-.044	1
625		3	...	.137	6	.542	7	.755	7	.32	8	.153	1	.464	9	.295	6
626			...	0	1	-.025	1	.026	1	-.153	1	-.32	8	-.295	6	-.464	9
627		4	...	.139	6	.538	7	.753	7	1.8...	6	.235	1	2.724	9	-.203	1
628			...	0	1	-.029	1	.026	1	-.235	1	-1.856	6	.203	1	-2.724	9
629		5	...	.14	6	.533	7	.75	7	3.4...	6	.331	1	4.992	9	-.282	1
630			...	0	1	-.034	1	.026	1	-.331	1	-3.446	6	.282	1	-4.992	9
631	M66	1	...	.17	6	.028	7	.114	8	.022	6	.186	1	1.112	7	.696	8
632			...	0	1	.026	8	-.106	7	-.186	1	-.022	6	-.696	8	-1.112	7
633		2	...	.173	6	.014	7	.121	8	.211	6	-.014	1	.436	8	-.015	1
634			...	0	1	.012	8	-.114	7	.014	1	-.211	6	.015	1	-.436	8
635		3	...	.177	6	0	7	.128	8	.27	7	-.076	1	1.638	8	1.077	7
636			...	0	1	-.003	8	-.121	7	.076	1	-.27	7	-1.077	7	-1.638	8
637		4	...	.18	6	-.015	7	.136	8	.193	7	.002	1	2.909	8	2.275	7
638			...	0	1	-.017	8	-.128	7	-.002	1	-.193	7	-2.275	7	-2.909	8
639		5	...	.184	6	-.03	7	.143	8	-.022	7	.218	1	4.249	8	3.543	7
640			...	0	1	-.032	8	-.135	7	-.218	1	.022	7	-3.543	7	-4.249	8
641	M67	1	...	.184	6	.026	1	.654	7	-.022	7	.218	1	4.249	8	3.543	7
642			...	0	1	.009	6	-.308	8	-.218	1	.022	7	-3.543	7	-4.249	8
643		2	...	.185	6	.024	1	.653	7	-.005	7	.174	1	3.706	8	2.389	7
644			...	0	1	.006	6	-.307	8	-.174	1	.005	7	-2.389	7	-3.706	8
645		3	...	.185	6	.021	1	.652	7	.008	7	.135	1	3.165	8	1.236	7
646			...	0	1	.003	6	-.306	8	-.135	1	-.008	7	-1.236	7	-3.165	8
647		4	...	.186	6	.018	1	.65	7	.016	7	.1	1	2.626	8	.086	7
648			...	0	1	0	6	-.304	8	-.1	1	-.016	7	-.086	7	-2.626	8
649		5	...	.187	6	.016	1	.649	7	.019	7	.07	1	2.757	6	-.007	1
650			...	0	1	-.002	6	-.303	8	-.07	1	-.019	7	.007	1	-2.757	6
651	M68	1	...	.264	6	.016	1	.593	7	.107	7	.07	1	2.757	6	-.007	1
652			...	0	1	-.002	6	-.381	8	-.07	1	-.107	7	.007	1	-2.757	6
653		2	...	.264	6	.015	1	.593	7	.107	7	.064	1	2.954	6	-.007	1
654			...	0	1	-.003	6	-.38	8	-.064	1	-.107	7	.007	1	-2.954	6
655		3	...	.264	6	.015	1	.593	7	.107	7	.059	1	3.151	6	-.006	1
656			...	0	1	-.003	6	-.38	8	-.059	1	-.107	7	.006	1	-3.151	6
657		4	...	.264	6	.014	1	.593	7	.107	7	.054	1	3.348	6	-.006	1
658			...	0	1	-.004	6	-.38	8	-.054	1	-.107	7	.006	1	-3.348	6
659		5	...	.264	6	.013	1	.593	7	.106	7	.048	1	3.544	6	.074	9
660			...	0	1	-.004	6	-.38	8	-.048	1	-.106	7	-.074	9	-3.544	6
661	M69	1	...	.36	6	.013	1	.367	7	.255	7	.037	1	3.544	6	.074	9
662			...	.071	9	-.004	6	-.455	8	-.037	1	-.255	7	-.074	9	-3.544	6
663		2	...	.36	6	.013	1	.367	7	.254	7	.032	1	3.615	6	.177	9

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

Mar 25, 2006
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[..	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
664			...	-.071	9	-.005	6	-.455	8	-.032	1	-.254	7	-.177	9	-3.615	6
665		3	...	.36	6	.012	1	.367	7	.254	7	.028	1	3.686	6	.281	9
666			...	-.071	9	-.005	6	-.455	8	-.028	1	-.254	7	-.281	9	-3.686	6
667		4	...	.36	6	.012	1	.367	7	.252	7	.023	1	3.757	6	.385	9
668			...	-.071	9	-.006	6	-.455	8	-.023	1	-.252	7	-.385	9	-3.757	6
669		5	...	.36	6	.011	1	.367	7	.251	7	.019	1	3.828	6	.488	9
670			...	-.071	9	-.006	6	-.455	8	-.019	1	-.251	7	-.488	9	-3.828	6
671	M70	1	...	.359	6	.011	1	.044	7	.332	7	0	1	3.828	6	.488	9
672			...	-.131	9	-.006	6	-.408	8	0	1	-.332	7	-.488	9	-3.828	6
673		2	...	.358	6	.011	1	.044	7	.33	7	-.004	1	3.754	6	.551	9
674			...	-.13	9	-.007	6	-.409	8	.004	1	-.33	7	-.551	9	-3.754	6
675		3	...	.358	6	.01	1	.045	7	.329	7	-.008	1	3.68	6	.613	9
676			...	-.13	9	-.008	6	-.409	8	.008	1	-.329	7	-.613	9	-3.68	6
677		4	...	.358	6	.009	1	.045	7	.327	7	-.011	1	3.606	6	.676	9
678			...	-.13	9	-.008	6	-.409	8	.011	1	-.327	7	-.676	9	-3.606	6
679		5	...	.358	6	.009	1	.045	7	.324	7	-.015	1	3.531	6	.738	9
680			...	-.13	9	-.009	6	-.409	8	.015	1	-.324	7	-.738	9	-3.531	6
681	M71	1	...	.323	7	.009	1	-.001	1	.341	6	-.024	1	3.531	6	.738	9
682			...	-.15	8	-.009	6	-.377	6	.024	1	-.341	6	-.738	9	-3.531	6
683		2	...	.322	7	.004	1	-.001	1	.307	6	-.044	1	2.352	6	1.024	9
684			...	-.149	8	-.013	6	-.379	6	.044	1	-.307	6	-1.024	9	-2.352	6
685		3	...	.321	7	0	1	-.001	1	.264	7	-.05	1	1.795	7	1.933	8
686			...	-.147	8	-.018	6	-.382	6	.05	1	-.264	7	-1.933	8	-1.795	7
687		4	...	.319	7	-.005	1	-.001	1	.209	7	-.041	1	1.418	7	3.023	8
688			...	-.146	8	-.023	6	-.384	6	.041	1	-.209	7	-3.023	8	-1.418	7
689		5	...	.318	7	-.01	1	-.001	1	.138	7	-.018	1	1.049	7	4.12	8
690			...	-.145	8	-.027	6	-.386	6	.018	1	-.138	7	-4.12	8	-1.049	7
691	M72	1	...	.318	7	.01	1	.124	8	.138	7	-.018	1	1.049	7	4.12	8
692			...	-.145	8	.006	7	-.035	7	.018	1	-.138	7	-4.12	8	-1.049	7
693		2	...	.314	7	-.005	1	.116	8	.122	7	-.04	1	.73	7	2.906	8
694			...	-.141	8	-.009	7	-.028	7	.04	1	-.122	7	-2.906	8	-.73	7
695		3	...	.311	7	-.021	1	.108	8	-.049	7	.093	1	.488	7	1.769	8
696			...	-.137	8	-.024	7	-.02	7	-.093	1	.049	7	-1.769	8	-.488	7
697		4	...	.307	7	-.036	1	.101	8	-.37	9	.38	1	.323	7	.709	8
698			...	-.134	8	-.04	7	-.012	7	-.38	1	.37	9	-.709	8	-.323	7
699		5	...	.303	7	-.051	1	.093	8	-.822	1	.854	7	.713	9	.204	6
700			...	-.13	8	-.055	7	-.005	7	-.854	7	.822	1	-.204	6	-.713	9
701	M73	1	...	.303	7	.067	2	.033	4	-.822	1	.854	7	.713	9	.204	6
702			...	-.13	8	.066	1	-.04	5	-.854	7	.822	1	-.204	6	-.713	9
703		2	...	.294	7	.032	2	.013	4	.309	1	-.295	7	.622	8	.274	7
704			...	-.121	8	.031	1	-.02	5	.295	7	-.309	1	-.274	7	-.622	8
705		3	...	.286	7	-.003	2	.004	7	.639	2	-.628	3	.567	8	.381	7
706			...	-.112	8	-.003	1	-.011	8	.628	3	-.639	2	-.381	7	-.567	8
707		4	...	.277	7	-.037	2	.022	7	.175	2	-.149	1	.109	8	.084	7
708			...	-.104	8	-.038	1	-.028	8	.149	1	-.175	2	-.084	7	-.109	8
709		5	...	.268	7	-.072	2	.039	7	-1.0...	2	1.142	1	.616	7	.753	8
710			...	-.095	8	-.073	1	-.046	8	-1.1...	1	1.097	2	-.753	8	-.616	7
711	M74	1	...	.268	7	.071	1	.041	4	-1.0...	2	1.142	1	.616	7	.753	8
712			...	-.095	8	.069	2	-.039	5	-1.1...	1	1.097	2	-.753	8	-.616	7
713		2	...	.259	7	.034	1	.02	4	.143	3	-.139	2	.035	6	.124	9
714			...	-.086	8	.032	2	-.018	5	.139	2	-.143	3	-.124	9	-.035	6
715		3	...	.25	7	-.003	1	.003	9	.513	1	-.463	2	.268	4	.309	5
716			...	-.077	8	-.005	2	0	6	.463	2	-.513	1	-.309	5	-.268	4
717		4	...	.24	7	-.04	1	.023	5	-.027	1	.124	2	.016	7	.01	8
718			...	-.067	8	-.042	2	-.021	4	-.124	2	.027	1	-.01	8	-.016	7
719		5	...	.231	7	-.077	1	.044	5	-1.4...	1	1.622	2	.843	5	.79	4
720			...	-.058	8	-.079	2	-.042	4	-1.6...	2	1.478	1	-.79	4	-.843	5

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
721	M75	1	...	.231	7	.091	2	.047	4	-1.4...	1	1.622	2	.843	5	.79	4
722			...	-.058	8	.085	1	-.048	5	-1.6...	2	1.478	1	-.79	4	-.843	5
723		2	...	.221	7	.05	2	.024	4	.32	2	-.301	1	.18	4	.16	5
724			...	-.048	8	.044	1	-.025	5	.301	1	-.32	2	-.16	5	-.18	4
725		3	...	.21	7	.008	2	0	6	1.1...	2	-.942	1	.509	4	.522	5
726			...	-.037	8	.003	1	-.002	9	.942	1	-1.123	2	-.522	5	-.509	4
727		4	...	.2	7	-.033	2	.022	5	.787	2	-.445	1	.197	4	.244	5
728			...	-.027	8	-.039	1	-.023	4	.445	1	-.787	2	-.244	5	-.197	4
729		5	...	.19	7	-.074	2	.045	5	-.686	2	1.19	1	.676	5	.756	4
730			...	-.017	8	-.08	1	-.046	4	-1.19	1	.686	2	-.756	4	-.676	5
731	M76	1	...	.05	8	.046	8	.009	6	-.016	1	.249	8	.07	9	.015	6
732			...	-.05	6	.04	1	-.035	9	-.249	8	.016	1	-.015	6	-.07	9
733		2	...	.051	8	.044	8	.009	6	.018	1	.209	8	.04	9	.007	6
734			...	-.051	6	.038	1	-.034	9	-.209	8	-.018	1	-.007	6	-.04	9
735		3	...	.051	8	.042	8	.008	6	.051	1	.17	8	.022	8	.011	7
736			...	-.051	6	.036	1	-.033	9	-.17	8	-.051	1	-.011	7	-.022	8
737		4	...	.052	8	.041	8	.007	6	.082	1	.133	8	.025	8	.037	7
738			...	-.052	6	.034	1	-.032	9	-.133	8	-.082	1	-.037	7	-.025	8
739		5	...	.052	8	.039	8	.006	6	.112	1	.098	8	.028	8	.061	7
740			...	-.052	6	.032	1	-.031	9	-.098	8	-.112	1	-.061	7	-.028	8
741	M77	1	...	.052	8	.039	8	.006	6	.112	1	.098	8	.028	8	.061	7
742			...	-.052	6	.032	1	-.031	9	-.098	8	-.112	1	-.061	7	-.028	8
743		2	...	.053	8	.035	8	.004	6	.161	1	.038	8	.03	8	.104	7
744			...	-.053	6	.029	1	-.029	9	-.038	8	-.161	1	-.104	7	-.03	8
745		3	...	.054	8	.032	8	.002	6	.205	1	-.016	8	.029	8	.144	7
746			...	-.054	6	.025	1	-.027	9	.016	8	-.205	1	-.144	7	-.029	8
747		4	...	.055	8	.028	8	0	6	.243	1	-.064	8	.027	6	.182	9
748			...	-.055	6	.022	1	-.025	9	.064	8	-.243	1	-.182	9	-.027	6
749		5	...	.056	8	.025	8	0	1	.275	1	-.107	8	.026	6	.222	9
750			...	-.056	6	.018	1	-.024	9	.107	8	-.275	1	-.222	9	-.026	6
751	M78	1	...	.056	9	.025	8	0	1	.275	1	-.107	8	.026	6	.222	9
752			...	-.056	7	.018	1	-.024	9	.107	8	-.275	1	-.222	9	-.026	6
753		2	...	.061	9	.005	8	0	1	.351	1	-.242	8	0	1	.394	9
754			...	-.061	7	-.001	1	-.015	8	.242	8	-.351	1	-.394	9	0	1
755		3	...	.065	9	-.015	8	0	1	.248	1	-.197	9	0	1	.475	9
756			...	-.065	7	-.021	1	-.025	8	.197	9	-.248	1	-.475	9	0	1
757		4	...	.07	9	-.034	8	.009	7	-.028	8	.036	1	0	1	.518	8
758			...	-.07	7	-.041	1	-.034	8	.036	1	.028	8	-.518	8	0	1
759		5	...	.075	9	-.054	8	.019	7	-.433	8	.5	1	0	1	.878	8
760			...	-.075	7	-.061	1	-.044	8	-.5	1	.433	8	-.878	8	0	1
761	M79	1	...	0	1	.012	8	.117	7	-.086	7	.246	8	0	1	2.705	7
762			...	0	1	.005	7	0	1	-.246	8	.086	7	-2.705	7	0	1
763		2	...	0	6	.01	8	.116	7	-.082	7	.237	8	0	1	2.601	7
764			...	0	7	.003	7	0	1	-.237	8	.082	7	-2.601	7	0	1
765		3	...	0	6	.008	8	.115	7	-.081	7	.229	8	0	1	2.498	7
766			...	0	7	0	7	0	1	-.229	8	.081	7	-2.498	7	0	1
767		4	...	.001	6	.006	8	.114	7	-.081	7	.223	8	0	1	2.396	7
768			...	-.001	7	-.001	7	0	1	-.223	8	.081	7	-2.396	7	0	1
769		5	...	.002	6	.004	8	.113	7	-.083	7	.218	8	0	1	2.294	7
770			...	-.002	7	-.003	7	0	1	-.218	8	.083	7	-2.294	7	0	1
771	M80	1	...	.002	6	.004	8	.113	7	-.083	7	.218	8	0	1	2.294	7
772			...	-.002	9	-.003	7	0	1	-.218	8	.083	7	-2.294	7	0	1
773		2	...	.003	6	0	8	.111	7	-.092	7	.215	8	0	1	2.076	7
774			...	-.003	9	-.007	7	0	1	-.215	8	.092	7	-2.076	7	0	1
775		3	...	.004	6	-.004	8	.109	7	-.11	7	.219	8	0	1	1.862	7
776			...	-.004	9	-.011	7	0	1	-.219	8	.11	7	-1.862	7	0	1
777		4	...	.005	6	-.009	8	.107	7	-.136	7	.232	8	0	1	1.652	7

Company : DMJM H&N
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[..	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
778			...	-.005	9	-.016	7	0	1	-.232	8	.136	7	-1.652	7	0	1
779		5	...	.006	6	-.013	8	.105	7	-.171	7	.253	8	0	1	1.446	7
780			...	-.006	9	-.02	7	0	1	-.253	8	.171	7	-1.446	7	0	1
781	M81	1	...	.006	8	-.013	8	.105	7	-.171	7	.253	8	0	1	1.446	7
782			...	-.006	9	-.02	7	0	1	-.253	8	.171	7	-1.446	7	0	1
783		2	...	.008	8	-.021	8	.101	7	-.266	7	.32	8	0	1	1.038	7
784			...	-.008	9	-.028	7	0	1	-.32	8	.266	7	-1.038	7	0	1
785		3	...	.01	8	-.03	8	.096	7	-.395	7	.422	8	.081	9	.647	6
786			...	-.01	9	-.037	7	0	1	-.422	8	.395	7	-.647	6	-.081	9
787		4	...	.013	8	-.038	8	.095	3	-.557	6	.558	1	.281	9	.273	6
788			...	-.013	9	-.045	7	0	1	-.558	1	.557	6	-.273	6	-.281	9
789		5	...	.015	8	-.047	8	.099	3	-.726	8	.755	7	.653	3	.071	2
790			...	-.015	9	-.054	7	0	1	-.755	7	.726	8	-.071	2	-.653	3
791	M82	1	...	.19	7	.063	3	.037	4	-.686	2	1.19	1	.676	5	.756	4
792			...	-.017	8	.026	2	-.035	5	-1.19	1	.686	2	-.756	4	-.676	5
793		2	...	.187	2	.039	3	.023	4	-.345	3	.464	2	.223	5	.278	4
794			...	-.014	3	.002	2	-.022	5	-.464	2	.345	3	-.278	4	-.223	5
795		3	...	.187	2	.015	3	.01	4	.087	3	.623	2	.031	7	.06	8
796			...	-.014	3	-.022	2	-.008	5	.623	2	-.087	3	-.06	8	-.031	7
797		4	...	.187	2	-.009	3	.006	7	.138	3	1.162	2	.067	6	.071	9
798			...	-.014	3	-.046	2	-.004	8	1.1	2	-.138	3	-.071	9	-.067	6
799		5	...	.187	2	-.033	3	.019	5	-.191	3	2.081	2	.221	7	.199	8
800			...	-.014	3	-.07	2	-.017	4	-2.0	2	.191	3	-.199	8	-.221	7
801	M83	1	...	.157	2	.215	2	.019	5	-.191	3	2.081	2	.146	7	.088	8
802			...	.002	3	-.042	3	-.017	4	-2.0	2	.191	3	-.088	8	-.146	7
803		2	...	.157	2	.21	2	.021	5	-.323	3	1.429	2	.205	7	.141	8
804			...	.004	3	-.044	3	-.02	4	-1.4	2	.323	3	-.141	8	-.205	7
805		3	...	.158	2	.204	2	.024	5	-.446	8	.806	7	.271	7	.202	8
806			...	.007	3	-.045	3	-.022	4	-.806	7	.446	8	-.202	8	-.271	7
807		4	...	.159	2	.199	2	.026	5	-.17	6	.603	9	.344	7	.27	8
808			...	.01	3	-.047	3	-.025	4	-.603	9	.17	6	-.27	8	-.344	7
809		5	...	.159	2	.194	2	.029	5	.433	2	.746	3	.423	7	.345	8
810			...	.012	3	-.048	3	-.027	4	-.746	3	-.433	2	-.345	8	-.423	7
811	M84	1	...	.181	2	.078	9	-.001	1	.433	2	.746	3	.416	7	.381	8
812			...	-.008	3	.062	6	-.163	7	-.746	3	-.433	2	-.381	8	-.416	7
813		2	...	.158	2	.059	3	.003	8	.566	2	.524	3	.941	5	-.049	1
814			...	-.021	3	.043	2	-.092	7	-.524	3	-.566	2	.049	1	-.941	5
815		3	...	.158	2	.054	3	0	8	.703	2	.333	3	.72	9	-.047	1
816			...	-.021	3	.038	2	-.089	7	-.333	3	-.703	2	.047	1	-.72	9
817		4	...	.158	2	.049	3	0	1	.822	2	.16	3	.663	8	-.044	1
818			...	-.021	3	.033	2	-.087	7	-.16	3	-.822	2	.044	1	-.663	8
819		5	...	.158	2	.044	3	0	1	.924	2	.003	3	.651	8	.018	7
820			...	-.021	3	.028	2	-.084	7	-.003	3	-.924	2	-.018	7	-.651	8
821	M85	1	...	.124	7	.052	7	.042	6	.339	8	.576	7	.043	1	6.314	8
822			...	0	1	.037	8	-.076	9	-.576	7	-.339	8	-6.314	8	-.043	1
823		2	...	.123	7	.049	7	.04	6	.483	8	.367	7	.038	1	6.215	8
824			...	0	1	.033	8	-.073	9	-.367	7	-.483	8	-6.215	8	-.038	1
825		3	...	.121	7	.046	7	.038	6	.613	8	.177	1	.034	1	6.116	8
826			...	0	1	.03	8	-.071	9	-.177	1	-.613	8	-6.116	8	-.034	1
827		4	...	.12	7	.042	7	.035	6	.729	8	.03	1	.029	1	6.224	9
828			...	0	1	.026	8	-.068	9	-.03	1	-.729	8	-6.224	9	-.029	1
829		5	...	.119	7	.039	7	.033	6	.83	8	-.102	1	.024	1	6.501	9
830			...	0	1	.023	8	-.066	9	.102	1	-.83	8	-6.501	9	-.024	1
831	M86	1	...	.104	7	.039	7	.137	2	.659	8	.423	7	.024	1	6.501	9
832			...	0	1	.023	8	.0	1	-.423	7	-.659	8	-6.501	9	-.024	1
833		2	...	.099	7	.017	7	.12	5	.98	8	-.313	7	.032	1	3.501	9
834			...	0	1	.001	8	0	1	.313	7	-.98	8	-3.501	9	-.032	1

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
835		3	...	.093	7	-.005	7	.13	9	.725	8	-.472	7	.076	2	.254	3
836			...	0	1	-.021	8	0	1	.472	7	-.725	8	-.254	3	-.076	2
837		4	...	.091	5	-.027	7	.147	3	.111	5	.161	4	3.371	3	-.047	1
838			...	0	1	-.042	8	0	1	-.161	4	-.111	5	.047	1	-3.371	3
839		5	...	.091	5	.025	1	.052	2	-.276	1	1.135	4	5.296	9	-.045	1
840			...	0	1	-.037	7	-.038	3	-1.1	4	.276	1	.045	1	-5.296	9
841	M87	1	...	.073	7	.025	1	-.002	1	-.091	7	.403	8	5.296	9	-.045	1
842			...	0	1	-.037	7	-.122	9	-.403	8	.091	7	.045	1	-5.296	9
843		2	...	.069	7	.015	1	-.002	1	.027	1	.793	8	3.863	9	-.025	1
844			...	0	1	.047	7	-.115	9	-.793	8	-.027	1	.025	1	-3.863	9
845		3	...	.066	7	.005	1	-.002	1	.147	1	1.304	8	2.529	8	-.004	1
846			...	0	1	-.057	7	-.108	9	-1.3	8	-.147	1	.004	1	-2.529	8
847		4	...	.062	7	-.005	1	-.002	1	.146	1	1.983	5	1.448	2	.017	1
848			...	0	1	-.067	7	-.101	9	-1.9	5	-.146	1	-.017	1	-1.448	2
849		5	...	.059	7	-.015	1	-.002	1	.024	1	2.844	5	.389	2	.037	1
850			...	0	1	-.076	7	-.095	8	-2.8	5	-.024	1	-.037	1	-.389	2
851	M88	1	...	.065	7	-.015	1	-.002	1	.024	1	2.844	5	.618	2	.002	1
852			...	.002	1	-.052	7	-.095	8	-2.8	5	-.024	1	-.002	1	-.618	2
853		2	...	.065	7	-.015	1	-.002	1	.02	1	2.858	5	.593	2	.003	1
854			...	.002	1	-.052	7	-.095	8	-2.8	5	-.02	1	-.003	1	-.593	2
855		3	...	.065	7	-.015	1	-.002	1	.016	1	2.872	5	.569	2	.003	1
856			...	.002	1	-.053	7	-.095	8	-2.8	5	-.016	1	-.003	1	-.569	2
857		4	...	.065	7	-.015	1	-.002	1	.012	1	2.886	5	.544	2	.004	1
858			...	.002	1	-.053	7	-.095	8	-2.8	5	-.012	1	-.004	1	-.544	2
859		5	...	.065	7	-.015	1	-.002	1	.008	1	2.901	5	.519	2	.004	1
860			...	.002	1	-.053	7	-.095	8	-2.9	5	-.008	1	-.004	1	-.519	2
861	M89	1	...	.07	7	.001	2	-.002	1	.008	1	2.901	5	.919	6	-.066	1
862			...	.005	1	-.013	1	-.095	8	-2.9	5	-.008	1	.066	1	-.919	6
863		2	...	.07	7	0	2	-.002	1	.005	1	2.9	5	.894	6	-.065	1
864			...	.005	1	-.013	1	-.095	8	-2.9	5	-.005	1	.065	1	-.894	6
865		3	...	.07	7	0	2	-.002	1	.001	1	2.901	5	.87	6	-.065	1
866			...	.005	1	-.013	1	-.095	8	-2.9	5	-.001	1	.065	1	-.87	6
867		4	...	.07	7	0	2	-.002	1	-.002	1	2.901	5	.845	6	-.064	1
868			...	.005	1	-.013	1	-.095	8	-2.9	5	.002	1	.064	1	-.845	6
869		5	...	.07	7	0	2	-.002	1	-.006	1	2.901	5	.821	6	-.064	1
870			...	.005	1	-.013	1	-.095	8	-2.9	5	.006	1	.064	1	-.821	6
871	M90	1	...	.065	7	.053	7	-.002	1	-.006	1	2.901	5	1.088	6	-.124	1
872			...	.007	1	-.009	1	-.095	8	-2.9	5	.006	1	.124	1	-1.088	6
873		2	...	.065	7	.053	7	-.002	1	-.008	1	2.886	5	1.063	6	-.123	1
874			...	.007	1	-.009	1	-.095	8	-2.8	5	.008	1	.123	1	-1.063	6
875		3	...	.065	7	.052	7	-.002	1	-.011	1	2.872	5	1.039	6	-.123	1
876			...	.007	1	-.009	1	-.095	8	-2.8	5	.011	1	.123	1	-1.039	6
877		4	...	.065	7	.052	7	-.002	1	-.013	1	2.858	5	1.014	6	-.122	1
878			...	.008	1	-.009	1	-.095	8	-2.8	5	.013	1	.122	1	-1.014	6
879		5	...	.065	7	.052	7	-.002	1	-.016	1	2.844	5	.989	6	-.122	1
880			...	.008	1	-.009	1	-.095	8	-2.8	5	.016	1	.122	1	-.989	6
881	M91	1	...	.05	7	.098	7	-.002	1	-.016	1	2.844	5	1.098	6	-.163	1
882			...	.009	1	-.003	1	-.095	8	-2.8	5	.016	1	.163	1	-1.098	6
883		2	...	.05	7	.097	7	-.002	1	-.016	1	2.818	5	1.074	6	-.162	1
884			...	.009	1	-.003	1	-.095	8	-2.8	5	.016	1	.162	1	-1.074	6
885		3	...	.05	7	.097	7	-.002	1	-.017	1	2.791	5	1.049	6	-.162	1
886			...	.009	1	-.003	1	-.095	8	-2.7	5	.017	1	.162	1	-1.049	6
887		4	...	.05	7	.097	7	-.002	1	-.018	1	2.765	5	1.024	6	-.162	1
888			...	.009	1	-.003	1	-.095	8	-2.7	5	.018	1	.162	1	-1.024	6
889		5	...	.05	7	.097	7	-.002	1	-.019	1	2.739	5	.999	6	-.161	1
890			...	.009	1	-.003	1	-.095	8	-2.7	5	.019	1	.161	1	-.999	6
891	M92	1	...	.04	7	.019	7	-.002	1	.109	1	1.451	5	2.6	6	-.135	1

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
892			...	.009	1	-.005	8	-.145	2	-1.4...	5	-.109	1	.135	1	-2.6	6
893		2	...	.046	7	.018	5	-.002	1	.101	1	1.294	3	.506	4	-.107	1
894			...	.016	1	-.004	4	-.145	2	-1.2...	3	-.101	1	.107	1	-.506	4
895		3	...	.053	7	.022	3	-.002	1	.092	1	1.272	4	.079	1	1.803	2
896			...	.022	1	-.008	2	-.151	4	-1.2...	4	-.092	1	-1.803	2	-.079	1
897		4	...	.059	7	.033	3	-.002	1	.084	1	1.346	2	.05	1	4.056	4
898			...	.028	1	-.019	2	-.162	4	-1.3...	2	-.084	1	-4.056	4	-.05	1
899		5	...	.065	7	.044	3	-.002	1	.076	1	1.715	2	.022	1	6.584	4
900			...	.034	1	-.03	2	-.173	4	-1.7...	2	-.076	1	-6.584	4	-.022	1
901	M93	1	...	.162	2	.044	3	.014	6	.915	2	.01	3	.651	8	.018	7
902			...	-.019	3	.028	2	-.04	9	-.01	3	-.915	2	-.018	7	-.651	8
903		2	...	.154	2	.014	3	0	1	1.1...	2	-.565	3	.465	8	.349	7
904			...	-.01	3	-.002	2	-.022	9	.565	3	-1.169	2	-.349	7	-.465	8
905		3	...	.145	2	-.016	3	0	7	.819	2	-.536	3	.092	4	.492	5
906			...	-.002	3	-.032	2	-.026	8	.536	3	-.819	2	-.492	5	-.092	4
907		4	...	.137	2	-.047	3	.015	5	-.084	8	.145	7	0	1	.588	8
908			...	0	1	-.063	2	-.041	4	-.145	7	.084	8	-.588	8	0	1
909		5	...	.1	2	.04	2	0	6	-.438	1	.647	2	.81	5	.01	1
910			...	-.003	3	.036	1	-.041	9	-.647	2	.438	1	-.01	1	-.81	5
911	M94	1	...	.144	2	.058	2	0	6	-.819	1	1.21	2	1.515	5	.018	1
912			...	-.005	3	.052	1	-.059	9	-1.21	2	.819	1	-.018	1	-1.515	5
913		2	...	.135	2	.029	2	0	1	.127	3	.122	2	.479	6	.012	1
914			...	0	1	.023	1	-.042	9	-.122	2	-.127	3	-.012	1	-.479	6
915		3	...	.126	2	0	2	0	1	.359	3	-.228	2	-.005	1	.604	9
916			...	0	1	-.007	1	-.035	4	.228	2	-.359	3	-.604	9	.005	1
917		4	...	.118	2	-.03	2	0	1	-.137	8	.212	1	.002	1	1.328	4
918			...	0	1	-.036	1	-.053	4	-.212	1	.137	8	-1.328	4	-.002	1
919		5	...	.062	2	.031	4	0	1	-.409	1	.508	8	1.255	5	.002	1
920			...	0	1	.028	1	-.05	5	-.508	8	.409	1	-.002	1	-1.255	5
921	M95	1	...	.134	2	.067	4	0	1	-1.3...	1	1.624	8	4.013	5	.005	1
922			...	0	1	.06	1	-.108	5	-1.6...	8	1.306	1	-.005	1	-4.013	5
923		2	...	.121	2	.037	4	0	1	.336	1	-.262	3	1.215	4	-.001	1
924			...	0	1	.031	1	-.083	5	.262	3	-.336	1	.001	1	-1.215	4
925		3	...	.109	2	.008	4	0	1	1.1...	2	-.9	1	.008	1	1.975	5
926			...	0	1	0	1	-.067	8	.9	1	-1.133	2	-1.975	5	-.008	1
927		4	...	.096	2	-.022	4	0	1	.853	2	-.385	1	.014	1	3.728	8
928			...	0	1	-.029	1	-.088	4	.385	1	-.853	2	-3.728	8	-.014	1
929		5	...	.091	7	.036	5	0	1	.478	2	.143	1	.018	1	6.625	4
930			...	0	1	.033	4	-.195	9	-.143	1	-.478	2	-6.625	4	-.018	1
931	M96	1	...	.115	7	.036	5	.146	2	.042	8	.066	1	.018	1	6.625	4
932			...	0	1	.033	4	0	1	.066	1	-.042	8	-6.625	4	-.018	1
933		2	...	.108	7	.01	5	.123	9	.736	3	-.609	1	-.006	1	2.801	3
934			...	0	1	.007	4	0	1	.609	1	-.736	3	-2.801	3	.006	1
935		3	...	.102	7	-.017	5	.141	3	.602	3	-.431	1	1.487	5	.029	1
936			...	0	1	-.02	4	0	1	.431	1	-.602	3	-.029	1	-1.487	5
937		4	...	.098	5	-.043	5	.164	3	-.377	5	.597	1	6.251	3	.052	1
938			...	0	1	-.046	4	0	1	.597	1	.377	5	-.052	1	-6.251	3
939		5	...	.098	5	.016	1	.001	1	0	1	1.681	2	5.069	5	.015	1
940			...	0	1	-.049	5	-.063	3	-1.6...	2	0	1	-.015	1	-5.069	5
941	M97	1	...	.061	5	.016	1	.001	1	-.094	1	.855	5	5.069	5	.015	1
942			...	0	1	-.049	5	-.155	9	-.855	5	.094	1	-.015	1	-5.069	5
943		2	...	.059	5	.009	1	.001	1	.006	1	1.284	5	3.829	5	.007	1
944			...	0	1	-.056	5	-.151	9	-1.2...	5	-.006	1	-.007	1	-3.829	5
945		3	...	.057	5	.002	1	.001	1	.052	1	1.767	5	2.743	2	-.002	1
946			...	0	1	-.063	5	-.146	5	-1.7...	5	-.052	1	.002	1	-2.743	2
947		4	...	.055	5	-.005	1	.001	1	.042	1	2.305	5	1.715	2	-.011	1
948			...	0	1	-.069	5	-.142	5	-2.3...	5	-.042	1	.011	1	-1.715	2

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Icy	Shear[...	Icz	Shear[k...	Icy-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
949		5	...	.053	5	-.011	1	.001	1	-.022	1	2.899	5	.653	2	-.019	1
950			...	0	1	-.076	5	-.138	5	-2.8...	5	.022	1	.019	1	-.653	2
951	M98	1	...	.136	7	.038	5	.114	6	.431	8	.192	1	.025	1	9.84	8
952			...	0	1	.033	4	0	1	-.192	1	-.431	8	-9.84	8	-.025	1
953		2	...	.135	7	.034	5	.112	6	.557	8	.05	1	.024	1	9.446	8
954			...	0	1	.03	4	0	1	-.05	1	-.557	8	-9.446	8	-.024	1
955		3	...	.133	7	.031	5	.11	6	.669	8	-.078	1	.022	1	9.051	8
956			...	0	1	.026	4	0	1	.078	1	-.669	8	-9.051	8	-.022	1
957		4	...	.132	7	.028	5	.108	6	.769	8	-.193	1	.021	1	8.654	8
958			...	0	1	.023	4	0	1	.193	1	-.769	8	-8.654	8	-.021	1
959		5	...	.131	7	.025	5	.105	6	.854	8	-.295	1	.02	1	8.502	9
960			...	0	1	.02	4	0	1	.295	1	-.854	8	-8.502	9	-.02	1
961	M99	1	...	.102	7	.025	5	.178	2	.593	8	-.294	7	.02	1	8.502	9
962			...	0	1	.02	4	0	1	.294	7	-.593	8	-8.502	9	-.02	1
963		2	...	.096	7	0	5	.169	9	.815	8	-.657	7	.011	1	3.738	3
964			...	0	1	-.004	4	0	1	.657	7	-.815	8	-3.738	3	-.011	1
965		3	...	.09	7	-.024	5	.186	3	.401	3	-.25	2	1.414	8	-.002	1
966			...	0	1	-.029	4	0	1	.25	2	-.401	3	.002	1	-1.414	8
967		4	...	.085	5	-.048	5	.208	3	-.683	5	.895	4	7.153	3	.007	1
968			...	0	1	-.053	4	0	1	-.895	4	.683	5	-.007	1	-7.153	3
969		5	...	.085	5	.015	1	0	1	-.027	1	1.501	2	5.043	5	.005	1
970			...	0	1	-.035	5	-.08	3	-1.5...	2	.027	1	-.005	1	-5.043	5
971	M100	1	...	.046	7	.015	1	0	1	-.023	1	.536	8	5.043	5	.005	1
972			...	0	1	-.035	5	-.152	9	-.536	8	.023	1	-.005	1	-5.043	5
973		2	...	.043	7	.009	1	0	1	.075	1	.822	5	3.83	5	.005	1
974			...	0	1	-.041	5	-.147	9	-.822	5	-.075	1	-.005	1	-3.83	5
975		3	...	.041	7	.002	1	0	1	.117	1	1.188	5	2.745	2	.005	1
976			...	0	1	-.048	5	-.142	9	-1.1...	5	-.117	1	-.005	1	-2.745	2
977		4	...	.039	7	-.005	1	0	1	.105	1	1.608	5	1.742	2	.005	1
978			...	0	1	-.055	5	-.138	5	-1.6...	5	-.105	1	-.005	1	-1.742	2
979		5	...	.036	7	-.012	1	0	1	.038	1	2.084	5	.704	2	.005	1
980			...	0	1	-.062	5	-.134	5	-2.0...	5	-.038	1	-.005	1	-.704	2
981	M101	1	...	.129	7	.047	7	.105	6	.319	8	.561	7	.016	1	9.279	8
982			...	0	1	.035	8	0	1	.561	7	-.319	8	-9.279	8	-.016	1
983		2	...	.128	7	.044	7	.103	6	.452	8	.377	7	.014	1	8.913	8
984			...	0	1	.031	8	0	1	-.377	7	-.452	8	-8.913	8	-.014	1
985		3	...	.127	7	.041	7	.1	6	.571	8	.206	7	.012	1	8.546	8
986			...	0	1	.028	8	0	1	-.206	7	-.571	8	-8.546	8	-.012	1
987		4	...	.126	7	.037	7	.098	6	.676	8	.049	7	.011	1	8.176	8
988			...	0	1	.025	8	0	1	-.049	7	-.676	8	-8.176	8	-.011	1
989		5	...	.125	7	.034	7	.096	6	.769	8	-.095	7	.009	1	7.804	8
990			...	0	1	.021	8	0	1	.095	7	-.769	8	-7.804	8	-.009	1
991	M102	1	...	.1	7	.034	7	.161	2	.553	8	.252	7	.009	1	7.804	8
992			...	0	1	.021	8	0	1	-.252	7	-.553	8	-7.804	8	-.009	1
993		2	...	.094	7	.01	7	.153	8	.822	8	-.392	7	-.002	1	3.578	3
994			...	0	1	-.003	8	0	1	.392	7	-.822	8	-3.578	3	.002	1
995		3	...	.088	7	-.014	7	.171	3	.452	3	-.268	2	1.121	3	.013	1
996			...	0	1	-.027	8	0	1	.268	2	-.452	3	-.013	1	-1.121	3
997		4	...	.083	5	-.038	7	.193	3	-.419	5	.762	4	6.437	3	.025	1
998			...	0	1	-.051	8	0	1	-.762	4	.419	5	-.025	1	-6.437	3
999		5	...	.083	5	.015	1	0	1	-.005	1	1.358	6	4.59	5	.007	1
1000			...	0	1	-.04	7	-.07	3	-1.3...	6	.005	1	-.007	1	-4.59	5
1001	M103	1	...	.049	7	.015	1	0	1	-.032	1	.535	8	4.59	5	.007	1
1002			...	0	1	-.04	7	-.14	9	-.535	8	.032	1	-.007	1	-4.59	5
1003		2	...	.047	7	.008	1	0	1	.061	1	.846	5	3.476	5	.004	1
1004			...	0	1	-.047	7	-.135	9	-.846	5	-.061	1	-.004	1	-3.476	5
1005		3	...	.044	7	.001	1	0	1	.099	1	1.254	7	2.501	2	.001	1

Company : DMJM H&N
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[..	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
1006			...	0	1	-.054	7	-.131	9	-1.2...	7	-.099	1	-.001	1	-2.501	2
1007		4	...	.042	7	-.005	1	0	1	.082	1	1.721	7	1.597	2	-.002	1
1008			...	0	1	-.061	7	-.126	5	-1.7...	7	-.082	1	.002	1	-1.597	2
1009		5	...	.04	7	-.012	1	0	1	.01	1	2.242	7	.659	2	-.005	1
1010			...	0	1	-.067	7	-.122	5	-2.2...	7	-.01	1	.005	1	-.659	2
1011	M104	1	...	.045	7	-.012	1	0	1	.01	1	2.242	7	.921	2	0	1
1012			...	.001	1	-.05	7	-.122	5	-2.2...	7	-.01	1	0	1	-.921	2
1013		2	...	.045	7	-.012	1	0	1	.007	1	2.255	7	.89	2	0	1
1014			...	.001	1	-.051	7	-.122	5	-2.2...	7	-.007	1	0	1	-.89	2
1015		3	...	.045	7	-.012	1	0	1	.003	1	2.269	7	.858	2	0	1
1016			...	.001	1	-.051	7	-.122	5	-2.2...	7	-.003	1	0	1	-.858	2
1017		4	...	.045	7	-.012	1	0	1	0	1	2.283	7	.826	2	0	1
1018			...	.002	1	-.051	7	-.122	5	-2.2...	7	0	1	0	1	-.826	2
1019		5	...	.045	7	-.013	1	0	1	-.003	1	2.297	7	.794	2	0	1
1020			...	.002	1	-.051	7	-.121	5	-2.2...	7	.003	1	0	1	-.794	2
1021	M105	1	...	.052	7	-.011	1	0	1	-.003	1	2.297	7	1.214	2	.009	1
1022			...	.004	1	-.024	4	-.121	5	-2.2...	7	.003	1	-.009	1	-1.214	2
1023		2	...	.052	7	-.011	1	0	1	-.006	1	2.3	7	1.182	2	.009	1
1024			...	.004	1	-.025	4	-.121	5	-2.3...	7	.006	1	-.009	1	-1.182	2
1025		3	...	.052	7	-.011	1	0	1	-.009	1	2.304	7	1.15	2	.009	1
1026			...	.004	1	-.025	4	-.121	5	-2.3...	7	.009	1	-.009	1	-1.15	2
1027		4	...	.052	7	-.011	1	0	1	-.012	1	2.308	7	1.118	2	.009	1
1028			...	.004	1	-.025	4	-.121	5	-2.3...	7	.012	1	-.009	1	-1.118	2
1029		5	...	.052	7	-.011	1	0	1	-.015	1	2.312	7	1.086	2	.009	1
1030			...	.004	1	-.025	4	-.121	5	-2.3...	7	.015	1	-.009	1	-1.086	2
1031	M106	1	...	.05	7	.027	5	0	1	-.015	1	2.312	7	1.33	2	.017	1
1032			...	.006	1	-.007	1	-.121	5	-2.3...	7	.015	1	-.017	1	-1.33	2
1033		2	...	.05	7	.026	5	0	1	-.017	1	2.304	7	1.298	2	.017	1
1034			...	.006	1	-.007	1	-.121	5	-2.3...	7	.017	1	-.017	1	-1.298	2
1035		3	...	.05	7	.026	5	0	1	-.019	1	2.297	7	1.266	2	.017	1
1036			...	.006	1	-.008	1	-.121	5	-2.2...	7	.019	1	-.017	1	-1.266	2
1037		4	...	.051	7	.026	5	0	1	-.021	1	2.29	7	1.234	2	.017	1
1038			...	.006	1	-.008	1	-.121	5	-2.29	7	.021	1	-.017	1	-1.234	2
1039		5	...	.051	7	.026	5	0	1	-.024	1	2.283	7	1.202	2	.017	1
1040			...	.006	1	-.008	1	-.12	5	-2.2...	7	.024	1	-.017	1	-1.202	2
1041	M107	1	...	.042	7	.062	7	0	1	-.024	1	2.283	7	1.254	2	.022	1
1042			...	.007	1	-.002	1	-.12	5	-2.2...	7	.024	1	-.022	1	-1.254	2
1043		2	...	.042	7	.062	7	0	1	-.024	1	2.266	7	1.221	2	.022	1
1044			...	.007	1	-.002	1	-.12	5	-2.2...	7	.024	1	-.022	1	-1.221	2
1045		3	...	.042	7	.062	7	0	1	-.025	1	2.25	7	1.189	2	.022	1
1046			...	.008	1	-.002	1	-.12	5	-2.25	7	.025	1	-.022	1	-1.189	2
1047		4	...	.042	7	.062	7	0	1	-.026	1	2.233	7	1.157	2	.022	1
1048			...	.008	1	-.003	1	-.12	5	-2.2...	7	.026	1	-.022	1	-1.157	2
1049		5	...	.042	7	.062	7	0	1	-.026	1	2.216	7	1.124	2	.022	1
1050			...	.008	1	-.003	1	-.12	5	-2.2...	7	.026	1	-.022	1	-1.124	2
1051	M108	1	...	.035	7	0	1	0	1	-.035	1	.895	5	2.267	2	-.002	1
1052			...	.008	1	-.05	8	-.139	5	.895	5	.035	1	.002	1	-2.267	2
1053		2	...	.042	7	0	1	0	1	-.025	1	1.412	8	.392	4	0	1
1054			...	.014	1	-.048	4	-.133	2	-1.4...	8	.025	1	0	1	-.392	4
1055		3	...	.048	7	0	1	0	1	-.016	1	2.133	2	-.002	1	1.766	2
1056			...	.02	1	-.057	2	-.135	6	-2.1...	2	.016	1	-1.766	2	.002	1
1057		4	...	.054	7	0	1	0	1	-.006	1	3.079	2	-.004	1	3.782	2
1058			...	.027	1	-.068	2	-.145	4	-3.0...	2	.006	1	-3.782	2	.004	1
1059		5	...	.06	7	0	1	0	1	.003	1	4.189	2	-.006	1	5.934	4
1060			...	.033	1	-.079	2	-.156	4	-4.1...	2	-.003	1	-5.934	4	.006	1
1061	M109	1	...	.042	7	-.011	1	0	1	.038	1	2.084	5	1.004	2	.002	1
1062			...	.001	1	-.049	3	-.134	5	-2.0...	5	-.038	1	-.002	1	-1.004	2

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
1063		2	...	.041	7	-.012	1	0	1	.035	1	2.096	5	.969	2	.002	1
1064			...	.001	1	-.049	3	-.134	5	-2.0	5	-.035	1	-.002	1	-.969	2
1065		3	...	.041	7	-.012	1	0	1	.032	1	2.109	5	.934	2	.002	1
1066			...	.001	1	-.049	3	-.134	5	-2.1	5	-.032	1	-.002	1	-.934	2
1067		4	...	.041	7	-.012	1	0	1	.029	1	2.122	5	.899	2	.002	1
1068			...	.001	1	-.05	3	-.134	5	-2.1	5	-.029	1	-.002	1	-.899	2
1069		5	...	.041	7	-.012	1	0	1	.025	1	2.134	5	.863	2	.002	1
1070			...	.001	1	-.05	3	-.134	5	-2.1	5	-.025	1	-.002	1	-.863	2
1071	M110	1	...	.047	5	-.01	1	0	1	.025	1	2.134	5	1.347	2	-.005	1
1072			...	.004	1	-.025	8	-.134	5	-2.1	5	-.025	1	.005	1	-1.347	2
1073		2	...	.047	5	-.011	1	0	1	.023	1	2.138	5	1.312	2	-.005	1
1074			...	.004	1	-.025	8	-.133	5	-2.1	5	-.023	1	.005	1	-1.312	2
1075		3	...	.047	5	-.011	1	0	1	.02	1	2.141	5	1.277	2	-.005	1
1076			...	.004	1	-.025	8	-.133	5	-2.1	5	-.02	1	.005	1	-1.277	2
1077		4	...	.047	5	-.011	1	0	1	.017	1	2.145	5	1.242	2	-.005	1
1078			...	.004	1	-.025	8	-.133	5	-2.1	5	-.017	1	.005	1	-1.242	2
1079		5	...	.047	5	-.011	1	0	1	.014	1	2.148	5	1.206	2	-.005	1
1080			...	.004	1	-.025	8	-.133	5	-2.1	5	-.014	1	.005	1	-1.206	2
1081	M111	1	...	.046	5	.024	7	0	1	.014	1	2.148	5	1.496	2	-.01	1
1082			...	.006	1	-.007	1	-.133	5	-2.1	5	-.014	1	.01	1	-1.496	2
1083		2	...	.046	5	.024	7	0	1	.012	1	2.142	5	1.46	2	-.01	1
1084			...	.006	1	-.007	1	-.133	5	-2.1	5	-.012	1	.01	1	-1.46	2
1085		3	...	.046	5	.023	7	0	1	.01	1	2.135	5	1.425	2	-.01	1
1086			...	.006	1	-.008	1	-.133	5	-2.1	5	-.01	1	.01	1	-1.425	2
1087		4	...	.046	5	.023	7	0	1	.008	1	2.129	5	1.39	2	-.01	1
1088			...	.006	1	-.008	1	-.133	5	-2.1	5	-.008	1	.01	1	-1.39	2
1089		5	...	.046	5	.023	7	0	1	.006	1	2.123	5	1.354	2	-.01	1
1090			...	.006	1	-.008	1	-.132	5	-2.1	5	-.006	1	.01	1	-1.354	2
1091	M112	1	...	.038	5	.057	5	0	1	.006	1	2.123	5	1.427	2	-.015	1
1092			...	.007	1	-.003	1	-.132	5	-2.1	5	-.006	1	.015	1	-1.427	2
1093		2	...	.039	5	.057	5	0	1	.005	1	2.107	5	1.391	2	-.015	1
1094			...	.007	1	-.003	1	-.132	5	-2.1	5	-.005	1	.015	1	-1.391	2
1095		3	...	.039	5	.056	5	0	1	.004	1	2.092	5	1.356	2	-.015	1
1096			...	.007	1	-.003	1	-.132	5	-2.0	5	-.004	1	.015	1	-1.356	2
1097		4	...	.039	5	.056	5	0	1	.003	1	2.077	5	1.32	2	-.015	1
1098			...	.007	1	-.003	1	-.132	5	-2.0	5	-.003	1	.015	1	-1.32	2
1099		5	...	.039	5	.056	5	0	1	.003	1	2.062	5	1.284	2	-.015	1
1100			...	.007	1	-.003	1	-.132	5	-2.0	5	-.003	1	.015	1	-1.284	2
1101	M113	1	...	.033	5	0	1	0	1	.013	1	.731	3	2.293	2	-.009	1
1102			...	.008	1	-.059	8	-.143	5	-.731	3	-.013	1	.009	1	-2.293	2
1103		2	...	.039	5	0	1	0	1	.014	1	1.474	8	.363	4	-.008	1
1104			...	.014	1	-.058	2	-.138	2	-1.4	8	-.014	1	.008	1	-.363	4
1105		3	...	.045	5	0	1	0	1	.015	1	2.304	4	.007	1	1.891	2
1106			...	.02	1	-.069	2	-.142	4	-2.3	4	-.015	1	-1.891	2	-.007	1
1107		4	...	.051	5	0	1	0	1	.016	1	3.434	2	.006	1	3.983	2
1108			...	.026	1	-.08	2	-.153	4	-3.4	2	-.016	1	-3.983	2	-.006	1
1109		5	...	.058	5	0	1	0	1	.018	1	4.73	2	.005	1	6.302	4
1110			...	.033	1	-.091	2	-.163	4	-4.73	2	-.018	1	-6.302	4	-.005	1
1111	M114	1	...	.059	5	-.011	1	.001	1	-.022	1	2.899	5	.94	2	0	1
1112			...	.002	1	-.057	3	-.138	5	-2.8	5	.022	1	0	1	-.94	2
1113		2	...	.059	5	-.011	1	.001	1	-.025	1	2.913	5	.904	2	-.001	1
1114			...	.002	1	-.057	3	-.137	5	-2.9	5	.025	1	.001	1	-.904	2
1115		3	...	.059	5	-.011	1	.001	1	-.029	1	2.928	5	.868	2	-.001	1
1116			...	.002	1	-.057	3	-.137	5	-2.9	5	.029	1	.001	1	-.868	2
1117		4	...	.059	5	-.012	1	.001	1	-.032	1	2.943	5	.832	2	-.002	1
1118			...	.002	1	-.057	3	-.137	5	-2.9	5	.032	1	.002	1	-.832	2
1119		5	...	.059	5	-.012	1	.001	1	-.035	1	2.958	5	.796	2	-.002	1

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Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	v Shear[..	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
1120			...	.002	1	-.057	3	-.137	5	-2.9...	5	.035	1	.002	1	-.796	2
1121	M115	1	...	.065	5	-.006	5	.001	1	-.035	1	2.958	5	1.263	2	.034	1
1122			...	.004	1	-.021	4	-.137	5	-2.9...	5	.035	1	-.034	1	-1.263	2
1123		2	...	.065	5	-.006	5	.001	1	-.037	1	2.959	5	1.227	2	.034	1
1124			...	.004	1	-.021	4	-.137	5	-2.9...	5	.037	1	-.034	1	-1.227	2
1125		3	...	.065	5	-.006	5	.001	1	-.04	1	2.961	5	1.191	2	.034	1
1126			...	.004	1	-.021	4	-.137	5	-2.9...	5	.04	1	-.034	1	-1.191	2
1127		4	...	.065	5	-.007	5	.001	1	-.043	1	2.963	5	1.155	2	.034	1
1128			...	.004	1	-.021	4	-.137	5	-2.9...	5	.043	1	-.034	1	-1.155	2
1129		5	...	.065	5	-.007	5	.001	1	-.046	1	2.965	5	1.119	2	.033	1
1130			...	.004	1	-.021	4	-.136	5	-2.9...	5	.046	1	-.033	1	-1.119	2
1131	M116	1	...	.061	5	.043	5	.001	1	-.046	1	2.965	5	1.404	2	.065	1
1132			...	.006	1	-.006	1	-.136	5	-2.9...	5	.046	1	-.065	1	-1.404	2
1133		2	...	.061	5	.043	5	.001	1	-.047	1	2.953	5	1.368	2	.064	1
1134			...	.006	1	-.007	1	-.136	5	-2.9...	5	.047	1	-.064	1	-1.368	2
1135		3	...	.061	5	.043	5	.001	1	-.049	1	2.941	5	1.332	2	.064	1
1136			...	.006	1	-.007	1	-.136	5	-2.9...	5	.049	1	-.064	1	-1.332	2
1137		4	...	.061	5	.043	5	.001	1	-.051	1	2.93	5	1.296	2	.064	1
1138			...	.006	1	-.007	1	-.136	5	-2.93	5	.051	1	-.064	1	-1.296	2
1139		5	...	.062	5	.042	5	.001	1	-.053	1	2.918	5	1.259	2	.063	1
1140			...	.006	1	-.007	1	-.136	5	-2.9...	5	.053	1	-.063	1	-1.259	2
1141	M117	1	...	.049	5	.086	5	.001	1	-.053	1	2.918	5	1.342	2	.085	1
1142			...	.007	1	-.002	1	-.136	5	-2.9...	5	.053	1	-.085	1	-1.342	2
1143		2	...	.049	5	.086	5	.001	1	-.053	1	2.895	5	1.306	2	.085	1
1144			...	.007	1	-.002	1	-.136	5	-2.8...	5	.053	1	-.085	1	-1.306	2
1145		3	...	.049	5	.086	5	.001	1	-.054	1	2.871	5	1.269	2	.084	1
1146			...	.007	1	-.002	1	-.136	5	-2.8...	5	.054	1	-.084	1	-1.269	2
1147		4	...	.049	5	.086	5	.001	1	-.054	1	2.848	5	1.233	2	.084	1
1148			...	.007	1	-.002	1	-.135	5	-2.8...	5	.054	1	-.084	1	-1.233	2
1149		5	...	.049	5	.086	5	.001	1	-.055	1	2.825	5	1.196	2	.084	1
1150			...	.007	1	-.002	1	-.135	5	-2.8...	5	.055	1	-.084	1	-1.196	2
1151	M118	1	...	.04	5	.001	1	0	1	-.102	1	1.26	5	2.735	5	.025	1
1152			...	.007	1	-.043	4	-.169	5	-1.26	5	.102	1	-.025	1	-2.735	5
1153		2	...	.046	5	.001	1	0	1	-.081	1	1.726	8	.436	8	.023	1
1154			...	.014	1	-.043	4	-.16	2	-1.7...	8	.081	1	-.023	1	-.436	8
1155		3	...	.052	5	.001	1	0	1	-.06	1	2.343	4	-.022	1	2.129	2
1156			...	.02	1	-.052	2	-.163	6	-2.3...	4	.06	1	-2.129	2	.022	1
1157		4	...	.059	5	.001	1	0	1	-.039	1	3.174	2	-.02	1	4.544	2
1158			...	.026	1	-.063	2	-.171	4	-3.1...	2	.039	1	-4.544	2	.02	1
1159		5	...	.065	5	.008	3	0	1	-.018	1	4.211	2	-.018	1	7.121	6
1160			...	.032	1	-.074	2	-.182	4	-4.2...	2	.018	1	-7.121	6	.018	1
1161	M119	1	...	.002	6	-.007	6	.003	8	7.3...	7	-.153	1	.013	1	1.021	8
1162			...	-.002	7	-.007	2	-.003	6	.153	1	-7.378	7	-1.021	8	-.013	1
1163		2	...	.002	6	-.008	6	.004	8	7.3...	7	-.149	1	.013	1	1.019	8
1164			...	-.002	7	-.008	2	-.004	6	.149	1	-7.374	7	-1.019	8	-.013	1
1165		3	...	.002	6	-.009	6	.005	8	7.37	7	-.144	1	.013	1	1.017	8
1166			...	-.002	7	-.009	2	-.005	6	.144	1	-7.37	7	-1.017	8	-.013	1
1167		4	...	.003	6	-.01	6	.005	8	7.3...	7	-.139	1	.013	1	1.014	8
1168			...	-.003	7	-.01	2	-.005	6	.139	1	-7.364	7	-1.014	8	-.013	1
1169		5	...	.003	6	-.012	6	.006	8	7.3...	7	-.133	1	.013	1	1.011	8
1170			...	-.003	7	-.012	2	-.006	6	.133	1	-7.358	7	-1.011	8	-.013	1
1171	M120	1	...	0	1	0	1	0	1	1.5...	8	-.563	1	.74	6	.011	9
1172			...	0	1	0	1	0	1	.563	1	-1.506	8	-.011	9	-.74	6
1173		2	...	0	8	-.002	1	0	7	1.5...	8	-.562	1	.739	6	.01	9
1174			...	0	6	-.002	1	0	6	.562	1	-1.505	8	-.01	9	-.739	6
1175		3	...	0	8	-.004	1	.002	7	1.5...	8	-.56	1	.738	6	.009	9
1176			...	0	6	-.004	1	-.002	6	.56	1	-1.503	8	-.009	9	-.738	6

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
1177		4	...	.001	8	-.006	1	.003	7	1.4...	8	-.556	1	.736	6	.007	9
1178			...	-.001	6	-.006	1	-.003	6	.556	1	-1.498	8	-.007	9	-.736	6
1179		5	...	.002	8	-.008	1	.004	7	1.4...	8	-.55	1	.733	6	.004	9
1180			...	-.002	6	-.008	1	-.004	6	.55	1	-1.492	8	-.004	9	-.733	6
1181	M121	1	...	.002	8	-.008	2	.004	9	1.4...	8	-.55	1	.733	6	.004	9
1182			...	-.002	6	-.008	5	-.004	8	.55	1	-1.492	8	-.004	9	-.733	6
1183		2	...	.007	8	-.03	2	.015	9	1.3	8	-.357	1	.637	6	0	1
1184			...	-.007	6	-.03	5	-.015	8	.357	1	-1.3	8	0	1	-.637	6
1185		3	...	.013	8	-.052	2	.026	9	.879	8	.063	1	.437	4	0	1
1186			...	-.013	6	-.052	5	-.026	8	-.063	1	-.879	8	0	1	-.437	4
1187		4	...	.019	8	-.074	2	.037	9	.232	8	.711	1	.63	7	0	1
1188			...	-.019	6	-.074	5	-.037	8	-.711	1	-.232	8	0	1	-.63	7
1189		5	...	.024	8	-.096	1	.048	9	-.644	8	1.587	1	1.068	7	.339	8
1190			...	-.024	6	-.096	4	-.048	6	-1.5...	1	.644	8	-.339	8	-1.068	7
1191	M122	1	...	.011	8	.443	6	.126	6	-.782	1	7.439	6	.013	1	1.063	6
1192			...	-.011	7	.066	1	0	1	-7.4...	6	.782	1	-1.063	6	-.013	1
1193		2	...	.013	8	.436	6	.122	6	-.554	1	5.821	6	.01	1	.77	7
1194			...	-.013	7	.058	1	0	1	-5.8...	6	.554	1	-.77	7	-.01	1
1195		3	...	.015	8	.428	6	.118	6	-.356	1	4.232	6	.007	1	.612	7
1196			...	-.015	7	.05	1	0	1	-4.2...	6	.356	1	-.612	7	-.007	1
1197		4	...	.017	8	.42	6	.114	6	-.187	1	2.672	6	.258	6	.479	9
1198			...	-.017	7	.042	1	0	1	-2.6...	6	.187	1	-.479	9	-.258	6
1199		5	...	.019	8	.412	6	.111	8	-.048	1	1.146	7	.669	6	.36	9
1200			...	-.019	7	.034	1	0	1	-1.1...	7	.048	1	-.36	9	-.669	6
1201	M123	1	...	.14	6	.034	1	-.009	1	3.4...	6	.331	1	4.992	9	-.282	1
1202			...	0	1	-.083	6	-.164	9	-.331	1	-3.446	6	.282	1	-4.992	9
1203		2	...	.143	6	.019	1	-.009	1	2.5...	6	.059	1	3.365	9	-.193	1
1204			...	0	1	-.098	6	-.156	9	-.059	1	-2.525	6	.193	1	-3.365	9
1205		3	...	.147	6	.004	1	-.009	1	1.4...	6	-.059	1	1.815	9	-.104	1
1206			...	0	1	-.114	6	-.151	7	.059	1	-1.449	6	.104	1	-1.815	9
1207		4	...	.151	6	-.011	1	-.009	1	.218	6	-.022	1	.398	8	-.015	1
1208			...	0	1	-.129	6	-.159	7	.022	1	-.218	6	.015	1	-.398	8
1209		5	...	.155	6	-.027	1	-.009	1	-.17	1	1.167	6	-.075	1	1.566	7
1210			...	0	1	-.144	6	-.166	7	-1.1...	6	.17	1	-1.566	7	.075	1
1211	M124	1	...	.155	6	.06	6	.083	7	-.17	1	1.167	6	-.075	1	1.566	7
1212			...	0	1	.029	1	-.012	8	-1.1	6	.17	1	-1.566	7	.075	1
1213		2	...	.159	6	.045	6	.076	7	.042	1	.654	6	-.052	1	.95	9
1214			...	0	1	.014	1	-.005	8	-.654	6	-.042	1	-.95	9	.052	1
1215		3	...	.162	6	.03	6	.068	7	.11	1	.284	6	-.029	1	.893	8
1216			...	0	1	0	1	.002	1	-.284	6	-.11	1	-.893	8	.029	1
1217		4	...	.166	6	.016	6	.061	7	.034	1	.064	7	.551	7	.831	8
1218			...	0	1	-.015	1	.002	1	-.064	7	-.034	1	-.831	8	-.551	7
1219		5	...	.17	6	0	6	.054	7	.022	6	.186	1	1.112	7	.696	8
1220			...	0	1	-.03	1	.002	1	-.186	1	-.022	6	-.696	8	-1.112	7

Envelope Member Section Torsion

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
1	M1	1	max	.25	1	.209	1	NC		NC		NC		NC	
2			min	-.536	8	-.448	8	NC		NC		NC		NC	
3		2	max	.25	1	.209	1	NC		NC		NC		NC	
4			min	-.536	8	-.448	8	NC		NC		NC		NC	
5		3	max	.25	1	.209	1	NC		NC		NC		NC	
6			min	-.536	8	-.448	8	NC		NC		NC		NC	
7		4	max	.25	1	.209	1	NC		NC		NC		NC	
8			min	-.536	8	-.448	8	NC		NC		NC		NC	
9		5	max	.25	1	.209	1	NC		NC		NC		NC	

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
10			min	-.536	8	-.448	8	NC		NC		NC		NC	
11	M2	1	max	.244	1	.204	1	NC		NC		NC		NC	
12			min	-.419	9	-.35	9	NC		NC		NC		NC	
13		2	max	.244	1	.204	1	NC		NC		NC		NC	
14			min	-.419	9	-.35	9	NC		NC		NC		NC	
15		3	max	.244	1	.204	1	NC		NC		NC		NC	
16			min	-.419	9	-.35	9	NC		NC		NC		NC	
17		4	max	.244	1	.204	1	NC		NC		NC		NC	
18			min	-.419	9	-.35	9	NC		NC		NC		NC	
19		5	max	.244	1	.204	1	NC		NC		NC		NC	
20			min	-.419	9	-.35	9	NC		NC		NC		NC	
21	M3	1	max	.203	1	.17	1	NC		NC		NC		NC	
22			min	-.149	9	-.125	9	NC		NC		NC		NC	
23		2	max	.203	1	.17	1	NC		NC		NC		NC	
24			min	-.149	9	-.125	9	NC		NC		NC		NC	
25		3	max	.203	1	.17	1	NC		NC		NC		NC	
26			min	-.149	9	-.125	9	NC		NC		NC		NC	
27		4	max	.203	1	.17	1	NC		NC		NC		NC	
28			min	-.149	9	-.125	9	NC		NC		NC		NC	
29		5	max	.203	1	.17	1	NC		NC		NC		NC	
30			min	-.149	9	-.125	9	NC		NC		NC		NC	
31	M4	1	max	.221	6	.185	6	NC		NC		NC		NC	
32			min	.132	1	.111	1	NC		NC		NC		NC	
33		2	max	.221	6	.185	6	NC		NC		NC		NC	
34			min	.132	1	.111	1	NC		NC		NC		NC	
35		3	max	.221	6	.185	6	NC		NC		NC		NC	
36			min	.132	1	.111	1	NC		NC		NC		NC	
37		4	max	.221	6	.185	6	NC		NC		NC		NC	
38			min	.132	1	.111	1	NC		NC		NC		NC	
39		5	max	.221	6	.185	6	NC		NC		NC		NC	
40			min	.132	1	.111	1	NC		NC		NC		NC	
41	M5	1	max	.478	8	.4	8	NC		NC		NC		NC	
42			min	.041	1	.034	1	NC		NC		NC		NC	
43		2	max	.478	8	.4	8	NC		NC		NC		NC	
44			min	.041	1	.034	1	NC		NC		NC		NC	
45		3	max	.478	8	.4	8	NC		NC		NC		NC	
46			min	.041	1	.034	1	NC		NC		NC		NC	
47		4	max	.478	8	.4	8	NC		NC		NC		NC	
48			min	.041	1	.034	1	NC		NC		NC		NC	
49		5	max	.478	8	.4	8	NC		NC		NC		NC	
50			min	.041	1	.034	1	NC		NC		NC		NC	
51	M6	1	max	.591	8	.494	8	NC		NC		NC		NC	
52			min	-.008	1	-.006	1	NC		NC		NC		NC	
53		2	max	.591	8	.494	8	NC		NC		NC		NC	
54			min	-.008	1	-.006	1	NC		NC		NC		NC	
55		3	max	.591	8	.494	8	NC		NC		NC		NC	
56			min	-.008	1	-.006	1	NC		NC		NC		NC	
57		4	max	.591	8	.494	8	NC		NC		NC		NC	
58			min	-.008	1	-.006	1	NC		NC		NC		NC	
59		5	max	.591	8	.494	8	NC		NC		NC		NC	
60			min	-.008	1	-.006	1	NC		NC		NC		NC	
61	M7	1	max	.481	8	.403	8	NC		NC		NC		NC	
62			min	.041	1	.034	1	NC		NC		NC		NC	
63		2	max	.481	8	.403	8	NC		NC		NC		NC	
64			min	.041	1	.034	1	NC		NC		NC		NC	
65		3	max	.481	8	.403	8	NC		NC		NC		NC	
66			min	.041	1	.034	1	NC		NC		NC		NC	

Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
67		4	max	.481	8	.403	8	NC		NC		NC		NC	
68			min	.041	1	.034	1	NC		NC		NC		NC	
69		5	max	.481	8	.403	8	NC		NC		NC		NC	
70			min	.041	1	.034	1	NC		NC		NC		NC	
71	M8	1	max	.216	8	.181	8	NC		NC		NC		NC	
72			min	.132	1	.111	1	NC		NC		NC		NC	
73		2	max	.216	8	.181	8	NC		NC		NC		NC	
74			min	.132	1	.111	1	NC		NC		NC		NC	
75		3	max	.216	8	.181	8	NC		NC		NC		NC	
76			min	.132	1	.111	1	NC		NC		NC		NC	
77		4	max	.216	8	.181	8	NC		NC		NC		NC	
78			min	.132	1	.111	1	NC		NC		NC		NC	
79		5	max	.216	8	.181	8	NC		NC		NC		NC	
80			min	.132	1	.111	1	NC		NC		NC		NC	
81	M9	1	max	.203	1	.17	1	NC		NC		NC		NC	
82			min	-.125	7	-.105	7	NC		NC		NC		NC	
83		2	max	.203	1	.17	1	NC		NC		NC		NC	
84			min	-.125	7	-.105	7	NC		NC		NC		NC	
85		3	max	.203	1	.17	1	NC		NC		NC		NC	
86			min	-.125	7	-.105	7	NC		NC		NC		NC	
87		4	max	.203	1	.17	1	NC		NC		NC		NC	
88			min	-.125	7	-.105	7	NC		NC		NC		NC	
89		5	max	.203	1	.17	1	NC		NC		NC		NC	
90			min	-.125	7	-.105	7	NC		NC		NC		NC	
91	M10	1	max	.244	1	.204	1	NC		NC		NC		NC	
92			min	-.381	7	-.319	7	NC		NC		NC		NC	
93		2	max	.244	1	.204	1	NC		NC		NC		NC	
94			min	-.381	7	-.319	7	NC		NC		NC		NC	
95		3	max	.244	1	.204	1	NC		NC		NC		NC	
96			min	-.381	7	-.319	7	NC		NC		NC		NC	
97		4	max	.244	1	.204	1	NC		NC		NC		NC	
98			min	-.381	7	-.319	7	NC		NC		NC		NC	
99		5	max	.244	1	.204	1	NC		NC		NC		NC	
100			min	-.381	7	-.319	7	NC		NC		NC		NC	
101	M11	1	max	.25	1	.209	1	NC		NC		NC		NC	
102			min	-.495	6	-.414	6	NC		NC		NC		NC	
103		2	max	.25	1	.209	1	NC		NC		NC		NC	
104			min	-.495	6	-.414	6	NC		NC		NC		NC	
105		3	max	.25	1	.209	1	NC		NC		NC		NC	
106			min	-.495	6	-.414	6	NC		NC		NC		NC	
107		4	max	.25	1	.209	1	NC		NC		NC		NC	
108			min	-.495	6	-.414	6	NC		NC		NC		NC	
109		5	max	.25	1	.209	1	NC		NC		NC		NC	
110			min	-.495	6	-.414	6	NC		NC		NC		NC	
111	M12	1	max	.251	1	.21	1	NC		NC		NC		NC	
112			min	-.352	6	-.295	6	NC		NC		NC		NC	
113		2	max	.251	1	.21	1	NC		NC		NC		NC	
114			min	-.352	6	-.295	6	NC		NC		NC		NC	
115		3	max	.251	1	.21	1	NC		NC		NC		NC	
116			min	-.352	6	-.295	6	NC		NC		NC		NC	
117		4	max	.251	1	.21	1	NC		NC		NC		NC	
118			min	-.352	6	-.295	6	NC		NC		NC		NC	
119		5	max	.251	1	.21	1	NC		NC		NC		NC	
120			min	-.352	6	-.295	6	NC		NC		NC		NC	
121	M13	1	max	.215	1	.18	1	NC		NC		NC		NC	
122			min	-.139	6	-.117	6	NC		NC		NC		NC	
123		2	max	.215	1	.18	1	NC		NC		NC		NC	

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
124			min	-.139	6	-.117	6	NC		NC		NC		NC	
125		3	max	.215	1	.18	1	NC		NC		NC		NC	
126			min	-.139	6	-.117	6	NC		NC		NC		NC	
127		4	max	.215	1	.18	1	NC		NC		NC		NC	
128			min	-.139	6	-.117	6	NC		NC		NC		NC	
129		5	max	.215	1	.18	1	NC		NC		NC		NC	
130			min	-.139	6	-.117	6	NC		NC		NC		NC	
131	M14	1	max	.139	1	.116	1	NC		NC		NC		NC	
132			min	-.011	6	-.009	6	NC		NC		NC		NC	
133		2	max	.139	1	.116	1	NC		NC		NC		NC	
134			min	-.011	6	-.009	6	NC		NC		NC		NC	
135		3	max	.139	1	.116	1	NC		NC		NC		NC	
136			min	-.011	6	-.009	6	NC		NC		NC		NC	
137		4	max	.139	1	.116	1	NC		NC		NC		NC	
138			min	-.011	6	-.009	6	NC		NC		NC		NC	
139		5	max	.139	1	.116	1	NC		NC		NC		NC	
140			min	-.011	6	-.009	6	NC		NC		NC		NC	
141	M15	1	max	.034	1	.029	1	NC		NC		NC		NC	
142			min	.013	6	.011	6	NC		NC		NC		NC	
143		2	max	.034	1	.029	1	NC		NC		NC		NC	
144			min	.013	6	.011	6	NC		NC		NC		NC	
145		3	max	.034	1	.029	1	NC		NC		NC		NC	
146			min	.013	6	.011	6	NC		NC		NC		NC	
147		4	max	.034	1	.029	1	NC		NC		NC		NC	
148			min	.013	6	.011	6	NC		NC		NC		NC	
149		5	max	.034	1	.029	1	NC		NC		NC		NC	
150			min	.013	6	.011	6	NC		NC		NC		NC	
151	M16	1	max	-.022	9	-.019	9	NC		NC		NC		NC	
152			min	-.028	6	-.024	6	NC		NC		NC		NC	
153		2	max	-.022	9	-.019	9	NC		NC		NC		NC	
154			min	-.028	6	-.024	6	NC		NC		NC		NC	
155		3	max	-.022	9	-.019	9	NC		NC		NC		NC	
156			min	-.028	6	-.024	6	NC		NC		NC		NC	
157		4	max	-.022	9	-.019	9	NC		NC		NC		NC	
158			min	-.028	6	-.024	6	NC		NC		NC		NC	
159		5	max	-.022	9	-.019	9	NC		NC		NC		NC	
160			min	-.028	6	-.024	6	NC		NC		NC		NC	
161	M17	1	max	-.022	9	-.019	9	NC		NC		NC		NC	
162			min	-.028	6	-.024	6	NC		NC		NC		NC	
163		2	max	-.022	9	-.019	9	NC		NC		NC		NC	
164			min	-.028	6	-.024	6	NC		NC		NC		NC	
165		3	max	-.022	9	-.019	9	NC		NC		NC		NC	
166			min	-.028	6	-.024	6	NC		NC		NC		NC	
167		4	max	-.022	9	-.019	9	NC		NC		NC		NC	
168			min	-.028	6	-.024	6	NC		NC		NC		NC	
169		5	max	-.022	9	-.019	9	NC		NC		NC		NC	
170			min	-.028	6	-.024	6	NC		NC		NC		NC	
171	M18	1	max	-.022	9	-.019	9	NC		NC		NC		NC	
172			min	-.028	6	-.024	6	NC		NC		NC		NC	
173		2	max	-.022	9	-.019	9	NC		NC		NC		NC	
174			min	-.028	6	-.024	6	NC		NC		NC		NC	
175		3	max	-.022	9	-.019	9	NC		NC		NC		NC	
176			min	-.028	6	-.024	6	NC		NC		NC		NC	
177		4	max	-.022	9	-.019	9	NC		NC		NC		NC	
178			min	-.028	6	-.024	6	NC		NC		NC		NC	
179		5	max	-.022	9	-.019	9	NC		NC		NC		NC	
180			min	-.028	6	-.024	6	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
181	M19	1	max	-.022	9	-.019	9	NC		NC		NC		NC	
182			min	-.028	6	-.024	6	NC		NC		NC		NC	
183		2	max	-.022	9	-.019	9	NC		NC		NC		NC	
184			min	-.028	6	-.024	6	NC		NC		NC		NC	
185		3	max	-.022	9	-.019	9	NC		NC		NC		NC	
186			min	-.028	6	-.024	6	NC		NC		NC		NC	
187		4	max	-.022	9	-.019	9	NC		NC		NC		NC	
188			min	-.028	6	-.024	6	NC		NC		NC		NC	
189		5	max	-.022	9	-.019	9	NC		NC		NC		NC	
190			min	-.028	6	-.024	6	NC		NC		NC		NC	
191	M20	1	max	-.022	9	-.019	9	NC		NC		NC		NC	
192			min	-.028	6	-.024	6	NC		NC		NC		NC	
193		2	max	-.022	9	-.019	9	NC		NC		NC		NC	
194			min	-.028	6	-.024	6	NC		NC		NC		NC	
195		3	max	-.022	9	-.019	9	NC		NC		NC		NC	
196			min	-.028	6	-.024	6	NC		NC		NC		NC	
197		4	max	-.022	9	-.019	9	NC		NC		NC		NC	
198			min	-.028	6	-.024	6	NC		NC		NC		NC	
199		5	max	-.022	9	-.019	9	NC		NC		NC		NC	
200			min	-.028	6	-.024	6	NC		NC		NC		NC	
201	M21	1	max	-.022	9	-.019	9	NC		NC		NC		NC	
202			min	-.028	6	-.024	6	NC		NC		NC		NC	
203		2	max	-.022	9	-.019	9	NC		NC		NC		NC	
204			min	-.028	6	-.024	6	NC		NC		NC		NC	
205		3	max	-.022	9	-.019	9	NC		NC		NC		NC	
206			min	-.028	6	-.024	6	NC		NC		NC		NC	
207		4	max	-.022	9	-.019	9	NC		NC		NC		NC	
208			min	-.028	6	-.024	6	NC		NC		NC		NC	
209		5	max	-.022	9	-.019	9	NC		NC		NC		NC	
210			min	-.028	6	-.024	6	NC		NC		NC		NC	
211	M22	1	max	-.013	9	-.011	9	NC		NC		NC		NC	
212			min	-.052	6	-.043	6	NC		NC		NC		NC	
213		2	max	-.013	9	-.011	9	NC		NC		NC		NC	
214			min	-.052	6	-.043	6	NC		NC		NC		NC	
215		3	max	-.013	9	-.011	9	NC		NC		NC		NC	
216			min	-.052	6	-.043	6	NC		NC		NC		NC	
217		4	max	-.013	9	-.011	9	NC		NC		NC		NC	
218			min	-.052	6	-.043	6	NC		NC		NC		NC	
219		5	max	-.013	9	-.011	9	NC		NC		NC		NC	
220			min	-.052	6	-.043	6	NC		NC		NC		NC	
221	M23	1	max	.008	7	.007	7	NC		NC		NC		NC	
222			min	-.095	8	-.08	8	NC		NC		NC		NC	
223		2	max	.008	7	.007	7	NC		NC		NC		NC	
224			min	-.095	8	-.08	8	NC		NC		NC		NC	
225		3	max	.008	7	.007	7	NC		NC		NC		NC	
226			min	-.095	8	-.08	8	NC		NC		NC		NC	
227		4	max	.008	7	.007	7	NC		NC		NC		NC	
228			min	-.095	8	-.08	8	NC		NC		NC		NC	
229		5	max	.008	7	.007	7	NC		NC		NC		NC	
230			min	-.095	8	-.08	8	NC		NC		NC		NC	
231	M24	1	max	.029	7	.024	7	NC		NC		NC		NC	
232			min	-.129	8	-.108	8	NC		NC		NC		NC	
233		2	max	.029	7	.024	7	NC		NC		NC		NC	
234			min	-.129	8	-.108	8	NC		NC		NC		NC	
235		3	max	.029	7	.024	7	NC		NC		NC		NC	
236			min	-.129	8	-.108	8	NC		NC		NC		NC	
237		4	max	.029	7	.024	7	NC		NC		NC		NC	

Company : DMJM H&N
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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
238			min	-.129	8	-.108	8	NC		NC		NC		NC	
239		5	max	.029	7	.024	7	NC		NC		NC		NC	
240			min	-.129	8	-.108	8	NC		NC		NC		NC	
241	M25	1	max	.045	7	.037	7	NC		NC		NC		NC	
242			min	-.147	8	-.123	8	NC		NC		NC		NC	
243		2	max	.045	7	.037	7	NC		NC		NC		NC	
244			min	-.147	8	-.123	8	NC		NC		NC		NC	
245		3	max	.045	7	.037	7	NC		NC		NC		NC	
246			min	-.147	8	-.123	8	NC		NC		NC		NC	
247		4	max	.045	7	.037	7	NC		NC		NC		NC	
248			min	-.147	8	-.123	8	NC		NC		NC		NC	
249		5	max	.045	7	.037	7	NC		NC		NC		NC	
250			min	-.147	8	-.123	8	NC		NC		NC		NC	
251	M26	1	max	.049	7	.041	7	NC		NC		NC		NC	
252			min	-.151	8	-.126	8	NC		NC		NC		NC	
253		2	max	.049	7	.041	7	NC		NC		NC		NC	
254			min	-.151	8	-.126	8	NC		NC		NC		NC	
255		3	max	.049	7	.041	7	NC		NC		NC		NC	
256			min	-.151	8	-.126	8	NC		NC		NC		NC	
257		4	max	.049	7	.041	7	NC		NC		NC		NC	
258			min	-.151	8	-.126	8	NC		NC		NC		NC	
259		5	max	.049	7	.041	7	NC		NC		NC		NC	
260			min	-.151	8	-.126	8	NC		NC		NC		NC	
261	M27	1	max	.049	7	.041	7	NC		NC		NC		NC	
262			min	-.151	8	-.126	8	NC		NC		NC		NC	
263		2	max	.049	7	.041	7	NC		NC		NC		NC	
264			min	-.151	8	-.126	8	NC		NC		NC		NC	
265		3	max	.049	7	.041	7	NC		NC		NC		NC	
266			min	-.151	8	-.126	8	NC		NC		NC		NC	
267		4	max	.049	7	.041	7	NC		NC		NC		NC	
268			min	-.151	8	-.126	8	NC		NC		NC		NC	
269		5	max	.049	7	.041	7	NC		NC		NC		NC	
270			min	-.151	8	-.126	8	NC		NC		NC		NC	
271	M28	1	max	.049	7	.041	7	NC		NC		NC		NC	
272			min	-.151	8	-.126	8	NC		NC		NC		NC	
273		2	max	.049	7	.041	7	NC		NC		NC		NC	
274			min	-.151	8	-.126	8	NC		NC		NC		NC	
275		3	max	.049	7	.041	7	NC		NC		NC		NC	
276			min	-.151	8	-.126	8	NC		NC		NC		NC	
277		4	max	.049	7	.041	7	NC		NC		NC		NC	
278			min	-.151	8	-.126	8	NC		NC		NC		NC	
279		5	max	.049	7	.041	7	NC		NC		NC		NC	
280			min	-.151	8	-.126	8	NC		NC		NC		NC	
281	M29	1	max	.049	7	.041	7	NC		NC		NC		NC	
282			min	-.151	8	-.126	8	NC		NC		NC		NC	
283		2	max	.049	7	.041	7	NC		NC		NC		NC	
284			min	-.151	8	-.126	8	NC		NC		NC		NC	
285		3	max	.049	7	.041	7	NC		NC		NC		NC	
286			min	-.151	8	-.126	8	NC		NC		NC		NC	
287		4	max	.049	7	.041	7	NC		NC		NC		NC	
288			min	-.151	8	-.126	8	NC		NC		NC		NC	
289		5	max	.049	7	.041	7	NC		NC		NC		NC	
290			min	-.151	8	-.126	8	NC		NC		NC		NC	
291	M30	1	max	.049	7	.041	7	NC		NC		NC		NC	
292			min	-.151	8	-.126	8	NC		NC		NC		NC	
293		2	max	.049	7	.041	7	NC		NC		NC		NC	
294			min	-.151	8	-.126	8	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
295		3	max	.049	7	.041	7	NC		NC		NC		NC	
296			min	-.151	8	-.126	8	NC		NC		NC		NC	
297		4	max	.049	7	.041	7	NC		NC		NC		NC	
298			min	-.151	8	-.126	8	NC		NC		NC		NC	
299		5	max	.049	7	.041	7	NC		NC		NC		NC	
300			min	-.151	8	-.126	8	NC		NC		NC		NC	
301	M31	1	max	.049	7	.041	7	NC		NC		NC		NC	
302			min	-.151	8	-.126	8	NC		NC		NC		NC	
303		2	max	.049	7	.041	7	NC		NC		NC		NC	
304			min	-.151	8	-.126	8	NC		NC		NC		NC	
305		3	max	.049	7	.041	7	NC		NC		NC		NC	
306			min	-.151	8	-.126	8	NC		NC		NC		NC	
307		4	max	.049	7	.041	7	NC		NC		NC		NC	
308			min	-.151	8	-.126	8	NC		NC		NC		NC	
309		5	max	.049	7	.041	7	NC		NC		NC		NC	
310			min	-.151	8	-.126	8	NC		NC		NC		NC	
311	M32	1	max	.049	7	.041	7	NC		NC		NC		NC	
312			min	-.151	8	-.126	8	NC		NC		NC		NC	
313		2	max	.049	7	.041	7	NC		NC		NC		NC	
314			min	-.151	8	-.126	8	NC		NC		NC		NC	
315		3	max	.049	7	.041	7	NC		NC		NC		NC	
316			min	-.151	8	-.126	8	NC		NC		NC		NC	
317		4	max	.049	7	.041	7	NC		NC		NC		NC	
318			min	-.151	8	-.126	8	NC		NC		NC		NC	
319		5	max	.049	7	.041	7	NC		NC		NC		NC	
320			min	-.151	8	-.126	8	NC		NC		NC		NC	
321	M33	1	max	.049	7	.041	7	NC		NC		NC		NC	
322			min	-.151	8	-.126	8	NC		NC		NC		NC	
323		2	max	.049	7	.041	7	NC		NC		NC		NC	
324			min	-.151	8	-.126	8	NC		NC		NC		NC	
325		3	max	.049	7	.041	7	NC		NC		NC		NC	
326			min	-.151	8	-.126	8	NC		NC		NC		NC	
327		4	max	.049	7	.041	7	NC		NC		NC		NC	
328			min	-.151	8	-.126	8	NC		NC		NC		NC	
329		5	max	.049	7	.041	7	NC		NC		NC		NC	
330			min	-.151	8	-.126	8	NC		NC		NC		NC	
331	M36	1	max	.049	7	.041	7	NC		NC		NC		NC	
332			min	-.151	8	-.126	8	NC		NC		NC		NC	
333		2	max	.049	7	.041	7	NC		NC		NC		NC	
334			min	-.151	8	-.126	8	NC		NC		NC		NC	
335		3	max	.049	7	.041	7	NC		NC		NC		NC	
336			min	-.151	8	-.126	8	NC		NC		NC		NC	
337		4	max	.049	7	.041	7	NC		NC		NC		NC	
338			min	-.151	8	-.126	8	NC		NC		NC		NC	
339		5	max	.049	7	.041	7	NC		NC		NC		NC	
340			min	-.151	8	-.126	8	NC		NC		NC		NC	
341	M37	1	max	.906	7	.759	7	NC		NC		NC		NC	
342			min	-.034	1	-.028	1	NC		NC		NC		NC	
343		2	max	.906	7	.759	7	NC		NC		NC		NC	
344			min	-.034	1	-.028	1	NC		NC		NC		NC	
345		3	max	.906	7	.759	7	NC		NC		NC		NC	
346			min	-.034	1	-.028	1	NC		NC		NC		NC	
347		4	max	.906	7	.759	7	NC		NC		NC		NC	
348			min	-.034	1	-.028	1	NC		NC		NC		NC	
349		5	max	.906	7	.759	7	NC		NC		NC		NC	
350			min	-.034	1	-.028	1	NC		NC		NC		NC	
351	M38	1	max	.907	7	.759	7	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
352			min	-.034	1	-.028	1	NC		NC		NC		NC	
353		2	max	.907	7	.759	7	NC		NC		NC		NC	
354			min	-.034	1	-.028	1	NC		NC		NC		NC	
355		3	max	.907	7	.759	7	NC		NC		NC		NC	
356			min	-.034	1	-.028	1	NC		NC		NC		NC	
357		4	max	.907	7	.759	7	NC		NC		NC		NC	
358			min	-.034	1	-.028	1	NC		NC		NC		NC	
359		5	max	.907	7	.759	7	NC		NC		NC		NC	
360			min	-.034	1	-.028	1	NC		NC		NC		NC	
361	M39	1	max	.995	7	.833	7	NC		NC		NC		NC	
362			min	-.031	1	-.026	1	NC		NC		NC		NC	
363		2	max	.995	7	.833	7	NC		NC		NC		NC	
364			min	-.031	1	-.026	1	NC		NC		NC		NC	
365		3	max	.995	7	.833	7	NC		NC		NC		NC	
366			min	-.031	1	-.026	1	NC		NC		NC		NC	
367		4	max	.995	7	.833	7	NC		NC		NC		NC	
368			min	-.031	1	-.026	1	NC		NC		NC		NC	
369		5	max	.995	7	.833	7	NC		NC		NC		NC	
370			min	-.031	1	-.026	1	NC		NC		NC		NC	
371	M40	1	max	1.103	9	.923	9	NC		NC		NC		NC	
372			min	-.02	1	-.017	1	NC		NC		NC		NC	
373		2	max	1.103	9	.923	9	NC		NC		NC		NC	
374			min	-.02	1	-.017	1	NC		NC		NC		NC	
375		3	max	1.103	9	.923	9	NC		NC		NC		NC	
376			min	-.02	1	-.017	1	NC		NC		NC		NC	
377		4	max	1.103	9	.923	9	NC		NC		NC		NC	
378			min	-.02	1	-.017	1	NC		NC		NC		NC	
379		5	max	1.103	9	.923	9	NC		NC		NC		NC	
380			min	-.02	1	-.017	1	NC		NC		NC		NC	
381	M41	1	max	1.161	9	.972	9	NC		NC		NC		NC	
382			min	-.005	1	-.004	1	NC		NC		NC		NC	
383		2	max	1.161	9	.972	9	NC		NC		NC		NC	
384			min	-.005	1	-.004	1	NC		NC		NC		NC	
385		3	max	1.161	9	.972	9	NC		NC		NC		NC	
386			min	-.005	1	-.004	1	NC		NC		NC		NC	
387		4	max	1.161	9	.972	9	NC		NC		NC		NC	
388			min	-.005	1	-.004	1	NC		NC		NC		NC	
389		5	max	1.161	9	.972	9	NC		NC		NC		NC	
390			min	-.005	1	-.004	1	NC		NC		NC		NC	
391	M42	1	max	1.091	9	.913	9	NC		NC		NC		NC	
392			min	.013	1	.011	1	NC		NC		NC		NC	
393		2	max	1.091	9	.913	9	NC		NC		NC		NC	
394			min	.013	1	.011	1	NC		NC		NC		NC	
395		3	max	1.091	9	.913	9	NC		NC		NC		NC	
396			min	.013	1	.011	1	NC		NC		NC		NC	
397		4	max	1.091	9	.913	9	NC		NC		NC		NC	
398			min	.013	1	.011	1	NC		NC		NC		NC	
399		5	max	1.091	9	.913	9	NC		NC		NC		NC	
400			min	.013	1	.011	1	NC		NC		NC		NC	
401	M43	1	max	1.015	9	.85	9	NC		NC		NC		NC	
402			min	.021	1	.018	1	NC		NC		NC		NC	
403		2	max	1.015	9	.85	9	NC		NC		NC		NC	
404			min	.021	1	.018	1	NC		NC		NC		NC	
405		3	max	1.015	9	.85	9	NC		NC		NC		NC	
406			min	.021	1	.018	1	NC		NC		NC		NC	
407		4	max	1.015	9	.85	9	NC		NC		NC		NC	
408			min	.021	1	.018	1	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
409		5	max	1.015	9	.85	9	NC		NC		NC		NC	
410			min	.021	1	.018	1	NC		NC		NC		NC	
411	M44	1	max	.645	9	.54	9	NC		NC		NC		NC	
412			min	0	1	0	1	NC		NC		NC		NC	
413		2	max	.645	9	.54	9	NC		NC		NC		NC	
414			min	0	1	0	1	NC		NC		NC		NC	
415		3	max	.645	9	.54	9	NC		NC		NC		NC	
416			min	0	1	0	1	NC		NC		NC		NC	
417		4	max	.645	9	.54	9	NC		NC		NC		NC	
418			min	0	1	0	1	NC		NC		NC		NC	
419		5	max	.645	9	.54	9	NC		NC		NC		NC	
420			min	0	1	0	1	NC		NC		NC		NC	
421	M45	1	max	.613	8	.514	8	NC		NC		NC		NC	
422			min	-.432	7	-.362	7	NC		NC		NC		NC	
423		2	max	.613	8	.514	8	NC		NC		NC		NC	
424			min	-.432	7	-.362	7	NC		NC		NC		NC	
425		3	max	.613	8	.514	8	NC		NC		NC		NC	
426			min	-.432	7	-.362	7	NC		NC		NC		NC	
427		4	max	.613	8	.514	8	NC		NC		NC		NC	
428			min	-.432	7	-.362	7	NC		NC		NC		NC	
429		5	max	.613	8	.514	8	NC		NC		NC		NC	
430			min	-.432	7	-.362	7	NC		NC		NC		NC	
431	M46	1	max	.525	8	.44	8	NC		NC		NC		NC	
432			min	-1.31	7	-1.097	7	NC		NC		NC		NC	
433		2	max	.525	8	.44	8	NC		NC		NC		NC	
434			min	-1.31	7	-1.097	7	NC		NC		NC		NC	
435		3	max	.525	8	.44	8	NC		NC		NC		NC	
436			min	-1.31	7	-1.097	7	NC		NC		NC		NC	
437		4	max	.525	8	.44	8	NC		NC		NC		NC	
438			min	-1.31	7	-1.097	7	NC		NC		NC		NC	
439		5	max	.525	8	.44	8	NC		NC		NC		NC	
440			min	-1.31	7	-1.097	7	NC		NC		NC		NC	
441	M47	1	max	.356	8	.298	8	NC		NC		NC		NC	
442			min	-2.046	7	-1.713	7	NC		NC		NC		NC	
443		2	max	.356	8	.298	8	NC		NC		NC		NC	
444			min	-2.046	7	-1.713	7	NC		NC		NC		NC	
445		3	max	.356	8	.298	8	NC		NC		NC		NC	
446			min	-2.046	7	-1.713	7	NC		NC		NC		NC	
447		4	max	.356	8	.298	8	NC		NC		NC		NC	
448			min	-2.046	7	-1.713	7	NC		NC		NC		NC	
449		5	max	.356	8	.298	8	NC		NC		NC		NC	
450			min	-2.046	7	-1.713	7	NC		NC		NC		NC	
451	M48	1	max	.248	8	.208	8	NC		NC		NC		NC	
452			min	-2.332	7	-1.952	7	NC		NC		NC		NC	
453		2	max	.248	8	.208	8	NC		NC		NC		NC	
454			min	-2.332	7	-1.952	7	NC		NC		NC		NC	
455		3	max	.248	8	.208	8	NC		NC		NC		NC	
456			min	-2.332	7	-1.952	7	NC		NC		NC		NC	
457		4	max	.248	8	.208	8	NC		NC		NC		NC	
458			min	-2.332	7	-1.952	7	NC		NC		NC		NC	
459		5	max	.248	8	.208	8	NC		NC		NC		NC	
460			min	-2.332	7	-1.952	7	NC		NC		NC		NC	
461	M49	1	max	0	1	0	1	NC		NC		NC		NC	
462			min	0	1	0	1	NC		NC		NC		NC	
463		2	max	0	1	0	1	NC		NC		NC		NC	
464			min	0	1	0	1	NC		NC		NC		NC	
465		3	max	0	1	0	1	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
466			min	0	1	0	1	NC		NC		NC		NC	
467		4	max	0	1	0	1	NC		NC		NC		NC	
468			min	0	1	0	1	NC		NC		NC		NC	
469		5	max	0	1	0	1	NC		NC		NC		NC	
470			min	0	1	0	1	NC		NC		NC		NC	
471	M50	1	max	0	1	0	1	NC		NC		NC		NC	
472			min	0	1	0	1	NC		NC		NC		NC	
473		2	max	0	1	0	1	NC		NC		NC		NC	
474			min	0	1	0	1	NC		NC		NC		NC	
475		3	max	0	1	0	1	NC		NC		NC		NC	
476			min	0	1	0	1	NC		NC		NC		NC	
477		4	max	0	1	0	1	NC		NC		NC		NC	
478			min	0	1	0	1	NC		NC		NC		NC	
479		5	max	0	1	0	1	NC		NC		NC		NC	
480			min	0	1	0	1	NC		NC		NC		NC	
481	M51	1	max	0	1	0	1	NC		NC		NC		NC	
482			min	0	1	0	1	NC		NC		NC		NC	
483		2	max	0	1	0	1	NC		NC		NC		NC	
484			min	0	1	0	1	NC		NC		NC		NC	
485		3	max	0	1	0	1	NC		NC		NC		NC	
486			min	0	1	0	1	NC		NC		NC		NC	
487		4	max	0	1	0	1	NC		NC		NC		NC	
488			min	0	1	0	1	NC		NC		NC		NC	
489		5	max	0	1	0	1	NC		NC		NC		NC	
490			min	0	1	0	1	NC		NC		NC		NC	
491	M52	1	max	0	1	0	1	NC		NC		NC		NC	
492			min	0	1	0	1	NC		NC		NC		NC	
493		2	max	0	1	0	1	NC		NC		NC		NC	
494			min	0	1	0	1	NC		NC		NC		NC	
495		3	max	0	1	0	1	NC		NC		NC		NC	
496			min	0	1	0	1	NC		NC		NC		NC	
497		4	max	0	1	0	1	NC		NC		NC		NC	
498			min	0	1	0	1	NC		NC		NC		NC	
499		5	max	0	1	0	1	NC		NC		NC		NC	
500			min	0	1	0	1	NC		NC		NC		NC	
501	M53	1	max	.345	9	.289	9	NC		NC		NC		NC	
502			min	-.474	6	-.397	6	NC		NC		NC		NC	
503		2	max	.345	9	.289	9	NC		NC		NC		NC	
504			min	-.474	6	-.397	6	NC		NC		NC		NC	
505		3	max	.345	9	.289	9	NC		NC		NC		NC	
506			min	-.474	6	-.397	6	NC		NC		NC		NC	
507		4	max	.345	9	.289	9	NC		NC		NC		NC	
508			min	-.474	6	-.397	6	NC		NC		NC		NC	
509		5	max	.345	9	.289	9	NC		NC		NC		NC	
510			min	-.474	6	-.397	6	NC		NC		NC		NC	
511	M54	1	max	.438	9	.366	9	NC		NC		NC		NC	
512			min	-.553	6	-.463	6	NC		NC		NC		NC	
513		2	max	.438	9	.366	9	NC		NC		NC		NC	
514			min	-.553	6	-.463	6	NC		NC		NC		NC	
515		3	max	.438	9	.366	9	NC		NC		NC		NC	
516			min	-.553	6	-.463	6	NC		NC		NC		NC	
517		4	max	.438	9	.366	9	NC		NC		NC		NC	
518			min	-.553	6	-.463	6	NC		NC		NC		NC	
519		5	max	.438	9	.366	9	NC		NC		NC		NC	
520			min	-.553	6	-.463	6	NC		NC		NC		NC	
521	M55	1	max	.497	9	.416	9	NC		NC		NC		NC	
522			min	-.644	6	-.539	6	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
523		2	max	.497	9	.416	9	NC		NC		NC		NC	
524			min	-.644	6	-.539	6	NC		NC		NC		NC	
525		3	max	.497	9	.416	9	NC		NC		NC		NC	
526			min	-.644	6	-.539	6	NC		NC		NC		NC	
527		4	max	.497	9	.416	9	NC		NC		NC		NC	
528			min	-.644	6	-.539	6	NC		NC		NC		NC	
529		5	max	.497	9	.416	9	NC		NC		NC		NC	
530			min	-.644	6	-.539	6	NC		NC		NC		NC	
531	M56	1	max	.408	9	.342	9	NC		NC		NC		NC	
532			min	-.635	6	-.531	6	NC		NC		NC		NC	
533		2	max	.408	9	.342	9	NC		NC		NC		NC	
534			min	-.635	6	-.531	6	NC		NC		NC		NC	
535		3	max	.408	9	.342	9	NC		NC		NC		NC	
536			min	-.635	6	-.531	6	NC		NC		NC		NC	
537		4	max	.408	9	.342	9	NC		NC		NC		NC	
538			min	-.635	6	-.531	6	NC		NC		NC		NC	
539		5	max	.408	9	.342	9	NC		NC		NC		NC	
540			min	-.635	6	-.531	6	NC		NC		NC		NC	
541	M57	1	max	.184	9	.154	9	NC		NC		NC		NC	
542			min	-.527	6	-.441	6	NC		NC		NC		NC	
543		2	max	.184	9	.154	9	NC		NC		NC		NC	
544			min	-.527	6	-.441	6	NC		NC		NC		NC	
545		3	max	.184	9	.154	9	NC		NC		NC		NC	
546			min	-.527	6	-.441	6	NC		NC		NC		NC	
547		4	max	.184	9	.154	9	NC		NC		NC		NC	
548			min	-.527	6	-.441	6	NC		NC		NC		NC	
549		5	max	.184	9	.154	9	NC		NC		NC		NC	
550			min	-.527	6	-.441	6	NC		NC		NC		NC	
551	M58	1	max	.071	1	.059	1	NC		NC		NC		NC	
552			min	-.441	6	-.369	6	NC		NC		NC		NC	
553		2	max	.071	1	.059	1	NC		NC		NC		NC	
554			min	-.441	6	-.369	6	NC		NC		NC		NC	
555		3	max	.071	1	.059	1	NC		NC		NC		NC	
556			min	-.441	6	-.369	6	NC		NC		NC		NC	
557		4	max	.938	7	.785	7	NC		NC		NC		NC	
558			min	.061	1	.051	1	NC		NC		NC		NC	
559		5	max	.938	7	.785	7	NC		NC		NC		NC	
560			min	.061	1	.051	1	NC		NC		NC		NC	
561	M59	1	max	.01	6	.022	6	NC		NC		NC		NC	
562			min	-.022	9	-.05	9	NC		NC		NC		NC	
563		2	max	.01	6	.022	6	NC		NC		NC		NC	
564			min	-.022	9	-.05	9	NC		NC		NC		NC	
565		3	max	.01	6	.022	6	NC		NC		NC		NC	
566			min	-.022	9	-.05	9	NC		NC		NC		NC	
567		4	max	.01	6	.022	6	NC		NC		NC		NC	
568			min	-.022	9	-.05	9	NC		NC		NC		NC	
569		5	max	.01	6	.022	6	NC		NC		NC		NC	
570			min	-.022	9	-.05	9	NC		NC		NC		NC	
571	M60	1	max	.381	7	.87	7	NC		NC		NC		NC	
572			min	-.013	1	-.029	1	NC		NC		NC		NC	
573		2	max	.381	7	.87	7	NC		NC		NC		NC	
574			min	-.013	1	-.029	1	NC		NC		NC		NC	
575		3	max	.381	7	.87	7	NC		NC		NC		NC	
576			min	-.013	1	-.029	1	NC		NC		NC		NC	
577		4	max	.381	7	.87	7	NC		NC		NC		NC	
578			min	-.013	1	-.029	1	NC		NC		NC		NC	
579		5	max	.381	7	.87	7	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
580			min	-.013	1	-.029	1	NC		NC		NC		NC	
581	M61	1	max	1.063	7	2.427	7	NC		NC		NC		NC	
582			min	-.002	1	-.004	1	NC		NC		NC		NC	
583		2	max	1.063	7	2.427	7	NC		NC		NC		NC	
584			min	-.002	1	-.004	1	NC		NC		NC		NC	
585		3	max	1.063	7	2.427	7	NC		NC		NC		NC	
586			min	-.002	1	-.004	1	NC		NC		NC		NC	
587		4	max	1.063	7	2.427	7	NC		NC		NC		NC	
588			min	-.002	1	-.004	1	NC		NC		NC		NC	
589		5	max	1.063	7	2.427	7	NC		NC		NC		NC	
590			min	-.002	1	-.004	1	NC		NC		NC		NC	
591	M62	1	max	.955	7	2.18	7	NC		NC		NC		NC	
592			min	0	1	-.001	1	NC		NC		NC		NC	
593		2	max	.955	7	2.18	7	NC		NC		NC		NC	
594			min	0	1	-.001	1	NC		NC		NC		NC	
595		3	max	.955	7	2.18	7	NC		NC		NC		NC	
596			min	0	1	-.001	1	NC		NC		NC		NC	
597		4	max	.955	7	2.18	7	NC		NC		NC		NC	
598			min	0	1	-.001	1	NC		NC		NC		NC	
599		5	max	.955	7	2.18	7	NC		NC		NC		NC	
600			min	0	1	-.001	1	NC		NC		NC		NC	
601	M63	1	max	.647	7	1.477	7	NC		NC		NC		NC	
602			min	0	1	.002	1	NC		NC		NC		NC	
603		2	max	.647	7	1.477	7	NC		NC		NC		NC	
604			min	0	1	.002	1	NC		NC		NC		NC	
605		3	max	.647	7	1.477	7	NC		NC		NC		NC	
606			min	0	1	.002	1	NC		NC		NC		NC	
607		4	max	.647	7	1.477	7	NC		NC		NC		NC	
608			min	0	1	.002	1	NC		NC		NC		NC	
609		5	max	.647	7	1.477	7	NC		NC		NC		NC	
610			min	0	1	.002	1	NC		NC		NC		NC	
611	M64	1	max	.257	7	.586	7	NC		NC		NC		NC	
612			min	0	1	0	1	NC		NC		NC		NC	
613		2	max	.257	7	.586	7	NC		NC		NC		NC	
614			min	0	1	0	1	NC		NC		NC		NC	
615		3	max	.257	7	.586	7	NC		NC		NC		NC	
616			min	0	1	0	1	NC		NC		NC		NC	
617		4	max	.257	7	.586	7	NC		NC		NC		NC	
618			min	0	1	0	1	NC		NC		NC		NC	
619		5	max	.257	7	.586	7	NC		NC		NC		NC	
620			min	0	1	0	1	NC		NC		NC		NC	
621	M65	1	max	.079	6	.18	6	NC		NC		NC		NC	
622			min	-.002	1	-.005	1	NC		NC		NC		NC	
623		2	max	.079	6	.18	6	NC		NC		NC		NC	
624			min	-.002	1	-.005	1	NC		NC		NC		NC	
625		3	max	.079	6	.18	6	NC		NC		NC		NC	
626			min	-.002	1	-.005	1	NC		NC		NC		NC	
627		4	max	.079	6	.18	6	NC		NC		NC		NC	
628			min	-.002	1	-.005	1	NC		NC		NC		NC	
629		5	max	.079	6	.18	6	NC		NC		NC		NC	
630			min	-.002	1	-.005	1	NC		NC		NC		NC	
631	M66	1	max	.079	6	.18	6	NC		NC		NC		NC	
632			min	-.002	1	-.005	1	NC		NC		NC		NC	
633		2	max	.079	6	.18	6	NC		NC		NC		NC	
634			min	-.002	1	-.005	1	NC		NC		NC		NC	
635		3	max	.079	6	.18	6	NC		NC		NC		NC	
636			min	-.002	1	-.005	1	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
637		4	max	.079	6	.18	6	NC		NC		NC		NC	
638			min	-.002	1	-.005	1	NC		NC		NC		NC	
639		5	max	.079	6	.18	6	NC		NC		NC		NC	
640			min	-.002	1	-.005	1	NC		NC		NC		NC	
641	M67	1	max	.079	6	.18	6	NC		NC		NC		NC	
642			min	-.002	1	-.005	1	NC		NC		NC		NC	
643		2	max	.079	6	.18	6	NC		NC		NC		NC	
644			min	-.002	1	-.005	1	NC		NC		NC		NC	
645		3	max	.079	6	.18	6	NC		NC		NC		NC	
646			min	-.002	1	-.005	1	NC		NC		NC		NC	
647		4	max	.079	6	.18	6	NC		NC		NC		NC	
648			min	-.002	1	-.005	1	NC		NC		NC		NC	
649		5	max	.079	6	.18	6	NC		NC		NC		NC	
650			min	-.002	1	-.005	1	NC		NC		NC		NC	
651	M68	1	max	.078	6	.178	6	NC		NC		NC		NC	
652			min	.002	1	.005	1	NC		NC		NC		NC	
653		2	max	.078	6	.178	6	NC		NC		NC		NC	
654			min	.002	1	.005	1	NC		NC		NC		NC	
655		3	max	.078	6	.178	6	NC		NC		NC		NC	
656			min	.002	1	.005	1	NC		NC		NC		NC	
657		4	max	.078	6	.178	6	NC		NC		NC		NC	
658			min	.002	1	.005	1	NC		NC		NC		NC	
659		5	max	.078	6	.178	6	NC		NC		NC		NC	
660			min	.002	1	.005	1	NC		NC		NC		NC	
661	M69	1	max	.061	6	.14	6	NC		NC		NC		NC	
662			min	.007	1	.016	1	NC		NC		NC		NC	
663		2	max	.061	6	.14	6	NC		NC		NC		NC	
664			min	.007	1	.016	1	NC		NC		NC		NC	
665		3	max	.061	6	.14	6	NC		NC		NC		NC	
666			min	.007	1	.016	1	NC		NC		NC		NC	
667		4	max	.061	6	.14	6	NC		NC		NC		NC	
668			min	.007	1	.016	1	NC		NC		NC		NC	
669		5	max	.061	6	.14	6	NC		NC		NC		NC	
670			min	.007	1	.016	1	NC		NC		NC		NC	
671	M70	1	max	.033	8	.076	8	NC		NC		NC		NC	
672			min	.008	1	.019	1	NC		NC		NC		NC	
673		2	max	.033	8	.076	8	NC		NC		NC		NC	
674			min	.008	1	.019	1	NC		NC		NC		NC	
675		3	max	.033	8	.076	8	NC		NC		NC		NC	
676			min	.008	1	.019	1	NC		NC		NC		NC	
677		4	max	.033	8	.076	8	NC		NC		NC		NC	
678			min	.008	1	.019	1	NC		NC		NC		NC	
679		5	max	.033	8	.076	8	NC		NC		NC		NC	
680			min	.008	1	.019	1	NC		NC		NC		NC	
681	M71	1	max	.016	8	.037	8	NC		NC		NC		NC	
682			min	-.003	7	-.007	7	NC		NC		NC		NC	
683		2	max	.016	8	.037	8	NC		NC		NC		NC	
684			min	-.003	7	-.007	7	NC		NC		NC		NC	
685		3	max	.016	8	.037	8	NC		NC		NC		NC	
686			min	-.003	7	-.007	7	NC		NC		NC		NC	
687		4	max	.016	8	.037	8	NC		NC		NC		NC	
688			min	-.003	7	-.007	7	NC		NC		NC		NC	
689		5	max	.016	8	.037	8	NC		NC		NC		NC	
690			min	-.003	7	-.007	7	NC		NC		NC		NC	
691	M72	1	max	.016	8	.037	8	NC		NC		NC		NC	
692			min	-.003	7	-.007	7	NC		NC		NC		NC	
693		2	max	.016	8	.037	8	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
694			min	-.003	7	-.007	7	NC		NC		NC		NC	
695		3	max	.016	8	.037	8	NC		NC		NC		NC	
696			min	-.003	7	-.007	7	NC		NC		NC		NC	
697		4	max	.016	8	.037	8	NC		NC		NC		NC	
698			min	-.003	7	-.007	7	NC		NC		NC		NC	
699		5	max	.016	8	.037	8	NC		NC		NC		NC	
700			min	-.003	7	-.007	7	NC		NC		NC		NC	
701	M73	1	max	.016	8	.037	8	NC		NC		NC		NC	
702			min	-.003	7	-.007	7	NC		NC		NC		NC	
703		2	max	.016	8	.037	8	NC		NC		NC		NC	
704			min	-.003	7	-.007	7	NC		NC		NC		NC	
705		3	max	.016	8	.037	8	NC		NC		NC		NC	
706			min	-.003	7	-.007	7	NC		NC		NC		NC	
707		4	max	.016	8	.037	8	NC		NC		NC		NC	
708			min	-.003	7	-.007	7	NC		NC		NC		NC	
709		5	max	.016	8	.037	8	NC		NC		NC		NC	
710			min	-.003	7	-.007	7	NC		NC		NC		NC	
711	M74	1	max	.016	8	.037	8	NC		NC		NC		NC	
712			min	-.003	7	-.007	7	NC		NC		NC		NC	
713		2	max	.016	8	.037	8	NC		NC		NC		NC	
714			min	-.003	7	-.007	7	NC		NC		NC		NC	
715		3	max	.016	8	.037	8	NC		NC		NC		NC	
716			min	-.003	7	-.007	7	NC		NC		NC		NC	
717		4	max	.016	8	.037	8	NC		NC		NC		NC	
718			min	-.003	7	-.007	7	NC		NC		NC		NC	
719		5	max	.016	8	.037	8	NC		NC		NC		NC	
720			min	-.003	7	-.007	7	NC		NC		NC		NC	
721	M75	1	max	.016	8	.037	8	NC		NC		NC		NC	
722			min	-.003	7	-.007	7	NC		NC		NC		NC	
723		2	max	.016	8	.037	8	NC		NC		NC		NC	
724			min	-.003	7	-.007	7	NC		NC		NC		NC	
725		3	max	.016	8	.037	8	NC		NC		NC		NC	
726			min	-.003	7	-.007	7	NC		NC		NC		NC	
727		4	max	.016	8	.037	8	NC		NC		NC		NC	
728			min	-.003	7	-.007	7	NC		NC		NC		NC	
729		5	max	.016	8	.037	8	NC		NC		NC		NC	
730			min	-.003	7	-.007	7	NC		NC		NC		NC	
731	M76	1	max	-.022	9	-.019	9	NC		NC		NC		NC	
732			min	-.028	6	-.024	6	NC		NC		NC		NC	
733		2	max	-.022	9	-.019	9	NC		NC		NC		NC	
734			min	-.028	6	-.024	6	NC		NC		NC		NC	
735		3	max	-.022	9	-.019	9	NC		NC		NC		NC	
736			min	-.028	6	-.024	6	NC		NC		NC		NC	
737		4	max	-.022	9	-.019	9	NC		NC		NC		NC	
738			min	-.028	6	-.024	6	NC		NC		NC		NC	
739		5	max	-.022	9	-.019	9	NC		NC		NC		NC	
740			min	-.028	6	-.024	6	NC		NC		NC		NC	
741	M77	1	max	-.022	9	-.019	9	NC		NC		NC		NC	
742			min	-.028	6	-.024	6	NC		NC		NC		NC	
743		2	max	-.022	9	-.019	9	NC		NC		NC		NC	
744			min	-.028	6	-.024	6	NC		NC		NC		NC	
745		3	max	-.022	9	-.019	9	NC		NC		NC		NC	
746			min	-.028	6	-.024	6	NC		NC		NC		NC	
747		4	max	-.022	9	-.019	9	NC		NC		NC		NC	
748			min	-.028	6	-.024	6	NC		NC		NC		NC	
749		5	max	-.022	9	-.019	9	NC		NC		NC		NC	
750			min	-.028	6	-.024	6	NC		NC		NC		NC	

Company : **DMJM H&N**
Designer : **Kevin M. Jones - DMJMH&N**
Job Number : **145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
751	M78	1	max	-.022	9	-.019	9	NC		NC		NC		NC	
752			min	-.028	6	-.024	6	NC		NC		NC		NC	
753		2	max	-.022	9	-.019	9	NC		NC		NC		NC	
754			min	-.028	6	-.024	6	NC		NC		NC		NC	
755		3	max	-.022	9	-.019	9	NC		NC		NC		NC	
756			min	-.028	6	-.024	6	NC		NC		NC		NC	
757		4	max	-.022	9	-.019	9	NC		NC		NC		NC	
758			min	-.028	6	-.024	6	NC		NC		NC		NC	
759		5	max	-.022	9	-.019	9	NC		NC		NC		NC	
760			min	-.028	6	-.024	6	NC		NC		NC		NC	
761	M79	1	max	.049	7	.041	7	NC		NC		NC		NC	
762			min	-.151	8	-.126	8	NC		NC		NC		NC	
763		2	max	.049	7	.041	7	NC		NC		NC		NC	
764			min	-.151	8	-.126	8	NC		NC		NC		NC	
765		3	max	.049	7	.041	7	NC		NC		NC		NC	
766			min	-.151	8	-.126	8	NC		NC		NC		NC	
767		4	max	.049	7	.041	7	NC		NC		NC		NC	
768			min	-.151	8	-.126	8	NC		NC		NC		NC	
769		5	max	.049	7	.041	7	NC		NC		NC		NC	
770			min	-.151	8	-.126	8	NC		NC		NC		NC	
771	M80	1	max	.049	7	.041	7	NC		NC		NC		NC	
772			min	-.151	8	-.126	8	NC		NC		NC		NC	
773		2	max	.049	7	.041	7	NC		NC		NC		NC	
774			min	-.151	8	-.126	8	NC		NC		NC		NC	
775		3	max	.049	7	.041	7	NC		NC		NC		NC	
776			min	-.151	8	-.126	8	NC		NC		NC		NC	
777		4	max	.049	7	.041	7	NC		NC		NC		NC	
778			min	-.151	8	-.126	8	NC		NC		NC		NC	
779		5	max	.049	7	.041	7	NC		NC		NC		NC	
780			min	-.151	8	-.126	8	NC		NC		NC		NC	
781	M81	1	max	.049	7	.041	7	NC		NC		NC		NC	
782			min	-.151	8	-.126	8	NC		NC		NC		NC	
783		2	max	.049	7	.041	7	NC		NC		NC		NC	
784			min	-.151	8	-.126	8	NC		NC		NC		NC	
785		3	max	.049	7	.041	7	NC		NC		NC		NC	
786			min	-.151	8	-.126	8	NC		NC		NC		NC	
787		4	max	.049	7	.041	7	NC		NC		NC		NC	
788			min	-.151	8	-.126	8	NC		NC		NC		NC	
789		5	max	.049	7	.041	7	NC		NC		NC		NC	
790			min	-.151	8	-.126	8	NC		NC		NC		NC	
791	M82	1	max	.016	8	.037	8	NC		NC		NC		NC	
792			min	-.003	7	-.007	7	NC		NC		NC		NC	
793		2	max	.016	8	.037	8	NC		NC		NC		NC	
794			min	-.003	7	-.007	7	NC		NC		NC		NC	
795		3	max	.016	8	.037	8	NC		NC		NC		NC	
796			min	-.003	7	-.007	7	NC		NC		NC		NC	
797		4	max	.016	8	.037	8	NC		NC		NC		NC	
798			min	-.003	7	-.007	7	NC		NC		NC		NC	
799		5	max	.016	8	.037	8	NC		NC		NC		NC	
800			min	-.003	7	-.007	7	NC		NC		NC		NC	
801	M83	1	max	.042	8	.097	8	NC		NC		NC		NC	
802			min	-.036	7	-.083	7	NC		NC		NC		NC	
803		2	max	.042	8	.097	8	NC		NC		NC		NC	
804			min	-.036	7	-.083	7	NC		NC		NC		NC	
805		3	max	.042	8	.097	8	NC		NC		NC		NC	
806			min	-.036	7	-.083	7	NC		NC		NC		NC	
807		4	max	.042	8	.097	8	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
808			min	-.036	7	-.083	7	NC		NC		NC		NC	
809		5	max	.042	8	.097	8	NC		NC		NC		NC	
810			min	-.036	7	-.083	7	NC		NC		NC		NC	
811	M84	1	max	.045	5	.103	5	NC		NC		NC		NC	
812			min	-.029	4	-.065	4	NC		NC		NC		NC	
813		2	max	.02	9	.046	9	NC		NC		NC		NC	
814			min	-.027	6	-.062	6	NC		NC		NC		NC	
815		3	max	.02	9	.046	9	NC		NC		NC		NC	
816			min	-.027	6	-.062	6	NC		NC		NC		NC	
817		4	max	.02	9	.046	9	NC		NC		NC		NC	
818			min	-.027	6	-.062	6	NC		NC		NC		NC	
819		5	max	.02	9	.046	9	NC		NC		NC		NC	
820			min	-.027	6	-.062	6	NC		NC		NC		NC	
821	M85	1	max	.028	7	.386	7	NC		NC		NC		NC	
822			min	-.005	1	-.069	1	NC		NC		NC		NC	
823		2	max	.028	7	.386	7	NC		NC		NC		NC	
824			min	-.005	1	-.069	1	NC		NC		NC		NC	
825		3	max	.028	7	.386	7	NC		NC		NC		NC	
826			min	-.005	1	-.069	1	NC		NC		NC		NC	
827		4	max	.028	7	.386	7	NC		NC		NC		NC	
828			min	-.005	1	-.069	1	NC		NC		NC		NC	
829		5	max	.028	7	.386	7	NC		NC		NC		NC	
830			min	-.005	1	-.069	1	NC		NC		NC		NC	
831	M86	1	max	.026	2	.359	2	NC		NC		NC		NC	
832			min	0	1	-.013	1	NC		NC		NC		NC	
833		2	max	.026	2	.359	2	NC		NC		NC		NC	
834			min	0	1	-.013	1	NC		NC		NC		NC	
835		3	max	.026	2	.359	2	NC		NC		NC		NC	
836			min	0	1	-.013	1	NC		NC		NC		NC	
837		4	max	.026	2	.359	2	NC		NC		NC		NC	
838			min	0	1	-.013	1	NC		NC		NC		NC	
839		5	max	.026	2	.359	2	NC		NC		NC		NC	
840			min	0	1	-.013	1	NC		NC		NC		NC	
841	M87	1	max	.046	6	.622	6	NC		NC		NC		NC	
842			min	.006	1	.089	1	NC		NC		NC		NC	
843		2	max	.046	6	.622	6	NC		NC		NC		NC	
844			min	.006	1	.089	1	NC		NC		NC		NC	
845		3	max	.046	6	.622	6	NC		NC		NC		NC	
846			min	.006	1	.089	1	NC		NC		NC		NC	
847		4	max	.046	6	.622	6	NC		NC		NC		NC	
848			min	.006	1	.089	1	NC		NC		NC		NC	
849		5	max	.046	6	.622	6	NC		NC		NC		NC	
850			min	.006	1	.089	1	NC		NC		NC		NC	
851	M88	1	max	.042	6	.573	6	NC		NC		NC		NC	
852			min	.007	1	.091	1	NC		NC		NC		NC	
853		2	max	.042	6	.573	6	NC		NC		NC		NC	
854			min	.007	1	.091	1	NC		NC		NC		NC	
855		3	max	.042	6	.573	6	NC		NC		NC		NC	
856			min	.007	1	.091	1	NC		NC		NC		NC	
857		4	max	.042	6	.573	6	NC		NC		NC		NC	
858			min	.007	1	.091	1	NC		NC		NC		NC	
859		5	max	.042	6	.573	6	NC		NC		NC		NC	
860			min	.007	1	.091	1	NC		NC		NC		NC	
861	M89	1	max	.032	6	.43	6	NC		NC		NC		NC	
862			min	.006	1	.084	1	NC		NC		NC		NC	
863		2	max	.032	6	.43	6	NC		NC		NC		NC	
864			min	.006	1	.084	1	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
865		3	max	.032	6	.43	6	NC		NC		NC		NC	
866			min	.006	1	.084	1	NC		NC		NC		NC	
867		4	max	.032	6	.43	6	NC		NC		NC		NC	
868			min	.006	1	.084	1	NC		NC		NC		NC	
869		5	max	.032	6	.43	6	NC		NC		NC		NC	
870			min	.006	1	.084	1	NC		NC		NC		NC	
871	M90	1	max	.021	3	.291	3	NC		NC		NC		NC	
872			min	.005	1	.066	1	NC		NC		NC		NC	
873		2	max	.021	3	.291	3	NC		NC		NC		NC	
874			min	.005	1	.066	1	NC		NC		NC		NC	
875		3	max	.021	3	.291	3	NC		NC		NC		NC	
876			min	.005	1	.066	1	NC		NC		NC		NC	
877		4	max	.021	3	.291	3	NC		NC		NC		NC	
878			min	.005	1	.066	1	NC		NC		NC		NC	
879		5	max	.021	3	.291	3	NC		NC		NC		NC	
880			min	.005	1	.066	1	NC		NC		NC		NC	
881	M91	1	max	.012	3	.159	3	NC		NC		NC		NC	
882			min	.002	2	.028	2	NC		NC		NC		NC	
883		2	max	.012	3	.159	3	NC		NC		NC		NC	
884			min	.002	2	.028	2	NC		NC		NC		NC	
885		3	max	.012	3	.159	3	NC		NC		NC		NC	
886			min	.002	2	.028	2	NC		NC		NC		NC	
887		4	max	.012	3	.159	3	NC		NC		NC		NC	
888			min	.002	2	.028	2	NC		NC		NC		NC	
889		5	max	.012	3	.159	3	NC		NC		NC		NC	
890			min	.002	2	.028	2	NC		NC		NC		NC	
891	M92	1	max	.007	3	.093	3	NC		NC		NC		NC	
892			min	-.005	2	-.067	2	NC		NC		NC		NC	
893		2	max	.007	3	.093	3	NC		NC		NC		NC	
894			min	-.005	2	-.067	2	NC		NC		NC		NC	
895		3	max	.007	3	.093	3	NC		NC		NC		NC	
896			min	-.005	2	-.067	2	NC		NC		NC		NC	
897		4	max	.007	3	.093	3	NC		NC		NC		NC	
898			min	-.005	2	-.067	2	NC		NC		NC		NC	
899		5	max	.007	3	.093	3	NC		NC		NC		NC	
900			min	-.005	2	-.067	2	NC		NC		NC		NC	
901	M93	1	max	.044	7	.1	7	NC		NC		NC		NC	
902			min	-.006	8	-.013	8	NC		NC		NC		NC	
903		2	max	.044	7	.1	7	NC		NC		NC		NC	
904			min	-.006	8	-.013	8	NC		NC		NC		NC	
905		3	max	.044	7	.1	7	NC		NC		NC		NC	
906			min	-.006	8	-.013	8	NC		NC		NC		NC	
907		4	max	.044	7	.1	7	NC		NC		NC		NC	
908			min	-.006	8	-.013	8	NC		NC		NC		NC	
909		5	max	.013	7	.03	7	NC		NC		NC		NC	
910			min	-.002	8	-.005	8	NC		NC		NC		NC	
911	M94	1	max	.013	7	.054	7	NC		NC		NC		NC	
912			min	-.003	8	-.011	8	NC		NC		NC		NC	
913		2	max	.013	7	.054	7	NC		NC		NC		NC	
914			min	-.003	8	-.011	8	NC		NC		NC		NC	
915		3	max	.013	7	.054	7	NC		NC		NC		NC	
916			min	-.003	8	-.011	8	NC		NC		NC		NC	
917		4	max	.013	7	.054	7	NC		NC		NC		NC	
918			min	-.003	8	-.011	8	NC		NC		NC		NC	
919		5	max	.004	7	.019	7	NC		NC		NC		NC	
920			min	.001	1	.005	1	NC		NC		NC		NC	
921	M95	1	max	.004	7	.06	7	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
922			min	.001	1	.017	1	NC		NC		NC		NC	
923		2	max	.004	7	.06	7	NC		NC		NC		NC	
924			min	.001	1	.017	1	NC		NC		NC		NC	
925		3	max	.004	7	.06	7	NC		NC		NC		NC	
926			min	.001	1	.017	1	NC		NC		NC		NC	
927		4	max	.004	7	.06	7	NC		NC		NC		NC	
928			min	.001	1	.017	1	NC		NC		NC		NC	
929		5	max	.004	7	.06	7	NC		NC		NC		NC	
930			min	.001	1	.017	1	NC		NC		NC		NC	
931	M96	1	max	.018	2	.245	2	NC		NC		NC		NC	
932			min	-.005	1	-.066	1	NC		NC		NC		NC	
933		2	max	.018	2	.245	2	NC		NC		NC		NC	
934			min	-.005	1	-.066	1	NC		NC		NC		NC	
935		3	max	.018	2	.245	2	NC		NC		NC		NC	
936			min	-.005	1	-.066	1	NC		NC		NC		NC	
937		4	max	.018	2	.245	2	NC		NC		NC		NC	
938			min	-.005	1	-.066	1	NC		NC		NC		NC	
939		5	max	.018	2	.245	2	NC		NC		NC		NC	
940			min	-.005	1	-.066	1	NC		NC		NC		NC	
941	M97	1	max	.056	2	.767	2	NC		NC		NC		NC	
942			min	-.003	1	-.046	1	NC		NC		NC		NC	
943		2	max	.056	2	.767	2	NC		NC		NC		NC	
944			min	-.003	1	-.046	1	NC		NC		NC		NC	
945		3	max	.056	2	.767	2	NC		NC		NC		NC	
946			min	-.003	1	-.046	1	NC		NC		NC		NC	
947		4	max	.056	2	.767	2	NC		NC		NC		NC	
948			min	-.003	1	-.046	1	NC		NC		NC		NC	
949		5	max	.056	2	.767	2	NC		NC		NC		NC	
950			min	-.003	1	-.046	1	NC		NC		NC		NC	
951	M98	1	max	.017	2	.225	2	NC		NC		NC		NC	
952			min	-.007	1	-.095	1	NC		NC		NC		NC	
953		2	max	.017	2	.225	2	NC		NC		NC		NC	
954			min	-.007	1	-.095	1	NC		NC		NC		NC	
955		3	max	.017	2	.225	2	NC		NC		NC		NC	
956			min	-.007	1	-.095	1	NC		NC		NC		NC	
957		4	max	.017	2	.225	2	NC		NC		NC		NC	
958			min	-.007	1	-.095	1	NC		NC		NC		NC	
959		5	max	.017	2	.225	2	NC		NC		NC		NC	
960			min	-.007	1	-.095	1	NC		NC		NC		NC	
961	M99	1	max	.028	2	.384	2	NC		NC		NC		NC	
962			min	0	1	-.002	1	NC		NC		NC		NC	
963		2	max	.028	2	.384	2	NC		NC		NC		NC	
964			min	0	1	-.002	1	NC		NC		NC		NC	
965		3	max	.028	2	.384	2	NC		NC		NC		NC	
966			min	0	1	-.002	1	NC		NC		NC		NC	
967		4	max	.028	2	.384	2	NC		NC		NC		NC	
968			min	0	1	-.002	1	NC		NC		NC		NC	
969		5	max	.028	2	.384	2	NC		NC		NC		NC	
970			min	0	1	-.002	1	NC		NC		NC		NC	
971	M100	1	max	.059	2	.801	2	NC		NC		NC		NC	
972			min	0	1	.008	1	NC		NC		NC		NC	
973		2	max	.059	2	.801	2	NC		NC		NC		NC	
974			min	0	1	.008	1	NC		NC		NC		NC	
975		3	max	.059	2	.801	2	NC		NC		NC		NC	
976			min	0	1	.008	1	NC		NC		NC		NC	
977		4	max	.059	2	.801	2	NC		NC		NC		NC	
978			min	0	1	.008	1	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
979		5	max	.059	2	.801	2	NC		NC		NC		NC	
980			min	0	1	.008	1	NC		NC		NC		NC	
981	M101	1	max	.023	7	.315	7	NC		NC		NC		NC	
982			min	-.006	1	-.077	1	NC		NC		NC		NC	
983		2	max	.023	7	.315	7	NC		NC		NC		NC	
984			min	-.006	1	-.077	1	NC		NC		NC		NC	
985		3	max	.023	7	.315	7	NC		NC		NC		NC	
986			min	-.006	1	-.077	1	NC		NC		NC		NC	
987		4	max	.023	7	.315	7	NC		NC		NC		NC	
988			min	-.006	1	-.077	1	NC		NC		NC		NC	
989		5	max	.023	7	.315	7	NC		NC		NC		NC	
990			min	-.006	1	-.077	1	NC		NC		NC		NC	
991	M102	1	max	.023	2	.318	2	NC		NC		NC		NC	
992			min	-.001	1	-.02	1	NC		NC		NC		NC	
993		2	max	.023	2	.318	2	NC		NC		NC		NC	
994			min	-.001	1	-.02	1	NC		NC		NC		NC	
995		3	max	.023	2	.318	2	NC		NC		NC		NC	
996			min	-.001	1	-.02	1	NC		NC		NC		NC	
997		4	max	.023	2	.318	2	NC		NC		NC		NC	
998			min	-.001	1	-.02	1	NC		NC		NC		NC	
999		5	max	.023	2	.318	2	NC		NC		NC		NC	
1000			min	-.001	1	-.02	1	NC		NC		NC		NC	
1001	M103	1	max	.052	2	.704	2	NC		NC		NC		NC	
1002			min	0	1	-.012	1	NC		NC		NC		NC	
1003		2	max	.052	2	.704	2	NC		NC		NC		NC	
1004			min	0	1	-.012	1	NC		NC		NC		NC	
1005		3	max	.052	2	.704	2	NC		NC		NC		NC	
1006			min	0	1	-.012	1	NC		NC		NC		NC	
1007		4	max	.052	2	.704	2	NC		NC		NC		NC	
1008			min	0	1	-.012	1	NC		NC		NC		NC	
1009		5	max	.052	2	.704	2	NC		NC		NC		NC	
1010			min	0	1	-.012	1	NC		NC		NC		NC	
1011	M104	1	max	.046	2	.626	2	NC		NC		NC		NC	
1012			min	0	1	-.012	1	NC		NC		NC		NC	
1013		2	max	.046	2	.626	2	NC		NC		NC		NC	
1014			min	0	1	-.012	1	NC		NC		NC		NC	
1015		3	max	.046	2	.626	2	NC		NC		NC		NC	
1016			min	0	1	-.012	1	NC		NC		NC		NC	
1017		4	max	.046	2	.626	2	NC		NC		NC		NC	
1018			min	0	1	-.012	1	NC		NC		NC		NC	
1019		5	max	.046	2	.626	2	NC		NC		NC		NC	
1020			min	0	1	-.012	1	NC		NC		NC		NC	
1021	M105	1	max	.034	9	.468	9	NC		NC		NC		NC	
1022			min	0	1	-.011	1	NC		NC		NC		NC	
1023		2	max	.034	9	.468	9	NC		NC		NC		NC	
1024			min	0	1	-.011	1	NC		NC		NC		NC	
1025		3	max	.034	9	.468	9	NC		NC		NC		NC	
1026			min	0	1	-.011	1	NC		NC		NC		NC	
1027		4	max	.034	9	.468	9	NC		NC		NC		NC	
1028			min	0	1	-.011	1	NC		NC		NC		NC	
1029		5	max	.034	9	.468	9	NC		NC		NC		NC	
1030			min	0	1	-.011	1	NC		NC		NC		NC	
1031	M106	1	max	.022	3	.302	3	NC		NC		NC		NC	
1032			min	0	1	-.009	1	NC		NC		NC		NC	
1033		2	max	.022	3	.302	3	NC		NC		NC		NC	
1034			min	0	1	-.009	1	NC		NC		NC		NC	
1035		3	max	.022	3	.302	3	NC		NC		NC		NC	

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
1036			min	0	1	-.009	1	NC		NC		NC		NC	
1037		4	max	.022	3	.302	3	NC		NC		NC		NC	
1038			min	0	1	-.009	1	NC		NC		NC		NC	
1039		5	max	.022	3	.302	3	NC		NC		NC		NC	
1040			min	0	1	-.009	1	NC		NC		NC		NC	
1041	M107	1	max	.009	3	.118	3	NC		NC		NC		NC	
1042			min	-.004	2	-.057	2	NC		NC		NC		NC	
1043		2	max	.009	3	.118	3	NC		NC		NC		NC	
1044			min	-.004	2	-.057	2	NC		NC		NC		NC	
1045		3	max	.009	3	.118	3	NC		NC		NC		NC	
1046			min	-.004	2	-.057	2	NC		NC		NC		NC	
1047		4	max	.009	3	.118	3	NC		NC		NC		NC	
1048			min	-.004	2	-.057	2	NC		NC		NC		NC	
1049		5	max	.009	3	.118	3	NC		NC		NC		NC	
1050			min	-.004	2	-.057	2	NC		NC		NC		NC	
1051	M108	1	max	.002	3	.029	3	NC		NC		NC		NC	
1052			min	-.012	2	-.165	2	NC		NC		NC		NC	
1053		2	max	.002	3	.029	3	NC		NC		NC		NC	
1054			min	-.012	2	-.165	2	NC		NC		NC		NC	
1055		3	max	.002	3	.029	3	NC		NC		NC		NC	
1056			min	-.012	2	-.165	2	NC		NC		NC		NC	
1057		4	max	.002	3	.029	3	NC		NC		NC		NC	
1058			min	-.012	2	-.165	2	NC		NC		NC		NC	
1059		5	max	.002	3	.029	3	NC		NC		NC		NC	
1060			min	-.012	2	-.165	2	NC		NC		NC		NC	
1061	M109	1	max	.053	2	.717	2	NC		NC		NC		NC	
1062			min	0	1	.008	1	NC		NC		NC		NC	
1063		2	max	.053	2	.717	2	NC		NC		NC		NC	
1064			min	0	1	.008	1	NC		NC		NC		NC	
1065		3	max	.053	2	.717	2	NC		NC		NC		NC	
1066			min	0	1	.008	1	NC		NC		NC		NC	
1067		4	max	.053	2	.717	2	NC		NC		NC		NC	
1068			min	0	1	.008	1	NC		NC		NC		NC	
1069		5	max	.053	2	.717	2	NC		NC		NC		NC	
1070			min	0	1	.008	1	NC		NC		NC		NC	
1071	M110	1	max	.038	5	.515	5	NC		NC		NC		NC	
1072			min	0	1	.008	1	NC		NC		NC		NC	
1073		2	max	.038	5	.515	5	NC		NC		NC		NC	
1074			min	0	1	.008	1	NC		NC		NC		NC	
1075		3	max	.038	5	.515	5	NC		NC		NC		NC	
1076			min	0	1	.008	1	NC		NC		NC		NC	
1077		4	max	.038	5	.515	5	NC		NC		NC		NC	
1078			min	0	1	.008	1	NC		NC		NC		NC	
1079		5	max	.038	5	.515	5	NC		NC		NC		NC	
1080			min	0	1	.008	1	NC		NC		NC		NC	
1081	M111	1	max	.024	3	.323	3	NC		NC		NC		NC	
1082			min	0	1	.007	1	NC		NC		NC		NC	
1083		2	max	.024	3	.323	3	NC		NC		NC		NC	
1084			min	0	1	.007	1	NC		NC		NC		NC	
1085		3	max	.024	3	.323	3	NC		NC		NC		NC	
1086			min	0	1	.007	1	NC		NC		NC		NC	
1087		4	max	.024	3	.323	3	NC		NC		NC		NC	
1088			min	0	1	.007	1	NC		NC		NC		NC	
1089		5	max	.024	3	.323	3	NC		NC		NC		NC	
1090			min	0	1	.007	1	NC		NC		NC		NC	
1091	M112	1	max	.008	3	.116	3	NC		NC		NC		NC	
1092			min	-.003	2	-.047	2	NC		NC		NC		NC	

Company : DMJM H&N
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Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	Ic	Torsion Shear[ksi]	Ic	y-y Warp...	Ic	z-z Warp Shear[ksi]	Ic	z-Top W...	Ic	z-Bot Wa...	Ic
1093		2	max	.008	3	.116	3	NC		NC		NC		NC	
1094			min	-.003	2	-.047	2	NC		NC		NC		NC	
1095		3	max	.008	3	.116	3	NC		NC		NC		NC	
1096			min	-.003	2	-.047	2	NC		NC		NC		NC	
1097		4	max	.008	3	.116	3	NC		NC		NC		NC	
1098			min	-.003	2	-.047	2	NC		NC		NC		NC	
1099		5	max	.008	3	.116	3	NC		NC		NC		NC	
1100			min	-.003	2	-.047	2	NC		NC		NC		NC	
1101	M113	1	max	.001	3	.017	3	NC		NC		NC		NC	
1102			min	-.013	2	-.171	2	NC		NC		NC		NC	
1103		2	max	.001	3	.017	3	NC		NC		NC		NC	
1104			min	-.013	2	-.171	2	NC		NC		NC		NC	
1105		3	max	.001	3	.017	3	NC		NC		NC		NC	
1106			min	-.013	2	-.171	2	NC		NC		NC		NC	
1107		4	max	.001	3	.017	3	NC		NC		NC		NC	
1108			min	-.013	2	-.171	2	NC		NC		NC		NC	
1109		5	max	.001	3	.017	3	NC		NC		NC		NC	
1110			min	-.013	2	-.171	2	NC		NC		NC		NC	
1111	M114	1	max	.05	2	.688	2	NC		NC		NC		NC	
1112			min	-.003	1	-.047	1	NC		NC		NC		NC	
1113		2	max	.05	2	.688	2	NC		NC		NC		NC	
1114			min	-.003	1	-.047	1	NC		NC		NC		NC	
1115		3	max	.05	2	.688	2	NC		NC		NC		NC	
1116			min	-.003	1	-.047	1	NC		NC		NC		NC	
1117		4	max	.05	2	.688	2	NC		NC		NC		NC	
1118			min	-.003	1	-.047	1	NC		NC		NC		NC	
1119		5	max	.05	2	.688	2	NC		NC		NC		NC	
1120			min	-.003	1	-.047	1	NC		NC		NC		NC	
1121	M115	1	max	.039	5	.532	5	NC		NC		NC		NC	
1122			min	-.003	1	-.044	1	NC		NC		NC		NC	
1123		2	max	.039	5	.532	5	NC		NC		NC		NC	
1124			min	-.003	1	-.044	1	NC		NC		NC		NC	
1125		3	max	.039	5	.532	5	NC		NC		NC		NC	
1126			min	-.003	1	-.044	1	NC		NC		NC		NC	
1127		4	max	.039	5	.532	5	NC		NC		NC		NC	
1128			min	-.003	1	-.044	1	NC		NC		NC		NC	
1129		5	max	.039	5	.532	5	NC		NC		NC		NC	
1130			min	-.003	1	-.044	1	NC		NC		NC		NC	
1131	M116	1	max	.025	3	.347	3	NC		NC		NC		NC	
1132			min	-.003	1	-.034	1	NC		NC		NC		NC	
1133		2	max	.025	3	.347	3	NC		NC		NC		NC	
1134			min	-.003	1	-.034	1	NC		NC		NC		NC	
1135		3	max	.025	3	.347	3	NC		NC		NC		NC	
1136			min	-.003	1	-.034	1	NC		NC		NC		NC	
1137		4	max	.025	3	.347	3	NC		NC		NC		NC	
1138			min	-.003	1	-.034	1	NC		NC		NC		NC	
1139		5	max	.025	3	.347	3	NC		NC		NC		NC	
1140			min	-.003	1	-.034	1	NC		NC		NC		NC	
1141	M117	1	max	.011	3	.15	3	NC		NC		NC		NC	
1142			min	-.002	2	-.025	2	NC		NC		NC		NC	
1143		2	max	.011	3	.15	3	NC		NC		NC		NC	
1144			min	-.002	2	-.025	2	NC		NC		NC		NC	
1145		3	max	.011	3	.15	3	NC		NC		NC		NC	
1146			min	-.002	2	-.025	2	NC		NC		NC		NC	
1147		4	max	.011	3	.15	3	NC		NC		NC		NC	
1148			min	-.002	2	-.025	2	NC		NC		NC		NC	
1149		5	max	.011	3	.15	3	NC		NC		NC		NC	

Company : DMJM H&N
Designer : Kevin M. Jones - DMJMH&N
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
1150			min	-.002	2	-.025	2	NC		NC		NC		NC	
1151	M118	1	max	.004	3	.055	3	NC		NC		NC		NC	
1152			min	-.01	2	-.141	2	NC		NC		NC		NC	
1153		2	max	.004	3	.055	3	NC		NC		NC		NC	
1154			min	-.01	2	-.141	2	NC		NC		NC		NC	
1155		3	max	.004	3	.055	3	NC		NC		NC		NC	
1156			min	-.01	2	-.141	2	NC		NC		NC		NC	
1157		4	max	.004	3	.055	3	NC		NC		NC		NC	
1158			min	-.01	2	-.141	2	NC		NC		NC		NC	
1159		5	max	.004	3	.055	3	NC		NC		NC		NC	
1160			min	-.01	2	-.141	2	NC		NC		NC		NC	
1161	M119	1	max	.25	1	.209	1	NC		NC		NC		NC	
1162			min	-.536	8	-.448	8	NC		NC		NC		NC	
1163		2	max	.25	1	.209	1	NC		NC		NC		NC	
1164			min	-.536	8	-.448	8	NC		NC		NC		NC	
1165		3	max	.25	1	.209	1	NC		NC		NC		NC	
1166			min	-.536	8	-.448	8	NC		NC		NC		NC	
1167		4	max	.25	1	.209	1	NC		NC		NC		NC	
1168			min	-.536	8	-.448	8	NC		NC		NC		NC	
1169		5	max	.25	1	.209	1	NC		NC		NC		NC	
1170			min	-.536	8	-.448	8	NC		NC		NC		NC	
1171	M120	1	max	-.022	9	-.019	9	NC		NC		NC		NC	
1172			min	-.028	6	-.024	6	NC		NC		NC		NC	
1173		2	max	-.022	9	-.019	9	NC		NC		NC		NC	
1174			min	-.028	6	-.024	6	NC		NC		NC		NC	
1175		3	max	-.022	9	-.019	9	NC		NC		NC		NC	
1176			min	-.028	6	-.024	6	NC		NC		NC		NC	
1177		4	max	-.022	9	-.019	9	NC		NC		NC		NC	
1178			min	-.028	6	-.024	6	NC		NC		NC		NC	
1179		5	max	-.022	9	-.019	9	NC		NC		NC		NC	
1180			min	-.028	6	-.024	6	NC		NC		NC		NC	
1181	M121	1	max	-.022	9	-.019	9	NC		NC		NC		NC	
1182			min	-.028	6	-.024	6	NC		NC		NC		NC	
1183		2	max	-.022	9	-.019	9	NC		NC		NC		NC	
1184			min	-.028	6	-.024	6	NC		NC		NC		NC	
1185		3	max	-.022	9	-.019	9	NC		NC		NC		NC	
1186			min	-.028	6	-.024	6	NC		NC		NC		NC	
1187		4	max	-.022	9	-.019	9	NC		NC		NC		NC	
1188			min	-.028	6	-.024	6	NC		NC		NC		NC	
1189		5	max	-.022	9	-.019	9	NC		NC		NC		NC	
1190			min	-.028	6	-.024	6	NC		NC		NC		NC	
1191	M122	1	max	.25	1	.209	1	NC		NC		NC		NC	
1192			min	-.495	6	-.414	6	NC		NC		NC		NC	
1193		2	max	.25	1	.209	1	NC		NC		NC		NC	
1194			min	-.495	6	-.414	6	NC		NC		NC		NC	
1195		3	max	.25	1	.209	1	NC		NC		NC		NC	
1196			min	-.495	6	-.414	6	NC		NC		NC		NC	
1197		4	max	.25	1	.209	1	NC		NC		NC		NC	
1198			min	-.495	6	-.414	6	NC		NC		NC		NC	
1199		5	max	.25	1	.209	1	NC		NC		NC		NC	
1200			min	-.495	6	-.414	6	NC		NC		NC		NC	
1201	M123	1	max	.079	6	.18	6	NC		NC		NC		NC	
1202			min	-.002	1	-.005	1	NC		NC		NC		NC	
1203		2	max	.079	6	.18	6	NC		NC		NC		NC	
1204			min	-.002	1	-.005	1	NC		NC		NC		NC	
1205		3	max	.079	6	.18	6	NC		NC		NC		NC	
1206			min	-.002	1	-.005	1	NC		NC		NC		NC	

Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[k...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
1207		4	max	.079	6	.18	6	NC		NC		NC		NC	
1208			min	-.002	1	-.005	1	NC		NC		NC		NC	
1209		5	max	.079	6	.18	6	NC		NC		NC		NC	
1210			min	-.002	1	-.005	1	NC		NC		NC		NC	
1211	M124	1	max	.079	6	.18	6	NC		NC		NC		NC	
1212			min	-.002	1	-.005	1	NC		NC		NC		NC	
1213		2	max	.079	6	.18	6	NC		NC		NC		NC	
1214			min	-.002	1	-.005	1	NC		NC		NC		NC	
1215		3	max	.079	6	.18	6	NC		NC		NC		NC	
1216			min	-.002	1	-.005	1	NC		NC		NC		NC	
1217		4	max	.079	6	.18	6	NC		NC		NC		NC	
1218			min	-.002	1	-.005	1	NC		NC		NC		NC	
1219		5	max	.079	6	.18	6	NC		NC		NC		NC	
1220			min	-.002	1	-.005	1	NC		NC		NC		NC	

amec

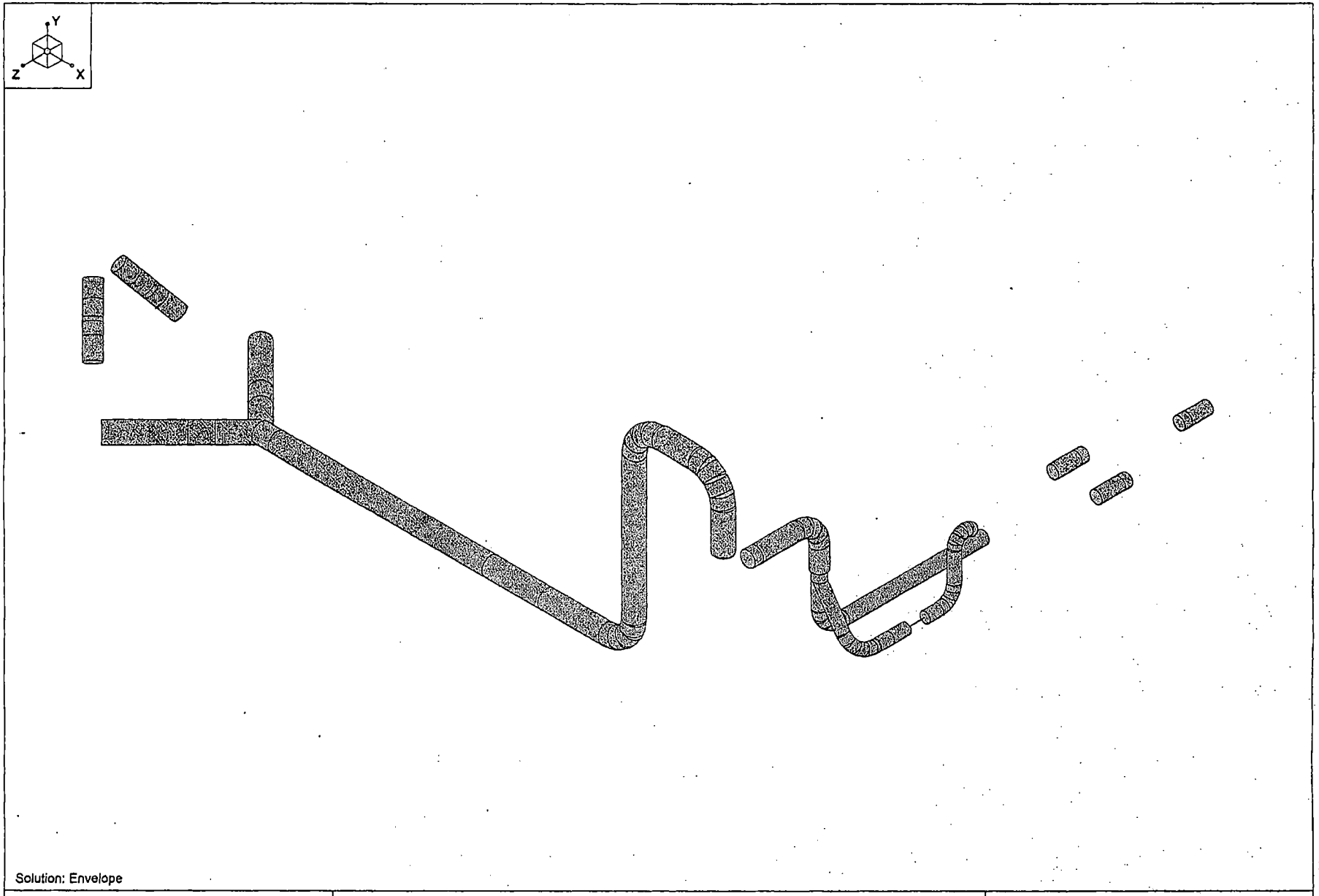
CALCULATION SHEET

CALC. NO.:	145579-V-CA-005	REV:	1	DATE:	March 26, 2006
CALC. TITLE:	Off-Gas Treatment System Pipe Stress Analysis				
PROJECT NO.:	145579	PROJECT TITLE:	Final DBVS Design		

Attachment 8 Model 5 RISA 3D Analysis Input and Output Data

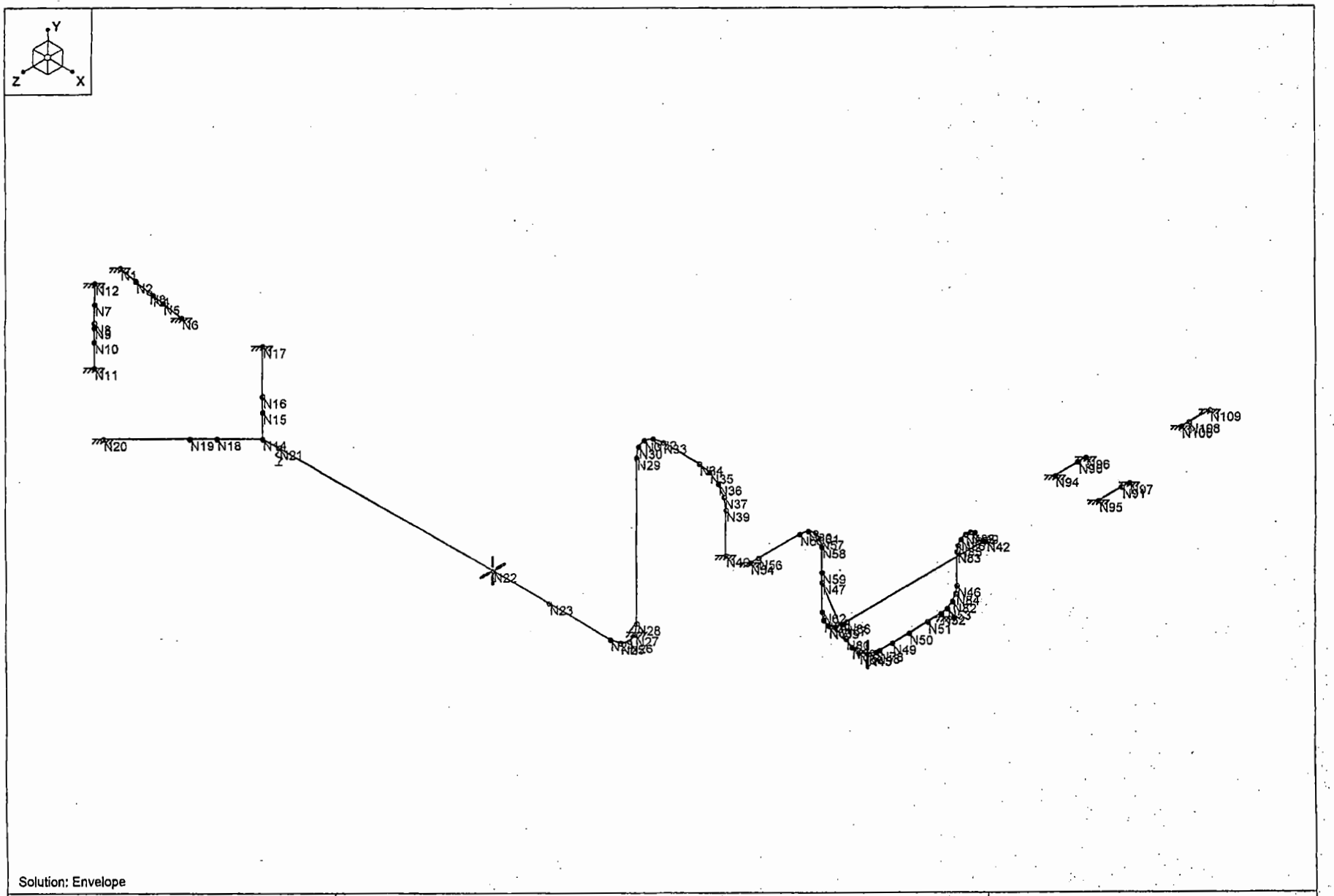
NOTE: This cover sheet represents the approval signatures of the originator and checker for all pages of this attachment

ORIGINATOR:	DATE:	CHECKER:	DATE:
Kevin M. Jones KMJ	3/26/06	J. Van Corbach JVC	3/26/06



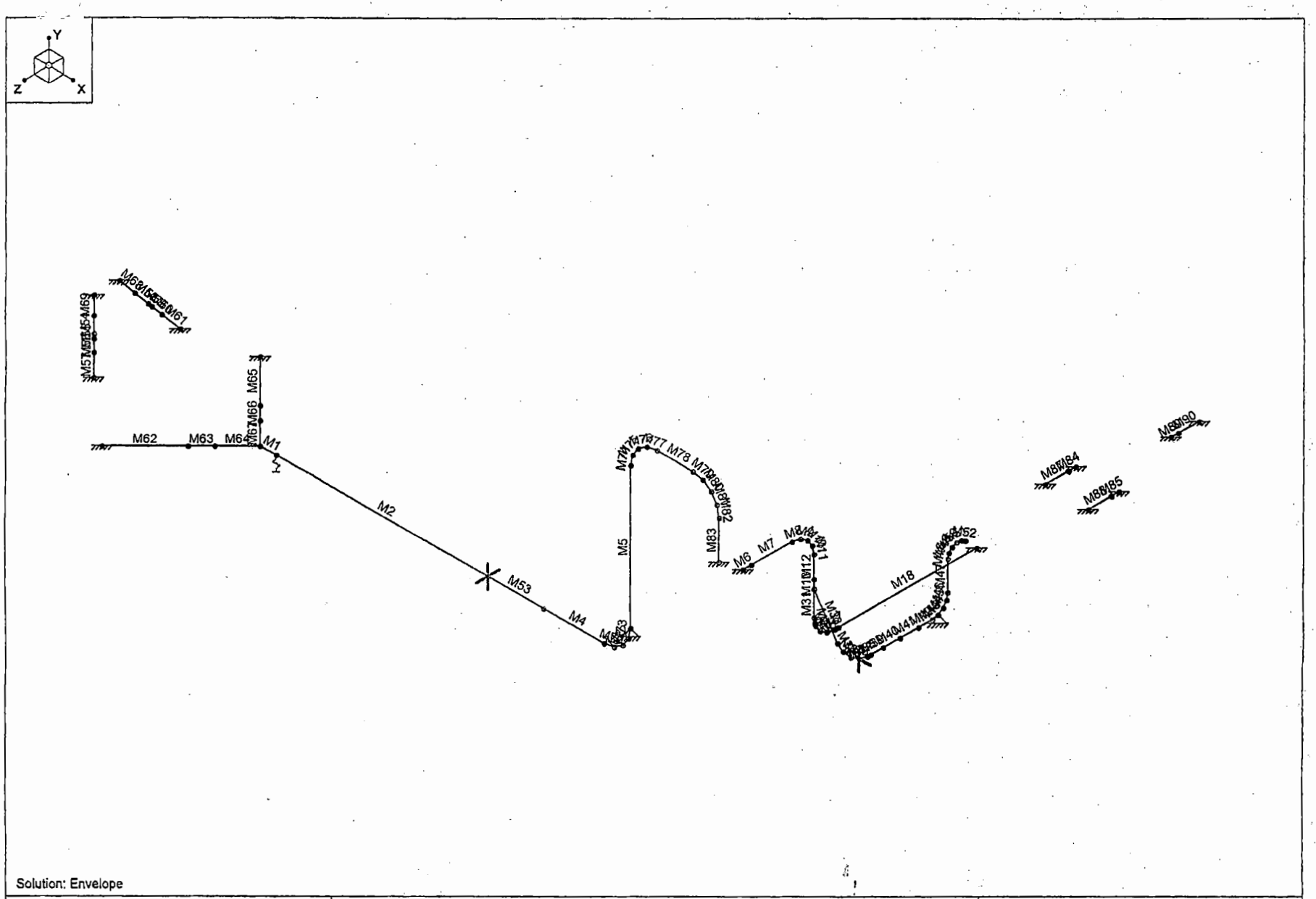
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 7:38 AM
145579-V-CA-005 Model 5	Rendered Model Geometry	145579-V-CA-005 Model 5.r3d



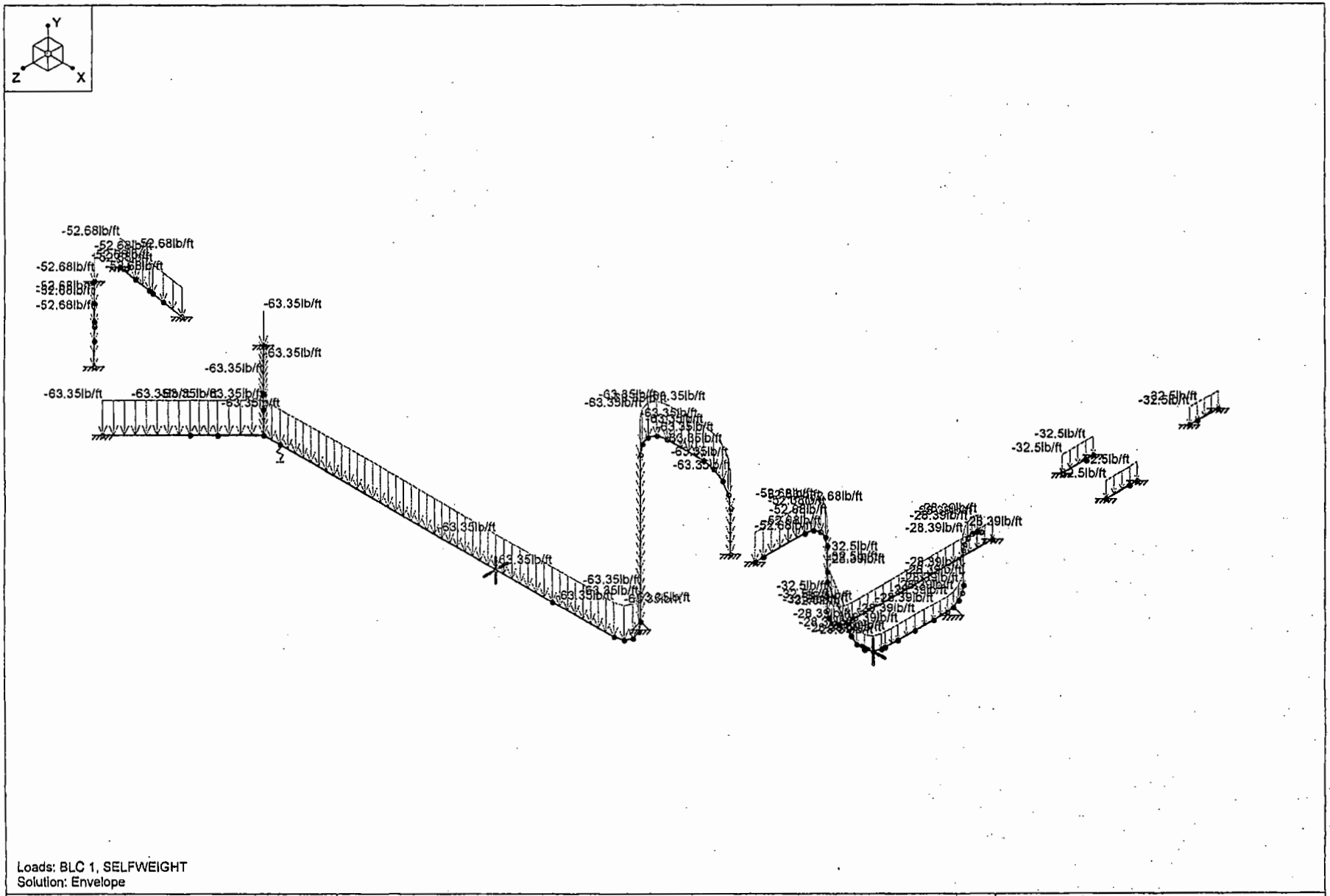
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 7:41 AM
145579-V-CA-005 Model 5	Nodes and Support Locations	145579-V-CA-005 Model 5.r3d



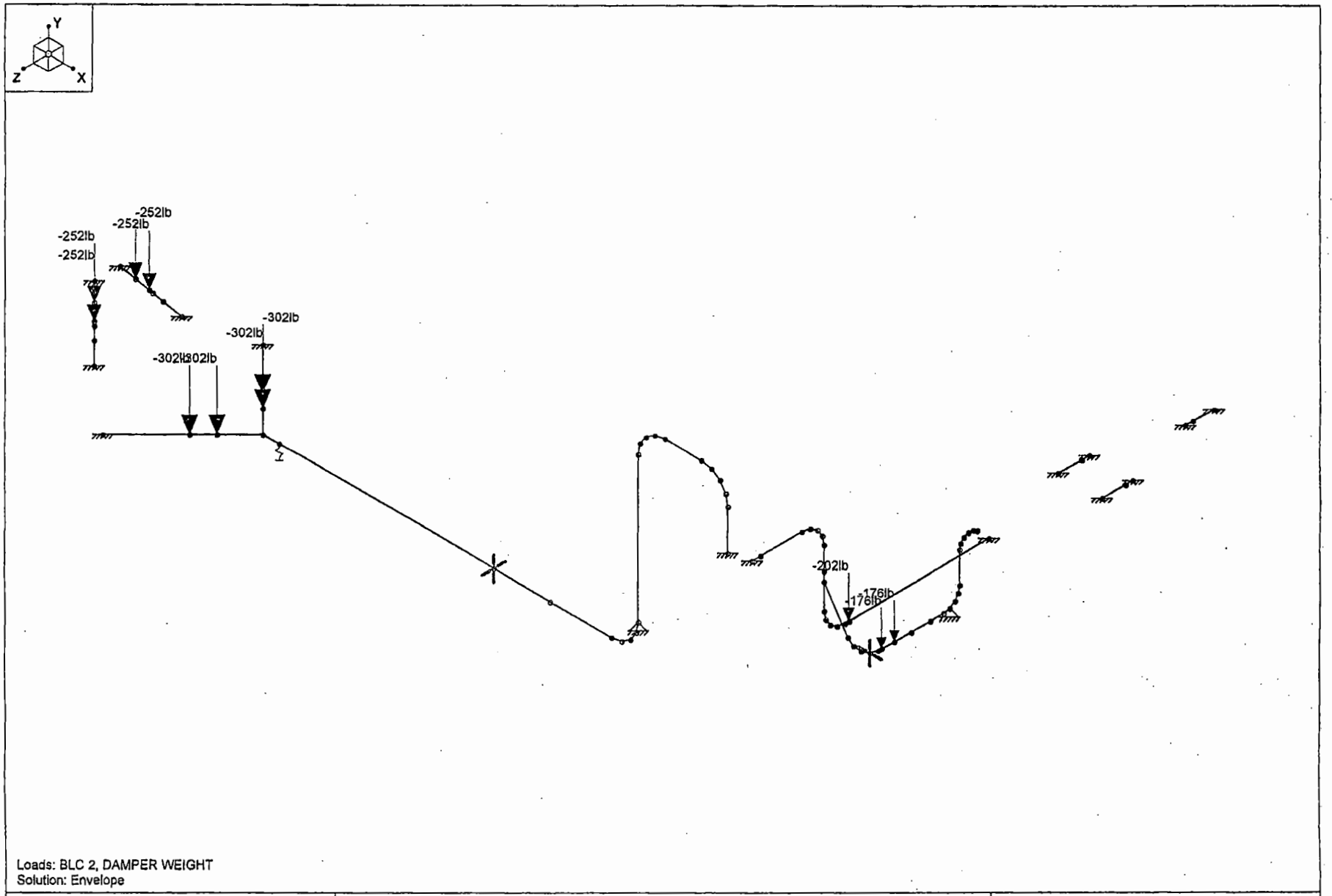
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 7:42 AM
145579-V-CA-005 Model 5	Members	145579-V-CA-005 Model 5.r3d



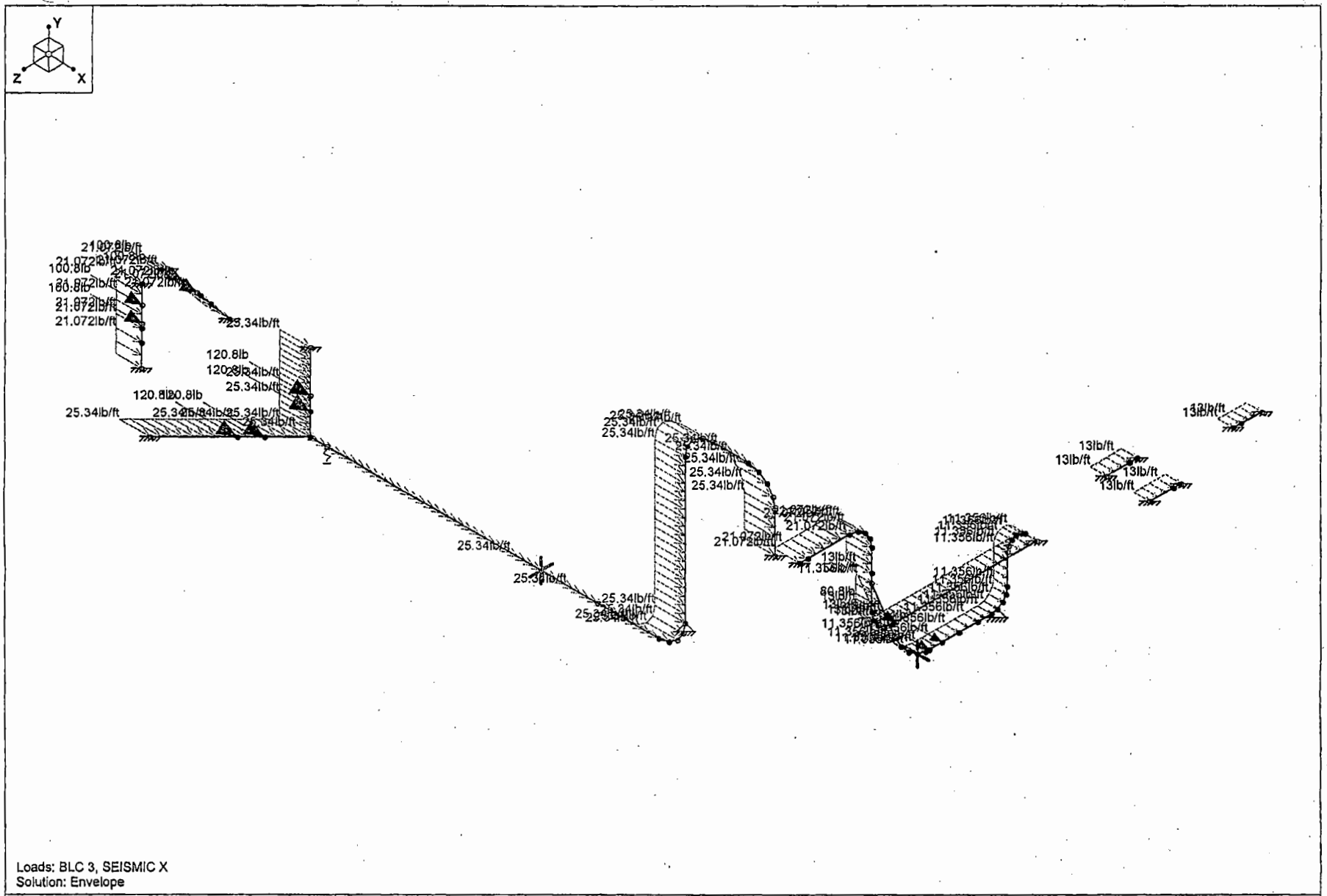
Loads: BLC 1, SELFWEIGHT
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 7:44 AM
145579-V-CA-005 Model 5	BLC - Selfweight	145579-V-CA-005 Model 5.r3d



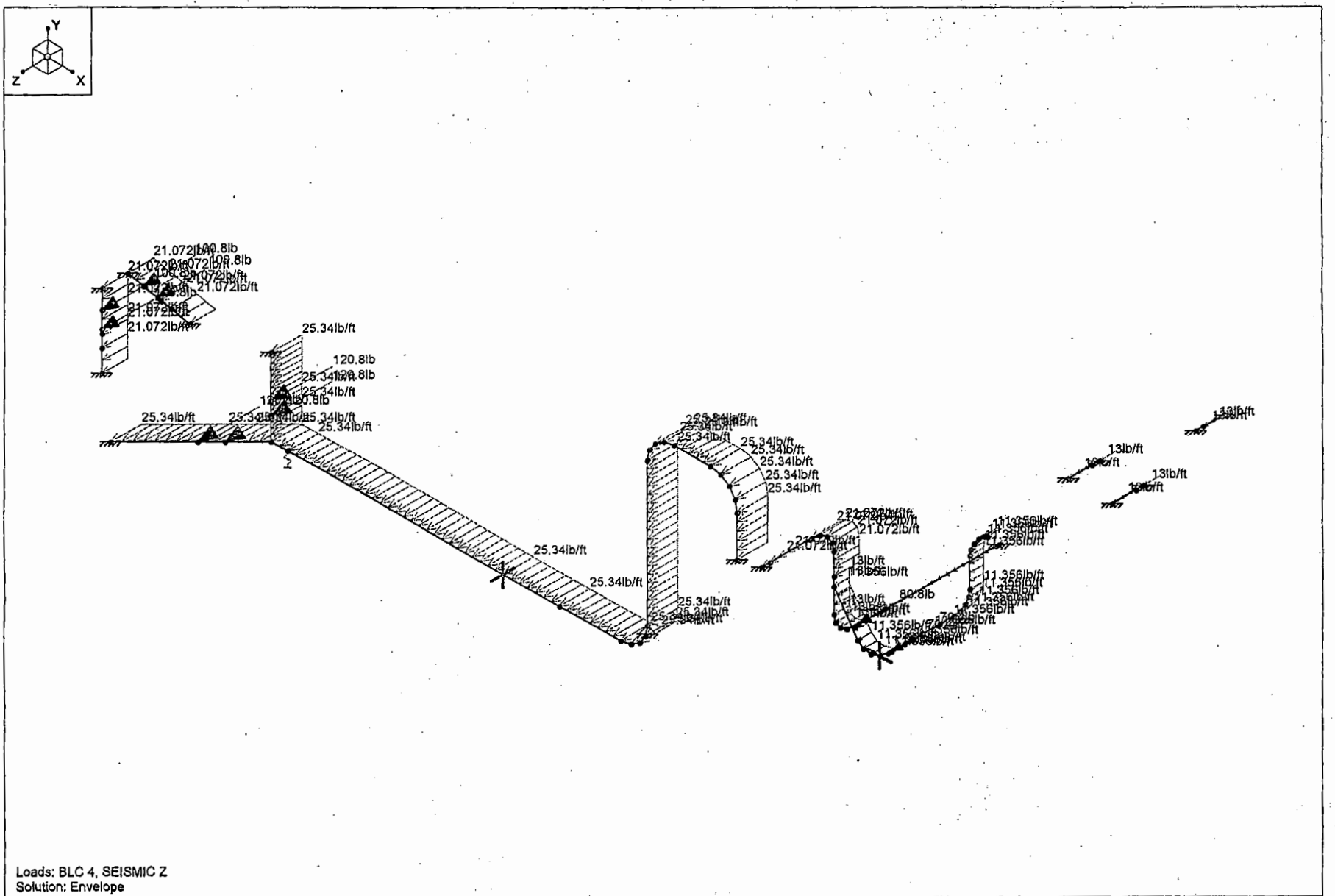
Loads: BLC 2, DAMPER WEIGHT
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 7:44 AM
145579-V-CA-005 Model 5	BLC - Dampers	145579-V-CA-005 Model 5.r3d



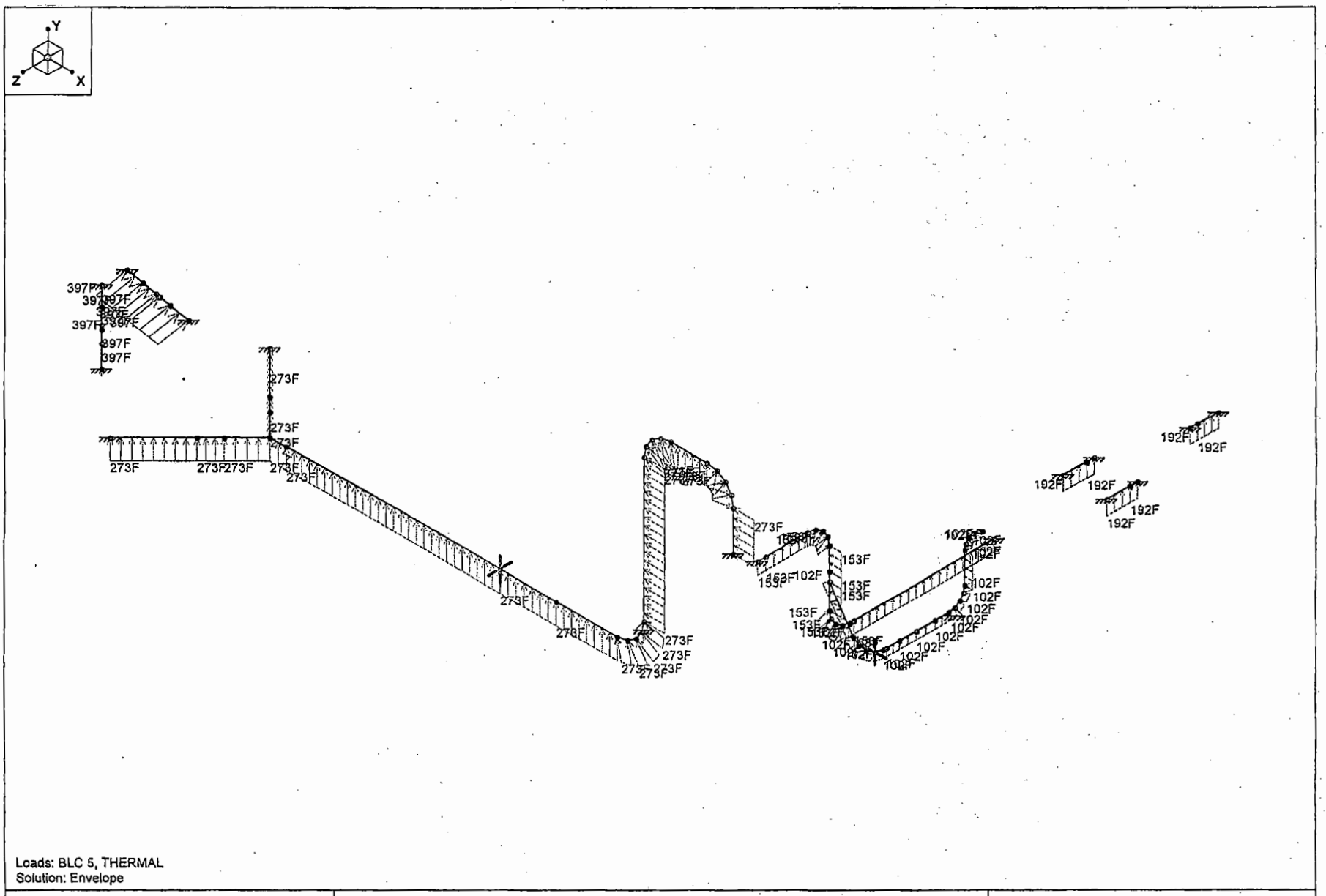
Loads: BLC 3, SEISMIC X
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 7:45 AM
145579-V-CA-005 Model 5	BLC - Seismic X	145579-V-CA-005 Model 5.r3d



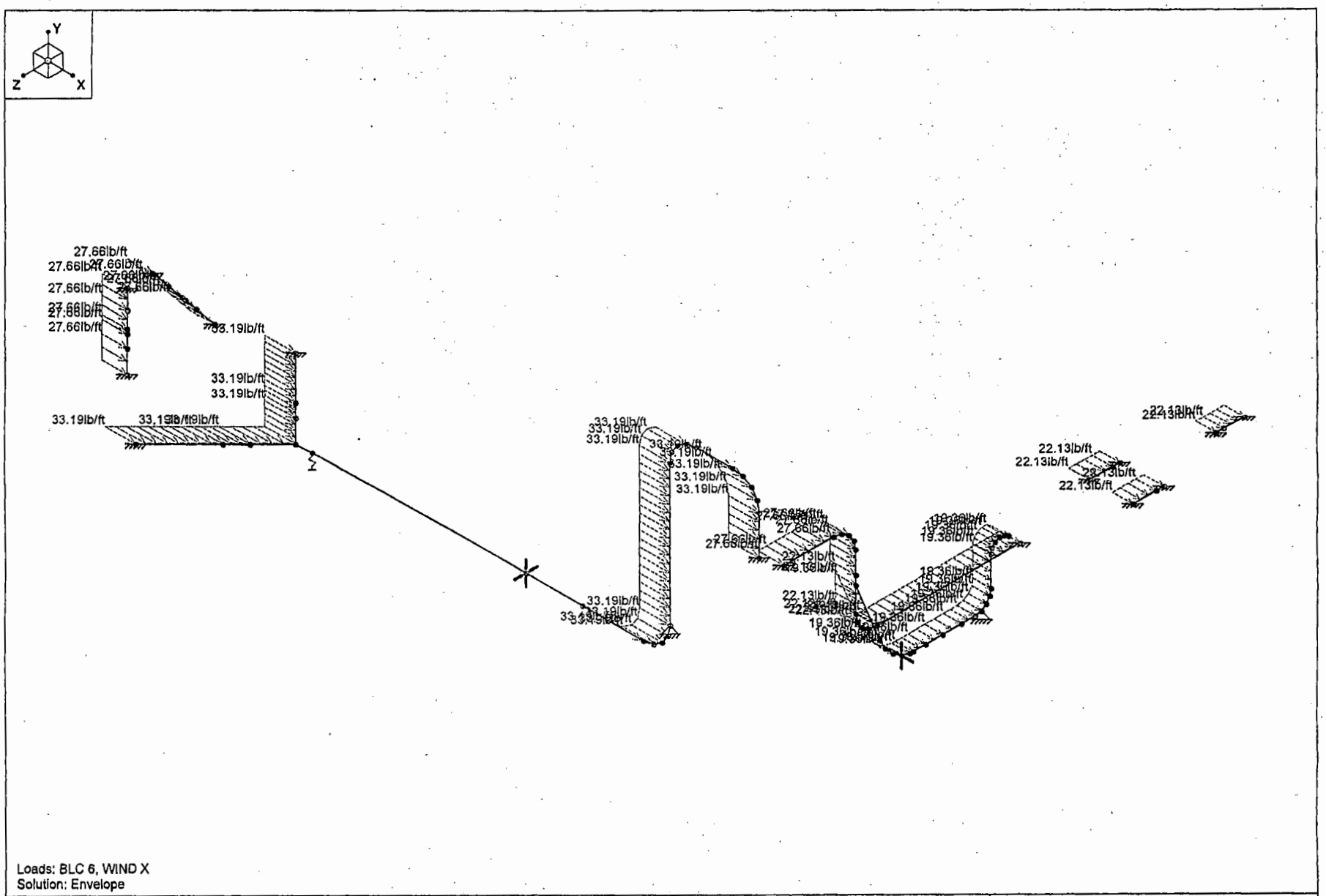
Loads: BLC 4, SEISMIC Z
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 7:46 AM
145579-V-CA-005 Model 5	BLC - Seismic Z	145579-V-CA-005 Model 5.r3d

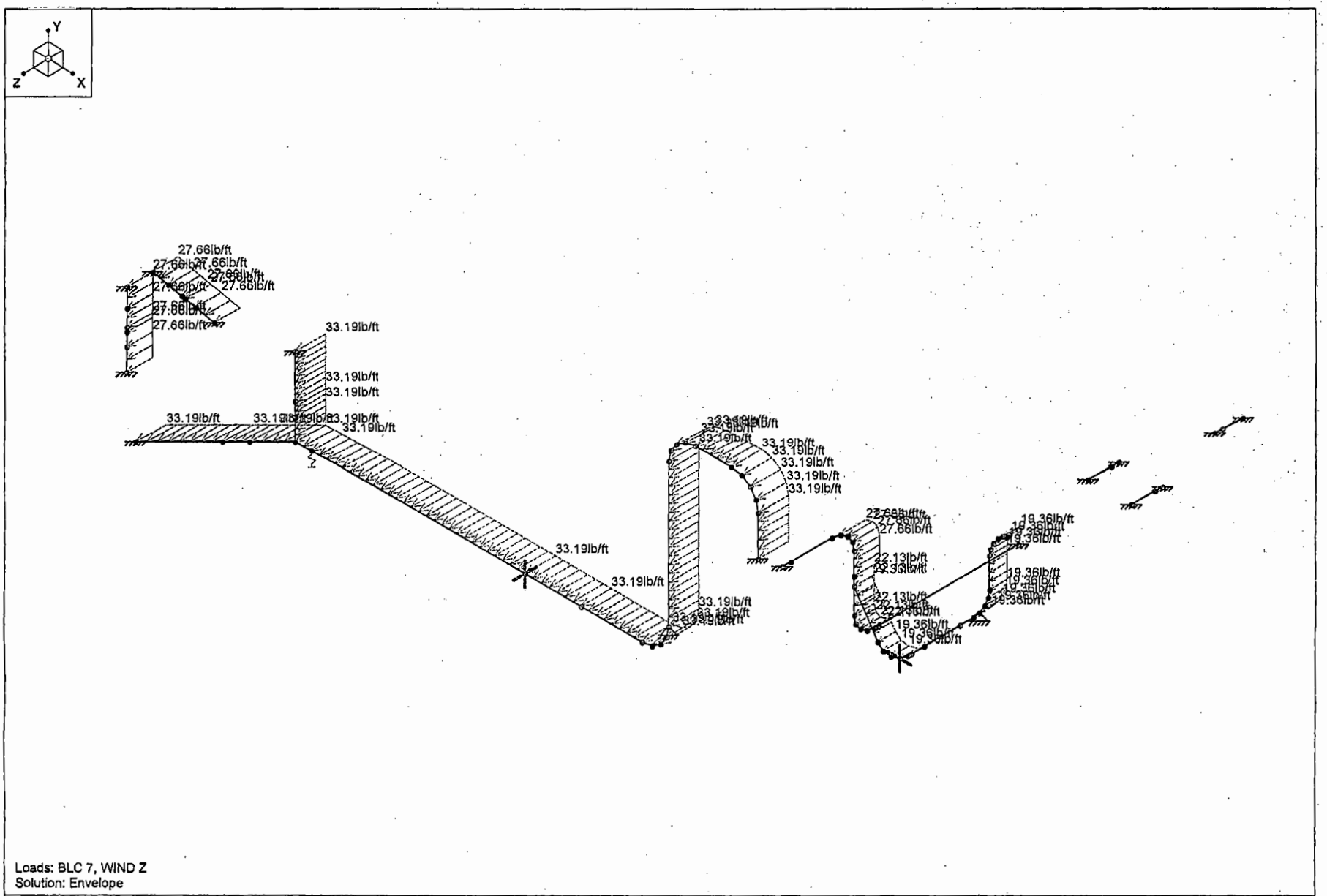


Loads: BLC 5, THERMAL
Solution: Envelope

DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 7:52 AM
145579-V-CA-005 Model 5	BLC - Thermal	145579-V-CA-005 Model 5.r3d

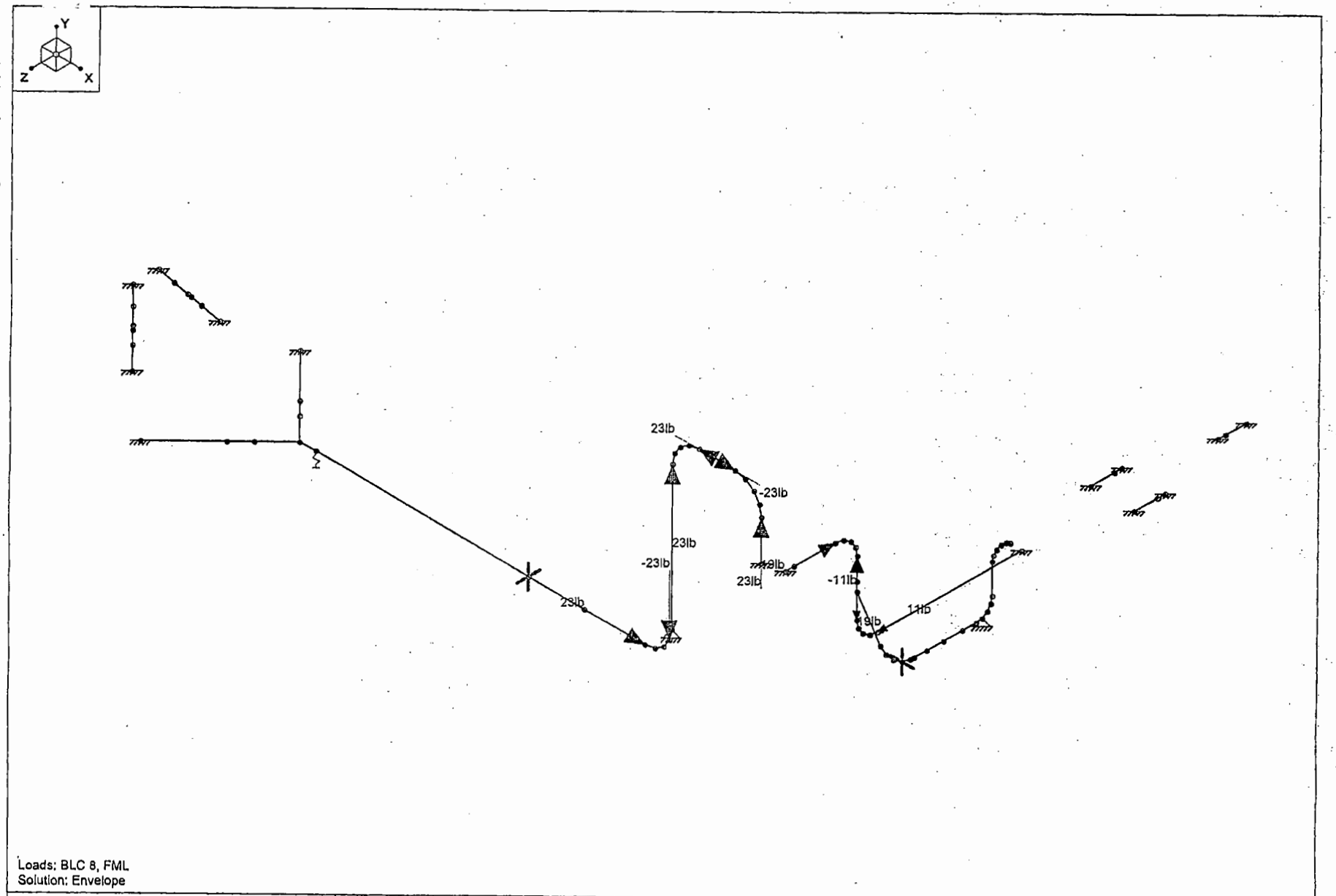


DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 7:52 AM
145579-V-CA-005 Model 5	BLC - Wind X	145579-V-CA-005 Model 5.r3d



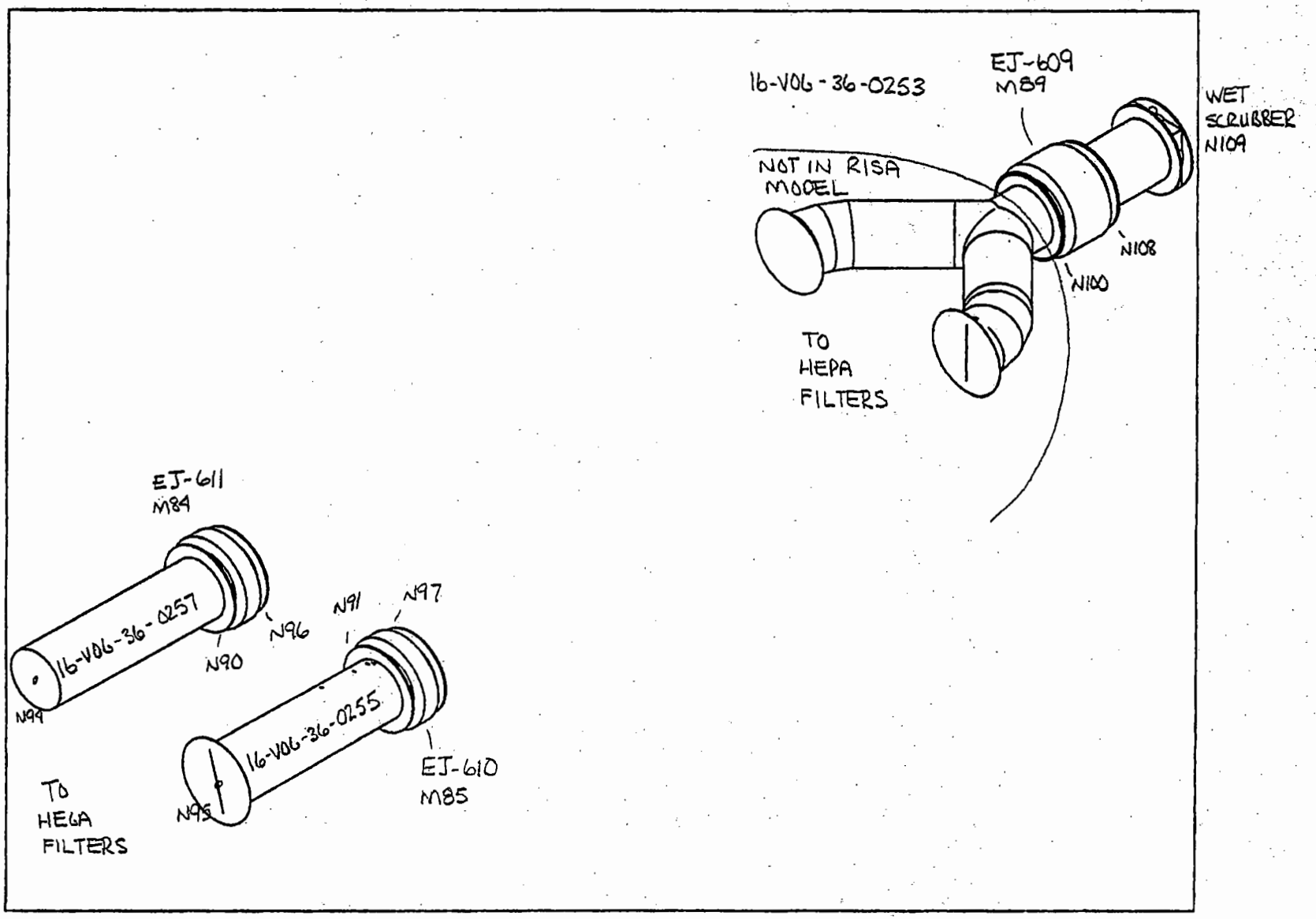
Loads: BLC 7, WIND Z
Solution: Envelope

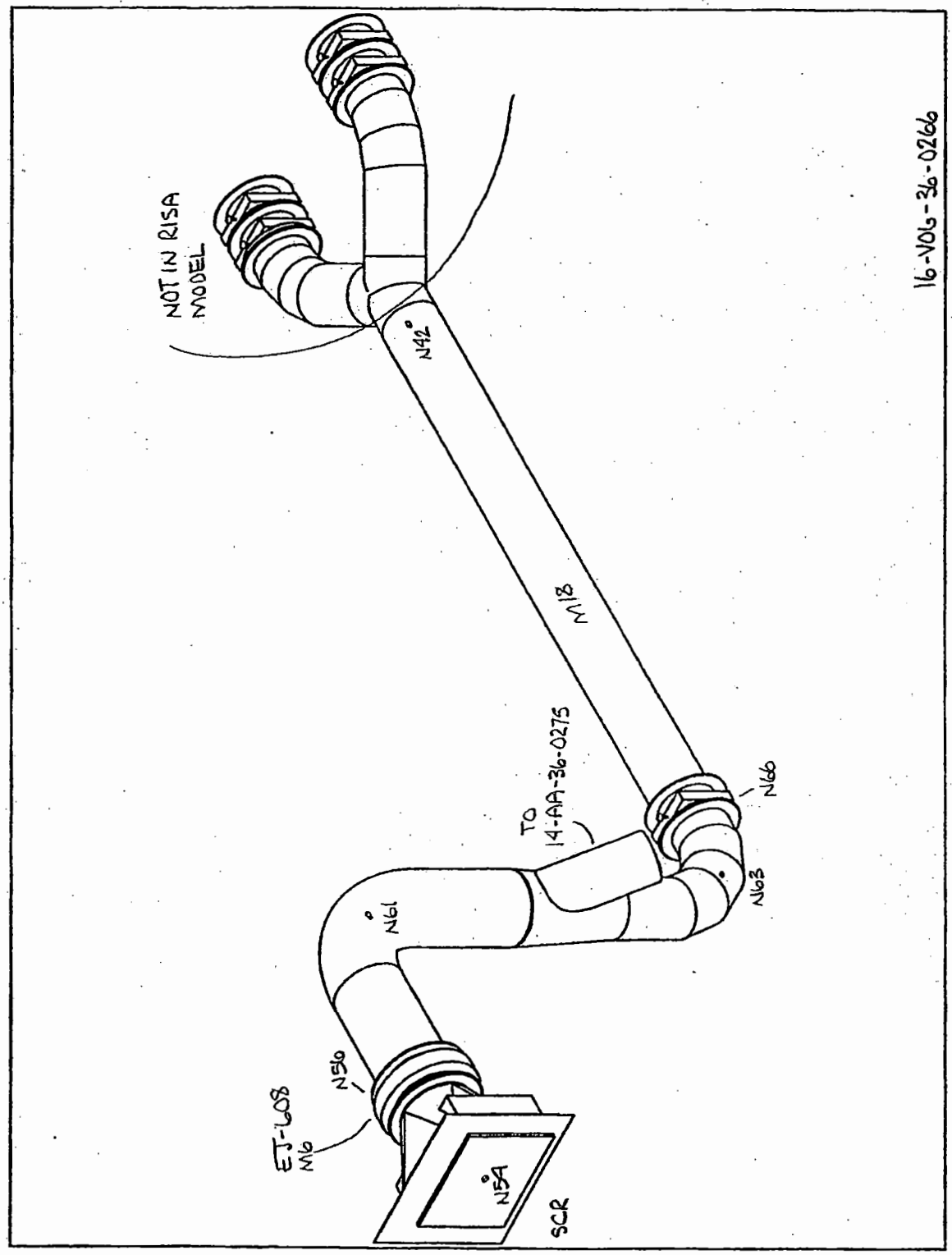
DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 7:53 AM
145579-V-CA-005 Model 5	BLC - Wind Z	145579-V-CA-005 Model 5.r3d

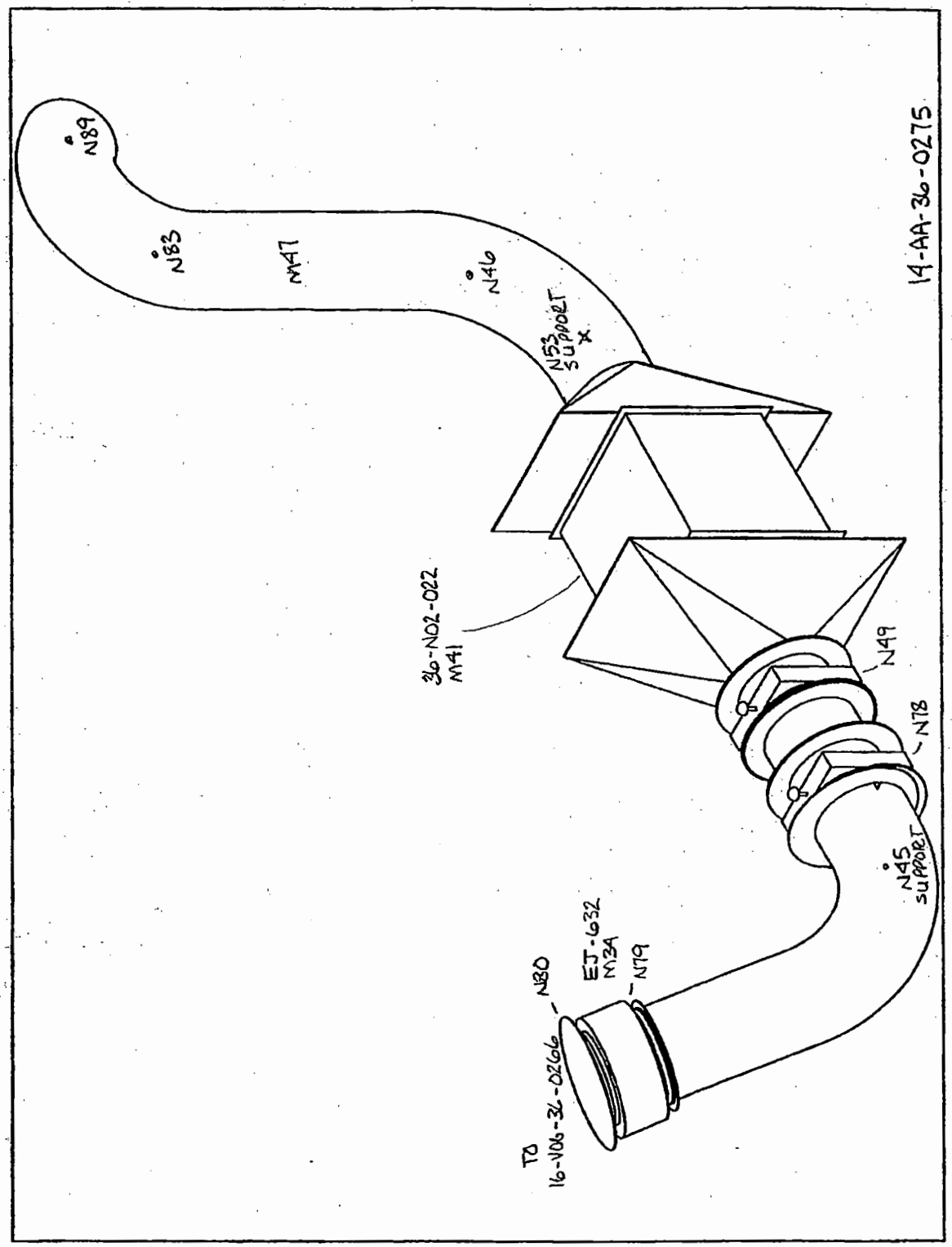


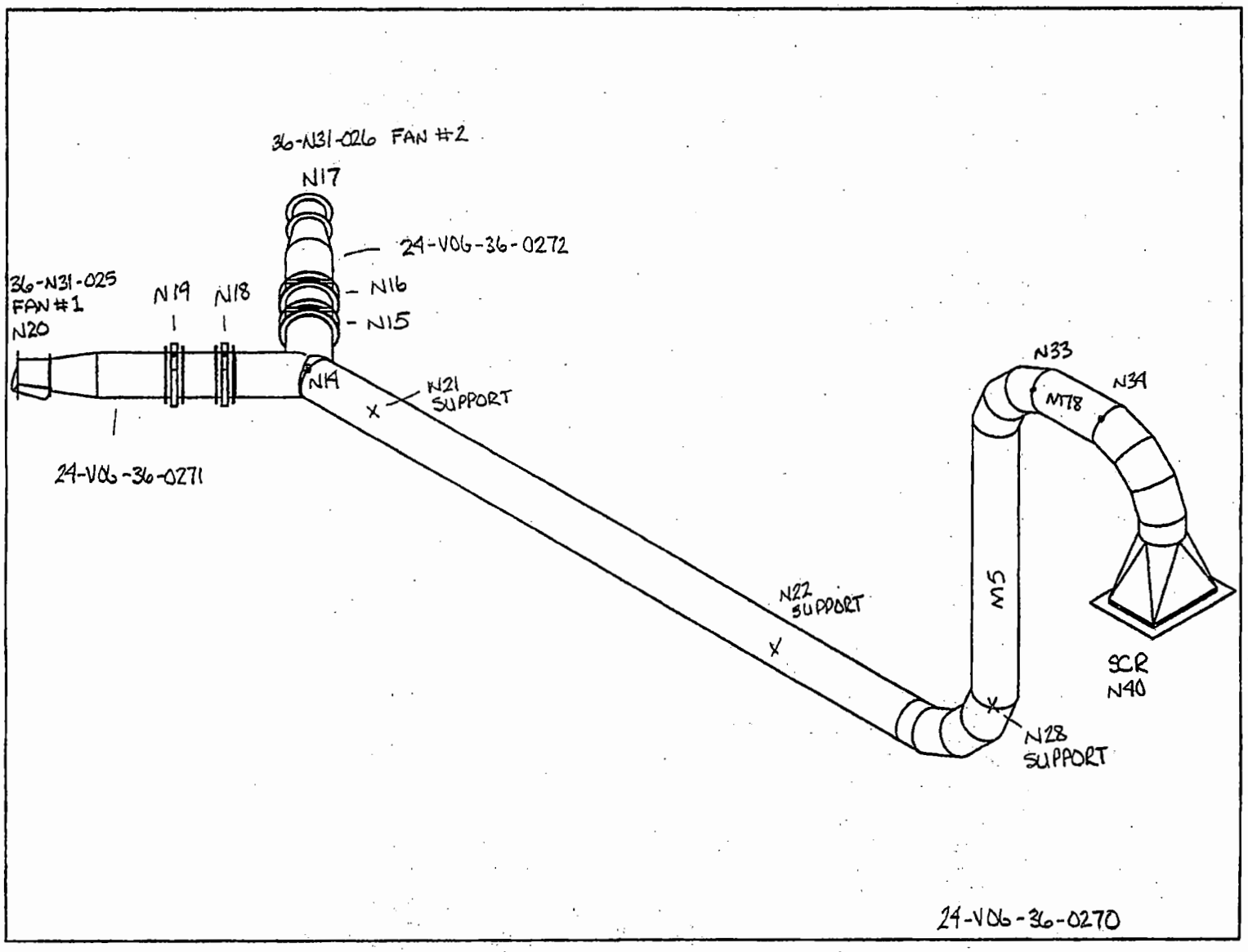
Loads: BLC 8, FML
Solution: Envelope

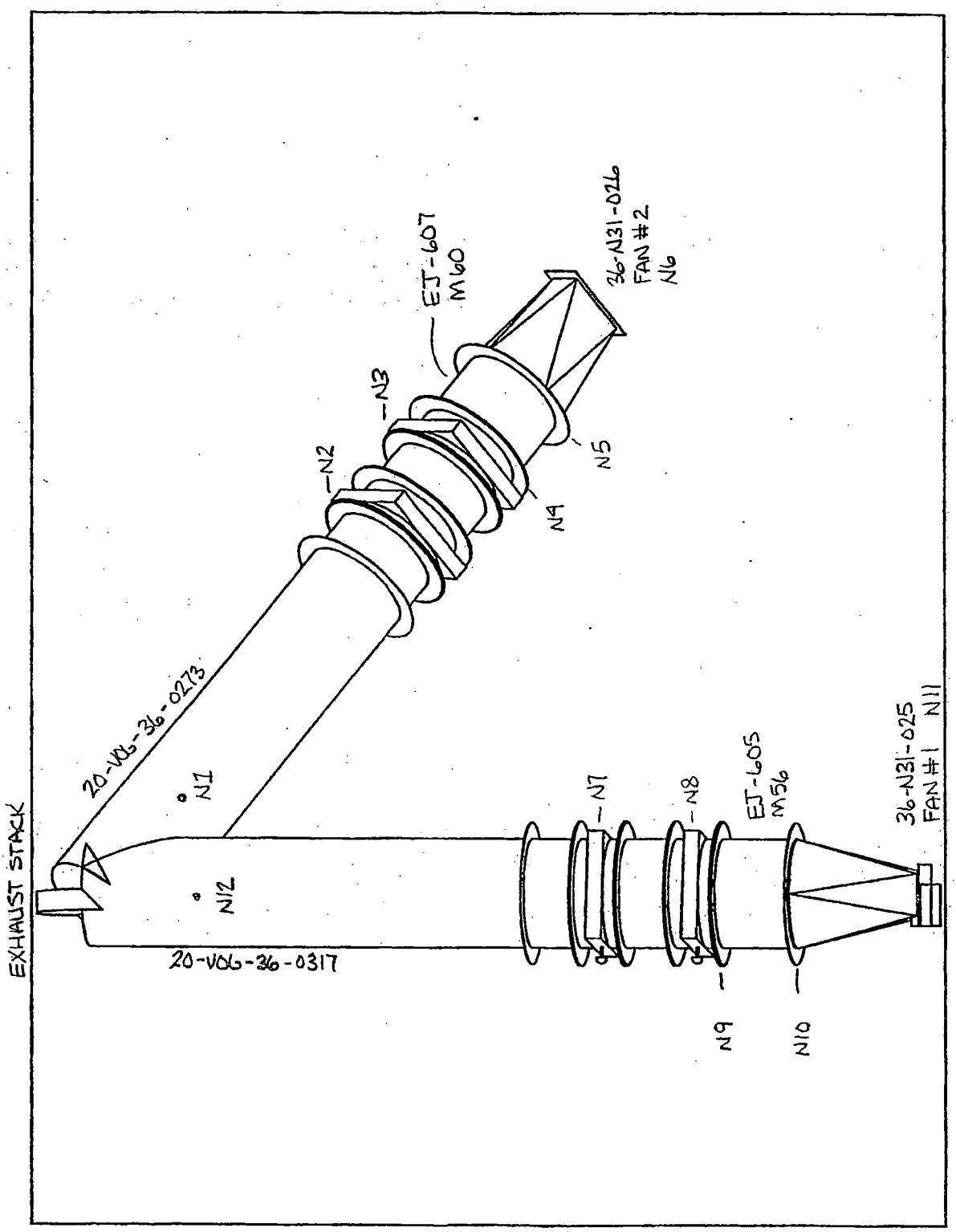
DMJM H&N	DBVS Off-Gas Treatment Duct Analysis	
Kevin M. Jones		Feb 24, 2006 at 7:54 AM
145579-V-CA-005 Model 5	BLC - FML	145579-V-CA-005 Model 5.r3d


16-V06-36-0253
EJ-609
M89
WET
SCRUBBER
N109
NOT IN RISA
MODEL
N108
N100
TO
HEPA
FILTERS
EJ-611
M84
16-V06-36-0257
N96
N91
N97
N90
N99
16-V06-36-0255
EJ-610
M85
TO
HEGA
FILTERS
N95


NOT IN RISA MODEL
N42
M18
TO 14-AA-36-0275
N66
N63
N61
N56
EJ-608
M6
N54
SCR
16-V06-36-0266


N89
N83
N47
N46
N53 SUPPORT
14-AA-36-0275
36-N02-022
M41
N49
N78
N45 SUPPORT
EJ-632
M3A
N79
N80
TO
16-V06-32-0206


36-N31-026 FAN #2
N17
24-V06-36-0272
N16
N15
36-N31-025
FAN #1
N20
N19
N18
N14
N21
SUPPORT
24-V06-36-0271
N33
N34
N78
N22
SUPPORT
N5
SCR
N40
N28
SUPPORT
24-V06-36-0270


EXHAUST STACK
20-VOG-36-0273
20-VOG-36-0317
N1
N2
N3
N4
N5
N6
N7
N8
N9
N10
N11
N12
EJ-607
M60
36-N31-026
FAN #2
36-N31-025
FAN #1
EJ-605
M56

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Global

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation	Yes
Include Warping	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Vertical Axis	Y

Hot Rolled Steel Code	AISC: ASD 9th
Cold Formed Steel Code	AISI 99: ASD
NDS Wood Code	NDS 91: ASD
NDS Temperature	<100F
Concrete Code	ACI 1999

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections	Yes
Bad Framing Warnings	No
Unused Force Warnings	Yes

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diaphragm
1	N1	16.971	85.75	-16.971	0	
2	N2	27.286	71.162	-27.286	0	
3	N3	36.411	58.257	-36.411	0	
4	N4	38.724	54.987	-38.723	0	
5	N5	45.724	45.087	-45.723	0	Yes
6	N6	58.192	27.454	-58.192	0	
7	N7	27.286	71.162	27.286	0	
8	N8	36.411	58.257	36.411	0	
9	N9	38.724	54.987	38.724	0	
10	N10	45.724	45.087	45.724	0	
11	N11	58.192	27.454	58.192	0	
12	N12	16.971	85.75	16.971	0	
13	N14	224.482	0	0	0	
14	N15	194.079	0	-30.403	0	
15	N16	175.96	0	-48.522	0	
16	N17	118.118	0	-106.364	0	
17	N18	194.079	0	30.403	0	
18	N19	175.96	0	48.522	0	
19	N20	118.118	0	106.364	0	
20	N21	246.48	0	0	0	
21	N22	533.169	0	0	0	
22	N23	608.607	0	0	0	
23	N24	690.997	0	0	0	
24	N25	704.774	2.74	0	0	
25	N26	716.453	10.544	0	0	
26	N27	724.257	22.223	0	0	
27	N28	726.997	36	0	0	
28	N29	726.997	228.125	0	0	
29	N30	729.737	241.901	0	0	
30	N31	737.541	253.58	0	0	
31	N32	749.22	261.384	0	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diaphragm
32	N33	762.997	264.125	0	0	
33	N34	811.997	264.125	0	0	
34	N35	825.773	261.385	0	0	
35	N36	837.452	253.581	0	0	
36	N37	845.256	241.902	0	0	
37	N39	847.997	228.125	0	0	
38	N40	847.997	174.5	0	0	
39	N42	847.997	16.625	-350.625	0	
40	N45	893.27	10.158	-145.627	0	
41	N46	894.372	29.75	-265	0	
42	N47	847.997	78.25	-129.5	0	
43	N48	894.372	8.5	-155.625	0	
44	N49	894.372	8.5	-177.375	0	
45	N50	894.372	8.5	-200.125	0	
46	N51	894.372	8.5	-225.25	0	
47	N52	894.372	8.5	-243.75	0	
48	N53	894.372	10.118	-251.882	0	
49	N54	847.997	149.5	-33	0	
50	N55	847.997	149.5	-99.625	0	
51	N56	847.997	149.5	-44	0	
52	N57	847.997	131.058	-127.226	0	
53	N58	847.997	119.625	-129.5	0	
54	N59	847.997	89.937	-129.5	0	
55	N60	847.997	147.226	-111.058	0	
56	N61	847.997	140.75	-120.75	0	
57	N62	847.997	44.625	-129.5	0	
58	N63	847.997	24.826	-137.701	0	
59	N64	847.997	33.91	-131.631	0	
60	N65	847.997	18.756	-146.785	0	
61	N66	847.997	16.625	-162.5	0	
62	N67	847.997	16.625	-157.5	0	
63	N78	894.372	8.5	-160.125	0	
64	N79	885.452	21.938	-131.489	0	
65	N80	879.924	30.268	-129.5	0	
66	N81	890.139	14.876	-137.152	0	
67	N82	894.372	14.724	-258.776	0	
68	N83	894.372	69.476	-265	0	
69	N84	894.372	21.618	-263.382	0	
70	N85	894.372	75.832	-266.526	0	
71	N86	894.372	80.802	-270.771	0	
72	N87	894.372	83.304	-276.81	0	
73	N88	894.372	82.791	-283.326	0	
74	N89	894.372	79.375	-288.899	0	
75	N90	818.872	16.625	-503.75	0	
76	N91	877.122	16.625	-503.75	0	
77	N94	818.872	16.625	-472.375	0	
78	N95	877.122	16.625	-472.375	0	
79	N96	818.872	16.625	-513.75	0	
80	N97	877.122	16.625	-513.75	0	
81	N100	847.997	16.625	-612.875	0	
82	N108	847.997	16.625	-622.875	0	
83	N109	847.997	16.625	-650.875	0	

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Joint Boundary Conditions

	Joint Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N21		CS1e+6				
2	N22		Reaction	Reaction			
3	N54	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N56						
5	N45	Reaction	Reaction				
6	N46						
7	N53	Reaction	Reaction	Reaction			
8	N17	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
9	N20	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
10	N7						
11	N8						
12	N9						
13	N10						
14	N11	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
15	N2						
16	N3						
17	N4						
18	N5						
19	N6	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
20	N12	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
21	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
22	N28	Reaction	Reaction	Reaction			
23	N40	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
24	N95	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
25	N94	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
26	N97	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
27	N96	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
28	N100	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
29	N108						
30	N109	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
31	N42	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
32	N64	Reaction	Reaction				

General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[lb/in^3]
1	RIGID	1e+7		0	0	0

General Section Sets

	Label	Shape	Type	Material	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	GEN1A	RE4X4	Beam	RIGID	16	21.333	21.333	36.053
2	RIGID		None	RIGID	1e+6	1e+8	1e+8	1e+6

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[lb/in^3]	Yield[ksi]
1	A36	29000	11154	.3	.65	.283	36
2	A312TP316L	29000	11154	.3	1.013	.29	25
3	A312TP316	29000	11154	.3	1.013	.29	30
4	A53	29000	11154	.3	.779	.283	30

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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Hot Rolled Steel Section Sets

	Label	Shape	Design List	Type	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	14DIADUCTSS	14 in Sch 1...	Pipe	Beam	A312TP316L	Typical	6.746	161.657	161.657	323.315
2	16DIADUCTSS	16 in dia Sc...	Pipe	Beam	A312TP316L	Typical	7.721	242.316	242.316	484.632
3	20DIADUCTSS	20 in dia Sc...	Pipe	Beam	A312TP316L	Typical	11.196	549.806	549.806	1099.612
4	20DIADUCT	20 in dia Sc...	Pipe	Beam	A53	Typical	12.367	606.17	606.17	1212.34
5	24DIADUCT	24 in dia Sc...	Pipe	Beam	A53	Typical	14.865	1052.696	1052.696	2105.393

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Design List	Type	Material	Design Rules
1	M1	N14	N21			24DIADUCT	Pipe	Beam	A53	Typical
2	M2	N21	N22			24DIADUCT	Pipe	Beam	A53	Typical
3	M4	N23	N24			24DIADUCT	Pipe	Beam	A53	Typical
4	M5	N28	N29			24DIADUCT	Pipe	Beam	A53	Typical
5	M6	N54	N56			20DIADUCTSS	Pipe	Beam	A312TP3...	Typical
6	M7	N56	N55			20DIADUCTSS	Pipe	Beam	A312TP3...	Typical
7	M8	N55	N60			20DIADUCTSS	Pipe	Beam	A312TP3...	Typical
8	M9	N60	N61			20DIADUCTSS	Pipe	Beam	A312TP3...	Typical
9	M10	N61	N57			20DIADUCTSS	Pipe	Beam	A312TP3...	Typical
10	M11	N57	N58			20DIADUCTSS	Pipe	Beam	A312TP3...	Typical
11	M12	N58	N59			20DIADUCTSS	Pipe	Beam	A312TP3...	Typical
12	M13	N59	N47			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
13	M14	N64	N63			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
14	M15	N63	N65			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
15	M16	N65	N67			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
16	M17	N67	N66			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
17	M18	N66	N42			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
18	M31	N47	N62			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
19	M32	N62	N64			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
20	M33	N47	N80			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
21	M34	N80	N79			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
22	M35	N79	N81			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
23	M36	N81	N45			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
24	M37	N45	N48			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
25	M38	N48	N78			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
26	M39	N78	N49			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
27	M40	N49	N50			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
28	M41	N50	N51			RIGID	None	None	RIGID	Typical
29	M42	N51	N52			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
30	M43	N52	N53			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
31	M44	N53	N82			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
32	M45	N82	N84			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
33	M46	N84	N46			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
34	M47	N46	N83			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
35	M48	N83	N85			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
36	M49	N85	N86			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
37	M50	N86	N87			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
38	M51	N87	N88			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
39	M52	N88	N89			14DIADUCTSS	Pipe	Beam	A312TP3...	Typical
40	M53	N22	N23			24DIADUCT	Pipe	Beam	A53	Typical
41	M54	N7	N8			20DIADUCT	Pipe	Beam	A53	Typical
42	M55	N8	N9			20DIADUCT	Pipe	Beam	A53	Typical
43	M56	N9	N10			20DIADUCT	Pipe	Beam	A53	Typical
44	M57	N10	N11			20DIADUCT	Pipe	Beam	A53	Typical
45	M58	N2	N3			20DIADUCT	Pipe	Beam	A53	Typical
46	M59	N3	N4			20DIADUCT	Pipe	Beam	A53	Typical
47	M60	N4	N5			20DIADUCT	Pipe	Beam	A53	Typical

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Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(de...	Section/Shape	Design List	Type	Material	Design Rules
48	M61	N5	N6			20DIADUCT	Pipe	Beam	A53	Typical
49	M62	N20	N19			24DIADUCT	Pipe	Beam	A53	Typical
50	M63	N19	N18			24DIADUCT	Pipe	Beam	A53	Typical
51	M64	N18	N14			24DIADUCT	Pipe	Beam	A53	Typical
52	M65	N17	N16			24DIADUCT	Pipe	Beam	A53	Typical
53	M66	N16	N15			24DIADUCT	Pipe	Beam	A53	Typical
54	M67	N15	N14			24DIADUCT	Pipe	Beam	A53	Typical
55	M68	N1	N2			20DIADUCT	Pipe	Beam	A53	Typical
56	M69	N12	N7			20DIADUCT	Pipe	Beam	A53	Typical
57	M70	N24	N25			24DIADUCT	Pipe	Beam	A53	Typical
58	M71	N25	N26			24DIADUCT	Pipe	Beam	A53	Typical
59	M72	N26	N27			24DIADUCT	Pipe	Beam	A53	Typical
60	M73	N27	N28			24DIADUCT	Pipe	Beam	A53	Typical
61	M74	N29	N30			24DIADUCT	Pipe	Beam	A53	Typical
62	M75	N30	N31			24DIADUCT	Pipe	Beam	A53	Typical
63	M76	N31	N32			24DIADUCT	Pipe	Beam	A53	Typical
64	M77	N32	N33			24DIADUCT	Pipe	Beam	A53	Typical
65	M78	N33	N34			24DIADUCT	Pipe	Beam	A53	Typical
66	M79	N34	N35			24DIADUCT	Pipe	Beam	A53	Typical
67	M80	N35	N36			24DIADUCT	Pipe	Beam	A53	Typical
68	M81	N36	N37			24DIADUCT	Pipe	Beam	A53	Typical
69	M82	N37	N39			24DIADUCT	Pipe	Beam	A53	Typical
70	M83	N39	N40			24DIADUCT	Pipe	Beam	A53	Typical
71	M84	N90	N96			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
72	M85	N91	N97			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
73	M87	N94	N90			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
74	M88	N95	N91			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
75	M89	N100	N108			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical
76	M90	N108	N109			16DIADUCTSS	Pipe	Beam	A312TP3...	Typical

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area (Me...	Surface (...
1	SELFWEIGHT	DL						76		
2	DAMPER WEIGHT	DL				11				
3	SEISMIC X	ELX				11		76		
4	SEISMIC Z	ELZ				11		76		
5	THERMAL	None						76		
6	WIND X	WLX						70		
7	WIND Z	WLZ						58		
8	FML	DL				10				

Joint Loads and Enforced Displacements (BLC 2 : DAMPER WEIGHT)

	Joint Label	L,D,M	Direction	Magnitude[lb,lb-ft in,rad lb*s^2/in]
1	N2	L	Y	-252
2	N3	L	Y	-252
3	N7	L	Y	-252
4	N8	L	Y	-252
5	N15	L	Y	-302
6	N16	L	Y	-302
7	N18	L	Y	-302
8	N19	L	Y	-302
9	N49	L	Y	-176
10	N66	L	Y	-202
11	N78	L	Y	-176

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Joint Loads and Enforced Displacements (BLC 3 : SEISMIC X)

	Joint Label	L,D,M	Direction	Magnitude[lb,lb-ft in,rad lb*s^2/in]
1	N2	L	X	100.8
2	N3	L	X	100.8
3	N7	L	X	100.8
4	N8	L	X	100.8
5	N15	L	X	120.8
6	N16	L	X	120.8
7	N18	L	X	120.8
8	N19	L	X	120.8
9	N49	L	X	70.4
10	N66	L	X	80.8
11	N78	L	X	70.4

Joint Loads and Enforced Displacements (BLC 4 : SEISMIC Z)

	Joint Label	L,D,M	Direction	Magnitude[lb,lb-ft in,rad lb*s^2/in]
1	N2	L	Z	100.8
2	N3	L	Z	100.8
3	N7	L	Z	100.8
4	N8	L	Z	100.8
5	N15	L	Z	120.8
6	N16	L	Z	120.8
7	N18	L	Z	120.8
8	N19	L	Z	120.8
9	N49	L	Z	70.4
10	N66	L	Z	80.8
11	N78	L	Z	70.4

Joint Loads and Enforced Displacements (BLC 8 : FML)

	Joint Label	L,D,M	Direction	Magnitude[lb,lb-ft in,rad lb*s^2/in]
1	N24	L	X	23
2	N34	L	X	23
3	N27	L	Y	-23
4	N29	L	Y	23
5	N39	L	Y	23
6	N33	L	X	-23
7	N67	L	Z	11
8	N62	L	Y	-11
9	N58	L	Y	19
10	N55	L	Z	-19

Member Distributed Loads (BLC 1 : SELFWEIGHT)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M1	Y	-63.35	-63.35	0	0
2	M2	Y	-63.35	-63.35	0	0
3	M4	Y	-63.35	-63.35	0	0
4	M5	Y	-63.35	-63.35	0	0
5	M53	Y	-63.35	-63.35	0	0
6	M6	Y	-52.68	-52.68	0	0
7	M7	Y	-52.68	-52.68	0	0
8	M8	Y	-52.68	-52.68	0	0
9	M9	Y	-52.68	-52.68	0	0
10	M10	Y	-52.68	-52.68	0	0
11	M11	Y	-52.68	-52.68	0	0
12	M12	Y	-52.68	-52.68	0	0
13	M13	Y	-32.5	-32.5	0	0
14	M14	Y	-32.5	-32.5	0	0

Member Distributed Loads (BLC 1 : SELFWEIGHT) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
15	M15	Y	-32.5	-32.5	0	0
16	M16	Y	-32.5	-32.5	0	0
17	M17	Y	-32.5	-32.5	0	0
18	M18	Y	-32.5	-32.5	0	0
19	M31	Y	-32.5	-32.5	0	0
20	M32	Y	-32.5	-32.5	0	0
21	M33	Y	-28.39	-28.39	0	0
22	M34	Y	-28.39	-28.39	0	0
23	M35	Y	-28.39	-28.39	0	0
24	M36	Y	-28.39	-28.39	0	0
25	M37	Y	-28.39	-28.39	0	0
26	M38	Y	-28.39	-28.39	0	0
27	M39	Y	-28.39	-28.39	0	0
28	M40	Y	-28.39	-28.39	0	0
29	M41	Y	-28.39	-28.39	0	0
30	M42	Y	-28.39	-28.39	0	0
31	M43	Y	-28.39	-28.39	0	0
32	M44	Y	-28.39	-28.39	0	0
33	M45	Y	-28.39	-28.39	0	0
34	M46	Y	-28.39	-28.39	0	0
35	M47	Y	-28.39	-28.39	0	0
36	M48	Y	-28.39	-28.39	0	0
37	M49	Y	-28.39	-28.39	0	0
38	M50	Y	-28.39	-28.39	0	0
39	M51	Y	-28.39	-28.39	0	0
40	M52	Y	-28.39	-28.39	0	0
41	M62	Y	-63.35	-63.35	0	0
42	M63	Y	-63.35	-63.35	0	0
43	M64	Y	-63.35	-63.35	0	0
44	M65	Y	-63.35	-63.35	0	0
45	M66	Y	-63.35	-63.35	0	0
46	M67	Y	-63.35	-63.35	0	0
47	M70	Y	-63.35	-63.35	0	0
48	M71	Y	-63.35	-63.35	0	0
49	M72	Y	-63.35	-63.35	0	0
50	M73	Y	-63.35	-63.35	0	0
51	M74	Y	-63.35	-63.35	0	0
52	M75	Y	-63.35	-63.35	0	0
53	M76	Y	-63.35	-63.35	0	0
54	M77	Y	-63.35	-63.35	0	0
55	M78	Y	-63.35	-63.35	0	0
56	M79	Y	-63.35	-63.35	0	0
57	M80	Y	-63.35	-63.35	0	0
58	M81	Y	-63.35	-63.35	0	0
59	M82	Y	-63.35	-63.35	0	0
60	M83	Y	-63.35	-63.35	0	0
61	M54	Y	-52.68	-52.68	0	0
62	M55	Y	-52.68	-52.68	0	0
63	M56	Y	-52.68	-52.68	0	0
64	M57	Y	-52.68	-52.68	0	0
65	M58	Y	-52.68	-52.68	0	0
66	M59	Y	-52.68	-52.68	0	0
67	M60	Y	-52.68	-52.68	0	0
68	M61	Y	-52.68	-52.68	0	0
69	M68	Y	-52.68	-52.68	0	0
70	M69	Y	-52.68	-52.68	0	0
71	M87	Y	-32.5	-32.5	0	0

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Member Distributed Loads (BLC 1 : SELFWEIGHT) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
72	M88	Y	-32.5	-32.5	0	0
73	M89	Y	-32.5	-32.5	0	0
74	M90	Y	-32.5	-32.5	0	0
75	M84	Y	-32.5	-32.5	0	10
76	M85	Y	-32.5	-32.5	0	10

Member Distributed Loads (BLC 3 : SEISMIC X)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M1	X	25.34	25.34	0	0
2	M2	X	25.34	25.34	0	0
3	M4	X	25.34	25.34	0	0
4	M5	X	25.34	25.34	0	0
5	M53	X	25.34	25.34	0	0
6	M6	X	21.072	21.072	0	0
7	M7	X	21.072	21.072	0	0
8	M8	X	21.072	21.072	0	0
9	M9	X	21.072	21.072	0	0
10	M10	X	21.072	21.072	0	0
11	M11	X	21.072	21.072	0	0
12	M12	X	21.072	21.072	0	0
13	M13	X	13	13	0	0
14	M14	X	13	13	0	0
15	M15	X	13	13	0	0
16	M16	X	13	13	0	0
17	M17	X	13	13	0	0
18	M18	X	13	13	0	0
19	M31	X	13	13	0	0
20	M32	X	13	13	0	0
21	M33	X	11.356	11.356	0	0
22	M34	X	11.356	11.356	0	0
23	M35	X	11.356	11.356	0	0
24	M36	X	11.356	11.356	0	0
25	M37	X	11.356	11.356	0	0
26	M38	X	11.356	11.356	0	0
27	M39	X	11.356	11.356	0	0
28	M40	X	11.356	11.356	0	0
29	M41	X	11.356	11.356	0	0
30	M42	X	11.356	11.356	0	0
31	M43	X	11.356	11.356	0	0
32	M44	X	11.356	11.356	0	0
33	M45	X	11.356	11.356	0	0
34	M46	X	11.356	11.356	0	0
35	M47	X	11.356	11.356	0	0
36	M48	X	11.356	11.356	0	0
37	M49	X	11.356	11.356	0	0
38	M50	X	11.356	11.356	0	0
39	M51	X	11.356	11.356	0	0
40	M52	X	11.356	11.356	0	0
41	M62	X	25.34	25.34	0	0
42	M63	X	25.34	25.34	0	0
43	M64	X	25.34	25.34	0	0
44	M65	X	25.34	25.34	0	0
45	M66	X	25.34	25.34	0	0
46	M67	X	25.34	25.34	0	0
47	M70	X	25.34	25.34	0	0
48	M71	X	25.34	25.34	0	0
49	M72	X	25.34	25.34	0	0

Member Distributed Loads (BLC 3 : SEISMIC X) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
50	M73	X	25.34	25.34	0	0
51	M74	X	25.34	25.34	0	0
52	M75	X	25.34	25.34	0	0
53	M76	X	25.34	25.34	0	0
54	M77	X	25.34	25.34	0	0
55	M78	X	25.34	25.34	0	0
56	M79	X	25.34	25.34	0	0
57	M80	X	25.34	25.34	0	0
58	M81	X	25.34	25.34	0	0
59	M82	X	25.34	25.34	0	0
60	M83	X	25.34	25.34	0	0
61	M54	X	21.072	21.072	0	0
62	M55	X	21.072	21.072	0	0
63	M56	X	21.072	21.072	0	0
64	M57	X	21.072	21.072	0	0
65	M58	X	21.072	21.072	0	0
66	M59	X	21.072	21.072	0	0
67	M60	X	21.072	21.072	0	0
68	M61	X	21.072	21.072	0	0
69	M68	X	21.072	21.072	0	0
70	M69	X	21.072	21.072	0	0
71	M87	X	13	13	0	0
72	M88	X	13	13	0	0
73	M89	X	13	13	0	0
74	M90	X	13	13	0	0
75	M84	X	13	13	0	10
76	M85	X	13	13	0	10

Member Distributed Loads (BLC 4 : SEISMIC Z)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M1	Z	25.34	25.34	0	0
2	M2	Z	25.34	25.34	0	0
3	M4	Z	25.34	25.34	0	0
4	M5	Z	25.34	25.34	0	0
5	M53	Z	25.34	25.34	0	0
6	M6	Z	21.072	21.072	0	0
7	M7	Z	21.072	21.072	0	0
8	M8	Z	21.072	21.072	0	0
9	M9	Z	21.072	21.072	0	0
10	M10	Z	21.072	21.072	0	0
11	M11	Z	21.072	21.072	0	0
12	M12	Z	21.072	21.072	0	0
13	M13	Z	13	13	0	0
14	M14	Z	13	13	0	0
15	M15	Z	13	13	0	0
16	M16	Z	13	13	0	0
17	M17	Z	13	13	0	0
18	M18	Z	13	13	0	0
19	M31	Z	13	13	0	0
20	M32	Z	13	13	0	0
21	M33	Z	11.356	11.356	0	0
22	M34	Z	11.356	11.356	0	0
23	M35	Z	11.356	11.356	0	0
24	M36	Z	11.356	11.356	0	0
25	M37	Z	11.356	11.356	0	0
26	M38	Z	11.356	11.356	0	0
27	M39	Z	11.356	11.356	0	0

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Member Distributed Loads (BLC 4 : SEISMIC Z) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
28	M40	Z	11.356	11.356	0	0
29	M41	Z	11.356	11.356	0	0
30	M42	Z	11.356	11.356	0	0
31	M43	Z	11.356	11.356	0	0
32	M44	Z	11.356	11.356	0	0
33	M45	Z	11.356	11.356	0	0
34	M46	Z	11.356	11.356	0	0
35	M47	Z	11.356	11.356	0	0
36	M48	Z	11.356	11.356	0	0
37	M49	Z	11.356	11.356	0	0
38	M50	Z	11.356	11.356	0	0
39	M51	Z	11.356	11.356	0	0
40	M52	Z	11.356	11.356	0	0
41	M62	Z	25.34	25.34	0	0
42	M63	Z	25.34	25.34	0	0
43	M64	Z	25.34	25.34	0	0
44	M65	Z	25.34	25.34	0	0
45	M66	Z	25.34	25.34	0	0
46	M67	Z	25.34	25.34	0	0
47	M70	Z	25.34	25.34	0	0
48	M71	Z	25.34	25.34	0	0
49	M72	Z	25.34	25.34	0	0
50	M73	Z	25.34	25.34	0	0
51	M74	Z	25.34	25.34	0	0
52	M75	Z	25.34	25.34	0	0
53	M76	Z	25.34	25.34	0	0
54	M77	Z	25.34	25.34	0	0
55	M78	Z	25.34	25.34	0	0
56	M79	Z	25.34	25.34	0	0
57	M80	Z	25.34	25.34	0	0
58	M81	Z	25.34	25.34	0	0
59	M82	Z	25.34	25.34	0	0
60	M83	Z	25.34	25.34	0	0
61	M54	Z	21.072	21.072	0	0
62	M55	Z	21.072	21.072	0	0
63	M56	Z	21.072	21.072	0	0
64	M57	Z	21.072	21.072	0	0
65	M58	Z	21.072	21.072	0	0
66	M59	Z	21.072	21.072	0	0
67	M60	Z	21.072	21.072	0	0
68	M61	Z	21.072	21.072	0	0
69	M68	Z	21.072	21.072	0	0
70	M69	Z	21.072	21.072	0	0
71	M87	Z	13	13	0	0
72	M88	Z	13	13	0	0
73	M89	Z	13	13	0	0
74	M90	Z	13	13	0	0
75	M84	Z	13	13	0	10
76	M85	Z	13	13	0	10

Member Distributed Loads (BLC 5 : THERMAL)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M6	T	153	153	0	0
2	M7	T	153	153	0	0
3	M8	T	153	153	0	0
4	M9	T	153	153	0	0
5	M10	T	153	153	0	0

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Member Distributed Loads (BLC 5 : THERMAL) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
6	M11	T	153	153	0	0
7	M12	T	153	153	0	0
8	M13	T	153	153	0	0
9	M14	T	153	153	0	0
10	M15	T	153	153	0	0
11	M16	T	153	153	0	0
12	M17	T	153	153	0	0
13	M18	T	153	153	0	0
14	M31	T	153	153	0	0
15	M32	T	153	153	0	0
16	M1	T	273	273	0	0
17	M2	T	273	273	0	0
18	M4	T	273	273	0	0
19	M5	T	273	273	0	0
20	M33	T	102	102	0	0
21	M34	T	102	102	0	0
22	M35	T	102	102	0	0
23	M36	T	102	102	0	0
24	M37	T	102	102	0	0
25	M38	T	102	102	0	0
26	M39	T	102	102	0	0
27	M40	T	102	102	0	0
28	M41	T	102	102	0	0
29	M42	T	102	102	0	0
30	M43	T	102	102	0	0
31	M44	T	102	102	0	0
32	M45	T	102	102	0	0
33	M46	T	102	102	0	0
34	M47	T	102	102	0	0
35	M48	T	102	102	0	0
36	M49	T	102	102	0	0
37	M50	T	102	102	0	0
38	M51	T	102	102	0	0
39	M52	T	102	102	0	0
40	M53	T	273	273	0	0
41	M62	T	273	273	0	0
42	M63	T	273	273	0	0
43	M64	T	273	273	0	0
44	M65	T	273	273	0	0
45	M66	T	273	273	0	0
46	M67	T	273	273	0	0
47	M70	T	273	273	0	0
48	M71	T	273	273	0	0
49	M72	T	273	273	0	0
50	M73	T	273	273	0	0
51	M74	T	273	273	0	0
52	M75	T	273	273	0	0
53	M76	T	273	273	0	0
54	M77	T	273	273	0	0
55	M78	T	273	273	0	0
56	M79	T	273	273	0	0
57	M80	T	273	273	0	0
58	M81	T	273	273	0	0
59	M82	T	273	273	0	0
60	M83	T	273	273	0	0
61	M54	T	397	397	0	0
62	M55	T	397	397	0	0

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Member Distributed Loads (BLC 5 : THERMAL) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
63	M56	T	397	397	0	0
64	M57	T	397	397	0	0
65	M58	T	397	397	0	0
66	M59	T	397	397	0	0
67	M60	T	397	397	0	0
68	M61	T	397	397	0	0
69	M68	T	397	397	0	0
70	M69	T	397	397	0	0
71	M87	T	192	192	0	0
72	M88	T	192	192	0	0
73	M89	T	192	192	0	0
74	M90	T	192	192	0	0
75	M84	T	192	192	0	10
76	M85	T	192	192	0	10

Member Distributed Loads (BLC 6 : WIND X)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M69	X	27.66	27.66	0	0
2	M54	X	27.66	27.66	0	0
3	M55	X	27.66	27.66	0	0
4	M56	X	27.66	27.66	0	0
5	M57	X	27.66	27.66	0	0
6	M68	X	27.66	27.66	0	0
7	M58	X	27.66	27.66	0	0
8	M59	X	27.66	27.66	0	0
9	M60	X	27.66	27.66	0	0
10	M61	X	27.66	27.66	0	0
11	M12	X	27.66	27.66	0	0
12	M11	X	27.66	27.66	0	0
13	M10	X	27.66	27.66	0	0
14	M9	X	27.66	27.66	0	0
15	M8	X	27.66	27.66	0	0
16	M7	X	27.66	27.66	0	0
17	M6	X	27.66	27.66	0	0
18	M62	X	33.19	33.19	0	0
19	M63	X	33.19	33.19	0	0
20	M64	X	33.19	33.19	0	0
21	M67	X	33.19	33.19	0	0
22	M66	X	33.19	33.19	0	0
23	M65	X	33.19	33.19	0	0
24	M70	X	33.19	33.19	0	0
25	M71	X	33.19	33.19	0	0
26	M72	X	33.19	33.19	0	0
27	M73	X	33.19	33.19	0	0
28	M5	X	33.19	33.19	0	0
29	M74	X	33.19	33.19	0	0
30	M75	X	33.19	33.19	0	0
31	M76	X	33.19	33.19	0	0
32	M79	X	33.19	33.19	0	0
33	M80	X	33.19	33.19	0	0
34	M81	X	33.19	33.19	0	0
35	M82	X	33.19	33.19	0	0
36	M83	X	33.19	33.19	0	0
37	M13	X	22.13	22.13	0	0
38	M31	X	22.13	22.13	0	0
39	M32	X	22.13	22.13	0	0
40	M14	X	22.13	22.13	0	0

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Member Distributed Loads (BLC 6 : WIND X) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
41	M15	X	22.13	22.13	0	0
42	M16	X	22.13	22.13	0	0
43	M17	X	22.13	22.13	0	0
44	M18	X	22.13	22.13	0	0
45	M33	X	19.36	19.36	0	0
46	M34	X	19.36	19.36	0	0
47	M35	X	19.36	19.36	0	0
48	M36	X	19.36	19.36	0	0
49	M37	X	19.36	19.36	0	0
50	M38	X	19.36	19.36	0	0
51	M39	X	19.36	19.36	0	0
52	M40	X	19.36	19.36	0	0
53	M41	X	19.36	19.36	0	0
54	M42	X	19.36	19.36	0	0
55	M43	X	19.36	19.36	0	0
56	M44	X	19.36	19.36	0	0
57	M45	X	19.36	19.36	0	0
58	M46	X	19.36	19.36	0	0
59	M47	X	19.36	19.36	0	0
60	M48	X	19.36	19.36	0	0
61	M49	X	19.36	19.36	0	0
62	M50	X	19.36	19.36	0	0
63	M51	X	19.36	19.36	0	0
64	M52	X	19.36	19.36	0	0
65	M87	X	22.13	22.13	0	0
66	M88	X	22.13	22.13	0	0
67	M89	X	22.13	22.13	0	0
68	M90	X	22.13	22.13	0	0
69	M84	X	22.13	22.13	0	10
70	M85	X	22.13	22.13	0	10

Member Distributed Loads (BLC 7 : WIND Z)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
1	M9	Z	27.66	27.66	0	0
2	M10	Z	27.66	27.66	0	0
3	M11	Z	27.66	27.66	0	0
4	M12	Z	27.66	27.66	0	0
5	M68	Z	27.66	27.66	0	0
6	M58	Z	27.66	27.66	0	0
7	M59	Z	27.66	27.66	0	0
8	M60	Z	27.66	27.66	0	0
9	M61	Z	27.66	27.66	0	0
10	M57	Z	27.66	27.66	0	0
11	M56	Z	27.66	27.66	0	0
12	M55	Z	27.66	27.66	0	0
13	M54	Z	27.66	27.66	0	0
14	M69	Z	27.66	27.66	0	0
15	M83	Z	33.19	33.19	0	0
16	M82	Z	33.19	33.19	0	0
17	M81	Z	33.19	33.19	0	0
18	M80	Z	33.19	33.19	0	0
19	M79	Z	33.19	33.19	0	0
20	M78	Z	33.19	33.19	0	0
21	M77	Z	33.19	33.19	0	0
22	M76	Z	33.19	33.19	0	0
23	M75	Z	33.19	33.19	0	0
24	M74	Z	33.19	33.19	0	0

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Member Distributed Loads (BLC 7 : WIND Z) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,deg]	End Magnitude[lb/ft,deg]	Start Location[i...	End Location[i...
25	M5	Z	33.19	33.19	0	0
26	M73	Z	33.19	33.19	0	0
27	M72	Z	33.19	33.19	0	0
28	M71	Z	33.19	33.19	0	0
29	M70	Z	33.19	33.19	0	0
30	M4	Z	33.19	33.19	0	0
31	M53	Z	33.19	33.19	0	0
32	M2	Z	33.19	33.19	0	0
33	M1	Z	33.19	33.19	0	0
34	M67	Z	33.19	33.19	0	0
35	M65	Z	33.19	33.19	0	0
36	M66	Z	33.19	33.19	0	0
37	M64	Z	33.19	33.19	0	0
38	M63	Z	33.19	33.19	0	0
39	M62	Z	33.19	33.19	0	0
40	M13	Z	22.13	22.13	0	0
41	M31	Z	22.13	22.13	0	0
42	M32	Z	22.13	22.13	0	0
43	M14	Z	22.13	22.13	0	0
44	M15	Z	22.13	22.13	0	0
45	M16	Z	22.13	22.13	0	0
46	M33	Z	19.36	19.36	0	0
47	M34	Z	19.36	19.36	0	0
48	M35	Z	19.36	19.36	0	0
49	M36	Z	19.36	19.36	0	0
50	M43	Z	19.36	19.36	0	0
51	M44	Z	19.36	19.36	0	0
52	M45	Z	19.36	19.36	0	0
53	M46	Z	19.36	19.36	0	0
54	M47	Z	19.36	19.36	0	0
55	M48	Z	19.36	19.36	0	0
56	M49	Z	19.36	19.36	0	0
57	M50	Z	19.36	19.36	0	0
58	M52	Z	19.36	19.36	0	0

Member Point Loads

Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
No Data to Print ...			

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	Normal Load	Yes			DL	1														
2	Normal + Wind(+X) + Thermal	Yes			DL	1	WLX	1	5	1										
3	Normal + Wind (-X) + Thermal	Yes			DL	1	WLX	-1	5	1										
4	Normal + Wind (+Z) + Thermal	Yes			DL	1	WLZ	1	5	1										
5	Normal + Wind (-Z) + Thermal	Yes			DL	1	WLZ	-1	5	1										
6	Normal + Seismic (+X)(+Z) + ...	Yes			DL	1	ELX	1	ELZ	1	5	1								
7	Normal + Seismic(+X)(-Z) + ...	Yes			DL	1	ELX	1	ELZ	-1	5	1								
8	Normal + Seismic(-X)(+Z) + ...	Yes			DL	1	ELX	-1	ELZ	1	5	1								
9	Normal + Seismic(-X)(-Z) + T...	Yes			DL	1	ELX	-1	ELZ	-1	5	1								

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Envelope Joint Reactions

	Joint		X [lb]	lc	Y [lb]	lc	Z [lb]	lc	MX [lb-ft]	lc	MY [lb-ft]	lc	MZ [lb-ft]	lc
1	N21	max	0	1	3914.599	1	0	1	0	1	0	1	0	1
2		min	0	1	3143.772	7	0	1	0	1	0	1	0	1
3	N22	max	0	1	5370.453	7	3374.651	9	0	1	0	1	0	1
4		min	0	1	1090.279	1	-3374.651	6	0	1	0	1	0	1
5	N54	max	0	1	0	1	0	1	-101.546	9	567.633	3	2939.238	2
6		min	0	1	0	1	0	1	-2726.827	6	-570.041	2	-2652.532	3
7	N45	max	181.655	9	564.802	4	0	1	0	1	0	1	0	1
8		min	-179.259	6	391.308	5	0	1	0	1	0	1	0	1
9	N53	max	264.699	3	515.414	5	362.688	7	0	1	0	1	0	1
10		min	-267.096	2	341.92	4	-362.689	8	0	1	0	1	0	1
11	N17	max	0	1	0	1	0	1	2564.806	5	11176.972	7	-4439.303	1
12		min	0	1	0	1	0	1	1731.102	4	-11176.972	8	-6190.644	7
13	N20	max	0	1	0	1	0	1	-1731.102	5	11176.972	9	-4439.303	1
14		min	0	1	0	1	0	1	-2564.806	4	-11176.972	6	-6190.644	6
15	N11	max	197.964	8	305.31	9	197.964	7	403.696	9	207.9	7	-109.673	6
16		min	-77.057	7	207.536	6	-77.057	8	109.673	6	-207.9	8	-403.696	9
17	N6	max	197.964	9	305.31	8	77.058	9	-109.679	7	207.907	9	-109.672	7
18		min	-77.057	6	207.537	7	-197.963	6	-403.704	8	-207.9	6	-403.69	8
19	N12	max	182.972	9	658.387	6	182.972	9	-144.531	8	260.358	8	512.748	8
20		min	-303.88	6	560.613	9	-303.88	6	-512.748	7	-260.358	7	144.531	7
21	N1	max	182.972	8	658.386	7	303.878	7	512.749	6	260.358	6	512.746	9
22		min	-303.879	7	560.612	8	-182.973	8	144.534	9	-260.36	9	144.531	6
23	N28	max	9592.999	8	13112.748	8	1086.127	6	0	1	0	1	0	1
24		min	-43.999	1	1973.738	1	-1086.127	9	0	1	0	1	0	1
25	N40	max	20.999	1	703.273	1	948.351	5	5645.924	5	3675.459	5	100604.133	2
26		min	-7495.479	2	-13448.54	8	-948.351	4	-5645.924	4	-3675.459	4	-460.846	1
27	N95	max	57.861	3	84.974	1	33.99	7	82.098	1	55.902	2	0	1
28		min	-57.861	2	84.974	1	-33.99	6	82.098	1	-55.902	3	0	1
29	N94	max	57.861	3	84.974	1	33.99	7	82.098	1	55.902	2	0	1
30		min	-57.861	2	84.974	1	-33.99	6	82.098	1	-55.902	3	0	1
31	N97	max	18.442	3	27.083	1	10.833	7	17.703	1	12.055	2	0	1
32		min	-18.442	2	27.083	1	-10.833	6	17.703	1	-12.055	3	0	1
33	N96	max	18.442	3	27.083	1	10.833	7	17.703	1	12.055	2	0	1
34		min	-18.442	2	27.083	1	-10.833	6	17.703	1	-12.055	3	0	1
35	N100	max	0	1	0	1	0	1	-54.317	1	36.986	3	0	1
36		min	0	1	0	1	0	1	-54.317	1	-36.986	2	0	1
37	N109	max	70.078	3	102.917	1	41.167	7	-108.634	1	73.972	3	0	1
38		min	-70.078	2	102.917	1	-41.167	6	-108.634	1	-73.972	2	0	1
39	N42	max	203.504	3	567.735	9	699.992	7	-1275.669	1	490.81	3	741.516	2
40		min	-200.784	2	359.359	1	-683.992	6	-3176.564	9	-459.979	2	-667.887	3
41	N64	max	739.263	3	1362.62	1	0	1	0	1	0	1	0	1
42		min	-741.983	2	1154.245	9	0	1	0	1	0	1	0	1
43	Totals:	max	4937.187	8	12369.466	7	4968.186	7						
44		min	-4983.187	7	12369.466	1	-4952.187	8						

Envelope Joint Displacements

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
1	N1	max	0	7	0	8	0	8	0	9	0	9	0	6
2		min	0	8	0	7	0	7	0	6	0	6	0	9
3	N2	max	.032	6	0	1	0	1	-7.31e-7	9	1.284e-6	9	-7.31e-7	6
4		min	0	1	-.045	8	-.032	9	-2.548e-6	6	-1.284e-6	6	-2.548e-6	9
5	N3	max	.06	6	0	1	0	1	2.224e-7	8	1.366e-7	6	2.225e-7	8
6		min	0	1	-.085	8	-.06	9	2.935e-8	7	-1.365e-7	9	2.939e-8	7
7	N4	max	.067	6	0	1	0	1	1.088e-6	8	5.791e-7	6	1.088e-6	8
8		min	0	1	-.095	8	-.067	9	2.696e-7	7	-5.79e-7	9	2.696e-7	7

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Envelope Joint Displacements (Continued)

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
9	N5	max	0	1	.054	7	.039	6	2.634e-6	8	1.365e-6	6	2.634e-6	8
10		min	-.039	9	0	1	0	1	7.032e-7	7	-1.365e-6	9	7.032e-7	7
11	N6	max	0	6	0	7	0	6	0	8	0	6	0	8
12		min	0	9	0	8	0	9	0	7	0	9	0	7
13	N7	max	.032	7	0	1	.032	8	2.548e-6	7	1.284e-6	7	-7.31e-7	7
14		min	0	1	-.045	9	0	1	7.31e-7	8	-1.284e-6	8	-2.548e-6	8
15	N8	max	.06	7	0	1	.06	8	-2.937e-8	6	1.366e-7	8	2.225e-7	9
16		min	0	1	-.085	9	0	1	-2.225e-7	9	-1.366e-7	7	2.937e-8	6
17	N9	max	.067	7	0	1	.067	8	-2.696e-7	6	5.791e-7	8	1.089e-6	9
18		min	0	1	-.095	9	0	1	-1.089e-6	9	-5.791e-7	7	2.696e-7	6
19	N10	max	0	1	.054	6	0	1	-7.032e-7	6	1.365e-6	8	2.634e-6	9
20		min	-.039	8	0	1	-.039	7	-2.634e-6	9	-1.365e-6	7	7.032e-7	6
21	N11	max	0	7	0	6	0	8	0	6	0	8	0	9
22		min	0	8	0	9	0	7	0	9	0	7	0	6
23	N12	max	0	6	0	9	0	6	0	7	0	7	0	7
24		min	0	9	0	6	0	9	0	8	0	8	0	8
25	N14	max	0	1	-.008	1	.293	6	2.786e-5	4	5.87e-4	6	3.06e-4	7
26		min	-1.058	8	-.011	7	-.293	9	-2.786e-5	5	-5.87e-4	9	1.924e-4	1
27	N15	max	0	1	-.016	1	.245	8	-1.846e-5	4	4.499e-4	8	2.569e-4	7
28		min	-1.139	8	-.021	7	-.374	7	-5.825e-5	5	-4.499e-4	7	1.757e-4	1
29	N16	max	0	1	-.019	1	.214	8	-2.389e-5	4	3.505e-4	8	2.054e-4	7
30		min	-1.185	8	-.027	7	-.42	7	-5.419e-5	5	-3.505e-4	7	1.437e-4	1
31	N17	max	0	1	0	1	0	1	0	4	0	8	0	7
32		min	0	1	0	1	0	1	0	5	0	7	0	1
33	N18	max	0	1	-.016	1	.374	6	5.825e-5	4	4.499e-4	6	2.569e-4	7
34		min	-1.139	9	-.021	6	-.245	9	1.846e-5	5	-4.499e-4	9	1.757e-4	1
35	N19	max	0	1	-.019	1	.42	6	5.419e-5	4	3.505e-4	6	2.054e-4	7
36		min	-1.185	9	-.027	6	-.214	9	2.389e-5	5	-3.505e-4	9	1.437e-4	1
37	N20	max	0	1	0	1	0	1	0	4	0	6	0	6
38		min	0	1	0	1	0	1	0	5	0	9	0	1
39	N21	max	0	1	-.003	7	.279	6	3.723e-5	4	7.225e-4	6	2.944e-4	7
40		min	-1.011	8	-.004	1	-.279	9	-3.723e-5	5	-7.225e-4	9	1.515e-4	1
41	N22	max	0	1	0	1	0	6	1.594e-4	4	5.288e-4	6	-8.413e-6	1
42		min	-.4	8	0	7	0	9	-1.594e-4	5	-5.288e-4	9	-5.201e-4	7
43	N23	max	0	1	-.002	1	.019	9	1.915e-4	4	6.684e-5	6	-1.127e-5	1
44		min	-.24	8	-.052	7	-.019	6	-1.915e-4	5	-6.684e-5	9	-6.412e-4	7
45	N24	max	0	1	-.001	1	.013	9	2.266e-4	4	1.31e-4	9	2.152e-5	1
46		min	-.064	8	-.086	7	-.013	6	-2.266e-4	5	-1.31e-4	6	-6.159e-5	8
47	N25	max	0	1	0	1	.011	9	2.315e-4	4	1.354e-4	9	1.942e-4	7
48		min	-.035	8	-.079	7	-.011	6	-2.315e-4	5	-1.354e-4	6	2.415e-5	1
49	N26	max	0	1	0	1	.007	9	2.338e-4	4	1.323e-4	9	3.92e-4	7
50		min	-.011	8	-.06	7	-.007	6	-2.338e-4	5	-1.323e-4	6	2.48e-5	1
51	N27	max	.004	7	0	1	.004	5	2.316e-4	4	1.231e-4	9	5.938e-4	7
52		min	0	1	-.031	7	-.004	4	-2.316e-4	5	-1.231e-4	6	2.358e-5	1
53	N28	max	0	1	0	1	0	9	2.232e-4	4	1.095e-4	9	7.901e-4	7
54		min	0	8	0	8	0	6	-2.232e-4	5	-1.095e-4	6	2.107e-5	1
55	N29	max	0	1	.402	7	.025	4	6.007e-5	4	1.377e-4	4	-6.224e-6	1
56		min	-.164	3	0	1	-.025	5	-6.007e-5	5	-1.377e-4	5	-6.164e-4	7
57	N30	max	0	1	.429	2	.026	4	5.774e-5	4	1.524e-4	4	-6.983e-6	1
58		min	-.148	3	0	1	-.026	5	-5.774e-5	5	-1.524e-4	5	1.034e-3	3
59	N31	max	0	1	.443	2	.025	4	5.848e-5	4	1.652e-4	4	-6.836e-6	1
60		min	-.117	3	0	1	-.025	5	-5.848e-5	5	-1.652e-4	5	-1.46e-3	3
61	N32	max	0	1	.439	2	.023	4	6.119e-5	4	1.748e-4	4	-5.449e-6	1
62		min	-.079	3	0	1	-.023	5	-6.119e-5	5	-1.748e-4	5	-1.852e-3	3
63	N33	max	0	1	.416	2	.021	4	6.46e-5	4	1.81e-4	4	-2.933e-6	1
64		min	-.044	3	0	1	-.021	5	-6.46e-5	5	-1.81e-4	5	-2.176e-3	3
65	N34	max	.063	2	.286	2	.012	4	7.68e-5	4	1.743e-4	4	8.422e-6	1

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Designer : Kevin M. Jones
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Envelope Joint Displacements (Continued)

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
66		min	0	1	0	1	-.012	5	-7.68e-5	5	-1.743e-4	5	-2.62e-3	2
67	N35	max	.085	2	.242	2	.009	4	8.036e-5	4	1.633e-4	4	1.044e-5	1
68		min	0	1	0	1	-.009	5	-8.036e-5	5	-1.633e-4	5	-2.547e-3	2
69	N36	max	.089	2	.195	2	.007	4	8.313e-5	4	1.471e-4	4	1.113e-5	1
70		min	0	1	0	1	-.007	5	-8.313e-5	5	-1.471e-4	5	-2.375e-3	2
71	N37	max	.078	2	.151	2	.004	4	8.273e-5	4	1.258e-4	4	1.042e-5	1
72		min	0	1	0	1	-.004	5	-8.273e-5	5	-1.258e-4	5	-2.111e-3	2
73	N39	max	.055	2	.116	8	.003	4	7.667e-5	4	1.007e-4	4	8.725e-6	1
74		min	0	1	0	1	-.003	5	-7.667e-5	5	-1.007e-4	5	-1.77e-3	2
75	N40	max	0	2	0	8	0	4	0	4	0	4	0	1
76		min	0	1	0	1	0	5	0	5	0	5	0	2
77	N42	max	0	2	0	1	0	6	0	9	0	2	0	3
78		min	0	3	0	9	0	7	0	1	0	3	0	2
79	N45	max	0	6	0	5	.084	8	1.24e-5	6	2.565e-5	8	4.48e-4	3
80		min	0	9	0	4	0	1	-4.522e-5	9	-6.055e-6	7	-5.082e-4	2
81	N46	max	.013	2	.021	4	0	1	4.508e-5	4	1.573e-5	7	6.217e-4	3
82		min	-.012	3	0	1	-.014	5	-5.102e-5	5	-8.891e-8	1	-6.826e-4	2
83	N47	max	.018	2	.069	9	.355	6	1.754e-4	6	1.841e-5	9	3.367e-4	3
84		min	-.016	3	0	1	-.003	1	-7.481e-5	9	-1.905e-5	6	-3.791e-4	2
85	N48	max	.002	3	0	1	.074	8	-1.206e-6	6	2.499e-5	8	4.653e-4	3
86		min	0	1	-.003	7	0	1	-4.012e-5	9	-4.859e-6	7	-5.263e-4	2
87	N49	max	.001	3	-.001	1	.051	8	-2.941e-6	2	1.481e-5	8	5.037e-4	3
88		min	0	1	-.003	7	0	1	-1.284e-5	3	1.26e-8	1	-5.647e-4	2
89	N50	max	.001	3	0	1	.028	8	2.206e-5	7	1.916e-5	7	5.439e-4	3
90		min	0	2	-.003	7	0	1	3.349e-6	8	-6.878e-8	1	-6.048e-4	2
91	N51	max	.001	3	0	1	.028	8	2.206e-5	7	1.916e-5	7	5.439e-4	3
92		min	0	2	-.002	4	0	1	3.349e-6	8	-6.878e-8	1	-6.048e-4	2
93	N52	max	.001	3	0	1	.008	5	2.493e-5	4	1.95e-5	7	5.766e-4	3
94		min	0	2	-.002	4	0	1	-3.045e-6	5	-8.7e-8	1	-6.375e-4	2
95	N53	max	0	2	0	4	0	8	2.961e-5	4	1.804e-5	7	5.911e-4	3
96		min	0	3	0	5	0	7	-1.734e-5	5	-8.891e-8	1	-6.52e-4	2
97	N54	max	0	1	0	1	0	1	0	6	0	2	0	3
98		min	0	1	0	1	0	1	0	9	0	3	0	2
99	N55	max	.04	2	.18	9	.413	6	1.232e-4	6	2.146e-5	2	1.729e-4	3
100		min	-.036	3	-.001	1	-.001	1	-8.479e-6	9	-2.134e-5	3	-1.916e-4	2
101	N56	max	.041	2	.179	9	.499	6	2.251e-5	6	4.687e-6	2	2.855e-5	3
102		min	-.037	3	-.003	1	-.001	1	7.796e-7	9	-4.667e-6	3	-3.163e-5	2
103	N57	max	.035	2	.151	9	.367	6	1.602e-4	6	1.048e-5	2	2.536e-4	3
104		min	-.032	3	0	1	-.002	1	-3.622e-5	9	-1.113e-5	3	-2.813e-4	2
105	N58	max	.032	2	.133	9	.362	6	1.668e-4	6	6.341e-6	7	2.735e-4	3
106		min	-.029	3	0	1	-.002	1	-4.69e-5	9	-7.108e-6	8	-3.037e-4	2
107	N59	max	.022	2	.087	9	.357	6	1.753e-4	6	9.946e-6	9	3.126e-4	3
108		min	-.02	3	0	1	-.003	1	-6.634e-5	9	-1.064e-5	6	-3.492e-4	2
109	N60	max	.04	2	.176	9	.395	6	1.386e-4	6	2.057e-5	2	2.027e-4	3
110		min	-.036	3	0	1	-.002	1	-1.589e-5	9	-2.058e-5	3	-2.246e-4	2
111	N61	max	.038	2	.166	9	.379	6	1.51e-4	6	1.622e-5	2	2.3e-4	3
112		min	-.034	3	0	1	-.002	1	-2.543e-5	9	-1.655e-5	3	-2.55e-4	2
113	N62	max	.004	2	.017	9	.348	6	1.868e-4	6	4.038e-5	3	3.48e-4	3
114		min	-.004	3	0	1	-.002	1	-7.576e-5	9	-4.242e-5	2	-3.86e-4	2
115	N63	max	.003	3	0	1	.332	6	1.639e-4	6	5.689e-5	3	3.185e-4	3
116		min	-.003	2	-.014	9	0	1	-6.541e-5	1	-5.951e-5	2	-3.535e-4	2
117	N64	max	0	2	0	9	.343	6	1.777e-4	6	4.976e-5	3	3.351e-4	3
118		min	0	3	0	1	-.001	1	-6.495e-5	9	-5.217e-5	2	-3.716e-4	2
119	N65	max	.004	3	-.001	1	.317	6	1.508e-4	6	6.099e-5	3	3.026e-4	3
120		min	-.004	2	-.024	9	0	1	-7.076e-5	1	-6.375e-5	2	-3.359e-4	2
121	N66	max	.003	3	-.002	1	.292	6	1.387e-4	6	6.357e-5	3	2.789e-4	3
122		min	-.004	2	-.028	9	0	1	-6.744e-5	1	-6.662e-5	2	-3.097e-4	2

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Envelope Joint Displacements (Continued)

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation ...	lc	Y Rotation ...	lc	Z Rotation ...	lc
123	N67	max	.004	3	-.002	1	.3	6	1.413e-4	6	6.314e-5	3	2.863e-4	3
124		min	-.004	2	-.028	9	0	1	-6.991e-5	1	-6.609e-5	2	-3.179e-4	2
125	N78	max	.002	3	0	1	.069	8	-4.11e-6	6	2.351e-5	8	4.732e-4	3
126		min	0	1	-.003	7	0	1	-3.559e-5	9	-3.164e-6	7	-5.342e-4	2
127	N79	max	0	1	.016	2	.099	8	4.811e-5	6	2.085e-5	8	4.159e-4	3
128		min	-.013	3	0	1	0	1	-4.926e-5	9	-4.296e-6	7	-4.76e-4	2
129	N80	max	.035	3	.03	3	.349	6	6.619e-5	6	2.062e-5	9	4.01e-4	3
130		min	0	1	0	1	-.002	1	-5.207e-5	9	-6.58e-6	6	-4.615e-4	2
131	N81	max	0	1	.007	2	.093	8	3.045e-5	6	2.366e-5	8	4.316e-4	3
132		min	-.005	3	0	1	0	1	-4.694e-5	9	-5.166e-6	7	-4.912e-4	2
133	N82	max	.003	2	.005	4	0	1	3.44e-5	4	1.682e-5	7	6.038e-4	3
134		min	-.003	3	0	1	-.007	5	-3.178e-5	5	-8.891e-8	1	-6.647e-4	2
135	N83	max	.041	2	.062	4	0	1	5.254e-5	4	2.122e-5	3	6.386e-4	3
136		min	-.037	3	0	1	-.017	5	-7.142e-5	5	-8.891e-8	1	-6.995e-4	2
137	N84	max	.008	2	.012	4	0	1	4.e-5	4	1.63e-5	7	6.139e-4	3
138		min	-.007	3	0	1	-.012	5	-4.273e-5	5	-8.891e-8	1	-6.748e-4	2
139	N85	max	.045	2	.068	4	0	1	5.191e-5	4	2.205e-5	3	6.391e-4	3
140		min	-.042	3	0	1	-.019	5	-7.277e-5	5	-8.891e-8	1	-7.e-4	2
141	N86	max	.049	2	.074	4	0	1	5.127e-5	4	2.262e-5	3	6.392e-4	3
142		min	-.045	3	0	1	-.024	5	-7.363e-5	5	-6.31e-7	2	-7.001e-4	2
143	N87	max	.05	2	.077	4	0	1	5.084e-5	4	2.292e-5	3	6.392e-4	3
144		min	-.047	3	0	1	-.03	5	-7.404e-5	5	-9.312e-7	2	-7.001e-4	2
145	N88	max	.05	2	.076	4	0	1	5.066e-5	4	2.303e-5	3	6.391e-4	3
146		min	-.046	3	0	1	-.037	5	-7.417e-5	5	-1.036e-6	2	-7.001e-4	2
147	N89	max	.048	2	.073	4	0	1	5.063e-5	4	2.304e-5	3	6.391e-4	3
148		min	-.044	3	0	1	-.042	5	-7.418e-5	5	-1.049e-6	2	-7.001e-4	2
149	N90	max	0	2	0	1	0	1	-4.308e-7	1	2.933e-7	3	0	1
150		min	0	3	0	1	-.061	7	-4.308e-7	1	-2.933e-7	2	0	1
151	N91	max	0	2	0	1	0	1	-4.308e-7	1	2.933e-7	3	0	1
152		min	0	3	0	1	-.061	7	-4.308e-7	1	-2.933e-7	2	0	1
153	N94	max	0	2	0	1	0	6	0	1	0	3	0	1
154		min	0	3	0	1	0	7	0	1	0	2	0	1
155	N95	max	0	2	0	1	0	6	0	1	0	3	0	1
156		min	0	3	0	1	0	7	0	1	0	2	0	1
157	N96	max	0	2	0	1	0	6	0	1	0	3	0	1
158		min	0	3	0	1	0	7	0	1	0	2	0	1
159	N97	max	0	2	0	1	0	6	0	1	0	3	0	1
160		min	0	3	0	1	0	7	0	1	0	2	0	1
161	N100	max	0	1	0	1	0	1	0	1	0	2	0	1
162		min	0	1	0	1	0	1	0	1	0	3	0	1
163	N108	max	0	2	0	1	.054	6	8.633e-7	1	5.879e-7	2	0	1
164		min	0	3	0	1	0	1	8.633e-7	1	-5.879e-7	3	0	1
165	N109	max	0	2	0	1	0	6	0	1	0	2	0	1
166		min	0	3	0	1	0	7	0	1	0	3	0	1

Envelope Member Section Stresses

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
1	M1	1	...	.075	6	-.376	1	.15	6	.173	7	.292	1	2.285	9	2.285	6
2			...	-.075	8	-.376	5	-.15	7	-.292	1	-.173	7	-2.285	6	-2.285	9
3		2	...	.076	6	-.38	1	.152	6	-.003	7	.468	1	2.214	9	2.214	6
4			...	-.076	8	-.38	5	-.152	7	-.468	1	.003	7	-2.214	6	-2.214	9
5		3	...	.077	6	-.384	1	.154	6	-.181	7	.646	1	2.143	9	2.143	6
6			...	-.077	8	-.384	5	-.154	7	-.646	1	.181	7	-2.143	6	-2.143	9
7		4	...	.078	6	-.388	1	.155	6	-.361	7	.826	1	2.071	9	2.071	6
8			...	-.078	8	-.388	5	-.155	7	-.826	1	.361	7	-2.071	6	-2.071	9
9		5	...	.078	6	-.392	1	.157	6	-.543	7	1.007	1	1.998	9	1.998	8

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
10			...	-.078	8	-.392	5	-.157	7	-1.0...	1	.543	7	-1.998	8	-1.998	9
11	M2	1	...	.078	7	.135	1	.157	6	-.543	7	1.007	1	1.998	9	1.998	6
12			...	-.078	8	.031	7	-.157	9	1.0...	1	.543	7	-1.998	6	-1.998	9
13		2	...	.089	7	.084	1	.177	6	-.343	1	.508	7	.985	9	.985	6
14			...	-.089	8	-.02	7	-.177	9	-.508	7	.343	1	-.985	6	-.985	9
15		3	...	.099	7	.033	1	.197	6	.012	1	.783	7	.153	6	.153	9
16			...	-.099	8	-.071	7	-.197	9	-.783	7	-.012	1	-.153	9	-.153	6
17		4	...	.109	7	-.018	1	.218	6	.058	1	1.366	7	1.414	6	1.414	9
18			...	-.109	8	-.122	7	-.218	9	-1.3...	7	-.058	1	-1.414	9	-1.414	6
19		5	...	.119	7	-.069	1	.238	6	-.205	1	2.259	7	2.798	6	2.798	9
20			...	-.119	8	-.172	7	-.238	9	-2.2...	7	.205	1	-2.798	9	-2.798	6
21	M4	1	...	.13	7	.496	7	.194	9	1.0...	7	-.122	1	1.487	6	1.487	9
22			...	-.13	8	.024	1	-.194	6	.122	1	-1.085	7	-1.487	9	-1.487	6
23		2	...	.133	7	.482	7	.189	9	1.9...	7	-.151	1	1.153	6	1.153	9
24			...	-.133	8	.01	1	-.189	6	.151	1	-1.939	7	-1.153	9	-1.153	6
25		3	...	.136	7	.467	7	.183	9	2.7...	7	-.156	1	.829	6	.829	9
26			...	-.136	8	-.005	1	-.183	6	.156	1	-2.767	7	-.829	9	-.829	6
27		4	...	.139	7	.453	7	.177	9	3.57	7	-.134	1	.515	6	.515	9
28			...	-.139	8	-.02	1	-.177	6	.134	1	-3.57	7	-.515	9	-.515	6
29		5	...	.142	7	.438	7	.171	9	4.3...	7	-.087	1	.211	6	.211	9
30			...	-.142	8	-.034	1	-.171	6	.087	1	-4.347	7	-.211	9	-.211	6
31	M5	1	...	1.046	9	.003	1	.024	5	5.6...	8	.072	1	.381	9	.381	6
32			...	.094	1	-.995	8	-.024	4	-.072	1	-5.611	8	-.381	6	-.381	9
33		2	...	1.029	9	.003	1	.006	5	1.59	8	.061	1	.39	9	.39	6
34			...	.077	1	-.981	8	-.006	4	-.061	1	-1.59	8	-.39	6	-.39	9
35		3	...	1.012	9	.003	1	.018	6	-.049	1	2.511	7	.344	5	.344	4
36			...	.06	1	-.967	8	-.018	9	-2.5...	7	.049	1	-.344	4	-.344	5
37		4	...	.995	9	.003	1	.032	6	-.038	1	6.34	3	.259	5	.259	4
38			...	.043	1	-.954	8	-.032	9	-6.34	3	.038	1	-.259	4	-.259	5
39		5	...	.978	9	.003	1	.048	4	-.026	1	10.138	8	.102	5	.102	4
40			...	.026	1	-.952	2	-.048	5	.10...	8	.026	1	-.102	4	-.102	5
41	M6	1	...	0	1	0	1	0	1	.595	6	-.022	9	.124	3	.124	2
42			...	0	1	0	1	0	1	.022	9	-.595	6	-.124	2	-.124	3
43		2	...	0	7	-.002	1	.001	2	.595	6	-.022	9	.124	3	.124	2
44			...	0	6	-.002	1	-.001	3	.022	9	-.595	6	-.124	2	-.124	3
45		3	...	0	7	-.004	1	.002	2	.594	6	-.021	9	.123	3	.124	2
46			...	0	6	-.004	1	-.002	3	.021	9	-.594	6	-.124	2	-.123	3
47		4	...	.001	7	-.006	1	.003	2	.592	6	-.019	9	.122	3	.123	2
48			...	-.001	6	-.006	1	-.003	3	.019	9	-.592	6	-.123	2	-.122	3
49		5	...	.002	7	-.009	1	.005	2	.59	6	-.017	9	.121	3	.122	2
50			...	-.002	6	-.009	1	-.005	3	.017	9	-.59	6	-.122	2	-.121	3
51	M7	1	...	.002	7	-.009	7	.005	2	.59	6	-.017	9	.121	3	.122	2
52			...	-.002	6	-.009	8	-.005	3	.017	9	-.59	6	-.122	2	-.121	3
53		2	...	.004	7	-.02	7	.01	2	.57	6	.003	9	.111	3	.111	2
54			...	-.004	6	-.02	8	-.01	3	-.003	9	-.57	6	-.111	2	-.111	3
55		3	...	.006	7	-.03	7	.016	2	.535	6	.038	9	.092	3	.093	2
56			...	-.006	6	-.03	8	-.016	3	.038	9	-.535	6	-.093	2	-.092	3
57		4	...	.008	7	-.041	7	.022	2	.484	6	.089	9	.066	3	.066	2
58			...	-.008	6	-.041	8	-.022	3	.089	9	-.484	6	-.066	2	-.066	3
59		5	...	.01	7	-.052	7	.027	2	.418	6	.155	9	.031	3	.031	2
60			...	-.01	6	-.052	8	-.027	3	-.155	9	-.418	6	-.031	2	-.031	3
61	M8	1	...	.017	9	-.047	7	.027	2	.418	6	.155	9	.143	3	.156	2
62			...	-.003	6	-.055	6	-.027	3	-.155	9	-.418	6	-.156	2	-.143	3
63		2	...	.018	9	-.049	7	.029	2	.401	6	.169	9	.135	3	.148	2
64			...	-.004	6	-.057	6	-.029	3	-.169	9	-.401	6	-.148	2	-.135	3
65		3	...	.018	9	-.051	7	.03	2	.384	6	.184	9	.126	3	.139	2
66			...	-.004	6	-.059	6	-.03	3	-.184	9	-.384	6	-.139	2	-.126	3

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

Mar 26, 2006
12:41 PM
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[..	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
67		4	...	.019	9	-.053	7	.031	2	.366	6	.199	9	.117	3	.13	2
68			...	-.004	6	-.062	6	-.031	3	-.199	9	-.366	6	-.13	2	-.117	3
69		5	...	.02	9	-.055	7	.032	2	.347	6	.215	9	.108	3	.121	2
70			...	.004	6	-.064	6	-.032	3	-.215	9	-.347	6	-.121	2	-.108	3
71	M9	1	...	.029	7	-.036	7	.032	2	.347	6	.215	9	.315	3	.35	2
72			...	.008	8	-.063	8	-.032	3	-.215	9	-.347	6	-.35	2	-.315	3
73		2	...	.03	7	-.037	7	.033	2	.328	6	.226	9	.305	3	.34	2
74			...	.009	8	-.065	8	-.033	3	-.226	9	-.328	6	-.34	2	-.305	3
75		3	...	.031	7	-.038	7	.035	2	.309	6	.237	9	.295	3	.33	2
76			...	.009	8	-.068	8	-.035	3	-.237	9	-.309	6	-.33	2	-.295	3
77		4	...	.032	7	-.04	7	.036	2	.288	6	.249	9	.284	3	.319	2
78			...	.009	8	-.07	8	-.036	3	-.249	9	-.288	6	-.319	2	-.284	3
79		5	...	.033	7	-.041	7	.037	2	.267	6	.261	9	.273	3	.309	2
80			...	.009	8	-.072	8	-.037	3	-.261	9	-.267	6	-.309	2	-.273	3
81	M10	1	...	.038	7	-.013	9	.037	2	.267	6	.261	9	.435	3	.488	2
82			...	.022	8	-.06	6	-.037	3	-.261	9	-.267	6	-.488	2	-.435	3
83		2	...	.039	7	-.013	9	.038	2	.249	6	.265	9	.424	3	.477	2
84			...	.023	8	-.062	6	-.038	3	-.265	9	-.249	6	-.477	2	-.424	3
85		3	...	.041	7	-.014	9	.039	2	.23	6	.269	9	.413	3	.465	2
86			...	.024	8	-.064	6	-.039	3	-.269	9	-.23	6	-.465	2	-.413	3
87		4	...	.042	7	-.014	9	.041	2	.211	6	.273	9	.401	3	.453	2
88			...	.025	8	-.066	6	-.041	3	-.273	9	-.211	6	-.453	2	-.401	3
89		5	...	.043	7	-.015	9	.042	2	.191	6	.277	9	.389	3	.441	2
90			...	.025	8	-.068	6	-.042	3	-.277	9	-.191	6	-.441	2	-.389	3
91	M11	1	...	.043	9	.019	9	.042	2	.191	6	.277	9	.488	3	.549	2
92			...	.036	8	-.043	8	-.042	3	-.277	9	-.191	6	-.549	2	-.488	3
93		2	...	.044	9	.019	9	.043	2	.178	6	.271	9	.475	3	.537	2
94			...	.037	8	-.045	8	-.043	3	-.271	9	-.178	6	-.537	2	-.475	3
95		3	...	.045	9	.02	9	.044	2	.165	6	.266	9	.462	3	.524	2
96			...	.038	8	-.046	8	-.044	3	-.266	9	-.165	6	-.524	2	-.462	3
97		4	...	.046	9	.02	9	.045	2	.151	6	.26	9	.449	3	.511	2
98			...	.039	8	-.047	8	-.045	3	-.26	9	-.151	6	-.511	2	-.449	3
99		5	...	.047	9	.021	9	.047	2	.136	6	.253	9	.435	3	.497	2
100			...	.04	8	-.049	8	-.047	3	-.253	9	-.136	6	-.497	2	-.435	3
101	M12	1	...	.043	2	.047	3	.039	7	.521	2	.459	3	.136	6	.253	9
102			...	.043	1	-.047	2	-.032	6	-.459	3	-.521	2	-.253	9	-.136	6
103		2	...	.046	2	.05	3	.041	7	.485	2	.422	3	.111	6	.223	9
104			...	.046	1	-.05	2	-.034	6	-.422	3	-.485	2	-.223	9	-.111	6
105		3	...	.049	2	.053	3	.044	7	.446	2	.384	3	.084	6	.191	9
106			...	.049	1	-.053	2	-.037	6	-.384	3	-.446	2	-.191	9	-.084	6
107		4	...	.051	2	.056	3	.046	7	.405	2	.343	3	.056	6	.157	9
108			...	.051	1	-.056	2	-.039	6	-.343	3	-.405	2	-.157	9	-.056	6
109		5	...	.054	2	.059	3	.048	7	.362	2	.299	3	.037	4	.153	1
110			...	.054	1	-.059	2	-.041	6	-.299	3	-.362	2	-.153	1	-.037	4
111	M13	1	...	.079	8	.085	3	.07	9	.657	2	.543	3	.067	4	.277	1
112			...	.079	1	-.085	2	-.06	8	-.543	3	-.657	2	-.277	1	-.067	4
113		2	...	.08	8	.087	3	.071	9	.625	2	.511	3	.054	4	.275	1
114			...	.08	1	-.087	2	-.061	8	-.511	3	-.625	2	-.275	1	-.054	4
115		3	...	.081	8	.088	3	.072	9	.592	2	.479	3	.041	4	.273	1
116			...	.081	1	-.088	2	-.062	8	-.479	3	-.592	2	-.273	1	-.041	4
117		4	...	.082	8	.09	3	.072	9	.559	2	.446	3	.027	4	.271	1
118			...	.082	1	-.09	2	-.063	8	-.446	3	-.559	2	-.271	1	-.027	4
119		5	...	.083	8	.091	3	.073	9	.526	2	.412	3	.012	4	.27	1
120			...	.083	1	-.091	2	-.063	8	-.412	3	-.526	2	-.27	1	-.012	4
121	M14	1	...	.001	9	.118	7	.055	3	.265	9	.284	6	.443	2	.414	3
122			...	-.073	6	-.01	8	-.056	2	-.284	6	-.265	9	-.414	3	-.443	2
123		2	...	.002	9	.118	7	.054	3	.307	9	.288	6	.424	2	.395	3

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
124			...	-.073	6	-.012	8	-.055	2	-.288	6	-.307	9	-.395	3	-.424	2
125		3	...	.003	9	.118	7	.053	3	.348	9	.293	6	.405	2	.376	3
126			...	-.072	6	-.014	8	-.053	2	-.293	6	-.348	9	-.376	3	-.405	2
127		4	...	.004	9	.117	7	.051	3	.388	9	.298	6	.387	2	.358	3
128			...	-.072	6	-.015	8	-.052	2	-.298	6	-.388	9	-.358	3	-.387	2
129		5	...	.005	9	.117	5	.05	3	.429	9	.304	6	.369	2	.34	3
130			...	-.071	6	-.017	4	-.051	2	-.304	6	-.429	9	-.34	3	-.369	2
131	M15	1	...	.027	9	.107	5	.05	3	.429	9	.304	6	.316	2	.294	3
132			...	-.069	6	.036	4	-.051	2	-.304	6	-.429	9	-.294	3	-.316	2
133		2	...	.028	9	.106	5	.049	3	.465	9	.291	6	.299	2	.277	3
134			...	-.069	6	.033	4	-.049	2	-.291	6	-.465	9	-.277	3	-.299	2
135		3	...	.029	9	.105	5	.047	3	.501	9	.278	6	.282	2	.26	3
136			...	-.068	6	.031	4	-.048	2	-.278	6	-.501	9	-.26	3	-.282	2
137		4	...	.03	9	.104	5	.046	3	.536	9	.267	6	.266	2	.244	3
138			...	-.068	6	.029	4	-.047	2	-.267	6	-.536	9	-.244	3	-.266	2
139		5	...	.031	9	.103	5	.045	8	.57	9	.256	6	.249	2	.228	3
140			...	-.068	6	.026	4	-.046	7	-.256	6	-.57	9	-.228	3	-.249	2
141	M16	1	...	.047	9	.101	1	.045	8	.57	9	.256	6	.154	2	.142	3
142			...	-.057	6	.068	9	-.046	7	-.256	6	-.57	9	-.142	3	-.154	2
143		2	...	.048	9	.1	1	.044	8	.594	9	.228	6	.138	2	.127	3
144			...	-.057	6	.066	9	-.045	7	-.228	6	-.594	9	-.127	3	-.138	2
145		3	...	.048	9	.098	1	.043	8	.617	9	.201	6	.123	2	.112	3
146			...	-.057	6	.065	9	-.044	7	-.201	6	-.617	9	-.112	3	-.123	2
147		4	...	.049	9	.096	1	.043	8	.639	9	.175	6	.108	2	.097	3
148			...	-.058	6	.063	9	-.043	7	-.175	6	-.639	9	-.097	3	-.108	2
149		5	...	.05	5	.094	1	.042	8	.661	9	.15	6	.094	2	.083	3
150			...	-.058	4	.061	9	-.043	7	-.15	6	-.661	9	-.083	3	-.094	2
151	M17	1	...	.054	5	.095	1	.042	8	.661	9	.15	6	.037	2	.032	3
152			...	-.052	4	.041	9	-.043	7	-.15	6	-.661	9	-.032	3	-.037	2
153		2	...	.054	5	.094	1	.042	8	.667	9	.135	6	.031	2	.026	3
154			...	-.052	4	.04	9	-.042	7	-.135	6	-.667	9	-.026	3	-.031	2
155		3	...	.054	5	.093	1	.041	8	.673	9	.12	6	.037	9	.032	6
156			...	-.052	4	.039	9	-.042	7	-.12	6	-.673	9	-.032	6	-.037	9
157		4	...	.054	5	.092	1	.041	8	.679	9	.106	6	.043	9	.038	6
158			...	-.052	4	.038	9	-.042	7	-.106	6	-.679	9	-.038	6	-.043	9
159		5	...	.054	7	.091	1	.041	8	.685	9	.091	6	.049	9	.045	6
160			...	-.052	6	.037	9	-.041	7	-.091	6	-.685	9	-.045	6	-.049	9
161	M18	1	...	.064	7	.039	1	.037	3	.685	9	.091	6	.049	9	.045	6
162			...	-.062	6	-.015	9	-.038	2	-.091	6	-.685	9	-.045	6	-.049	9
163		2	...	.071	7	.006	1	.015	3	.496	9	-.034	6	.147	3	.147	2
164			...	-.069	6	-.048	9	-.015	2	-.034	6	-.496	9	-.147	2	-.147	3
165		3	...	.077	7	-.027	1	.007	6	.215	1	.039	6	.168	3	.172	2
166			...	-.075	6	-.081	9	-.008	9	-.039	6	-.215	1	-.172	2	-.168	3
167		4	...	.084	7	-.06	1	.03	2	-.046	1	.476	9	.054	3	.062	2
168			...	-.082	6	-.114	9	-.03	3	-.476	9	.046	1	-.062	2	-.054	3
169		5	...	.091	7	-.093	1	.052	2	-.505	1	1.258	9	.182	2	.194	3
170			...	-.089	6	-.147	9	-.053	3	-1.2	9	.505	1	-.194	3	-.182	2
171	M31	1	...	.101	6	.115	3	.087	9	.306	2	.336	3	.292	4	.241	5
172			...	.101	1	-.115	2	-.078	8	-.336	3	-.306	2	-.241	5	-.292	4
173		2	...	.104	6	.119	3	.09	9	.18	2	.211	3	.222	4	.231	1
174			...	.104	1	-.119	2	-.08	8	-.211	3	-.18	2	-.231	1	-.222	4
175		3	...	.106	6	.123	3	.092	9	.051	2	.081	3	.147	4	.226	1
176			...	.106	1	-.123	2	-.082	8	-.081	3	-.051	2	-.226	1	-.147	4
177		4	...	.109	6	.127	3	.094	9	.053	8	.083	7	.092	9	.221	1
178			...	.109	1	-.127	2	-.085	8	-.083	7	-.053	8	-.221	1	-.092	9
179		5	...	.112	6	.131	3	.097	9	.191	3	.222	2	.194	9	.215	1
180			...	.112	1	-.131	2	-.087	8	-.222	2	-.191	3	-.215	1	-.194	9

Company : DMJM H&N
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[..	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
181	M32	1	...	.121	7	.051	7	.131	2	.194	9	.215	1	.248	2	.216	3
182			...	.103	6	-.13	6	-.131	3	-.215	1	-.194	9	-.216	3	-.248	2
183		2	...	.122	7	.051	7	.132	2	.212	9	.229	1	.294	2	.262	3
184			...	.104	6	-.131	6	-.132	3	-.229	1	-.212	9	-.262	3	-.294	2
185		3	...	.123	7	.051	7	.134	2	.229	9	.243	1	.34	2	.309	3
186			...	.105	6	-.132	6	-.134	3	-.243	1	-.229	9	-.309	3	-.34	2
187		4	...	.124	7	.052	7	.135	2	.247	9	.257	1	.387	2	.355	3
188			...	.106	6	-.133	6	-.135	3	-.257	1	-.247	9	-.355	3	-.387	2
189		5	...	.125	7	.052	7	.136	2	.265	9	.284	6	.434	2	.403	3
190			...	.107	6	-.134	6	-.136	3	-.284	6	-.265	9	-.403	3	-.434	2
191	M33	1	...	-.009	3	.045	3	.028	5	.099	3	.289	2	.346	8	.122	7
192			...	-.024	2	0	2	-.028	4	-.289	2	-.099	3	-.122	7	-.346	8
193		2	...	-.007	3	.034	3	.021	5	.183	3	.29	2	.317	8	.092	7
194			...	-.018	2	0	2	-.021	4	-.29	2	-.183	3	-.092	7	-.317	8
195		3	...	-.005	3	.023	3	.014	5	.243	3	.29	2	.295	8	.071	7
196			...	-.012	2	0	2	-.014	4	-.29	2	-.243	3	-.071	7	-.295	8
197		4	...	-.002	3	.011	3	.007	5	.278	3	.291	2	.283	8	.058	7
198			...	-.006	2	0	2	-.007	4	-.291	2	-.278	3	-.058	7	-.283	8
199		5	...	0	1	0	1	0	1	.29	3	.291	2	.278	8	.053	7
200			...	0	1	0	1	0	1	-.291	2	-.29	3	-.053	7	-.278	8
201	M34	1	...	0	1	0	1	0	1	.225	3	.319	2	.3	8	.093	7
202			...	0	1	0	1	0	1	-.319	2	-.225	3	-.093	7	-.3	8
203		2	...	.001	2	0	2	.001	4	.224	3	.319	2	.3	8	.093	7
204			...	0	3	-.002	3	-.001	5	-.319	2	-.224	3	-.093	7	-.3	8
205		3	...	.002	2	0	2	.002	4	.223	3	.319	2	.3	8	.094	7
206			...	0	3	-.004	3	-.002	5	-.319	2	-.223	3	-.094	7	-.3	8
207		4	...	.003	2	0	2	.003	4	.221	3	.32	2	.301	8	.094	7
208			...	.001	3	-.006	3	-.003	5	-.32	2	-.221	3	-.094	7	-.301	8
209		5	...	.004	2	0	2	.005	4	.219	3	.32	2	.301	8	.095	7
210			...	.002	3	-.008	3	-.005	5	-.32	2	-.219	3	-.095	7	-.301	8
211	M35	1	...	.004	7	-.002	7	.004	6	.145	9	.365	6	.228	3	.116	2
212			...	.001	8	-.008	8	-.004	9	-.365	6	-.145	9	-.116	2	-.228	3
213		2	...	.005	7	-.003	7	.005	6	.143	9	.367	6	.228	8	.116	7
214			...	.001	8	-.01	8	-.005	9	-.367	6	-.143	9	-.116	7	-.228	8
215		3	...	.006	7	-.004	7	.006	6	.141	9	.37	6	.228	8	.116	7
216			...	.002	8	-.012	8	-.006	9	-.37	6	-.141	9	-.116	7	-.228	8
217		4	...	.007	7	-.004	7	.007	6	.138	9	.373	6	.227	8	.115	7
218			...	.002	8	-.014	8	-.007	9	-.373	6	-.138	9	-.115	7	-.227	8
219		5	...	.008	7	-.005	7	.008	6	.134	9	.377	6	.227	8	.115	7
220			...	.002	8	-.016	8	-.008	9	-.377	6	-.134	9	-.115	7	-.227	8
221	M36	1	...	.007	5	-.008	5	.009	2	.1	9	.387	6	.152	3	.123	2
222			...	0	4	-.017	4	-.009	3	-.387	6	-.1	9	-.123	2	-.152	3
223		2	...	.008	5	-.009	5	.01	2	.096	9	.392	6	.148	3	.12	2
224			...	0	4	-.019	4	-.01	3	-.392	6	-.096	9	-.12	2	-.148	3
225		3	...	.009	5	-.011	5	.011	2	.091	9	.398	6	.144	3	.116	2
226			...	0	4	-.021	4	-.011	3	-.398	6	-.091	9	-.116	2	-.144	3
227		4	...	.01	5	-.012	5	.013	2	.086	9	.405	6	.14	3	.111	2
228			...	-.001	4	-.023	4	-.013	3	-.405	6	-.086	9	-.111	2	-.14	3
229		5	...	.011	5	-.013	5	.014	2	.08	9	.413	6	.135	3	.106	2
230			...	-.001	4	-.025	4	-.014	3	-.413	6	-.08	9	-.106	2	-.135	3
231	M37	1	...	0	5	.142	4	.045	8	.05	9	.393	6	.041	3	.052	2
232			...	-.019	4	.096	5	-.044	7	-.393	6	-.05	9	-.052	2	-.041	3
233		2	...	0	5	.14	4	.044	8	.086	9	.342	6	.048	3	.058	2
234			...	-.019	4	.094	5	-.044	7	-.342	6	-.086	9	-.058	2	-.048	3
235		3	...	0	5	.138	4	.044	8	.122	9	.291	6	.054	3	.064	2
236			...	-.019	4	.092	5	-.043	7	-.291	6	-.122	9	-.064	2	-.054	3
237		4	...	0	9	.136	4	.043	8	.157	9	.241	6	.066	8	.076	7

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
238			...	-.019	6	.09	5	-.042	7	-.241	6	-.157	9	-.076	7	-.066	8
239		5	...	0	9	.135	4	.042	8	.191	9	.192	6	.082	8	.091	7
240			...	-.019	6	.089	5	-.042	7	-.192	6	-.191	9	-.091	7	-.082	8
241	M38	1	...	.007	5	.139	4	.042	9	.179	7	.179	8	.053	8	.063	7
242			...	-.007	4	.087	5	-.042	6	-.179	8	-.179	7	-.063	7	-.053	8
243		2	...	.007	5	.138	4	.042	9	.193	7	.157	8	.06	8	.07	7
244			...	-.007	4	.087	5	-.041	6	-.157	8	-.193	7	-.07	7	-.06	8
245		3	...	.007	5	.137	4	.042	9	.208	7	.135	8	.067	8	.076	7
246			...	-.007	4	.086	5	-.041	6	-.135	8	-.208	7	-.076	7	-.067	8
247		4	...	.007	5	.136	4	.041	9	.222	7	.113	8	.073	8	.083	7
248			...	-.007	4	.085	5	-.041	6	-.113	8	-.222	7	-.083	7	-.073	8
249		5	...	.007	5	.136	4	.041	9	.237	7	.091	8	.08	8	.09	7
250			...	-.007	4	.084	5	-.04	6	-.091	8	-.237	7	-.09	7	-.08	8
251	M39	1	...	.017	7	.084	4	.02	9	.237	7	.091	8	.08	8	.09	7
252			...	-.017	6	.032	5	-.02	6	-.091	8	-.237	7	-.09	7	-.08	8
253		2	...	.017	7	.08	4	.019	9	.258	7	.041	8	.092	8	.101	7
254			...	-.017	6	.029	5	-.018	6	-.041	8	-.258	7	-.101	7	-.092	8
255		3	...	.018	7	.077	4	.018	9	.276	7	-.008	8	.103	8	.111	7
256			...	-.018	6	.026	5	-.017	6	.008	8	-.276	7	-.111	7	-.103	8
257		4	...	.019	7	.074	4	.017	9	.294	7	-.054	8	.113	8	.121	7
258			...	-.019	6	.023	5	-.016	6	.054	8	-.294	7	-.121	7	-.113	8
259		5	...	.019	7	.071	4	.015	9	.309	7	-.098	8	.123	8	.13	7
260			...	-.019	6	.02	5	-.015	6	.098	8	-.309	7	-.13	7	-.123	8
261	M40	1	...	.03	7	.019	4	.007	7	.309	7	-.098	8	.123	8	.13	7
262			...	-.03	8	-.032	5	-.006	8	.098	8	-.309	7	-.13	7	-.123	8
263		2	...	.03	7	.015	4	.009	7	.282	7	-.11	8	.117	8	.124	7
264			...	-.03	8	-.036	5	-.008	8	.11	8	-.282	7	-.124	7	-.117	8
265		3	...	.031	7	.011	4	.01	7	.253	7	-.119	8	.109	8	.116	7
266			...	-.031	8	-.04	5	-.01	8	.119	8	-.253	7	-.116	7	-.109	8
267		4	...	.032	7	.007	4	.012	7	.224	1	-.125	8	.101	8	.107	7
268			...	-.032	8	-.044	5	-.011	8	.125	8	-.224	1	-.107	7	-.101	8
269		5	...	.033	7	.003	4	.013	7	.207	4	-.104	5	.091	8	.096	7
270			...	-.033	8	-.048	5	-.013	8	.104	5	-.207	4	-.096	7	-.091	8
271	M41	1	...	0	7	0	1	0	1	0	1	0	1	0	1	0	1
272			...	0	6	0	1	0	1	0	1	0	1	0	1	0	1
273		2	...	0	7	0	1	0	1	0	1	0	1	0	1	0	1
274			...	0	6	0	1	0	1	0	1	0	1	0	1	0	1
275		3	...	0	7	0	1	0	1	0	1	0	1	0	1	0	1
276			...	0	6	0	1	0	1	0	1	0	1	0	1	0	1
277		4	...	0	7	0	1	0	1	0	1	0	1	0	1	0	1
278			...	0	6	0	1	0	1	0	1	0	1	0	1	0	1
279		5	...	0	7	0	1	0	1	0	1	0	1	0	1	0	1
280			...	0	6	0	1	0	1	0	1	0	1	0	1	0	1
281	M42	1	...	.036	7	-.014	4	.021	7	.186	4	.105	5	.031	8	.034	7
282			...	-.036	8	-.066	5	-.02	8	-.105	5	-.186	4	-.034	7	-.031	8
283		2	...	.037	7	-.018	4	.022	2	.175	4	.15	5	.017	8	.019	7
284			...	-.037	8	-.069	5	-.021	3	-.15	5	-.175	4	-.019	7	-.017	8
285		3	...	.038	7	-.021	4	.024	2	.163	4	.198	5	.031	2	.033	3
286			...	-.038	8	-.072	5	-.024	3	-.198	5	-.163	4	-.033	3	-.031	2
287		4	...	.038	7	-.024	4	.026	2	.147	4	.248	5	.048	2	.05	3
288			...	-.038	8	-.076	5	-.026	3	-.248	5	-.147	4	-.05	3	-.048	2
289		5	...	.039	7	-.027	4	.029	2	.13	4	.3	5	.067	2	.068	3
290			...	-.039	8	-.079	5	-.028	3	-.3	5	-.13	4	-.068	3	-.067	2
291	M43	1	...	.031	9	-.014	8	.029	2	.13	4	.3	5	.119	2	.12	3
292			...	-.041	6	-.09	7	-.028	3	-.3	5	-.13	4	-.12	3	-.119	2
293		2	...	.031	9	-.015	8	.03	2	.123	4	.325	5	.128	2	.129	3
294			...	-.042	6	-.092	7	-.029	3	-.325	5	-.123	4	-.129	3	-.128	2

Company : DMJM H&N
Designer : Kevin M. Jones
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
295		3	...	.031	9	-.017	8	.031	2	.115	4	.35	5	.137	2	.138	3
296			...	-.042	6	-.093	7	-.03	3	-.35	5	-.115	4	-.138	3	-.137	2
297		4	...	.031	9	-.018	8	.032	2	.107	4	.375	5	.147	2	.147	3
298			...	-.042	6	-.095	7	-.031	3	-.375	5	-.107	4	-.147	3	-.147	2
299		5	...	.031	9	-.019	8	.033	2	.098	4	.401	5	.157	2	.157	3
300			...	-.043	6	-.096	7	-.032	3	-.401	5	-.098	4	-.157	3	-.157	2
301	M44	1	...	.037	4	.081	5	.047	3	.098	4	.401	5	.243	2	.243	3
302			...	0	5	.033	4	-.047	2	-.401	5	-.098	4	-.243	3	-.243	2
303		2	...	.036	4	.079	5	.046	3	.108	4	.377	5	.229	2	.229	3
304			...	0	5	.032	4	-.046	2	-.377	5	-.108	4	-.229	3	-.229	2
305		3	...	.035	4	.077	5	.045	3	.117	4	.353	5	.216	2	.216	3
306			...	0	5	.031	4	-.045	2	-.353	5	-.117	4	-.216	3	-.216	2
307		4	...	.035	4	.076	5	.044	3	.127	4	.33	5	.202	2	.202	3
308			...	0	5	.031	4	-.044	2	-.33	5	-.127	4	-.202	3	-.202	2
309		5	...	.034	4	.074	5	.043	3	.136	4	.308	5	.189	2	.189	3
310			...	0	5	.03	4	-.043	2	-.308	5	-.136	4	-.189	3	-.189	2
311	M45	1	...	.037	4	.067	5	.043	3	.136	4	.308	5	.243	2	.243	3
312			...	.015	5	.002	4	-.043	2	-.308	5	-.136	4	-.243	3	-.243	2
313		2	...	.036	4	.066	5	.042	3	.136	4	.287	5	.23	2	.23	3
314			...	.015	5	.002	4	-.042	2	-.287	5	-.136	4	-.23	3	-.23	2
315		3	...	.035	4	.064	5	.041	3	.137	4	.268	5	.218	2	.218	3
316			...	.014	5	.002	4	-.041	2	-.268	5	-.137	4	-.218	3	-.218	2
317		4	...	.034	4	.063	5	.04	3	.138	4	.248	5	.205	2	.205	3
318			...	.014	5	.002	4	-.04	2	-.248	5	-.138	4	-.205	3	-.205	2
319		5	...	.033	4	.061	5	.039	3	.138	4	.23	5	.194	2	.194	3
320			...	.014	5	.002	4	-.039	2	-.23	5	-.138	4	-.194	3	-.194	2
321	M46	1	...	.031	4	.046	5	.039	3	.138	4	.23	5	.214	2	.214	3
322			...	.024	5	-.024	4	-.039	2	-.23	5	-.138	4	-.214	3	-.214	2
323		2	...	.03	4	.045	5	.038	3	.131	4	.216	5	.203	2	.203	3
324			...	.024	5	-.023	4	-.038	2	-.216	5	-.131	4	-.203	3	-.203	2
325		3	...	.03	4	.043	5	.037	3	.124	4	.203	5	.191	2	.191	3
326			...	.023	5	-.022	4	-.037	2	-.203	5	-.124	4	-.191	3	-.191	2
327		4	...	.029	4	.042	5	.036	3	.118	4	.19	5	.18	2	.18	3
328			...	.022	5	-.022	4	-.036	2	-.19	5	-.118	4	-.18	3	-.18	2
329		5	...	.028	4	.041	5	.035	3	.111	4	.177	5	.17	2	.17	3
330			...	.022	5	-.021	4	-.035	2	-.177	5	-.111	4	-.17	3	-.17	2
331	M47	1	...	.025	4	.035	2	.032	5	.169	3	.169	2	.111	4	.177	5
332			...	.025	1	-.035	3	-.032	4	-.169	2	-.169	3	-.177	5	-.111	4
333		2	...	.022	4	.03	2	.027	5	.122	3	.122	2	.069	4	.135	5
334			...	.022	1	-.03	3	-.027	4	-.122	2	-.122	3	-.135	5	-.069	4
335		3	...	.018	4	.025	2	.022	5	.082	3	.082	2	.034	4	.1	5
336			...	.018	1	-.025	3	-.022	4	-.082	2	-.082	3	-.1	5	-.034	4
337		4	...	.015	4	.02	2	.017	5	.049	3	.049	2	.005	4	.071	5
338			...	.015	1	-.02	3	-.017	4	-.049	2	-.049	3	-.071	5	-.005	4
339		5	...	.011	4	.016	2	.013	5	.023	3	.023	2	-.017	4	.05	5
340			...	.011	1	-.016	3	-.013	4	-.023	2	-.023	3	-.05	5	.017	4
341	M48	1	...	.013	4	.018	5	.016	3	-.017	4	.05	5	.027	2	.027	3
342			...	.01	5	-.007	4	-.016	2	-.05	5	.017	4	-.027	3	-.027	2
343		2	...	.012	4	.016	5	.015	3	-.018	4	.046	5	.024	2	.024	3
344			...	.009	5	-.006	4	-.015	2	-.046	5	.018	4	-.024	3	-.024	2
345		3	...	.011	4	.015	5	.014	3	-.02	4	.042	5	.02	2	.02	3
346			...	.009	5	-.006	4	-.014	2	-.042	5	.02	4	-.02	3	-.02	2
347		4	...	.011	4	.014	5	.013	3	-.021	4	.038	5	.017	2	.017	3
348			...	.008	5	-.005	4	-.013	2	-.038	5	.021	4	-.017	3	-.017	2
349		5	...	.01	4	.013	5	.013	3	-.022	4	.035	5	.014	2	.014	3
350			...	.008	5	-.005	4	-.013	2	-.035	5	.022	4	-.014	3	-.014	2
351	M49	1	...	.01	4	.019	5	.013	3	-.022	4	.035	5	.02	2	.02	3

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[..	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
352			...	.004	5	.005	4	-.013	2	-.035	5	.022	4	-.02	3	-.02	2
353		2	...	.009	4	.018	5	.012	3	-.021	4	.03	5	.017	2	.017	3
354			...	.004	5	.005	4	-.012	2	-.03	5	.021	4	-.017	3	-.017	2
355		3	...	.009	4	.016	5	.011	3	-.02	4	.026	5	.014	2	.014	3
356			...	.004	5	.004	4	-.011	2	-.026	5	.02	4	-.014	3	-.014	2
357		4	...	.008	4	.015	5	.01	3	-.019	6	.023	7	.012	2	.012	3
358			...	.003	5	.004	4	-.01	2	-.023	7	.019	6	-.012	3	-.012	2
359		5	...	.007	4	.014	5	.009	3	-.018	6	.02	7	.01	2	.01	3
360			...	.003	5	.004	4	-.009	2	-.02	7	.018	6	-.01	3	-.01	2
361	M50	1	...	.006	4	.015	5	.009	3	-.018	8	.02	7	.012	2	.012	3
362			...	0	5	.01	4	-.009	2	-.02	7	.018	8	-.012	3	-.012	2
363		2	...	.005	4	.014	5	.009	3	-.015	8	.016	7	.01	2	.01	3
364			...	0	5	.01	4	-.009	2	-.016	7	.015	8	-.01	3	-.01	2
365		3	...	.004	4	.012	5	.008	3	-.013	5	.013	4	.008	2	.008	3
366			...	0	5	.009	4	-.008	2	-.013	4	.013	5	-.008	3	-.008	2
367		4	...	.004	8	.011	9	.007	3	-.01	5	.011	4	.006	2	.006	3
368			...	0	9	.008	6	-.007	2	-.011	4	.01	5	-.006	3	-.006	2
369		5	...	.003	8	.01	9	.006	3	-.007	5	.009	4	.005	2	.005	3
370			...	0	9	.007	6	-.006	2	-.009	4	.007	5	-.005	3	-.005	2
371	M51	1	...	.001	6	.009	6	.006	3	-.007	5	.009	4	.006	2	.006	3
372			...	-.002	9	.009	7	-.006	2	-.009	4	.007	5	-.006	3	-.006	2
373		2	...	.001	6	.008	6	.005	3	-.005	5	.007	4	.004	2	.004	3
374			...	-.002	9	.008	7	-.005	2	-.007	4	.005	5	-.004	3	-.004	2
375		3	...	.001	4	.007	4	.005	3	-.004	5	.005	4	.003	2	.003	3
376			...	-.002	5	.007	5	-.005	2	-.005	4	.004	5	-.003	3	-.003	2
377		4	...	.001	4	.006	4	.004	3	-.002	5	.004	4	.002	2	.002	3
378			...	-.002	5	.005	5	-.004	2	-.004	4	.002	5	-.002	3	-.002	2
379		5	...	.001	4	.005	4	.003	3	-.001	5	.003	4	.001	2	.001	3
380			...	-.002	5	.004	5	-.003	2	-.003	4	.001	5	-.001	3	-.001	2
381	M52	1	...	0	4	.006	4	.003	3	-.001	5	.003	4	.001	2	.001	3
382			...	-.003	5	.002	5	-.003	2	-.003	4	.001	5	-.001	3	-.001	2
383		2	...	0	4	.004	4	.002	3	0	5	.001	4	0	2	0	3
384			...	-.002	5	.002	5	-.002	2	-.001	4	0	5	0	3	0	2
385		3	...	0	4	.003	4	.002	3	0	5	0	4	0	2	0	3
386			...	-.001	5	.001	5	-.002	2	0	4	0	5	0	3	0	2
387		4	...	0	4	.001	4	0	3	0	5	0	4	0	2	0	3
388			...	0	5	0	5	0	2	0	4	0	5	0	3	0	2
389		5	...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
390			...	0	1	0	1	0	1	0	1	0	1	0	1	0	1
391	M53	1	...	.119	7	.55	7	.216	9	-.205	1	2.259	7	2.798	6	2.798	9
392			...	-.119	8	.078	1	-.216	6	-2.2...	7	.205	1	-2.798	9	-2.798	6
393		2	...	.122	7	.537	7	.21	9	-.091	1	1.391	7	2.457	6	2.457	9
394			...	-.122	8	.065	1	-.21	6	-1.3...	7	.091	1	-2.457	9	-2.457	6
395		3	...	.124	7	.523	7	.205	9	.001	1	.571	8	2.125	6	2.125	9
396			...	-.124	8	.051	1	-.205	6	-.571	8	-.001	1	-2.125	9	-2.125	6
397		4	...	.127	7	.51	7	.2	9	.281	7	-.072	1	1.802	6	1.802	9
398			...	-.127	8	.038	1	-.2	6	.072	1	-.281	7	-1.802	9	-1.802	6
399		5	...	.13	7	.496	7	.194	9	1.0...	7	-.122	1	1.487	6	1.487	9
400			...	-.13	8	.024	1	-.194	6	.122	1	-1.085	7	-1.487	9	-1.487	6
401	M54	1	...	-.009	9	.032	9	.016	7	.037	9	-.01	6	.019	7	.019	8
402			...	-.032	6	.009	6	-.016	8	.01	6	-.037	9	-.019	8	-.019	7
403		2	...	-.008	9	.029	9	.015	7	.051	9	-.014	6	.026	7	.026	8
404			...	-.03	6	.008	6	-.015	8	.014	6	-.051	9	-.026	8	-.026	7
405		3	...	-.008	9	.025	9	.013	7	.063	9	-.017	6	.033	7	.033	8
406			...	-.028	6	.007	6	-.013	8	.017	6	-.063	9	-.033	8	-.033	7
407		4	...	-.007	9	.022	9	.011	7	.074	9	-.02	6	.038	7	.038	8
408			...	-.026	6	.006	6	-.011	8	.02	6	-.074	9	-.038	8	-.038	7

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
409		5	...	-.007	9	.018	9	.009	7	.083	9	-.023	6	.043	7	.043	8
410			...	-.024	6	.005	6	-.009	8	.023	6	-.083	9	-.043	8	-.043	7
411	M55	1	...	0	9	-.007	6	.014	8	.083	9	-.023	6	.043	7	.043	8
412			...	-.002	6	-.027	9	-.014	7	.023	6	-.083	9	-.043	8	-.043	7
413		2	...	0	9	-.008	6	.014	8	.08	9	-.022	6	.041	7	.041	8
414			...	-.001	6	-.028	9	-.014	7	.022	6	-.08	9	-.041	8	-.041	7
415		3	...	0	9	-.008	6	.015	8	.077	9	-.021	6	.039	7	.039	8
416			...	0	6	-.029	9	-.015	7	.021	6	-.077	9	-.039	8	-.039	7
417		4	...	0	9	-.008	6	.015	8	.073	9	-.02	6	.037	7	.037	8
418			...	0	6	-.03	9	-.015	7	.02	6	-.073	9	-.037	8	-.037	7
419		5	...	0	6	-.008	6	.016	8	.07	9	-.019	6	.036	7	.036	8
420			...	0	9	-.031	9	-.016	7	.019	6	-.07	9	-.036	8	-.036	7
421	M56	1	...	0	1	-.008	6	.016	8	.07	9	-.019	6	.036	7	.036	8
422			...	0	1	-.031	9	-.016	7	.019	6	-.07	9	-.036	8	-.036	7
423		2	...	.001	6	-.009	6	.017	8	.058	9	-.016	6	.03	7	.03	8
424			...	0	9	-.033	9	-.017	7	.016	6	-.058	9	-.03	8	-.03	7
425		3	...	.003	6	-.01	6	.019	8	.046	9	-.013	6	.023	7	.023	8
426			...	0	9	-.036	9	-.019	7	.013	6	-.046	9	-.023	8	-.023	7
427		4	...	.004	6	-.011	6	.02	8	.032	9	-.009	6	.016	7	.016	8
428			...	.001	9	-.039	9	-.02	7	.009	6	-.032	9	-.016	8	-.016	7
429		5	...	.006	6	-.011	6	.021	8	.018	9	-.005	6	.009	7	.009	8
430			...	.002	9	-.042	9	-.021	7	.005	6	-.018	9	-.009	8	-.009	7
431	M57	1	...	.006	6	-.011	6	.021	8	.018	9	-.005	6	.009	7	.009	8
432			...	.002	9	-.042	9	-.021	7	.005	6	-.018	9	-.009	8	-.009	7
433		2	...	.008	6	-.013	6	.024	8	-.002	6	.01	9	.005	8	.005	7
434			...	.002	9	-.047	9	-.024	7	-.01	9	.002	6	-.005	7	-.005	8
435		3	...	.01	6	-.014	6	.026	8	-.011	6	.041	9	.021	8	.021	7
436			...	.003	9	-.052	9	-.026	7	-.041	9	.011	6	-.021	7	-.021	8
437		4	...	.013	6	-.016	6	.029	8	-.02	6	.076	9	.039	8	.039	7
438			...	.004	9	-.056	9	-.029	7	-.076	9	.02	6	-.039	7	-.039	8
439		5	...	.015	6	-.017	6	.031	8	-.031	6	.113	9	.058	8	.058	7
440			...	.004	9	-.061	9	-.031	7	-.113	9	.031	6	-.058	7	-.058	8
441	M58	1	...	-.009	8	.032	8	.016	9	.037	8	-.01	7	.019	9	.019	6
442			...	-.032	7	.009	7	-.016	6	.01	7	-.037	8	-.019	6	-.019	9
443		2	...	-.008	8	.029	8	.015	9	.051	8	-.014	7	.026	9	.026	6
444			...	-.03	7	.008	7	-.015	6	.014	7	-.051	8	-.026	6	-.026	9
445		3	...	-.008	8	.025	8	.013	9	.063	8	-.017	7	.033	9	.033	6
446			...	-.028	7	.007	7	-.013	6	.017	7	-.063	8	-.033	6	-.033	9
447		4	...	-.007	8	.022	8	.011	9	.074	8	-.02	7	.038	9	.038	6
448			...	-.026	7	.006	7	-.011	6	.02	7	-.074	8	-.038	6	-.038	9
449		5	...	-.007	8	.018	8	.009	9	.083	8	-.023	7	.043	9	.043	6
450			...	-.024	7	.005	7	-.009	6	.023	7	-.083	8	-.043	6	-.043	9
451	M59	1	...	0	8	-.007	7	.014	6	.083	8	-.023	7	.043	9	.043	6
452			...	-.002	7	-.027	8	-.014	9	.023	7	-.083	8	-.043	6	-.043	9
453		2	...	0	8	-.008	7	.014	6	.08	8	-.022	7	.041	9	.041	6
454			...	-.001	7	-.028	8	-.014	9	.022	7	-.08	8	-.041	6	-.041	9
455		3	...	0	8	-.008	7	.015	6	.077	8	-.021	7	.039	9	.039	6
456			...	0	7	-.029	8	-.015	9	.021	7	-.077	8	-.039	6	-.039	9
457		4	...	0	8	-.008	7	.015	6	.073	8	-.02	7	.037	9	.038	6
458			...	0	7	-.03	8	-.015	9	.02	7	-.073	8	-.038	6	-.037	9
459		5	...	0	6	-.008	7	.016	6	.07	8	-.019	7	.036	9	.036	6
460			...	0	9	-.031	8	-.016	9	.019	7	-.07	8	-.036	6	-.036	9
461	M60	1	...	0	1	-.008	7	.016	6	.07	8	-.019	7	.036	9	.036	6
462			...	0	1	-.031	8	-.016	9	.019	7	-.07	8	-.036	6	-.036	9
463		2	...	.001	7	-.009	7	.017	6	.058	8	-.016	7	.03	9	.03	6
464			...	0	8	-.033	8	-.017	9	.016	7	-.058	8	-.03	6	-.03	9
465		3	...	.003	7	-.01	7	.019	6	.046	8	-.013	7	.023	9	.023	6

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[..	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
466			...	0	8	-.036	8	-.019	9	.013	7	-.046	8	-.023	6	-.023	9
467		4	...	.004	7	-.011	7	.02	6	.032	8	-.009	7	.016	9	.016	6
468			...	.001	8	-.039	8	-.02	9	.009	7	-.032	8	-.016	6	-.016	9
469		5	...	.006	7	-.011	7	.021	6	.018	8	-.005	7	.009	9	.009	6
470			...	.002	8	-.042	8	-.021	9	.005	7	-.018	8	-.009	6	-.009	9
471	M61	1	...	.006	7	-.011	7	.021	6	.018	8	-.005	7	.009	9	.009	6
472			...	.002	8	-.042	8	-.021	9	.005	7	-.018	8	-.009	6	-.009	9
473		2	...	.008	7	-.013	7	.024	6	-.002	7	.01	8	.005	6	.005	9
474			...	.002	8	-.047	8	-.024	9	-.01	8	.002	7	-.005	9	-.005	6
475		3	...	.01	7	-.014	7	.026	6	-.011	7	.041	8	.021	6	.021	9
476			...	.003	8	-.052	8	-.026	9	-.041	8	.011	7	-.021	9	-.021	6
477		4	...	.013	7	-.016	7	.029	6	-.02	7	.076	8	.039	6	.039	9
478			...	.004	8	-.056	8	-.029	9	-.076	8	.02	7	-.039	9	-.039	6
479		5	...	.015	7	-.017	7	.031	6	-.031	7	.113	8	.058	6	.058	9
480			...	.004	8	-.061	8	-.031	9	-.113	8	.031	7	-.058	9	-.058	6
481	M62	1	...	0	1	0	1	0	1	.846	6	-.617	1	1.529	9	1.529	6
482			...	0	1	0	1	0	1	.617	1	-.846	6	-1.529	6	-1.529	9
483		2	...	.004	7	-.015	1	.008	6	.834	6	-.604	1	1.522	9	1.522	6
484			...	-.004	8	-.015	1	-.008	9	.604	1	-.834	6	-1.522	6	-1.522	9
485		3	...	.008	7	-.029	1	.016	6	.796	6	-.566	1	1.5	9	1.5	6
486			...	-.008	8	-.029	1	-.016	9	.566	1	-.796	6	-1.5	6	-1.5	9
487		4	...	.012	7	-.044	1	.025	6	.733	6	-.503	1	1.465	9	1.465	6
488			...	-.012	8	-.044	1	-.025	9	.503	1	-.733	6	-1.465	6	-1.465	9
489		5	...	.016	7	-.058	1	.033	6	.645	6	-.415	1	1.415	9	1.415	6
490			...	-.016	8	-.058	1	-.033	9	.415	1	-.645	6	-1.415	6	-1.415	9
491	M63	1	...	.028	7	-.099	4	.056	6	.645	6	-.415	1	1.415	9	1.415	6
492			...	-.028	8	-.099	2	-.056	9	.415	1	-.645	6	-1.415	6	-1.415	9
493		2	...	.029	7	-.103	4	.058	6	.59	6	-.361	1	1.384	9	1.384	6
494			...	-.029	8	-.103	2	-.058	9	.361	1	-.59	6	-1.384	6	-1.384	9
495		3	...	.031	7	-.108	4	.061	6	.533	6	-.303	1	1.358	7	1.358	8
496			...	-.031	8	-.108	2	-.061	9	.303	1	-.533	6	-1.358	8	-1.358	7
497		4	...	.032	7	-.112	4	.064	6	.473	6	-.243	1	1.358	7	1.358	8
498			...	-.032	8	-.112	2	-.064	9	.243	1	-.473	6	-1.358	8	-1.358	7
499		5	...	.033	7	-.117	4	.066	6	.411	6	-.181	1	1.358	7	1.358	8
500			...	-.033	8	-.117	2	-.066	9	.181	1	-.411	6	-1.358	8	-1.358	7
501	M64	1	...	.045	7	-.158	1	.089	6	.411	6	-.181	1	1.358	7	1.358	8
502			...	-.045	8	-.158	4	-.089	9	.181	1	-.411	6	-1.358	8	-1.358	7
503		2	...	.047	7	-.165	1	.093	6	.264	6	-.034	1	1.358	7	1.358	8
504			...	-.047	8	-.165	4	-.093	9	.034	1	-.264	6	-1.358	8	-1.358	7
505		3	...	.049	7	-.173	1	.098	6	.11	6	.12	1	1.358	7	1.358	8
506			...	-.049	8	-.173	4	-.098	9	-.12	1	-.11	6	-1.358	8	-1.358	7
507		4	...	.051	7	-.18	1	.102	6	-.051	6	.281	1	1.358	7	1.358	8
508			...	-.051	8	-.18	4	-.102	9	-.281	1	.051	6	-1.358	8	-1.358	7
509		5	...	.053	7	-.188	1	.106	6	-.219	6	.448	1	1.358	7	1.358	8
510			...	-.053	8	-.188	4	-.106	9	-.448	1	.219	6	-1.358	8	-1.358	7
511	M65	1	...	0	1	0	1	0	1	.846	7	-.617	1	1.529	7	1.529	8
512			...	0	1	0	1	0	1	.617	1	-.846	7	-1.529	8	-1.529	7
513		2	...	.004	6	-.015	1	.008	8	.834	7	-.604	1	1.522	7	1.522	8
514			...	-.004	9	-.015	1	-.008	7	.604	1	-.834	7	-1.522	8	-1.522	7
515		3	...	.008	6	-.029	1	.016	8	.796	7	-.566	1	1.5	7	1.5	8
516			...	-.008	9	-.029	1	-.016	7	.566	1	-.796	7	-1.5	8	-1.5	7
517		4	...	.012	6	-.044	1	.025	8	.733	7	-.503	1	1.465	7	1.465	8
518			...	-.012	9	-.044	1	-.025	7	.503	1	-.733	7	-1.465	8	-1.465	7
519		5	...	.016	6	-.058	1	.033	8	.645	7	-.415	1	1.415	7	1.415	8
520			...	-.016	9	-.058	1	-.033	7	.415	1	-.645	7	-1.415	8	-1.415	7
521	M66	1	...	.028	6	-.099	6	.056	8	.645	7	-.415	1	1.415	7	1.415	8
522			...	-.028	9	-.099	2	-.056	7	.415	1	-.645	7	-1.415	8	-1.415	7

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
523		2	...	.029	6	-.103	6	.058	8	.59	7	-.361	1	1.384	7	1.384	8
524			...	-.029	9	-.103	2	-.058	7	.361	1	-.59	7	-1.384	8	-1.384	7
525		3	...	.031	6	-.108	6	.061	8	.533	7	-.303	1	1.358	9	1.358	6
526			...	-.031	9	-.108	2	-.061	7	.303	1	-.533	7	-1.358	6	-1.358	9
527		4	...	.032	6	-.112	6	.064	8	.473	7	-.243	1	1.358	9	1.358	6
528			...	-.032	9	-.112	2	-.064	7	.243	1	-.473	7	-1.358	6	-1.358	9
529		5	...	.033	6	-.117	6	.066	8	.411	7	-.181	1	1.358	9	1.358	6
530			...	-.033	9	-.117	2	-.066	7	.181	1	-.411	7	-1.358	6	-1.358	9
531	M67	1	...	.045	6	-.158	1	.089	8	.411	7	-.181	1	1.358	9	1.358	6
532			...	-.045	9	-.158	3	-.089	7	.181	1	-.411	7	-1.358	6	-1.358	9
533		2	...	.047	6	-.165	1	.093	8	.264	7	-.034	1	1.358	9	1.358	6
534			...	-.047	9	-.165	3	-.093	7	.034	1	-.264	7	-1.358	6	-1.358	9
535		3	...	.049	6	-.173	1	.098	8	.11	7	.12	1	1.358	9	1.358	6
536			...	-.049	9	-.173	3	-.098	7	-.12	1	-.11	7	-1.358	6	-1.358	9
537		4	...	.051	6	-.18	1	.102	8	-.051	7	.281	1	1.358	9	1.358	6
538			...	-.051	9	-.18	3	-.102	7	-.281	1	.051	7	-1.358	6	-1.358	9
539		5	...	.053	6	-.188	1	.106	8	-.219	7	.448	1	1.358	9	1.358	6
540			...	-.053	9	-.188	3	-.106	7	-.448	1	.219	7	-1.358	6	-1.358	9
541	M68	1	...	-.017	8	.094	8	.048	9	-.04	7	.144	8	.073	6	.073	9
542			...	-.062	7	.026	7	-.048	6	-.144	8	.04	7	-.073	9	-.073	6
543		2	...	-.017	8	.09	8	.046	9	-.027	7	.095	8	.048	6	.048	9
544			...	-.06	7	.025	7	-.046	6	-.095	8	.027	7	-.048	9	-.048	6
545		3	...	-.016	8	.086	8	.044	9	-.014	7	.049	8	.025	6	.025	9
546			...	-.058	7	.024	7	-.044	6	-.049	8	.014	7	-.025	9	-.025	6
547		4	...	-.016	8	.082	8	.042	9	-.002	7	.005	8	.002	6	.002	9
548			...	-.056	7	.023	7	-.042	6	-.005	8	.002	7	-.002	9	-.002	6
549		5	...	-.015	8	.077	8	.039	9	.037	8	-.01	7	.019	9	.019	6
550			...	-.054	7	.022	7	-.039	6	.01	7	-.037	8	-.019	6	-.019	9
551	M69	1	...	-.017	9	.094	9	.048	7	-.04	6	.144	9	.073	8	.073	7
552			...	-.062	6	.026	6	-.048	8	-.144	9	.04	6	-.073	7	-.073	8
553		2	...	-.017	9	.09	9	.046	7	-.027	6	.095	9	.048	8	.048	7
554			...	-.06	6	.025	6	-.046	8	-.095	9	.027	6	-.048	7	-.048	8
555		3	...	-.016	9	.086	9	.044	7	-.014	6	.049	9	.025	8	.025	7
556			...	-.058	6	.024	6	-.044	8	-.049	9	.014	6	-.025	7	-.025	8
557		4	...	-.016	9	.082	9	.042	7	-.002	6	.005	9	.002	8	.002	7
558			...	-.056	6	.023	6	-.042	8	-.005	9	.002	6	-.002	7	-.002	8
559		5	...	-.015	9	.077	9	.039	7	.037	9	-.01	6	.019	7	.019	8
560			...	-.054	6	.022	6	-.039	8	.01	6	-.037	9	-.019	8	-.019	7
561	M70	1	...	.183	7	.419	8	.171	9	4.3...	7	-.087	1	.229	6	.229	9
562			...	-.101	8	-.034	1	-.171	6	.087	1	-4.347	7	-.229	9	-.229	6
563		2	...	.183	7	.416	8	.17	9	4.4...	7	-.077	1	.178	6	.178	9
564			...	-.102	8	-.037	1	-.17	6	.077	1	-4.458	7	-.178	9	-.178	6
565		3	...	.184	7	.414	8	.169	9	4.5...	7	-.065	1	.128	6	.128	9
566			...	-.103	8	-.039	1	-.169	6	.065	1	-4.568	7	-.128	9	-.128	6
567		4	...	.184	7	.412	8	.168	9	4.6...	7	-.053	1	.077	6	.077	9
568			...	-.103	8	-.041	1	-.168	6	.053	1	-4.677	7	-.077	9	-.077	6
569		5	...	.184	7	.41	8	.167	9	4.7...	7	-.041	1	.028	6	.028	9
570			...	-.104	8	-.044	1	-.167	6	.041	1	-4.785	7	-.028	9	-.028	6
571	M71	1	...	.24	7	.458	8	.167	9	4.7...	7	-.041	1	.051	6	.051	9
572			...	-.018	8	-.038	1	-.167	6	.041	1	-4.785	7	-.051	9	-.051	6
573		2	...	.239	7	.457	8	.166	9	4.8...	7	-.029	1	.028	5	.028	4
574			...	-.019	8	-.041	1	-.166	6	.029	1	-4.843	7	-.028	4	-.028	5
575		3	...	.239	7	.455	8	.165	9	4.9	7	-.017	1	.069	5	.069	4
576			...	-.02	8	-.043	1	-.165	6	.017	1	-4.9	7	-.069	4	-.069	5
577		4	...	.239	7	.453	8	.164	9	4.9...	7	-.004	1	.111	5	.111	4
578			...	-.021	8	-.045	1	-.164	6	.004	1	-4.956	7	-.111	4	-.111	5
579		5	...	.238	7	.452	8	.163	9	5.0...	7	.01	1	.151	5	.151	4

Company : DMJM H&N
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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[..	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
580			...	-.022	8	-.047	1	-.163	6	-.01	1	-5.011	7	-.151	4	-.151	5
581	M72	1	...	.255	7	.435	8	.163	9	5.0...	7	.01	1	.115	9	.115	6
582			...	-.022	1	-.033	1	-.163	6	-.01	1	-5.011	7	-.115	6	-.115	9
583		2	...	.255	7	.434	8	.162	9	5.0...	7	.02	1	.163	9	.163	6
584			...	-.023	1	-.034	1	-.162	6	-.02	1	-5.007	7	-.163	6	-.163	9
585		3	...	.254	7	.433	8	.161	9	5.0...	3	.03	1	.212	9	.212	6
586			...	-.024	1	-.035	1	-.161	6	-.03	1	-5.015	3	-.212	6	-.212	9
587		4	...	.253	7	.433	8	.16	9	5.1...	3	.041	1	.259	9	.259	6
588			...	-.025	1	-.037	1	-.16	6	-.041	1	-5.106	3	-.259	6	-.259	9
589		5	...	.252	7	.432	8	.159	9	5.1...	3	.052	1	.307	9	.307	6
590			...	-.026	1	-.038	1	-.159	6	-.052	1	-5.197	3	-.307	6	-.307	9
591	M73	1	...	.228	7	.352	8	.159	9	5.1...	3	.052	1	.244	9	.244	6
592			...	-.033	1	-.213	7	-.159	6	-.052	1	-5.197	3	-.244	6	-.244	9
593		2	...	.227	7	.353	8	.158	9	5.2...	8	.057	1	.291	9	.291	6
594			...	-.034	1	-.215	7	-.158	6	-.057	1	-5.295	8	-.291	6	-.291	9
595		3	...	.225	7	.353	8	.157	9	5.4	8	.062	1	.338	9	.338	6
596			...	-.035	1	-.216	7	-.157	6	-.062	1	-5.4	8	-.338	6	-.338	9
597		4	...	.224	7	.354	8	.156	9	5.5...	8	.067	1	.385	9	.385	6
598			...	-.036	1	-.218	7	-.156	6	-.067	1	-5.505	8	-.385	6	-.385	9
599		5	...	.223	7	.354	8	.155	9	5.6...	8	.072	1	.431	9	.431	6
600			...	-.038	1	-.219	7	-.155	6	-.072	1	-5.611	8	-.431	6	-.431	9
601	M74	1	...	1.052	8	.013	1	.048	4	-.026	1	10.138	8	.157	5	.157	4
602			...	.027	1	-.558	2	-.048	5	-10...	8	.026	1	-.157	4	-.157	5
603		2	...	1.051	8	.013	1	.049	4	-.023	1	10.299	8	.143	5	.143	4
604			...	.025	1	-.56	2	-.049	5	-10...	8	.023	1	-.143	4	-.143	5
605		3	...	1.05	8	.013	1	.05	4	-.019	1	10.459	8	.128	5	.128	4
606			...	.024	1	-.561	2	-.05	5	-10...	8	.019	1	-.128	4	-.128	5
607		4	...	1.048	8	.012	1	.052	4	-.015	1	10.619	8	.113	5	.113	4
608			...	.023	1	-.563	2	-.052	5	-10...	8	.015	1	-.113	4	-.113	5
609		5	...	1.047	8	.012	1	.053	4	-.012	1	10.78	9	.098	5	.098	4
610			...	.022	1	-.565	2	-.053	5	-10...	9	.012	1	-.098	4	-.098	5
611	M75	1	...	1.07	9	.319	3	.053	4	-.012	1	10.78	8	.192	5	.192	4
612			...	.018	1	.027	1	-.053	5	-10...	8	.012	1	-.192	4	-.192	5
613		2	...	1.069	9	.319	3	.054	4	-.004	1	10.689	8	.177	5	.177	4
614			...	.017	1	.026	1	-.054	5	-10...	8	.004	1	-.177	4	-.177	5
615		3	...	1.068	9	.318	3	.055	4	.004	1	10.599	8	.16	5	.16	4
616			...	.016	1	.025	1	-.055	5	-10...	8	-.004	1	-.16	4	-.16	5
617		4	...	1.066	9	.318	3	.057	4	.011	1	10.509	8	.144	5	.144	4
618			...	.015	1	.023	1	-.057	5	-10...	8	-.011	1	-.144	4	-.144	5
619		5	...	1.065	9	.318	3	.058	4	.018	1	10.419	8	.127	5	.127	4
620			...	.014	1	.022	1	-.058	5	-10...	8	-.018	1	-.127	4	-.127	5
621	M76	1	...	.93	2	1.102	3	.058	4	.018	1	10.419	8	.197	5	.197	4
622			...	.009	1	.031	1	-.058	5	-10...	8	-.018	1	-.197	4	-.197	5
623		2	...	.929	2	1.1	3	.059	4	.027	1	10.093	8	.18	5	.18	4
624			...	.008	1	.029	1	-.059	5	-10...	8	-.027	1	-.18	4	-.18	5
625		3	...	.929	2	1.099	3	.061	4	.035	1	9.768	9	.162	5	.162	4
626			...	.007	1	.027	1	-.061	5	-9.7...	9	-.035	1	-.162	4	-.162	5
627		4	...	.929	2	1.098	3	.062	4	.042	1	9.444	9	.144	5	.144	4
628			...	.006	1	.024	1	-.062	5	-9.4...	9	-.042	1	-.144	4	-.144	5
629		5	...	.929	2	1.096	3	.063	4	.049	1	9.12	9	.125	9	.125	6
630			...	.006	1	.022	1	-.063	5	-9.12	9	-.049	1	-.125	6	-.125	9
631	M77	1	...	.66	2	1.711	8	.063	4	.049	1	9.12	8	.176	9	.176	6
632			...	.001	1	.025	1	-.063	5	-9.12	8	-.049	1	-.176	6	-.176	9
633		2	...	.659	2	1.709	8	.065	4	.056	1	8.612	2	.159	9	.159	6
634			...	0	1	.023	1	-.065	5	-8.6...	2	-.056	1	-.159	6	-.159	9
635		3	...	.659	2	1.706	8	.066	4	.063	1	8.116	2	.141	9	.141	6
636			...	0	1	.02	1	-.066	5	-8.1...	2	-.063	1	-.141	6	-.141	9

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
637		4	...	.659	2	1.704	8	.067	4	.068	1	7.621	2	.123	9	.123	6
638			...	0	1	.018	1	-.067	5	-7.6...	2	-.068	1	-.123	6	-.123	9
639		5	...	.659	2	1.702	8	.068	4	.073	1	7.126	2	.105	7	.105	6
640			...	0	1	.015	1	-.068	5	-7.1...	2	-.073	1	-.105	6	-.105	7
641	M78	1	...	.482	2	1.919	8	.068	4	.073	1	7.126	2	.122	9	.122	6
642			...	-.003	1	.015	1	-.068	5	-7.1...	2	-.073	1	-.122	6	-.122	9
643		2	...	.482	2	1.91	8	.073	4	.085	1	5.173	2	.056	9	.056	6
644			...	-.003	1	.006	1	-.073	5	-5.1...	2	-.085	1	-.056	6	-.056	9
645		3	...	.482	2	1.902	8	.078	4	.087	1	3.229	2	.044	4	.044	5
646			...	-.003	1	-.002	1	-.078	5	-3.2...	2	-.087	1	-.044	5	-.044	4
647		4	...	.482	2	1.893	8	.082	4	.08	1	1.294	2	.127	4	.127	5
648			...	-.003	1	-.011	1	-.082	5	-1.2...	2	-.08	1	-.127	5	-.127	4
649		5	...	.482	2	1.884	8	.087	4	.846	3	-.064	1	.215	4	.215	5
650			...	-.003	1	-.02	1	-.087	5	.064	1	-.846	3	-.215	5	-.215	4
651	M79	1	...	.294	2	2.026	8	.087	4	.846	3	-.064	1	.197	4	.197	5
652			...	0	1	-.02	1	-.087	5	.064	1	-.846	3	-.197	5	-.197	4
653		2	...	.295	2	2.023	8	.088	4	1.4...	3	-.058	1	.223	4	.223	5
654			...	0	1	-.022	1	-.088	5	.058	1	-1.446	3	-.223	5	-.223	4
655		3	...	.296	2	2.02	8	.089	4	2.0...	3	-.05	1	.25	4	.25	5
656			...	.001	1	-.025	1	-.089	5	.05	1	-2.045	3	-.25	5	-.25	4
657		4	...	.297	2	2.018	8	.091	4	2.6...	3	-.043	1	.277	4	.277	5
658			...	.001	1	-.027	1	-.091	5	.043	1	-2.643	3	-.277	5	-.277	4
659		5	...	.297	2	2.015	8	.092	4	3.2...	3	-.034	1	.304	4	.304	5
660			...	.002	1	-.03	1	-.092	5	.034	1	-3.241	3	-.304	5	-.304	4
661	M80	1	...	.007	1	2.072	2	.092	4	3.2...	3	-.034	1	.24	4	.24	5
662			...	-.145	3	-.026	1	-.092	5	.034	1	-3.241	3	-.24	5	-.24	4
663		2	...	.008	1	2.07	2	.093	4	3.8...	3	-.026	1	.267	4	.267	5
664			...	-.145	3	-.028	1	-.093	5	.026	1	-3.851	3	-.267	5	-.267	4
665		3	...	.008	1	2.069	2	.095	4	4.46	3	-.017	1	.295	4	.295	5
666			...	-.145	3	-.03	1	-.095	5	.017	1	-4.46	3	-.295	5	-.295	4
667		4	...	.009	1	2.068	2	.096	4	5.0...	3	-.008	1	.323	4	.323	5
668			...	-.145	3	-.032	1	-.096	5	.008	1	-5.068	3	-.323	5	-.323	4
669		5	...	.01	1	2.066	2	.097	4	5.6...	3	.002	1	.352	4	.352	5
670			...	-.145	3	-.035	1	-.097	5	-.002	1	-5.676	3	-.352	5	-.352	4
671	M81	1	...	.016	1	-1.831	2	.097	4	5.6...	3	.002	1	.243	4	.243	5
672			...	-.524	9	-.024	1	-.097	5	-.002	1	-5.676	3	-.243	5	-.243	4
673		2	...	.017	1	1.83	2	.098	4	6.2...	3	.009	1	.272	4	.272	5
674			...	-.524	9	-.026	1	-.098	5	-.009	1	-6.203	3	-.272	5	-.272	4
675		3	...	.018	1	1.83	2	.1	4	6.73	3	.017	1	.302	4	.302	5
676			...	-.523	9	-.027	1	-.1	5	-.017	1	-6.73	3	-.302	5	-.302	4
677		4	...	.019	1	1.83	2	.101	4	7.2...	3	.026	1	.331	4	.331	5
678			...	-.522	9	-.029	1	-.101	5	-.026	1	-7.256	3	-.331	5	-.331	4
679		5	...	.02	1	1.83	2	.102	4	7.7...	3	.034	1	.362	4	.362	5
680			...	-.521	3	-.03	1	-.102	5	-.034	1	-7.782	3	-.362	5	-.362	4
681	M82	1	...	.024	1	1.32	2	.102	4	7.7...	3	.034	1	.206	4	.206	5
682			...	-.822	9	-.012	1	-.102	5	-.034	1	-7.782	3	-.206	5	-.206	4
683		2	...	.025	1	1.321	2	.104	4	8.1...	8	.038	1	.237	4	.237	5
684			...	-.821	9	-.013	1	-.104	5	-.038	1	-8.148	8	-.237	5	-.237	4
685		3	...	.027	1	1.321	2	.105	4	8.5...	8	.042	1	.268	4	.268	5
686			...	-.819	9	-.013	1	-.105	5	-.042	1	-8.517	8	-.268	5	-.268	4
687		4	...	.028	1	1.322	2	.106	4	8.8...	8	.046	1	.3	4	.3	5
688			...	-.818	9	-.014	1	-.106	5	-.046	1	-8.886	8	-.3	5	-.3	4
689		5	...	.029	1	1.323	2	.108	4	9.2...	8	.05	1	.331	4	.331	5
690			...	-.817	9	-.014	1	-.108	5	-.05	1	-9.254	8	-.331	5	-.331	4
691	M83	1	...	.028	1	.003	1	.108	5	.05	1	9.254	8	.238	5	.238	4
692			...	-.924	8	-.989	2	-.108	4	-9.2...	8	-.05	1	-.238	4	-.238	5
693		2	...	.033	1	.003	1	.113	5	.053	1	10.351	2	.363	5	.363	4

Company : DMJM H&N
Designer : Kevin M. Jones
Job Number : 145579-V-CA-005 DBVS Off-Gas Treatment Duct Analysis

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	lc	y Shear[...	lc	z Shear[k...	lc	y-T...	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
694			...	-.919	8	-.994	2	-.113	4	-10...	2	-.053	1	-.363	4	-.363	5
695		3	...	.038	1	.003	1	.118	5	.057	1	11.482	2	.494	5	.494	4
696			...	-.914	8	-.998	2	-.118	4	-11...	2	-.057	1	-.494	4	-.494	5
697		4	...	.043	1	.003	1	.123	5	.06	1	12.619	2	.63	5	.63	4
698			...	-.909	8	-1.003	2	-.123	4	-12...	2	-.06	1	-.63	4	-.63	5
699		5	...	.047	1	.003	1	.128	5	.063	1	13.762	2	.772	5	.772	4
700			...	-.905	8	-1.008	2	-.128	4	-13...	2	-.063	1	-.772	4	-.772	5
701	M84	1	...	0	1	0	1	0	1	.011	1	-.011	1	.008	3	.008	2
702			...	0	1	0	1	0	1	.011	1	-.011	1	-.008	2	-.008	3
703		2	...	0	7	-.002	1	.001	2	.011	1	-.011	1	.008	3	.008	2
704			...	0	6	-.002	1	-.001	3	.011	1	-.011	1	-.008	2	-.008	3
705		3	...	0	7	-.004	1	.002	2	.01	1	-.01	1	.007	3	.007	2
706			...	0	6	-.004	1	-.002	3	.01	1	-.01	1	-.007	2	-.007	3
707		4	...	.001	7	-.005	1	.004	2	.009	1	-.009	1	.006	3	.006	2
708			...	-.001	6	-.005	1	-.004	3	.009	1	-.009	1	-.006	2	-.006	3
709		5	...	.001	7	-.007	1	.005	2	.007	1	-.007	1	.005	3	.005	2
710			...	-.001	6	-.007	1	-.005	3	.007	1	-.007	1	-.005	2	-.005	3
711	M85	1	...	0	1	0	1	0	1	.011	1	-.011	1	.008	3	.008	2
712			...	0	1	0	1	0	1	.011	1	-.011	1	-.008	2	-.008	3
713		2	...	0	7	-.002	1	.001	2	.011	1	-.011	1	.008	3	.008	2
714			...	0	6	-.002	1	-.001	3	.011	1	-.011	1	-.008	2	-.008	3
715		3	...	0	7	-.004	1	.002	2	.01	1	-.01	1	.007	3	.007	2
716			...	0	6	-.004	1	-.002	3	.01	1	-.01	1	-.007	2	-.007	3
717		4	...	.001	7	-.005	1	.004	2	.009	1	-.009	1	.006	3	.006	2
718			...	-.001	6	-.005	1	-.004	3	.009	1	-.009	1	-.006	2	-.006	3
719		5	...	.001	7	-.007	1	.005	2	.007	1	-.007	1	.005	3	.005	2
720			...	-.001	6	-.007	1	-.005	3	.007	1	-.007	1	-.005	2	-.005	3
721	M87	1	...	.004	6	.022	1	.015	3	-.033	1	.033	1	.022	2	.022	3
722			...	-.004	7	.022	1	-.015	2	-.033	1	.033	1	-.022	3	-.022	2
723		2	...	.003	6	.017	1	.011	3	-.013	1	.013	1	.009	2	.009	3
724			...	-.003	7	.017	1	-.011	2	-.013	1	.013	1	-.009	3	-.009	2
725		3	...	.002	6	.011	1	.007	3	0	1	0	1	0	3	0	2
726			...	-.002	7	.011	1	-.007	2	0	1	0	1	0	2	0	3
727		4	...	.001	6	.006	1	.004	3	.009	1	-.009	1	.006	3	.006	2
728			...	-.001	7	.006	1	-.004	2	.009	1	-.009	1	-.006	2	-.006	3
729		5	...	0	1	0	1	0	1	.011	1	-.011	1	.008	3	.008	2
730			...	0	1	0	1	0	1	.011	1	-.011	1	-.008	2	-.008	3
731	M88	1	...	.004	6	.022	1	.015	3	-.033	1	.033	1	.022	2	.022	3
732			...	-.004	7	.022	1	-.015	2	-.033	1	.033	1	-.022	3	-.022	2
733		2	...	.003	6	.017	1	.011	3	-.013	1	.013	1	.009	2	.009	3
734			...	-.003	7	.017	1	-.011	2	-.013	1	.013	1	-.009	3	-.009	2
735		3	...	.002	6	.011	1	.007	3	0	1	0	1	0	3	0	2
736			...	-.002	7	.011	1	-.007	2	0	1	0	1	0	2	0	3
737		4	...	.001	6	.006	1	.004	3	.009	1	-.009	1	.006	3	.006	2
738			...	-.001	7	.006	1	-.004	2	.009	1	-.009	1	-.006	2	-.006	3
739		5	...	0	1	0	1	0	1	.011	1	-.011	1	.008	3	.008	2
740			...	0	1	0	1	0	1	.011	1	-.011	1	-.008	2	-.008	3
741	M89	1	...	0	1	0	1	0	1	.022	1	-.022	1	.015	3	.015	2
742			...	0	1	0	1	0	1	.022	1	-.022	1	-.015	2	-.015	3
743		2	...	0	7	-.002	1	.001	2	.021	1	-.021	1	.014	3	.014	2
744			...	0	6	-.002	1	-.001	3	.021	1	-.021	1	-.014	2	-.014	3
745		3	...	0	7	-.004	1	.002	2	.02	1	-.02	1	.014	3	.014	2
746			...	0	6	-.004	1	-.002	3	.02	1	-.02	1	-.014	2	-.014	3
747		4	...	.001	7	-.005	1	.004	2	.019	1	-.019	1	.013	3	.013	2
748			...	-.001	6	-.005	1	-.004	3	.019	1	-.019	1	-.013	2	-.013	3
749		5	...	.001	7	-.007	1	.005	2	.017	1	-.017	1	.012	3	.012	2
750			...	-.001	6	-.007	1	-.005	3	.017	1	-.017	1	-.012	2	-.012	3

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[...	Ic	y Shear[...	Ic	z Shear[k...	Ic	y-T...	Ic	y-Bot[ksi]	Ic	z-Top[ksi]	Ic	z-Bot[ksi]	Ic
751	M90	1	...	.001	7	-.007	1	.005	2	.017	1	-.017	1	.012	3	.012	2
752			...	-.001	6	-.007	1	-.005	3	.017	1	-.017	1	-.012	2	-.012	3
753		2	...	.002	7	-.012	1	.008	2	.009	1	-.009	1	.006	3	.006	2
754			...	-.002	6	-.012	1	-.008	3	.009	1	-.009	1	-.006	2	-.006	3
755		3	...	.003	7	-.017	1	.011	2	-.004	1	.004	1	.003	2	.003	3
756			...	-.003	6	-.017	1	-.011	3	-.004	1	.004	1	-.003	3	-.003	2
757		4	...	.004	7	-.022	1	.015	2	-.021	1	.021	1	.015	2	.015	3
758			...	-.004	6	-.022	1	-.015	3	-.021	1	.021	1	-.015	3	-.015	2
759		5	...	.005	7	-.027	1	.018	2	-.043	1	.043	1	.029	2	.029	3
760			...	-.005	6	-.027	1	-.018	3	-.043	1	.043	1	-.029	3	-.029	2

Envelope Member Section Torsion

	Member	Sec		Torque[...	Ic	Torsion Shear[ksi]	Ic	y-y Warp...	Ic	z-z Warp Shear[ksi]	Ic	z-Top W...	Ic	z-Bot Wa...	Ic
1	M1	1	max	833.704	5	.057	5	NC		NC		NC		NC	
2			min	-833.704	4	-.057	4	NC		NC		NC		NC	
3		2	max	833.704	5	.057	5	NC		NC		NC		NC	
4			min	-833.704	4	-.057	4	NC		NC		NC		NC	
5		3	max	833.704	5	.057	5	NC		NC		NC		NC	
6			min	-833.704	4	-.057	4	NC		NC		NC		NC	
7		4	max	833.704	5	.057	5	NC		NC		NC		NC	
8			min	-833.704	4	-.057	4	NC		NC		NC		NC	
9		5	max	833.704	5	.057	5	NC		NC		NC		NC	
10			min	-833.704	4	-.057	4	NC		NC		NC		NC	
11	M2	1	max	833.704	5	.057	5	NC		NC		NC		NC	
12			min	-833.704	4	-.057	4	NC		NC		NC		NC	
13		2	max	833.704	5	.057	5	NC		NC		NC		NC	
14			min	-833.704	4	-.057	4	NC		NC		NC		NC	
15		3	max	833.704	5	.057	5	NC		NC		NC		NC	
16			min	-833.704	4	-.057	4	NC		NC		NC		NC	
17		4	max	833.704	5	.057	5	NC		NC		NC		NC	
18			min	-833.704	4	-.057	4	NC		NC		NC		NC	
19		5	max	833.704	5	.057	5	NC		NC		NC		NC	
20			min	-833.704	4	-.057	4	NC		NC		NC		NC	
21	M4	1	max	833.704	5	.057	5	NC		NC		NC		NC	
22			min	-833.704	4	-.057	4	NC		NC		NC		NC	
23		2	max	833.704	5	.057	5	NC		NC		NC		NC	
24			min	-833.704	4	-.057	4	NC		NC		NC		NC	
25		3	max	833.704	5	.057	5	NC		NC		NC		NC	
26			min	-833.704	4	-.057	4	NC		NC		NC		NC	
27		4	max	833.704	5	.057	5	NC		NC		NC		NC	
28			min	-833.704	4	-.057	4	NC		NC		NC		NC	
29		5	max	833.704	5	.057	5	NC		NC		NC		NC	
30			min	-833.704	4	-.057	4	NC		NC		NC		NC	
31	M5	1	max	2141.32	5	.146	5	NC		NC		NC		NC	
32			min	-2141.32	4	-.146	4	NC		NC		NC		NC	
33		2	max	2141.32	5	.146	5	NC		NC		NC		NC	
34			min	-2141.32	4	-.146	4	NC		NC		NC		NC	
35		3	max	2141.32	5	.146	5	NC		NC		NC		NC	
36			min	-2141.32	4	-.146	4	NC		NC		NC		NC	
37		4	max	2141.32	5	.146	5	NC		NC		NC		NC	
38			min	-2141.32	4	-.146	4	NC		NC		NC		NC	
39		5	max	2141.32	5	.146	5	NC		NC		NC		NC	
40			min	-2141.32	4	-.146	4	NC		NC		NC		NC	
41	M6	1	max	2652.532	3	.289	3	NC		NC		NC		NC	
42			min	-2939.238	2	-.32	2	NC		NC		NC		NC	
43		2	max	2652.532	3	.289	3	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
44			min	-2939.238	2	-.32	2	NC		NC		NC		NC	
45		3	max	2652.532	3	.289	3	NC		NC		NC		NC	
46			min	-2939.238	2	-.32	2	NC		NC		NC		NC	
47		4	max	2652.532	3	.289	3	NC		NC		NC		NC	
48			min	-2939.238	2	-.32	2	NC		NC		NC		NC	
49		5	max	2652.532	3	.289	3	NC		NC		NC		NC	
50			min	-2939.238	2	-.32	2	NC		NC		NC		NC	
51	M7	1	max	2652.532	3	.289	3	NC		NC		NC		NC	
52			min	-2939.238	2	-.32	2	NC		NC		NC		NC	
53		2	max	2652.532	3	.289	3	NC		NC		NC		NC	
54			min	-2939.238	2	-.32	2	NC		NC		NC		NC	
55		3	max	2652.532	3	.289	3	NC		NC		NC		NC	
56			min	-2939.238	2	-.32	2	NC		NC		NC		NC	
57		4	max	2652.532	3	.289	3	NC		NC		NC		NC	
58			min	-2939.238	2	-.32	2	NC		NC		NC		NC	
59		5	max	2652.532	3	.289	3	NC		NC		NC		NC	
60			min	-2939.238	2	-.32	2	NC		NC		NC		NC	
61	M8	1	max	2574.005	3	.281	3	NC		NC		NC		NC	
62			min	-2854.732	2	-.311	2	NC		NC		NC		NC	
63		2	max	2574.005	3	.281	3	NC		NC		NC		NC	
64			min	-2854.732	2	-.311	2	NC		NC		NC		NC	
65		3	max	2574.005	3	.281	3	NC		NC		NC		NC	
66			min	-2854.732	2	-.311	2	NC		NC		NC		NC	
67		4	max	2574.005	3	.281	3	NC		NC		NC		NC	
68			min	-2854.732	2	-.311	2	NC		NC		NC		NC	
69		5	max	2574.005	3	.281	3	NC		NC		NC		NC	
70			min	-2854.732	2	-.311	2	NC		NC		NC		NC	
71	M9	1	max	2189.074	3	.239	3	NC		NC		NC		NC	
72			min	-2426.123	2	-.264	2	NC		NC		NC		NC	
73		2	max	2189.074	3	.239	3	NC		NC		NC		NC	
74			min	-2426.123	2	-.264	2	NC		NC		NC		NC	
75		3	max	2189.074	3	.239	3	NC		NC		NC		NC	
76			min	-2426.123	2	-.264	2	NC		NC		NC		NC	
77		4	max	2189.074	3	.239	3	NC		NC		NC		NC	
78			min	-2426.123	2	-.264	2	NC		NC		NC		NC	
79		5	max	2189.074	3	.239	3	NC		NC		NC		NC	
80			min	-2426.123	2	-.264	2	NC		NC		NC		NC	
81	M10	1	max	1542.956	3	.168	3	NC		NC		NC		NC	
82			min	-1700.239	2	-.185	2	NC		NC		NC		NC	
83		2	max	1542.956	3	.168	3	NC		NC		NC		NC	
84			min	-1700.239	2	-.185	2	NC		NC		NC		NC	
85		3	max	1542.956	3	.168	3	NC		NC		NC		NC	
86			min	-1700.239	2	-.185	2	NC		NC		NC		NC	
87		4	max	1542.956	3	.168	3	NC		NC		NC		NC	
88			min	-1700.239	2	-.185	2	NC		NC		NC		NC	
89		5	max	1542.956	3	.168	3	NC		NC		NC		NC	
90			min	-1700.239	2	-.185	2	NC		NC		NC		NC	
91	M11	1	max	743.957	3	.081	3	NC		NC		NC		NC	
92			min	-797.525	2	-.087	2	NC		NC		NC		NC	
93		2	max	743.957	3	.081	3	NC		NC		NC		NC	
94			min	-797.525	2	-.087	2	NC		NC		NC		NC	
95		3	max	743.957	3	.081	3	NC		NC		NC		NC	
96			min	-797.525	2	-.087	2	NC		NC		NC		NC	
97		4	max	743.957	3	.081	3	NC		NC		NC		NC	
98			min	-797.525	2	-.087	2	NC		NC		NC		NC	
99		5	max	743.957	3	.081	3	NC		NC		NC		NC	
100			min	-797.525	2	-.087	2	NC		NC		NC		NC	

Company : **DMJM H&N**
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Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
101	M12	1	max	340.435	3	.037	3	NC		NC		NC		NC	
102			min	-338.027	2	-.037	2	NC		NC		NC		NC	
103		2	max	340.435	3	.037	3	NC		NC		NC		NC	
104			min	-338.027	2	-.037	2	NC		NC		NC		NC	
105		3	max	340.435	3	.037	3	NC		NC		NC		NC	
106			min	-338.027	2	-.037	2	NC		NC		NC		NC	
107		4	max	340.435	3	.037	3	NC		NC		NC		NC	
108			min	-338.027	2	-.037	2	NC		NC		NC		NC	
109		5	max	340.435	3	.037	3	NC		NC		NC		NC	
110			min	-338.027	2	-.037	2	NC		NC		NC		NC	
111	M13	1	max	340.435	3	.067	3	NC		NC		NC		NC	
112			min	-338.027	2	-.067	2	NC		NC		NC		NC	
113		2	max	340.435	3	.067	3	NC		NC		NC		NC	
114			min	-338.027	2	-.067	2	NC		NC		NC		NC	
115		3	max	340.435	3	.067	3	NC		NC		NC		NC	
116			min	-338.027	2	-.067	2	NC		NC		NC		NC	
117		4	max	340.435	3	.067	3	NC		NC		NC		NC	
118			min	-338.027	2	-.067	2	NC		NC		NC		NC	
119		5	max	340.435	3	.067	3	NC		NC		NC		NC	
120			min	-338.027	2	-.067	2	NC		NC		NC		NC	
121	M14	1	max	162.198	2	.032	2	NC		NC		NC		NC	
122			min	-134.756	3	-.027	3	NC		NC		NC		NC	
123		2	max	162.198	2	.032	2	NC		NC		NC		NC	
124			min	-134.756	3	-.027	3	NC		NC		NC		NC	
125		3	max	162.198	2	.032	2	NC		NC		NC		NC	
126			min	-134.756	3	-.027	3	NC		NC		NC		NC	
127		4	max	162.198	2	.032	2	NC		NC		NC		NC	
128			min	-134.756	3	-.027	3	NC		NC		NC		NC	
129		5	max	162.198	2	.032	2	NC		NC		NC		NC	
130			min	-134.756	3	-.027	3	NC		NC		NC		NC	
131	M15	1	max	506.361	2	.1	2	NC		NC		NC		NC	
132			min	-453.283	3	-.09	3	NC		NC		NC		NC	
133		2	max	506.361	2	.1	2	NC		NC		NC		NC	
134			min	-453.283	3	-.09	3	NC		NC		NC		NC	
135		3	max	506.361	2	.1	2	NC		NC		NC		NC	
136			min	-453.283	3	-.09	3	NC		NC		NC		NC	
137		4	max	506.361	2	.1	2	NC		NC		NC		NC	
138			min	-453.283	3	-.09	3	NC		NC		NC		NC	
139		5	max	506.361	2	.1	2	NC		NC		NC		NC	
140			min	-453.283	3	-.09	3	NC		NC		NC		NC	
141	M16	1	max	708.83	2	.14	2	NC		NC		NC		NC	
142			min	-639.14	3	-.127	3	NC		NC		NC		NC	
143		2	max	708.83	2	.14	2	NC		NC		NC		NC	
144			min	-639.14	3	-.127	3	NC		NC		NC		NC	
145		3	max	708.83	2	.14	2	NC		NC		NC		NC	
146			min	-639.14	3	-.127	3	NC		NC		NC		NC	
147		4	max	708.83	2	.14	2	NC		NC		NC		NC	
148			min	-639.14	3	-.127	3	NC		NC		NC		NC	
149		5	max	708.83	2	.14	2	NC		NC		NC		NC	
150			min	-639.14	3	-.127	3	NC		NC		NC		NC	
151	M17	1	max	741.516	2	.147	2	NC		NC		NC		NC	
152			min	-667.887	3	-.132	3	NC		NC		NC		NC	
153		2	max	741.516	2	.147	2	NC		NC		NC		NC	
154			min	-667.887	3	-.132	3	NC		NC		NC		NC	
155		3	max	741.516	2	.147	2	NC		NC		NC		NC	
156			min	-667.887	3	-.132	3	NC		NC		NC		NC	
157		4	max	741.516	2	.147	2	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
158			min	-667.887	3	-.132	3	NC		NC		NC		NC	
159		5	max	741.516	2	.147	2	NC		NC		NC		NC	
160			min	-667.887	3	-.132	3	NC		NC		NC		NC	
161	M18	1	max	741.516	2	.147	2	NC		NC		NC		NC	
162			min	-667.887	3	-.132	3	NC		NC		NC		NC	
163		2	max	741.516	2	.147	2	NC		NC		NC		NC	
164			min	-667.887	3	-.132	3	NC		NC		NC		NC	
165		3	max	741.516	2	.147	2	NC		NC		NC		NC	
166			min	-667.887	3	-.132	3	NC		NC		NC		NC	
167		4	max	741.516	2	.147	2	NC		NC		NC		NC	
168			min	-667.887	3	-.132	3	NC		NC		NC		NC	
169		5	max	741.516	2	.147	2	NC		NC		NC		NC	
170			min	-667.887	3	-.132	3	NC		NC		NC		NC	
171	M31	1	max	376.38	3	.075	3	NC		NC		NC		NC	
172			min	-395.194	2	-.078	2	NC		NC		NC		NC	
173		2	max	376.38	3	.075	3	NC		NC		NC		NC	
174			min	-395.194	2	-.078	2	NC		NC		NC		NC	
175		3	max	376.38	3	.075	3	NC		NC		NC		NC	
176			min	-395.194	2	-.078	2	NC		NC		NC		NC	
177		4	max	376.38	3	.075	3	NC		NC		NC		NC	
178			min	-395.194	2	-.078	2	NC		NC		NC		NC	
179		5	max	376.38	3	.075	3	NC		NC		NC		NC	
180			min	-395.194	2	-.078	2	NC		NC		NC		NC	
181	M32	1	max	275.104	3	.055	3	NC		NC		NC		NC	
182			min	-278.429	2	-.055	2	NC		NC		NC		NC	
183		2	max	275.104	3	.055	3	NC		NC		NC		NC	
184			min	-278.429	2	-.055	2	NC		NC		NC		NC	
185		3	max	275.104	3	.055	3	NC		NC		NC		NC	
186			min	-278.429	2	-.055	2	NC		NC		NC		NC	
187		4	max	275.104	3	.055	3	NC		NC		NC		NC	
188			min	-278.429	2	-.055	2	NC		NC		NC		NC	
189		5	max	275.104	3	.055	3	NC		NC		NC		NC	
190			min	-278.429	2	-.055	2	NC		NC		NC		NC	
191	M33	1	max	369.464	6	.096	6	NC		NC		NC		NC	
192			min	-56.085	9	-.015	9	NC		NC		NC		NC	
193		2	max	369.464	6	.096	6	NC		NC		NC		NC	
194			min	-56.085	9	-.015	9	NC		NC		NC		NC	
195		3	max	369.464	6	.096	6	NC		NC		NC		NC	
196			min	-56.085	9	-.015	9	NC		NC		NC		NC	
197		4	max	369.464	6	.096	6	NC		NC		NC		NC	
198			min	-56.085	9	-.015	9	NC		NC		NC		NC	
199		5	max	369.464	6	.096	6	NC		NC		NC		NC	
200			min	-56.085	9	-.015	9	NC		NC		NC		NC	
201	M34	1	max	420.267	8	.109	8	NC		NC		NC		NC	
202			min	-113.722	7	-.03	7	NC		NC		NC		NC	
203		2	max	420.267	8	.109	8	NC		NC		NC		NC	
204			min	-113.722	7	-.03	7	NC		NC		NC		NC	
205		3	max	420.267	8	.109	8	NC		NC		NC		NC	
206			min	-113.722	7	-.03	7	NC		NC		NC		NC	
207		4	max	420.267	8	.109	8	NC		NC		NC		NC	
208			min	-113.722	7	-.03	7	NC		NC		NC		NC	
209		5	max	420.267	8	.109	8	NC		NC		NC		NC	
210			min	-113.722	7	-.03	7	NC		NC		NC		NC	
211	M35	1	max	470.213	8	.122	8	NC		NC		NC		NC	
212			min	-215.224	7	-.056	7	NC		NC		NC		NC	
213		2	max	470.213	8	.122	8	NC		NC		NC		NC	
214			min	-215.224	7	-.056	7	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
215		3	max	470.213	8	.122	8	NC		NC		NC		NC	
216			min	-215.224	7	-.056	7	NC		NC		NC		NC	
217		4	max	470.213	8	.122	8	NC		NC		NC		NC	
218			min	-215.224	7	-.056	7	NC		NC		NC		NC	
219		5	max	470.213	8	.122	8	NC		NC		NC		NC	
220			min	-215.224	7	-.056	7	NC		NC		NC		NC	
221	M36	1	max	510.983	3	.133	3	NC		NC		NC		NC	
222			min	-359.432	2	-.093	2	NC		NC		NC		NC	
223		2	max	510.983	3	.133	3	NC		NC		NC		NC	
224			min	-359.432	2	-.093	2	NC		NC		NC		NC	
225		3	max	510.983	3	.133	3	NC		NC		NC		NC	
226			min	-359.432	2	-.093	2	NC		NC		NC		NC	
227		4	max	510.983	3	.133	3	NC		NC		NC		NC	
228			min	-359.432	2	-.093	2	NC		NC		NC		NC	
229		5	max	510.983	3	.133	3	NC		NC		NC		NC	
230			min	-359.432	2	-.093	2	NC		NC		NC		NC	
231	M37	1	max	514.798	3	.134	3	NC		NC		NC		NC	
232			min	-511.23	2	-.133	2	NC		NC		NC		NC	
233		2	max	514.798	3	.134	3	NC		NC		NC		NC	
234			min	-511.23	2	-.133	2	NC		NC		NC		NC	
235		3	max	514.798	3	.134	3	NC		NC		NC		NC	
236			min	-511.23	2	-.133	2	NC		NC		NC		NC	
237		4	max	514.798	3	.134	3	NC		NC		NC		NC	
238			min	-511.23	2	-.133	2	NC		NC		NC		NC	
239		5	max	514.798	3	.134	3	NC		NC		NC		NC	
240			min	-511.23	2	-.133	2	NC		NC		NC		NC	
241	M38	1	max	530.767	3	.138	3	NC		NC		NC		NC	
242			min	-530.444	2	-.138	2	NC		NC		NC		NC	
243		2	max	530.767	3	.138	3	NC		NC		NC		NC	
244			min	-530.444	2	-.138	2	NC		NC		NC		NC	
245		3	max	530.767	3	.138	3	NC		NC		NC		NC	
246			min	-530.444	2	-.138	2	NC		NC		NC		NC	
247		4	max	530.767	3	.138	3	NC		NC		NC		NC	
248			min	-530.444	2	-.138	2	NC		NC		NC		NC	
249		5	max	530.767	3	.138	3	NC		NC		NC		NC	
250			min	-530.444	2	-.138	2	NC		NC		NC		NC	
251	M39	1	max	530.767	3	.138	3	NC		NC		NC		NC	
252			min	-530.444	2	-.138	2	NC		NC		NC		NC	
253		2	max	530.767	3	.138	3	NC		NC		NC		NC	
254			min	-530.444	2	-.138	2	NC		NC		NC		NC	
255		3	max	530.767	3	.138	3	NC		NC		NC		NC	
256			min	-530.444	2	-.138	2	NC		NC		NC		NC	
257		4	max	530.767	3	.138	3	NC		NC		NC		NC	
258			min	-530.444	2	-.138	2	NC		NC		NC		NC	
259		5	max	530.767	3	.138	3	NC		NC		NC		NC	
260			min	-530.444	2	-.138	2	NC		NC		NC		NC	
261	M40	1	max	530.767	3	.138	3	NC		NC		NC		NC	
262			min	-530.444	2	-.138	2	NC		NC		NC		NC	
263		2	max	530.767	3	.138	3	NC		NC		NC		NC	
264			min	-530.444	2	-.138	2	NC		NC		NC		NC	
265		3	max	530.767	3	.138	3	NC		NC		NC		NC	
266			min	-530.444	2	-.138	2	NC		NC		NC		NC	
267		4	max	530.767	3	.138	3	NC		NC		NC		NC	
268			min	-530.444	2	-.138	2	NC		NC		NC		NC	
269		5	max	530.767	3	.138	3	NC		NC		NC		NC	
270			min	-530.444	2	-.138	2	NC		NC		NC		NC	
271	M41	1	max	530.767	3	0	1	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
272			min	-530.444	2	0	1	NC		NC		NC		NC	
273		2	max	530.767	3	0	1	NC		NC		NC		NC	
274			min	-530.444	2	0	1	NC		NC		NC		NC	
275		3	max	530.767	3	0	1	NC		NC		NC		NC	
276			min	-530.444	2	0	1	NC		NC		NC		NC	
277		4	max	530.767	3	0	1	NC		NC		NC		NC	
278			min	-530.444	2	0	1	NC		NC		NC		NC	
279		5	max	530.767	3	0	1	NC		NC		NC		NC	
280			min	-530.444	2	0	1	NC		NC		NC		NC	
281	M42	1	max	530.767	3	.138	3	NC		NC		NC		NC	
282			min	-530.444	2	-.138	2	NC		NC		NC		NC	
283		2	max	530.767	3	.138	3	NC		NC		NC		NC	
284			min	-530.444	2	-.138	2	NC		NC		NC		NC	
285		3	max	530.767	3	.138	3	NC		NC		NC		NC	
286			min	-530.444	2	-.138	2	NC		NC		NC		NC	
287		4	max	530.767	3	.138	3	NC		NC		NC		NC	
288			min	-530.444	2	-.138	2	NC		NC		NC		NC	
289		5	max	530.767	3	.138	3	NC		NC		NC		NC	
290			min	-530.444	2	-.138	2	NC		NC		NC		NC	
291	M43	1	max	495.111	3	.129	3	NC		NC		NC		NC	
292			min	-495.111	2	-.129	2	NC		NC		NC		NC	
293		2	max	495.111	3	.129	3	NC		NC		NC		NC	
294			min	-495.111	2	-.129	2	NC		NC		NC		NC	
295		3	max	495.111	3	.129	3	NC		NC		NC		NC	
296			min	-495.111	2	-.129	2	NC		NC		NC		NC	
297		4	max	495.111	3	.129	3	NC		NC		NC		NC	
298			min	-495.111	2	-.129	2	NC		NC		NC		NC	
299		5	max	495.111	3	.129	3	NC		NC		NC		NC	
300			min	-495.111	2	-.129	2	NC		NC		NC		NC	
301	M44	1	max	342.156	3	.089	3	NC		NC		NC		NC	
302			min	-342.156	2	-.089	2	NC		NC		NC		NC	
303		2	max	342.156	3	.089	3	NC		NC		NC		NC	
304			min	-342.156	2	-.089	2	NC		NC		NC		NC	
305		3	max	342.156	3	.089	3	NC		NC		NC		NC	
306			min	-342.156	2	-.089	2	NC		NC		NC		NC	
307		4	max	342.156	3	.089	3	NC		NC		NC		NC	
308			min	-342.156	2	-.089	2	NC		NC		NC		NC	
309		5	max	342.156	3	.089	3	NC		NC		NC		NC	
310			min	-342.156	2	-.089	2	NC		NC		NC		NC	
311	M45	1	max	176.771	3	.046	3	NC		NC		NC		NC	
312			min	-176.771	2	-.046	2	NC		NC		NC		NC	
313		2	max	176.771	3	.046	3	NC		NC		NC		NC	
314			min	-176.771	2	-.046	2	NC		NC		NC		NC	
315		3	max	176.771	3	.046	3	NC		NC		NC		NC	
316			min	-176.771	2	-.046	2	NC		NC		NC		NC	
317		4	max	176.771	3	.046	3	NC		NC		NC		NC	
318			min	-176.771	2	-.046	2	NC		NC		NC		NC	
319		5	max	176.771	3	.046	3	NC		NC		NC		NC	
320			min	-176.771	2	-.046	2	NC		NC		NC		NC	
321	M46	1	max	20.738	3	.005	3	NC		NC		NC		NC	
322			min	-20.738	2	-.005	2	NC		NC		NC		NC	
323		2	max	20.738	3	.005	3	NC		NC		NC		NC	
324			min	-20.738	2	-.005	2	NC		NC		NC		NC	
325		3	max	20.738	3	.005	3	NC		NC		NC		NC	
326			min	-20.738	2	-.005	2	NC		NC		NC		NC	
327		4	max	20.738	3	.005	3	NC		NC		NC		NC	
328			min	-20.738	2	-.005	2	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
329		5	max	20.738	3	.005	3	NC		NC		NC		NC	
330			min	-20.738	2	-.005	2	NC		NC		NC		NC	
331	M47	1	max	43.397	2	.011	2	NC		NC		NC		NC	
332			min	-43.397	3	-.011	3	NC		NC		NC		NC	
333		2	max	43.397	2	.011	2	NC		NC		NC		NC	
334			min	-43.397	3	-.011	3	NC		NC		NC		NC	
335		3	max	43.397	2	.011	2	NC		NC		NC		NC	
336			min	-43.397	3	-.011	3	NC		NC		NC		NC	
337		4	max	43.397	2	.011	2	NC		NC		NC		NC	
338			min	-43.397	3	-.011	3	NC		NC		NC		NC	
339		5	max	43.397	2	.011	2	NC		NC		NC		NC	
340			min	-43.397	3	-.011	3	NC		NC		NC		NC	
341	M48	1	max	31.986	2	.008	2	NC		NC		NC		NC	
342			min	-31.986	3	-.008	3	NC		NC		NC		NC	
343		2	max	31.986	2	.008	2	NC		NC		NC		NC	
344			min	-31.986	3	-.008	3	NC		NC		NC		NC	
345		3	max	31.986	2	.008	2	NC		NC		NC		NC	
346			min	-31.986	3	-.008	3	NC		NC		NC		NC	
347		4	max	31.986	2	.008	2	NC		NC		NC		NC	
348			min	-31.986	3	-.008	3	NC		NC		NC		NC	
349		5	max	31.986	2	.008	2	NC		NC		NC		NC	
350			min	-31.986	3	-.008	3	NC		NC		NC		NC	
351	M49	1	max	16.326	2	.004	2	NC		NC		NC		NC	
352			min	-16.326	3	-.004	3	NC		NC		NC		NC	
353		2	max	16.326	2	.004	2	NC		NC		NC		NC	
354			min	-16.326	3	-.004	3	NC		NC		NC		NC	
355		3	max	16.326	2	.004	2	NC		NC		NC		NC	
356			min	-16.326	3	-.004	3	NC		NC		NC		NC	
357		4	max	16.326	2	.004	2	NC		NC		NC		NC	
358			min	-16.326	3	-.004	3	NC		NC		NC		NC	
359		5	max	16.326	2	.004	2	NC		NC		NC		NC	
360			min	-16.326	3	-.004	3	NC		NC		NC		NC	
361	M50	1	max	6.236	2	.002	2	NC		NC		NC		NC	
362			min	-6.236	3	-.002	3	NC		NC		NC		NC	
363		2	max	6.236	2	.002	2	NC		NC		NC		NC	
364			min	-6.236	3	-.002	3	NC		NC		NC		NC	
365		3	max	6.236	2	.002	2	NC		NC		NC		NC	
366			min	-6.236	3	-.002	3	NC		NC		NC		NC	
367		4	max	6.236	2	.002	2	NC		NC		NC		NC	
368			min	-6.236	3	-.002	3	NC		NC		NC		NC	
369		5	max	6.236	2	.002	2	NC		NC		NC		NC	
370			min	-6.236	3	-.002	3	NC		NC		NC		NC	
371	M51	1	max	1.304	2	0	2	NC		NC		NC		NC	
372			min	-1.304	3	0	3	NC		NC		NC		NC	
373		2	max	1.304	2	0	2	NC		NC		NC		NC	
374			min	-1.304	3	0	3	NC		NC		NC		NC	
375		3	max	1.304	2	0	2	NC		NC		NC		NC	
376			min	-1.304	3	0	3	NC		NC		NC		NC	
377		4	max	1.304	2	0	2	NC		NC		NC		NC	
378			min	-1.304	3	0	3	NC		NC		NC		NC	
379		5	max	1.304	2	0	2	NC		NC		NC		NC	
380			min	-1.304	3	0	3	NC		NC		NC		NC	
381	M52	1	max	0	1	0	1	NC		NC		NC		NC	
382			min	0	1	0	1	NC		NC		NC		NC	
383		2	max	0	1	0	1	NC		NC		NC		NC	
384			min	0	1	0	1	NC		NC		NC		NC	
385		3	max	0	1	0	1	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
386			min	0	1	0	1	NC		NC		NC		NC	
387		4	max	0	1	0	1	NC		NC		NC		NC	
388			min	0	1	0	1	NC		NC		NC		NC	
389		5	max	0	1	0	1	NC		NC		NC		NC	
390			min	0	1	0	1	NC		NC		NC		NC	
391	M53	1	max	833.704	5	.057	5	NC		NC		NC		NC	
392			min	-833.704	4	-.057	4	NC		NC		NC		NC	
393		2	max	833.704	5	.057	5	NC		NC		NC		NC	
394			min	-833.704	4	-.057	4	NC		NC		NC		NC	
395		3	max	833.704	5	.057	5	NC		NC		NC		NC	
396			min	-833.704	4	-.057	4	NC		NC		NC		NC	
397		4	max	833.704	5	.057	5	NC		NC		NC		NC	
398			min	-833.704	4	-.057	4	NC		NC		NC		NC	
399		5	max	833.704	5	.057	5	NC		NC		NC		NC	
400			min	-833.704	4	-.057	4	NC		NC		NC		NC	
401	M54	1	max	.003	8	0	8	NC		NC		NC		NC	
402			min	-.003	7	0	7	NC		NC		NC		NC	
403		2	max	.003	8	0	8	NC		NC		NC		NC	
404			min	-.003	7	0	7	NC		NC		NC		NC	
405		3	max	.003	8	0	8	NC		NC		NC		NC	
406			min	-.003	7	0	7	NC		NC		NC		NC	
407		4	max	.003	8	0	8	NC		NC		NC		NC	
408			min	-.003	7	0	7	NC		NC		NC		NC	
409		5	max	.003	8	0	8	NC		NC		NC		NC	
410			min	-.003	7	0	7	NC		NC		NC		NC	
411	M55	1	max	.035	7	0	7	NC		NC		NC		NC	
412			min	-.035	8	0	8	NC		NC		NC		NC	
413		2	max	.035	7	0	7	NC		NC		NC		NC	
414			min	-.035	8	0	8	NC		NC		NC		NC	
415		3	max	.035	7	0	7	NC		NC		NC		NC	
416			min	-.035	8	0	8	NC		NC		NC		NC	
417		4	max	.035	7	0	7	NC		NC		NC		NC	
418			min	-.035	8	0	8	NC		NC		NC		NC	
419		5	max	.035	7	0	7	NC		NC		NC		NC	
420			min	-.035	8	0	8	NC		NC		NC		NC	
421	M56	1	max	.001	7	0	7	NC		NC		NC		NC	
422			min	-.001	8	0	8	NC		NC		NC		NC	
423		2	max	.001	7	0	7	NC		NC		NC		NC	
424			min	-.001	8	0	8	NC		NC		NC		NC	
425		3	max	.001	7	0	7	NC		NC		NC		NC	
426			min	-.001	8	0	8	NC		NC		NC		NC	
427		4	max	.001	7	0	7	NC		NC		NC		NC	
428			min	-.001	8	0	8	NC		NC		NC		NC	
429		5	max	.001	7	0	7	NC		NC		NC		NC	
430			min	-.001	8	0	8	NC		NC		NC		NC	
431	M57	1	max	.002	7	0	7	NC		NC		NC		NC	
432			min	-.002	8	0	8	NC		NC		NC		NC	
433		2	max	.002	7	0	7	NC		NC		NC		NC	
434			min	-.002	8	0	8	NC		NC		NC		NC	
435		3	max	.002	7	0	7	NC		NC		NC		NC	
436			min	-.002	8	0	8	NC		NC		NC		NC	
437		4	max	.002	7	0	7	NC		NC		NC		NC	
438			min	-.002	8	0	8	NC		NC		NC		NC	
439		5	max	.002	7	0	7	NC		NC		NC		NC	
440			min	-.002	8	0	8	NC		NC		NC		NC	
441	M58	1	max	.004	8	0	8	NC		NC		NC		NC	
442			min	.001	7	0	7	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
443		2	max	.004	8	0	8	NC		NC		NC		NC	
444			min	.001	7	0	7	NC		NC		NC		NC	
445		3	max	.004	8	0	8	NC		NC		NC		NC	
446			min	.001	7	0	7	NC		NC		NC		NC	
447		4	max	.004	8	0	8	NC		NC		NC		NC	
448			min	.001	7	0	7	NC		NC		NC		NC	
449		5	max	.004	8	0	8	NC		NC		NC		NC	
450			min	.001	7	0	7	NC		NC		NC		NC	
451	M59	1	max	-.017	7	0	7	NC		NC		NC		NC	
452			min	-.061	8	0	8	NC		NC		NC		NC	
453		2	max	-.017	7	0	7	NC		NC		NC		NC	
454			min	-.061	8	0	8	NC		NC		NC		NC	
455		3	max	-.017	7	0	7	NC		NC		NC		NC	
456			min	-.061	8	0	8	NC		NC		NC		NC	
457		4	max	-.017	7	0	7	NC		NC		NC		NC	
458			min	-.061	8	0	8	NC		NC		NC		NC	
459		5	max	-.017	7	0	7	NC		NC		NC		NC	
460			min	-.061	8	0	8	NC		NC		NC		NC	
461	M60	1	max	-.002	7	0	7	NC		NC		NC		NC	
462			min	-.007	8	0	8	NC		NC		NC		NC	
463		2	max	-.002	7	0	7	NC		NC		NC		NC	
464			min	-.007	8	0	8	NC		NC		NC		NC	
465		3	max	-.002	7	0	7	NC		NC		NC		NC	
466			min	-.007	8	0	8	NC		NC		NC		NC	
467		4	max	-.002	7	0	7	NC		NC		NC		NC	
468			min	-.007	8	0	8	NC		NC		NC		NC	
469		5	max	-.002	7	0	7	NC		NC		NC		NC	
470			min	-.007	8	0	8	NC		NC		NC		NC	
471	M61	1	max	-.001	7	0	7	NC		NC		NC		NC	
472			min	-.004	8	0	8	NC		NC		NC		NC	
473		2	max	-.001	7	0	7	NC		NC		NC		NC	
474			min	-.004	8	0	8	NC		NC		NC		NC	
475		3	max	-.001	7	0	7	NC		NC		NC		NC	
476			min	-.004	8	0	8	NC		NC		NC		NC	
477		4	max	-.001	7	0	7	NC		NC		NC		NC	
478			min	-.004	8	0	8	NC		NC		NC		NC	
479		5	max	-.001	7	0	7	NC		NC		NC		NC	
480			min	-.004	8	0	8	NC		NC		NC		NC	
481	M62	1	max	3060.703	7	.209	7	NC		NC		NC		NC	
482			min	1769.815	1	.121	1	NC		NC		NC		NC	
483		2	max	3060.703	7	.209	7	NC		NC		NC		NC	
484			min	1769.815	1	.121	1	NC		NC		NC		NC	
485		3	max	3060.703	7	.209	7	NC		NC		NC		NC	
486			min	1769.815	1	.121	1	NC		NC		NC		NC	
487		4	max	3060.703	7	.209	7	NC		NC		NC		NC	
488			min	1769.815	1	.121	1	NC		NC		NC		NC	
489		5	max	3060.703	7	.209	7	NC		NC		NC		NC	
490			min	1769.815	1	.121	1	NC		NC		NC		NC	
491	M63	1	max	3060.703	7	.209	7	NC		NC		NC		NC	
492			min	1769.815	1	.121	1	NC		NC		NC		NC	
493		2	max	3060.703	7	.209	7	NC		NC		NC		NC	
494			min	1769.815	1	.121	1	NC		NC		NC		NC	
495		3	max	3060.703	7	.209	7	NC		NC		NC		NC	
496			min	1769.815	1	.121	1	NC		NC		NC		NC	
497		4	max	3060.703	7	.209	7	NC		NC		NC		NC	
498			min	1769.815	1	.121	1	NC		NC		NC		NC	
499		5	max	3060.703	7	.209	7	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
500			min	1769.815	1	.121	1	NC		NC		NC		NC	
501	M64	1	max	3060.703	7	.209	7	NC		NC		NC		NC	
502			min	1769.815	1	.121	1	NC		NC		NC		NC	
503		2	max	3060.703	7	.209	7	NC		NC		NC		NC	
504			min	1769.815	1	.121	1	NC		NC		NC		NC	
505		3	max	3060.703	7	.209	7	NC		NC		NC		NC	
506			min	1769.815	1	.121	1	NC		NC		NC		NC	
507		4	max	3060.703	7	.209	7	NC		NC		NC		NC	
508			min	1769.815	1	.121	1	NC		NC		NC		NC	
509		5	max	3060.703	7	.209	7	NC		NC		NC		NC	
510			min	1769.815	1	.121	1	NC		NC		NC		NC	
511	M65	1	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
512			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
513		2	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
514			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
515		3	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
516			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
517		4	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
518			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
519		5	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
520			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
521	M66	1	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
522			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
523		2	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
524			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
525		3	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
526			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
527		4	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
528			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
529		5	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
530			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
531	M67	1	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
532			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
533		2	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
534			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
535		3	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
536			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
537		4	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
538			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
539		5	max	-1769.815	1	-.121	1	NC		NC		NC		NC	
540			min	-3060.703	6	-.209	6	NC		NC		NC		NC	
541	M68	1	max	.004	8	0	8	NC		NC		NC		NC	
542			min	.001	7	0	7	NC		NC		NC		NC	
543		2	max	.004	8	0	8	NC		NC		NC		NC	
544			min	.001	7	0	7	NC		NC		NC		NC	
545		3	max	.004	8	0	8	NC		NC		NC		NC	
546			min	.001	7	0	7	NC		NC		NC		NC	
547		4	max	.004	8	0	8	NC		NC		NC		NC	
548			min	.001	7	0	7	NC		NC		NC		NC	
549		5	max	.004	8	0	8	NC		NC		NC		NC	
550			min	.001	7	0	7	NC		NC		NC		NC	
551	M69	1	max	.003	8	0	8	NC		NC		NC		NC	
552			min	-.003	7	0	7	NC		NC		NC		NC	
553		2	max	.003	8	0	8	NC		NC		NC		NC	
554			min	-.003	7	0	7	NC		NC		NC		NC	
555		3	max	.003	8	0	8	NC		NC		NC		NC	
556			min	-.003	7	0	7	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
557		4	max	.003	8	0	8	NC		NC		NC		NC	
558			min	-.003	7	0	7	NC		NC		NC		NC	
559		5	max	.003	8	0	8	NC		NC		NC		NC	
560			min	-.003	7	0	7	NC		NC		NC		NC	
561	M70	1	max	628.842	5	.043	5	NC		NC		NC		NC	
562			min	-628.842	4	-.043	4	NC		NC		NC		NC	
563		2	max	628.842	5	.043	5	NC		NC		NC		NC	
564			min	-628.842	4	-.043	4	NC		NC		NC		NC	
565		3	max	628.842	5	.043	5	NC		NC		NC		NC	
566			min	-628.842	4	-.043	4	NC		NC		NC		NC	
567		4	max	628.842	5	.043	5	NC		NC		NC		NC	
568			min	-628.842	4	-.043	4	NC		NC		NC		NC	
569		5	max	628.842	5	.043	5	NC		NC		NC		NC	
570			min	-628.842	4	-.043	4	NC		NC		NC		NC	
571	M71	1	max	636.828	5	.044	5	NC		NC		NC		NC	
572			min	-636.828	4	-.044	4	NC		NC		NC		NC	
573		2	max	636.828	5	.044	5	NC		NC		NC		NC	
574			min	-636.828	4	-.044	4	NC		NC		NC		NC	
575		3	max	636.828	5	.044	5	NC		NC		NC		NC	
576			min	-636.828	4	-.044	4	NC		NC		NC		NC	
577		4	max	636.828	5	.044	5	NC		NC		NC		NC	
578			min	-636.828	4	-.044	4	NC		NC		NC		NC	
579		5	max	636.828	5	.044	5	NC		NC		NC		NC	
580			min	-636.828	4	-.044	4	NC		NC		NC		NC	
581	M72	1	max	1011.873	5	.069	5	NC		NC		NC		NC	
582			min	-1011.873	4	-.069	4	NC		NC		NC		NC	
583		2	max	1011.873	5	.069	5	NC		NC		NC		NC	
584			min	-1011.873	4	-.069	4	NC		NC		NC		NC	
585		3	max	1011.873	5	.069	5	NC		NC		NC		NC	
586			min	-1011.873	4	-.069	4	NC		NC		NC		NC	
587		4	max	1011.873	5	.069	5	NC		NC		NC		NC	
588			min	-1011.873	4	-.069	4	NC		NC		NC		NC	
589		5	max	1011.873	5	.069	5	NC		NC		NC		NC	
590			min	-1011.873	4	-.069	4	NC		NC		NC		NC	
591	M73	1	max	1679.632	5	.115	5	NC		NC		NC		NC	
592			min	-1679.632	4	-.115	4	NC		NC		NC		NC	
593		2	max	1679.632	5	.115	5	NC		NC		NC		NC	
594			min	-1679.632	4	-.115	4	NC		NC		NC		NC	
595		3	max	1679.632	5	.115	5	NC		NC		NC		NC	
596			min	-1679.632	4	-.115	4	NC		NC		NC		NC	
597		4	max	1679.632	5	.115	5	NC		NC		NC		NC	
598			min	-1679.632	4	-.115	4	NC		NC		NC		NC	
599		5	max	1679.632	5	.115	5	NC		NC		NC		NC	
600			min	-1679.632	4	-.115	4	NC		NC		NC		NC	
601	M74	1	max	1976.337	9	.135	9	NC		NC		NC		NC	
602			min	-1976.337	6	-.135	6	NC		NC		NC		NC	
603		2	max	1976.337	9	.135	9	NC		NC		NC		NC	
604			min	-1976.337	6	-.135	6	NC		NC		NC		NC	
605		3	max	1976.337	9	.135	9	NC		NC		NC		NC	
606			min	-1976.337	6	-.135	6	NC		NC		NC		NC	
607		4	max	1976.337	9	.135	9	NC		NC		NC		NC	
608			min	-1976.337	6	-.135	6	NC		NC		NC		NC	
609		5	max	1976.337	9	.135	9	NC		NC		NC		NC	
610			min	-1976.337	6	-.135	6	NC		NC		NC		NC	
611	M75	1	max	1599.134	9	.109	9	NC		NC		NC		NC	
612			min	-1599.134	6	-.109	6	NC		NC		NC		NC	
613		2	max	1599.134	9	.109	9	NC		NC		NC		NC	

Company : **DMJM H&N**
Designer : **Kevin M. Jones**
Job Number : **145579-V-CA-005** **DBVS Off-Gas Treatment Duct Analysis**

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
614			min	-1599.134	6	-.109	6	NC		NC		NC		NC	
615		3	max	1599.134	9	.109	9	NC		NC		NC		NC	
616			min	-1599.134	6	-.109	6	NC		NC		NC		NC	
617		4	max	1599.134	9	.109	9	NC		NC		NC		NC	
618			min	-1599.134	6	-.109	6	NC		NC		NC		NC	
619		5	max	1599.134	9	.109	9	NC		NC		NC		NC	
620			min	-1599.134	6	-.109	6	NC		NC		NC		NC	
621	M76	1	max	1150.53	9	.079	9	NC		NC		NC		NC	
622			min	-1150.53	6	-.079	6	NC		NC		NC		NC	
623		2	max	1150.53	9	.079	9	NC		NC		NC		NC	
624			min	-1150.53	6	-.079	6	NC		NC		NC		NC	
625		3	max	1150.53	9	.079	9	NC		NC		NC		NC	
626			min	-1150.53	6	-.079	6	NC		NC		NC		NC	
627		4	max	1150.53	9	.079	9	NC		NC		NC		NC	
628			min	-1150.53	6	-.079	6	NC		NC		NC		NC	
629		5	max	1150.53	9	.079	9	NC		NC		NC		NC	
630			min	-1150.53	6	-.079	6	NC		NC		NC		NC	
631	M77	1	max	712.022	9	.049	9	NC		NC		NC		NC	
632			min	-712.022	6	-.049	6	NC		NC		NC		NC	
633		2	max	712.022	9	.049	9	NC		NC		NC		NC	
634			min	-712.022	6	-.049	6	NC		NC		NC		NC	
635		3	max	712.022	9	.049	9	NC		NC		NC		NC	
636			min	-712.022	6	-.049	6	NC		NC		NC		NC	
637		4	max	712.022	9	.049	9	NC		NC		NC		NC	
638			min	-712.022	6	-.049	6	NC		NC		NC		NC	
639		5	max	712.022	9	.049	9	NC		NC		NC		NC	
640			min	-712.022	6	-.049	6	NC		NC		NC		NC	
641	M78	1	max	548.338	9	.038	9	NC		NC		NC		NC	
642			min	-548.338	6	-.038	6	NC		NC		NC		NC	
643		2	max	548.338	9	.038	9	NC		NC		NC		NC	
644			min	-548.338	6	-.038	6	NC		NC		NC		NC	
645		3	max	548.338	9	.038	9	NC		NC		NC		NC	
646			min	-548.338	6	-.038	6	NC		NC		NC		NC	
647		4	max	548.338	9	.038	9	NC		NC		NC		NC	
648			min	-548.338	6	-.038	6	NC		NC		NC		NC	
649		5	max	548.338	9	.038	9	NC		NC		NC		NC	
650			min	-548.338	6	-.038	6	NC		NC		NC		NC	
651	M79	1	max	784.068	5	.054	5	NC		NC		NC		NC	
652			min	-784.068	4	-.054	4	NC		NC		NC		NC	
653		2	max	784.068	5	.054	5	NC		NC		NC		NC	
654			min	-784.068	4	-.054	4	NC		NC		NC		NC	
655		3	max	784.068	5	.054	5	NC		NC		NC		NC	
656			min	-784.068	4	-.054	4	NC		NC		NC		NC	
657		4	max	784.068	5	.054	5	NC		NC		NC		NC	
658			min	-784.068	4	-.054	4	NC		NC		NC		NC	
659		5	max	784.068	5	.054	5	NC		NC		NC		NC	
660			min	-784.068	4	-.054	4	NC		NC		NC		NC	
661	M80	1	max	1574.144	5	.108	5	NC		NC		NC		NC	
662			min	-1574.144	4	-.108	4	NC		NC		NC		NC	
663		2	max	1574.144	5	.108	5	NC		NC		NC		NC	
664			min	-1574.144	4	-.108	4	NC		NC		NC		NC	
665		3	max	1574.144	5	.108	5	NC		NC		NC		NC	
666			min	-1574.144	4	-.108	4	NC		NC		NC		NC	
667		4	max	1574.144	5	.108	5	NC		NC		NC		NC	
668			min	-1574.144	4	-.108	4	NC		NC		NC		NC	
669		5	max	1574.144	5	.108	5	NC		NC		NC		NC	
670			min	-1574.144	4	-.108	4	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
671	M81	1	max	2439.283	5	.167	5	NC		NC		NC		NC	
672			min	-2439.283	4	-.167	4	NC		NC		NC		NC	
673		2	max	2439.283	5	.167	5	NC		NC		NC		NC	
674			min	-2439.283	4	-.167	4	NC		NC		NC		NC	
675		3	max	2439.283	5	.167	5	NC		NC		NC		NC	
676			min	-2439.283	4	-.167	4	NC		NC		NC		NC	
677		4	max	2439.283	5	.167	5	NC		NC		NC		NC	
678			min	-2439.283	4	-.167	4	NC		NC		NC		NC	
679		5	max	2439.283	5	.167	5	NC		NC		NC		NC	
680			min	-2439.283	4	-.167	4	NC		NC		NC		NC	
681	M82	1	max	3265.402	5	.223	5	NC		NC		NC		NC	
682			min	-3265.402	4	-.223	4	NC		NC		NC		NC	
683		2	max	3265.402	5	.223	5	NC		NC		NC		NC	
684			min	-3265.402	4	-.223	4	NC		NC		NC		NC	
685		3	max	3265.402	5	.223	5	NC		NC		NC		NC	
686			min	-3265.402	4	-.223	4	NC		NC		NC		NC	
687		4	max	3265.402	5	.223	5	NC		NC		NC		NC	
688			min	-3265.402	4	-.223	4	NC		NC		NC		NC	
689		5	max	3265.402	5	.223	5	NC		NC		NC		NC	
690			min	-3265.402	4	-.223	4	NC		NC		NC		NC	
691	M83	1	max	3675.459	5	.251	5	NC		NC		NC		NC	
692			min	-3675.459	4	-.251	4	NC		NC		NC		NC	
693		2	max	3675.459	5	.251	5	NC		NC		NC		NC	
694			min	-3675.459	4	-.251	4	NC		NC		NC		NC	
695		3	max	3675.459	5	.251	5	NC		NC		NC		NC	
696			min	-3675.459	4	-.251	4	NC		NC		NC		NC	
697		4	max	3675.459	5	.251	5	NC		NC		NC		NC	
698			min	-3675.459	4	-.251	4	NC		NC		NC		NC	
699		5	max	3675.459	5	.251	5	NC		NC		NC		NC	
700			min	-3675.459	4	-.251	4	NC		NC		NC		NC	
701	M84	1	max	0	1	0	1	NC		NC		NC		NC	
702			min	0	1	0	1	NC		NC		NC		NC	
703		2	max	0	1	0	1	NC		NC		NC		NC	
704			min	0	1	0	1	NC		NC		NC		NC	
705		3	max	0	1	0	1	NC		NC		NC		NC	
706			min	0	1	0	1	NC		NC		NC		NC	
707		4	max	0	1	0	1	NC		NC		NC		NC	
708			min	0	1	0	1	NC		NC		NC		NC	
709		5	max	0	1	0	1	NC		NC		NC		NC	
710			min	0	1	0	1	NC		NC		NC		NC	
711	M85	1	max	0	1	0	1	NC		NC		NC		NC	
712			min	0	1	0	1	NC		NC		NC		NC	
713		2	max	0	1	0	1	NC		NC		NC		NC	
714			min	0	1	0	1	NC		NC		NC		NC	
715		3	max	0	1	0	1	NC		NC		NC		NC	
716			min	0	1	0	1	NC		NC		NC		NC	
717		4	max	0	1	0	1	NC		NC		NC		NC	
718			min	0	1	0	1	NC		NC		NC		NC	
719		5	max	0	1	0	1	NC		NC		NC		NC	
720			min	0	1	0	1	NC		NC		NC		NC	
721	M87	1	max	0	1	0	1	NC		NC		NC		NC	
722			min	0	1	0	1	NC		NC		NC		NC	
723		2	max	0	1	0	1	NC		NC		NC		NC	
724			min	0	1	0	1	NC		NC		NC		NC	
725		3	max	0	1	0	1	NC		NC		NC		NC	
726			min	0	1	0	1	NC		NC		NC		NC	
727		4	max	0	1	0	1	NC		NC		NC		NC	

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Envelope Member Section Torsion (Continued)

	Member	Sec		Torque[l...	lc	Torsion Shear[ksi]	lc	y-y Warp...	lc	z-z Warp Shear[ksi]	lc	z-Top W...	lc	z-Bot Wa...	lc
728			min	0	1	0	1	NC		NC		NC		NC	
729		5	max	0	1	0	1	NC		NC		NC		NC	
730			min	0	1	0	1	NC		NC		NC		NC	
731	M88	1	max	0	1	0	1	NC		NC		NC		NC	
732			min	0	1	0	1	NC		NC		NC		NC	
733		2	max	0	1	0	1	NC		NC		NC		NC	
734			min	0	1	0	1	NC		NC		NC		NC	
735		3	max	0	1	0	1	NC		NC		NC		NC	
736			min	0	1	0	1	NC		NC		NC		NC	
737		4	max	0	1	0	1	NC		NC		NC		NC	
738			min	0	1	0	1	NC		NC		NC		NC	
739		5	max	0	1	0	1	NC		NC		NC		NC	
740			min	0	1	0	1	NC		NC		NC		NC	
741	M89	1	max	0	1	0	1	NC		NC		NC		NC	
742			min	0	1	0	1	NC		NC		NC		NC	
743		2	max	0	1	0	1	NC		NC		NC		NC	
744			min	0	1	0	1	NC		NC		NC		NC	
745		3	max	0	1	0	1	NC		NC		NC		NC	
746			min	0	1	0	1	NC		NC		NC		NC	
747		4	max	0	1	0	1	NC		NC		NC		NC	
748			min	0	1	0	1	NC		NC		NC		NC	
749		5	max	0	1	0	1	NC		NC		NC		NC	
750			min	0	1	0	1	NC		NC		NC		NC	
751	M90	1	max	0	1	0	1	NC		NC		NC		NC	
752			min	0	1	0	1	NC		NC		NC		NC	
753		2	max	0	1	0	1	NC		NC		NC		NC	
754			min	0	1	0	1	NC		NC		NC		NC	
755		3	max	0	1	0	1	NC		NC		NC		NC	
756			min	0	1	0	1	NC		NC		NC		NC	
757		4	max	0	1	0	1	NC		NC		NC		NC	
758			min	0	1	0	1	NC		NC		NC		NC	
759		5	max	0	1	0	1	NC		NC		NC		NC	
760			min	0	1	0	1	NC		NC		NC		NC	

amec

CALCULATION SHEET

CALC. NO.:	145579-V-CA-005	REV:	1	DATE:	March 26, 2006
CALC. TITLE:	Off-Gas Treatment System Pipe Stress Analysis				
PROJECT NO.:	145579	PROJECT TITLE:	Final DBVS Design		

Attachment 9: Excel Spreadsheet – Model 1 AG-1 Analysis and Unity Checks

NOTE: This cover sheet represents the approval signatures of the originator and checker for all pages of this attachment.

ORIGINATOR:	DATE:	CHECKER:	DATE:
Kevin M. Jones KMJ	3/26/06	J. Van Corbach JVC	3/26/06

Duct Size	σ_c (ksi) Eq. 1b	σ_b (ksi) Eq. 6 or 7	c_b (ksi) Eq. 5	ϵ_c (ksi) Eq. 9	v_t (ksi) Eq. 9	σ_v (ksi) Eq. 10	Temp	Material
2in Dia. Duct	4.6	27.0	22.5	32.3	15.6	15.6	100	CS
3in Dia. Duct	8.8	22.5	18.8	35.7	13.0	13.0	100	SS
4in Dia. Duct	10.4	22.5	18.8	33.2	13.0	13.0	100	SS
5in Dia. Duct	8.6	12.6	10.5	28.5	7.3	7.3	676	SS
6in Dia. Duct	7.8	14.0	11.7	27.8	8.1	8.1	572	SS
8in Dia. Duct	8.3	14.0	11.7	10.3	8.1	8.1	572	SS
12in Dia. Duct	13.7	22.5	18.8	10.8	13.0	13.0	100	SS
18in Dia. Duct	8.9	14.0	11.7	8.7	8.1	8.1	572	SS
8in Dia. Duct	13.0	22.5	18.8	11.3	13.0	13.0	100	SS

Model 1

D-2250

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_{by}/σ_b	f_{bz}/σ_b	f_s (ksi)	f/v_t	$1/\sigma_v$
1	M1	RIGID	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
2	M1	RIGID	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
3	M1	RIGID	Sec 2 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
4	M1	RIGID	Sec 2 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
5	M1	RIGID	Sec 3 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
6	M1	RIGID	Sec 3 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
7	M1	RIGID	Sec 4 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
8	M1	RIGID	Sec 4 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
9	M1	RIGID	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
10	M1	RIGID	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
11	M2	RIGID	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
12	M2	RIGID	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
13	M2	RIGID	Sec 2 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
14	M2	RIGID	Sec 2 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
15	M2	RIGID	Sec 3 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
16	M2	RIGID	Sec 3 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
17	M2	RIGID	Sec 4 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
18	M2	RIGID	Sec 4 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
19	M2	RIGID	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
20	M2	RIGID	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
21	M3	RIGID	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
22	M3	RIGID	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
23	M3	RIGID	Sec 2 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
24	M3	RIGID	Sec 2 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
25	M3	RIGID	Sec 3 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
26	M3	RIGID	Sec 3 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
27	M3	RIGID	Sec 4 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
28	M3	RIGID	Sec 4 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
29	M3	RIGID	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
30	M3	RIGID	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
31	M4	RIGID	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
32	M4	RIGID	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
33	M4	RIGID	Sec 2 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
34	M4	RIGID	Sec 2 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
35	M4	RIGID	Sec 3 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
36	M4	RIGID	Sec 3 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
37	M4	RIGID	Sec 4 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
38	M4	RIGID	Sec 4 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
39	M4	RIGID	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
40	M4	RIGID	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
41	M5	RIGID	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
42	M5	RIGID	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
43	M5	RIGID	Sec 2 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
44	M5	RIGID	Sec 2 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
45	M5	RIGID	Sec 3 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
46	M5	RIGID	Sec 3 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
47	M5	RIGID	Sec 4 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
48	M5	RIGID	Sec 4 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
49	M5	RIGID	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
50	M5	RIGID	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
51	M6	RIGID	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
52	M6	RIGID	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
53	M6	RIGID	Sec 2 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
54	M6	RIGID	Sec 2 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
55	M6	RIGID	Sec 3 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
56	M6	RIGID	Sec 3 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
57	M6	RIGID	Sec 4 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
58	M6	RIGID	Sec 4 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
59	M6	RIGID	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
60	M6	RIGID	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
261	M29	RIGID	Sec 1 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	4	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
262	M29	RIGID	Sec 1 - min	0.000	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
263	M29	RIGID	Sec 2 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	4	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
264	M29	RIGID	Sec 2 - min	0.000	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
265	M29	RIGID	Sec 3 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	4	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
266	M29	RIGID	Sec 3 - min	0.000	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
267	M29	RIGID	Sec 4 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	4	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
268	M29	RIGID	Sec 4 - min	0.000	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
269	M29	RIGID	Sec 5 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	4	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
270	M29	RIGID	Sec 5 - min	0.000	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1551	M166	RIGID	Sec 1 - max	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	183.236	2	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1552	M166	RIGID	Sec 1 - min	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-153.910	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a	f_t (ksi)	f_t/σ_t	f_t/σ_a
																									D-2250		
1553	M166	RIGID	Sec 2 - max	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	183.236	2	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1554	M166	RIGID	Sec 2 - min	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-153.910	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1555	M166	RIGID	Sec 3 - max	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	183.236	2	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1556	M166	RIGID	Sec 3 - min	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-153.910	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1557	M166	RIGID	Sec 4 - max	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	183.236	2	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1558	M166	RIGID	Sec 4 - min	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-153.910	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1559	M166	RIGID	Sec 5 - max	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	183.236	2	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1560	M166	RIGID	Sec 5 - min	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-153.910	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1561	M167	RIGID	Sec 1 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	153.913	2	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1562	M167	RIGID	Sec 1 - min	0.000	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-183.235	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1563	M167	RIGID	Sec 2 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	153.913	2	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1564	M167	RIGID	Sec 2 - min	0.000	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-183.235	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1565	M167	RIGID	Sec 3 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	153.913	2	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1566	M167	RIGID	Sec 3 - min	0.000	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-183.235	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1567	M167	RIGID	Sec 4 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	153.913	2	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1568	M167	RIGID	Sec 4 - min	0.000	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-183.235	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1569	M167	RIGID	Sec 5 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	153.913	2	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
1570	M167	RIGID	Sec 5 - min	0.000	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-183.235	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000
2541	M265	2in Dia. Duct	Sec 1 - max	0.148	5	-0.117	8	-0.133	6	9.963	5	-4.048	8	12.276	5	-4.602	8	0.000	1	0.000	1	0.033	0.369	0.455	12.276	0.000	0.000
2542	M265	2in Dia. Duct	Sec 1 - min	0.068	8	-0.208	5	-0.331	5	4.048	8	-9.963	5	4.602	8	-12.276	5	0.000	1	0.000	1	0.015	0.369	0.455	12.276	0.000	0.021
479	M50	Sin Dia. Duct	Sec 5 - max	0.275	5	-0.177	8	0.117	5	-2.430	5	3.495	8	1.429	5	7.414	8	115.607	7	0.101	7	0.033	0.250	0.530	7.414	0.012	0.022
770	M87	Sin Dia. Duct	Sec 5 - min	-0.246	5	-0.152	7	-0.238	6	-5.448	7	-4.228	6	-4.202	8	-0.959	5	-562.573	6	-0.732	6	0.036	0.432	0.341	5.448	0.101	0.033
2531	M264	2in Dia. Duct	Sec 1 - max	0.170	5	-0.070	8	-0.111	8	6.535	5	-2.323	8	14.248	5	-3.825	8	0.000	1	0.000	1	0.038	0.242	0.528	14.248	0.000	0.007
788	M87	Sin Dia. Duct	Sec 4 - min	-0.245	5	-0.152	7	-0.238	6	-5.370	7	-4.209	6	-4.189	8	-0.849	5	-562.573	6	-0.732	6	0.036	0.427	0.332	5.376	0.101	0.033
789	M87	Sin Dia. Duct	Sec 5 - max	0.102	8	0.040	6	0.232	5	4.228	6	5.448	7	0.959	5	4.302	8	506.461	7	0.659	7	0.015	0.432	0.341	5.448	0.091	0.032
2532	M264	2in Dia. Duct	Sec 1 - min	0.068	8	-0.174	5	-0.385	5	2.323	8	-6.535	5	3.825	8	-14.248	5	0.000	1	0.000	1	0.015	0.242	0.528	14.248	0.000	0.025
460	M50	Sin Dia. Duct	Sec 5 - min	0.039	5	-0.240	5	-0.291	8	-3.495	8	2.430	5	-7.414	8	-1.429	5	-149.129	6	-0.123	6	0.005	0.250	0.530	7.414	0.015	0.036
768	M87	Sin Dia. Duct	Sec 3 - min	-0.245	5	-0.151	7	-0.238	8	-5.304	7	-4.169	6	-4.076	8	-0.739	5	-562.573	6	-0.732	6	0.036	0.421	0.323	5.304	0.101	0.033
767	M87	Sin Dia. Duct	Sec 4 - max	0.102	8	0.040	6	0.232	5	4.209	6	5.376	7	0.849	5	4.169	8	506.461	7	0.659	7	0.015	0.427	0.332	5.376	0.091	0.032
1799	M190	Sin Dia. Duct	Sec 5 - max	0.008	8	-0.023	1	0.011	5	-7.434	5	7.650	8	-1.464	7	1.823	6	160.961	6	0.210	6	0.001	0.623	0.145	7.650	0.029	0.003
1800	M190	Sin Dia. Duct	Sec 5 - min	-0.006	5	-0.023	7	-0.011	7	-7.650	8	7.434	5	-1.823	6	1.464	7	-36.753	7	-0.048	7	0.001	0.623	0.145	7.650	0.007	0.002
764	M87	Sin Dia. Duct	Sec 2 - min	-0.244	5	-0.151	7	-0.238	8	-5.232	7	-4.170	6	-3.997	6	-0.663	7	-562.573	6	-0.732	6	0.036	0.415	0.317	5.232	0.101	0.033
1797	M190	Sin Dia. Duct	Sec 4 - max	0.005	6	-0.019	1	0.010	5	-7.393	5	7.609	8	-1.444	7	1.853	6	160.961	6	0.210	6	0.001	0.620	0.147	7.609	0.029	0.003
1798	M190	Sin Dia. Duct	Sec 4 - min	-0.005	5	-0.019	7	-0.010	7	-7.609	8	7.393	5	-1.853	6	1.444	7	-36.753	7	-0.048	7	0.001	0.620	0.147	7.609	0.007	0.002
1795	M190	Sin Dia. Duct	Sec 3 - max	0.004	8	-0.018	1	0.008	5	-7.359	5	7.775	8	-1.427	7	1.870	6	160.961	6	0.210	6	0.001	0.617	0.148	7.775	0.029	0.002
1796	M190	Sin Dia. Duct	Sec 3 - min	-0.004	5	-0.018	7	-0.008	7	-7.775	8	7.359	5	-1.870	6	1.427	7	-36.753	7	-0.048	7	0.001	0.617	0.148	7.775	0.007	0.002
1793	M190	Sin Dia. Duct	Sec 2 - max	0.003	8	-0.013	1	0.008	5	-7.332	5	7.748	8	-1.413	7	1.884	6	160.961	6	0.210	6	0.000	0.615	0.150	7.748	0.029	0.002
1794	M190	Sin Dia. Duct	Sec 2 - min	-0.003	5	-0.013	7	-0.006	7	-7.748	8	7.332	5	-1.884	6	1.413	7	-36.753	7	-0.048	7	0.000	0.615	0.150	7.748	0.007	0.002
101	M11	Sin Dia. Duct	Sec 1 - max	0.002	5	0.328	8	-0.046	6	-7.311	5	7.727	6	1.894	6	-1.403	7	160.961	6	0.210	6	0.000	0.613	0.150	7.727	0.029	0.045
102	M11	Sin Dia. Duct	Sec 1 - min	-0.002	6	0.296	5	-0.073	7	-7.727	8	7.311	5	1.403	7	-1.894	6	-36.753	7	-0.048	7	0.000	0.613	0.150	7.727	0.007	0.041
1771	M188	Sin Dia. Duct	Sec 1 - max	0.002	5	0.009	2	0.005	7	-7.311	5	7.727	8	-1.403	7	1.894	6	160.961	6	0.210	6	0.000	0.613	0.150	7.727	0.029	0.001
1772	M188	Sin Dia. Duct	Sec 1 - min	-0.002	6	0.009	1	-0.005	5	-7.727	8	7.311	5	-1.894	6	1.403	7	-36.753	7	-0.048	7	0.000	0.613	0.150	7.727	0.007	0.001
1769	M189	Sin Dia. Duct	Sec 5 - max	0.002	6	-0.009	1	0.005	5	-7.311	5	7.727	8	-1.403	7	1.894	6	160.961	6	0.210	6	0.000	0.613	0.150	7.727	0.029	0.001
1790	M189	Sin Dia. Duct	Sec 5 - min	-0.002	6	-0.009	1	-0.005	7	-7.727	8	7.311	5	-1.894	6	1.403	7	-36.753	7	-0.048	7	0.000	0.613	0.150	7.727	0.007	0.001
1791	M190	Sin Dia. Duct	Sec 1 - max	0.002	6	-0.009	1	0.005	5	-7.311	5	7.727	8	-1.403	7	1.894	6	160.961	6	0.210	6	0.000	0.613	0.150	7.727	0.029	0.001
1792	M190	Sin Dia. Duct	Sec 1 - min	-0.002	5	-0.009	7	-0.005	7	-7.727	8	7.311	5	-1.894	6	1.403	7	-36.753	7	-0.048	7	0.000	0.613	0.150	7.727	0.007	0.001
1773	M188	Sin Dia. Duct	Sec 2 - max	0.002	5	0.007	2	0.003	7	-7.301	5	7.717	8	-1.395	7	1.899	6	160.961	6	0.210	6	0.000	0.612	0.151	7.717	0.029	0.001
1774	M188	Sin Dia. Duct	Sec 2 - min	-0.002	6	0.007	1	-0.003	5	-7.717	8	7.301	5	-1.899	6	1.388	7	-36.753	7	-0.048	7	0.000	0.612	0.151	7.717	0.007	0.001
1787	M189	Sin Dia. Duct	Sec 4 - max	0.002	6	-0.007	1	0.003	5	-7.301	5	7.717	8	-1.395	7	1.899	6	160.961	6	0.210	6	0.000	0.612	0.151	7.717	0.029	0.001
1788	M189	Sin Dia. Duct	Sec 4 - min	-0.002	5	-0.007	1	-0.003	7	-7.717	8	7.301	5	-1.899	6	1.388	7	-36.753	7	-0.048	7	0.000	0.612	0.151	7.717	0.007	0.001
1775	M188	Sin Dia. Duct	Sec 3 - max	0.001	5	0.005	2	0.002	7	-7.294	5	7.710	8	-1.394	7	1.903	6	160.961	6	0.210	6	0.000	0.612	0.151	7.710	0.029	0.001
1776	M188	Sin Dia. Duct	Sec 3 - min	-0.001	6	0.005	1	-0.002	5	-7.710	8	7.294	5	-1.903	6	1.394	7	-36.753	7	-0.048	7	0.000	0.612	0.151	7.710	0.007	0.001
1785	M189	Sin Dia. Duct	Sec 3 - max	0.001	8	-0.005	1	0.002	5	-7.294	5	7.710	8	-1.394	7	1.903	6	160.961	6	0.210	6	0.000	0.612	0.151	7.710	0.029	0.001
1786	M189	Sin Dia. Duct	Sec 3 - min	-0.001	5	-0.005	1	-0.002	7	-7.710	8	7.294	5	-1.903	6	1.394	7	-36.753	7	-0.048	7	0.000	0.612	0.151	7.710	0.007	0.001
762	M87	Sin Dia. Duct	Sec 1 - min	-0.244	5	-0.151	7	-0.238	8	-5.161	7	-4.151	6	-3.999	6	-0.668	7	-562.573	6	-0.732	6	0.036	0.410	0.317	5.161	0.101	0.033
1777	M188	Sin Dia. Duct	Sec 4 - max	0.000	5	0.002	2	0.001	7	-7.289	5	7.706	8	-1.392	7	1.905	6	160.961	6	0.210	6	0.000	0.612	0.151	7.706	0.029	0.000
1778	M188	Sin Dia. Duct	Sec 4 - min	0.000	6	0.002	1	-0.001	5	-7.706	8	7.289	5	-1.905	6	1.392	7	-36.753	7	-0.048	7	0.000	0.612	0.151	7.706	0.007	0.000
1783	M189	Sin Dia. Duct	Sec 2 - max	0.000	6	-0.002	1	0.001	5	-7.289	5	7.706	8	-1.392	7	1.905	6	160.961	6	0.210	6	0.000	0.612	0.151	7.706	0.029	0.000
1784	M189	Sin Dia. Duct	Sec 2 - min	0.000	5	-0.002	1	-0.001	7	-7.706	8	7.289	5	-1.905	6	1.392	7	-36.753	7	-0.048	7	0.000	0.612	0.151	7.706	0.007	0.000
1779	M188	Sin Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	-7.288	5	7.704	8	-1.391	7	1.906	6	160.961	6	0.210	6	0.000	0.611	0.151	7.704	0.029	0.000
1780	M188	Sin Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	-7.704	8	7.288	5	-1.906	6	1.391	7	-36.753	7	-0.048	7	0.000	0.611	0.151	7.704	0.007	0.000
1781	M189	Sin Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	-7.288	5	7.704	8	-1.391	7	1.906	8	160.961	6	0.210	6	0.000	0.611	0.151	7.704	0.029	0.000
1782	M189	Sin Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	-7.704	8	7.288	5	-1.906	6	1.391	7	-36.753	7	-0.048	7	0.000	0.611	0.151	7.704	0.007	0.000
765	M87	Sin Dia. Duct	Sec 3 - max	0.102	8	0.040	6	0.232	5	4.189	6	5.304	7	0.739	5	4.076	8	506.461	7	0.659	7	0.015	0.421	0.323	5.304	0.091	0.032
401	M43	Sin Dia. Duct	Sec 1 - max	0.081	6	0.572	5	-0.061	8	-5.179	8	7.055	5	3.431	5	-0.600	6	414.335	5	0.347	5	0.010	0.504	0.245	7.055	0.043	0.071
402	M43	Sin Dia. Duct	Sec 1 - min	-0.081	7	0.240	6	-0.169	5	-7.055	5	5.179	8	0.600	8	-3.431	5	85.662	8	0.072	8	0.010	0.504	0.245	7.055	0.009	0.030
1219	M132	Sin Dia. Duct	Sec 5 - max	0.081	6	-0.333	8	0.303	5	-5.179	8	7.055	5	3.431	5	-0.600	8	414.335	5	0.347	5	0.010	0.504	0.245	7.055	0.043	0.041
1220	M132	Sin Dia. Duct	Sec 5 - min	-0.081	7	-0.366	5	0.082	8	-7.055	5	5.179	8	0.600	8	-3.431	5	85.662	8	0.072	8	0.010	0.504	0.245	7.055	0.009	0.045
763	M87	Sin Dia. Duct	Sec 2 - max	0.102	8	0.041	6	0.232	5	4.170	6	5.232	7	0.663	7	3.997	8	506.461	7	0.659	7	0.015	0.415	0.317	5.232	0.091	0.032
761	M87	Sin Dia. Duct	Sec 1 - max	0.103	8	0.041	6	0.232	5	4.151	6	5.161	7	0.668	7	3.999	8	506.461	7	0.659	7	0.015	0.410	0.317	5.161	0.091	0.032
103	M11	Sin Dia. Duct	Sec 2 - max	0.003	5	0.326	8	-0.048	8	-6.937	5	7.313	8	1.835	6	-1.311	7	160.961	6	0.210	6	0.000	0.580	0.145	7.313	0.029	0.045
104	M11	Sin Dia. Duct	Sec 2 - min	-0.003	8	0.294	5	-0.072	7	-7.313	8	6.937	5	1.311	7	-1.835	6	-36.753	7	-0.048	7	0.000	0.580	0.145	7.313	0.007	0.041
329	M35	Sin Dia. Duct	Sec 5 - max	0.038	7	0.150	6	0.357	5	1.727	6	4.762	7	3.036	5	4.289	8	1091.086	7	1.420	7	0.006	0.378	0.340	4.762	0.196	0.049
330	M35	Sin Dia. Duct	Sec 5 - min	-0.038	6	0.150	7	-0.232	8	-4.762	7	-1.727	6	-4.289	8	-3.036	5	443.829	6	0.578	6	0.006	0.378	0.340	4.762	0.080	0.032
760	M88	Sin Dia. Duct	Sec 5 - min	-0.203	6	-0.419	5	-0.233	8	-4.688	7	-4.859	8	-3.867	8	-0.033	5	-691.838	6	-0.901	6	0.030	0.386	0.307	4.859	0.124	0.058
776	M88	Sin Dia. Duct	Sec 4 - min	-0.203	8	-0.419	5	-0.233	8	-4.668	7	-4.943	6	-3.756	8	-0.520	5	-691.838	6	-0.901	6	0.030	0.392	0.298	4.943	0.124	0.058
776	M88	Sin Dia. Duct	Sec 3 - min	-0.203	6	-0.418	5	-0.233	8	-4.844	7	-5.027	6	-3.646	8	-0.408	5	-691.838	6	-0.901	6	0.030	0.399	0.289	5.027	0.124	0.058
774	M88	Sin Dia. Duct	Sec 2 - min	-0.203	8	-0.418	5	-0.232	8	-4.623	7	-5.110	8	-3.536	8	-0.298	5	-691.838	6	-0.901	6	0.030	0.406	0.281	5.110	0.124	0.059
327	M35	Sin Dia. Duct	Sec 4 - max	0.038	7	0.153	6	0.355	5	1.620	6	4.969	7	2.551	5	3.973	8	1091.086	7	1.420	7	0.006	0.394	0.315	4.969	0.196	0.049
328	M35	Sin Dia. Duct	Sec 4 - min	-0.038	6	0.153	7	-0.231	8	-4.969	7	-1.620	6	-3.973	8	-2.551	5	443.829	6	0.578	6	0.006	0.394	0.315	4.969	0.080	0.032
772	M88	Sin Dia. Duct	Sec 1 - min	-0.203	6	-0.418	5	-0.232	8	-4.602	7	-5.193	6	-3.426	8	-0.184	5	-691.838	6	-0.901	6	0.030	0.412	0.272	5.193	0.124	0.058
325	M35	Sin Dia. Duct	Sec 3 - max	0.039	7	0.155	6	0.354	5	1.311	6	5.178	7	2.068	5	3.659	8	1091.086	7	1.420	7	0.006	0.411	0.290	5.178	0.196	0.049
326	M35	Sin Dia. Duct	Sec 3 - min	-0.039	6	0.155	7	-0.230	8	-5.178	7	-1.311	6	-3.659	8	-2.068	5	443.829	6	0.578	6	0.006	0.411	0.290	5.178	0.080	0.032
779	M88	Sin Dia. Duct	Sec 5 - max	0.091	7	0.185	6	0.237	5	4.659	6	4.688	7	0.533	5	3.867	8	1211.078	7	1.576	7	0.013	0.386	0.307	4.659	0.217	0.033
777	M88	Sin Dia. Duct	Sec 4 - max	0.092	7	0.196	6	0.237	5	4.943	8	4.668	7	0.520	5	3.756	8	1211.078	7	1.576	7	0.014	0.392	0.298	4.943	0.217	0.033

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_b	f_{bz}/σ_b	[illegible]	f_t (ksi)	[illegible]	f_v/v_t	f_t/σ_t	[illegible]
775	M88	5in Dia. Duct	Sec 3 - max	0.092	7	0.197	6	0.236	5	5.027	6	4.644	7	0.408	5	3.646	8	1211.078	7	1.576	7	0.014	0.399	0.289	[illegible]	5.027	[illegible]	0.217	0.033	[illegible]
773	M88	5in Dia. Duct	Sec 2 - max	0.093	7	0.198	6	0.236	5	5.110	6	4.623	7	0.296	5	3.536	8	1211.078	7	1.576	7	0.014	0.408	0.281	[illegible]	5.110	[illegible]	0.217	0.033	[illegible]
323	M35	5in Dia. Duct	Sec 2 - max	0.039	7	0.158	6	0.353	5	1.098	6	5.391	7	1.587	5	3.347	8	1091.086	7	1.420	7	0.006	0.428	0.266	[illegible]	5.391	[illegible]	0.196	0.049	[illegible]
324	M35	5in Dia. Duct	Sec 2 - min	-0.039	6	0.158	7	-0.229	8	-5.391	7	-1.090	6	-3.347	8	-1.587	5	443.829	6	0.578	6	0.006	0.428	0.266	[illegible]	5.391	[illegible]	0.060	0.032	[illegible]
771	M88	5in Dia. Duct	Sec 1 - max	0.093	7	0.199	8	0.236	5	5.193	6	4.602	7	0.184	5	3.426	8	1211.078	7	1.576	7	0.014	0.412	0.272	[illegible]	5.193	[illegible]	0.217	0.033	[illegible]
321	M35	5in Dia. Duct	Sec 1 - max	0.040	7	0.160	8	0.352	5	0.881	6	5.608	7	1.107	5	3.037	8	1091.086	7	1.420	7	0.006	0.445	0.241	[illegible]	5.608	[illegible]	0.198	0.049	[illegible]
322	M35	5in Dia. Duct	Sec 1 - min	-0.040	6	0.160	7	-0.228	8	-5.808	7	-0.881	6	-3.037	8	-1.107	5	443.829	6	0.578	6	0.006	0.445	0.241	[illegible]	5.608	[illegible]	0.080	0.031	[illegible]
105	M11	5in Dia. Duct	Sec 3 - max	0.003	5	0.323	8	-0.049	6	-6.565	5	6.901	8	1.774	6	-1.220	7	160.961	6	0.210	6	0.000	0.548	0.141	[illegible]	6.901	[illegible]	0.029	0.045	[illegible]
106	M11	5in Dia. Duct	Sec 3 - min	-0.003	8	0.282	5	-0.071	7	-6.901	8	6.565	5	1.220	7	-1.774	6	-36.753	7	-0.048	7	0.000	0.548	0.141	[illegible]	6.901	[illegible]	0.007	0.040	[illegible]
2521	M283	2in Dia. Duct	Sec 1 - max	0.127	5	-0.063	8	-0.061	8	7.744	5	-2.004	8	9.607	5	-2.017	8	0.000	1	0.000	1	0.028	0.287	0.383	[illegible]	9.607	[illegible]	0.000	0.004	[illegible]
2522	M263	2in Dia. Duct	Sec 1 - min	0.043	8	-0.207	5	-0.264	5	2.084	8	-7.744	5	2.017	6	-9.807	5	0.000	1	0.000	1	0.010	0.287	0.383	[illegible]	9.807	[illegible]	0.000	0.017	[illegible]
1217	M132	8in Dia. Duct	Sec 4 - max	0.080	6	-0.328	8	0.301	5	-4.463	8	6.267	5	2.777	5	-0.419	8	414.335	5	0.347	5	0.010	0.448	0.198	[illegible]	6.207	[illegible]	0.043	0.040	[illegible]
1218	M132	6in Dia. Duct	Sec 4 - min	-0.080	7	-0.362	5	0.085	8	-6.267	5	4.460	8	0.419	8	-2.777	5	85.682	8	0.072	8	0.010	0.448	0.198	[illegible]	6.267	[illegible]	0.009	0.045	[illegible]
2543	M265	2in Dia. Duct	Sec 2 - max	0.162	5	-0.114	8	-0.130	8	7.513	5	-2.895	8	9.246	5	-3.411	8	0.000	1	0.000	1	0.034	0.278	0.343	[illegible]	9.246	[illegible]	0.000	0.006	[illegible]
107	M11	5in Dia. Duct	Sec 4 - max	0.004	5	0.321	8	-0.050	6	-6.197	5	6.493	8	1.711	6	-1.131	7	160.961	6	0.210	6	0.001	0.515	0.136	[illegible]	6.493	[illegible]	0.029	0.044	[illegible]
108	M11	5in Dia. Duct	Sec 4 - min	-0.004	8	0.289	5	-0.070	7	-6.493	8	6.197	5	1.131	7	-1.711	6	-36.753	7	-0.048	7	0.001	0.515	0.136	[illegible]	6.493	[illegible]	0.007	0.040	[illegible]
441	M47	8in Dia. Duct	Sec 1 - max	0.247	7	0.006	8	0.435	8	0.099	6	2.624	7	1.574	5	6.042	8	240.400	5	0.211	5	0.030	0.187	0.432	[illegible]	6.042	[illegible]	0.078	0.054	[illegible]
99	M10	3in Dia. Duct	Sec 5 - max	0.571	7	-0.046	1	-0.244	3	-1.331	1	1.711	2	-9.900	5	11.346	8	10.088	4	0.043	4	0.066	0.076	0.504	[illegible]	11.346	[illegible]	0.003	0.019	[illegible]
80	M8	6in Dia. Duct	Sec 5 - min	-0.331	1	-0.181	8	-0.224	8	-3.993	8	3.920	5	-4.335	8	1.160	8	83.143	7	0.070	7	0.042	0.285	0.310	[illegible]	4.335	[illegible]	0.009	0.026	[illegible]
2544	M265	2in Dia. Duct	Sec 2 - min	0.069	8	-0.271	5	-0.334	5	2.995	8	-7.513	5	3.411	6	-9.246	5	0.000	1	0.000	1	0.015	0.278	0.343	[illegible]	9.246	[illegible]	0.000	0.021	[illegible]
442	M47	8in Dia. Duct	Sec 1 - min	-0.134	8	-0.197	5	0.007	5	-2.624	7	-0.999	6	-6.042	8	-1.574	5	-1160.600	8	-1.036	8	0.016	0.187	0.432	[illegible]	6.042	[illegible]	0.126	0.024	[illegible]
443	M47	8in Dia. Duct	Sec 2 - max	0.246	7	0.004	8	0.433	8	0.963	6	2.745	7	1.580	5	5.690	8	240.400	5	0.211	5	0.030	0.196	0.406	[illegible]	5.690	[illegible]	0.026	0.053	[illegible]
2209	M231	2in Dia. Duct	Sec 5 - max	0.212	5	-0.131	8	0.045	5	-6.117	8	15.725	5	0.000	1	0.000	1	-10.064	6	-0.137	6	0.047	0.582	0.000	[illegible]	15.725	[illegible]	0.009	0.008	[illegible]
100	M10	3in Dia. Duct	Sec 5 - min	0.419	6	-0.077	2	-0.309	4	-1.711	2	1.331	1	-11.346	8	9.900	5	5.736	3	0.024	3	0.049	0.076	0.504	[illegible]	11.346	[illegible]	0.002	0.024	[illegible]
477	M50	8in Dia. Duct	Sec 4 - max	0.267	5	-0.173	6	0.125	5	-1.151	5	2.516	8	0.777	5	5.819	8	115.607	7	0.101	7	0.032	0.180	0.416	[illegible]	5.819	[illegible]	0.012	0.021	[illegible]
1200	M130	6in Dia. Duct	Sec 5 - min	-0.219	5	0.232	8	-0.136	5	1.137	5	-5.490	8	-2.848	6	2.381	7	-1415.751	5	-1.185	5	0.028	0.393	0.203	[illegible]	5.496	[illegible]	0.146	0.029	[illegible]
2489	M259	6in Dia. Duct	Sec 5 - max	0.087	5	-0.129	6	0.083	6	-4.137	6	6.506	7	1.852	6	2.065	7	-179.120	6	-0.150	8	0.011	0.465	0.148	[illegible]	6.506	[illegible]	0.019	0.016	[illegible]
2491	M260	8in Dia. Duct	Sec 1 - max	0.087	5	0.319	5	0.057	7	-4.137	8	6.506	7	1.852	6	2.065	7	-179.120	6	-0.150	0	0.011	0.465	0.148	[illegible]	6.506	[illegible]	0.019	0.039	[illegible]
432	M48	8in Dia. Duct	Sec 1 - min	-0.186	6	-0.317	5	0.106	5	-1.469	7	-2.423	6	-5.983	8	-0.822	5	-1940.300	8	-1.703	8	0.022	0.173	0.427	[illegible]	5.983	[illegible]	0.210	0.039	[illegible]
431	M48	8in Dia. Duct	Sec 1 - max	0.164	7	0.045	8	0.338	8	2.423	6	1.469	7	0.822	5	5.983	8	13.131	5	0.012	5	0.020	0.173	0.427	[illegible]	5.983	[illegible]	0.001	0.041	[illegible]
2533	M264	2in Dia. Duct	Sec 2 - max	0.173	5	-0.087	8	-0.108	8	4.942	5	-1.701	8	10.727	5	-2.828	8	0.000	1	0.000	1	0.038	0.183	0.397	[illegible]	10.727	[illegible]	0.000	0.007	[illegible]
1190	M129	6in Dia. Duct	Sec 5 - min	-0.255	5	0.094	7	-0.138	5	0.623	5	-5.055	8	-3.154	5	2.659	8	-751.656	5	-0.629	5	0.032	0.361	0.225	[illegible]	5.055	[illegible]	0.078	0.017	[illegible]
444	M47	8in Dia. Duct	Sec 2 - min	-0.133	6	-0.200	5	0.008	5	-2.745	7	-0.963	6	-5.690	8	-1.580	5	-1180.600	8	-1.036	8	0.016	0.196	0.408	[illegible]	5.690	[illegible]	0.128	0.025	[illegible]
445	M47	8in Dia. Duct	Sec 3 - max	0.246	7	0.002	8	0.432	8	0.926	6	2.868	7	1.587	5	5.340	8	240.400	5	0.211	5	0.030	0.205	0.381	[illegible]	5.340	[illegible]	0.028	0.053	[illegible]
2490	M259	6in Dia. Duct	Sec 5 - min	-0.028	8	-0.193	7	-0.032	7	-6.506	7	4.137	6	-2.065	7	-1.652	6	-325.274	7	-0.272	7	0.004	0.465	0.146	[illegible]	6.506	[illegible]	0.034	0.024	[illegible]
2492	M260	6in Dia. Duct	Sec 1 - min	-0.028	8	0.222	8	-0.084	6	-6.506	7	4.137	6	-2.065	7	-1.652	6	-325.274	7	-0.272	7	0.004	0.465	0.146	[illegible]	6.506	[illegible]	0.034	0.027	[illegible]
109	M11	5in Dia. Duct	Sec 5 - max	0.005	5	0.319	8	-0.051	6	-5.631	5	6.087	8	1.647	6	-1.043	7	160.961	6	0.210	6	0.001	0.483	0.131	[illegible]	6.087	[illegible]	0.029	0.044	[illegible]
110	M11	5in Dia. Duct	Sec 5 - min	-0.005	8	0.287	5	-0.069	7	-6.087	8	5.831	5	1.043	7	-1.647	6	-30.753	7	-0.048	7	0.001	0.483	0.131	[illegible]	6.087	[illegible]	0.007	0.040	[illegible]
1769	M187	5in Dia. Duct	Sec 5 - max	0.082	7	-0.260	5	-0.052	6	-5.830	5	6.081	8	-1.163	7	1.527	6	237.203	6	0.309	6	0.009	0.483	0.121	[illegible]	6.081	[illegible]	0.043	0.036	[illegible]
800	M98	5in Dia. Duct	Sec 5 - min	-0.071	8	-0.520	5	-0.202	8	-5.234	5	-4.409	8	-2.353	6	-0.895	5	-570.018	6	-0.742	6	0.010	0.415	0.187	[illegible]	5.234	[illegible]	0.102	0.072	[illegible]
1770	M187	5in Dia. Duct	Sec 5 - min	0.058	6	-0.298	8	-0.068	7	-6.081	8	5.830	5	-1.527	6	1.163	7	-31.177	7	-0.041	7	0.009	0.483	0.121	[illegible]	6.081	[illegible]	0.008	0.041	[illegible]
429	M45	6in Dia. Duct	Sec 5 - max	0.111	6	0.455	5	-0.109	6	6.325	8	-3.732	5	-1.691	7	2.049	6	-1531.361	8	-1.262	8	0.014	0.452	0.148	[illegible]	6.325	[illegible]	0.158	0.056	[illegible]
430	M45	6in Dia. Duct	Sec 5 - min	-0.111	7	0.123	8	-0.141	7	3.732	5	-6.325	8	-2.049	6	1.891	7	-2100.134	5	-1.758	5	0.014	0.452	0.146	[illegible]	6.325	[illegible]	0.217	0.017	[illegible]
1198	M130	6in Dia. Duct	Sec 4 - min	-0.219	5	0.233	8	-0.137	5	1.009	5	-5.388	8	-2.794	6	2.317	7	-1415.751	5	-1.185	5	0.028	0.385	0.200	[illegible]	5.386	[illegible]	0.146	0.029	[illegible]
799	M90	5in Dia. Duct	Sec 5 - max	0.083	5	0.182	8	0.212	5	4.409	8	5.234	5	0.895	5	2.353	8	1727.600	7	2.249	7	0.009	0.415	0.187	[illegible]	5.234	[illegible]	0.310	0.029	[illegible]
79	M8	8in Dia. Duct	Sec 5 - max	-0.113	2	-0.166	5	-0.028	5	-3.920	5	3.993	8	-1.160	5	4.335	8	139.532	6	0.117	6	0.014	0.285	0.310	[illegible]	4.335	[illegible]	0.014	0.020	[illegible]
434	M46	8in Dia. Duct	Sec 2 - min	-0.185	8	-0.319	5	0.108	5	-1.721	7	-2.454	6	-5.711	8	-0.909	5	-1940.300	8	-1.703	8	0.022	0.175	0.408	[illegible]	5.711	[illegible]	0.210	0.039	[illegible]
1189	M129	6in Dia. Duct	Sec 4 - min	-0.255	5	0.085	7	-0.139	5	0.583	5	-4.934	8	-3.088	5	2.607	8	-751.056	5	-0.629	5	0.032	0.352	0.221	[illegible]	4.834	[illegible]	0.078	0.017	[illegible]
433	M46	8in Dia. Duct	Sec 2 - max	0.164	7	0.043	8	0.335	8	2.454	6	1.721	7	0.909	5	5.711	8	13.131	5	0.012	5	0.020	0.175	0.408	[illegible]	5.711	[illegible]	0.001	0.041	[illegible]
1199	M130	6in Dia. Duct	Sec 5 - max	0.052	8	0.269	5	-0.114	8	5.496	8	-1.137	5	-2.381	7	2.848	6	-798.494	8	-0.668	8	0.007	0.393	0.203	[illegible]	5.496	[illegible]	0.082	0.033	[illegible]
446	M47	8in Dia. Duct	Sec 3 - min	-0.132	6	-0.202	5	0.010	5	-2.808	7	-0.926	6	-5.340	8	-1.587	5	-1160.600	8	-1.036	8	0.016	0.205	0.381	[illegible]	5.340	[illegible]	0.128	0.025	[illegible]
2210	M231	2in Dia. Duct	Sec 5 - min	0.088	8	-0.296	8	0.011	8	-15.725	5	6.117	8	0.000	1	0.000	1	-64.216	7	-0.675	7	0.020	0.582	0.000	[illegible]	15.725	[illegible]	0.058	0.019	[illegible]
1196	M130	6in Dia. Duct	Sec 3 - min	-0.219	5	0.233	6	-0.137	5	0.881	5	-5.276	8	-2.739	6	2.254	7	-1415.751	5	-1.185	5	0.028	0.377	0.196	[illegible]	5.276	[illegible]	0.146	0.029	[illegible]
447	M47	8in Dia. Duct	Sec 4 - max	0.246	7	0.000	8	0.430	8	0.888	6	2.993	7	1.596	5	4.991	8	240.400	5	0.211	5	0.030	0.214	0.357	[illegible]	4.991	[illegible]	0.028	0.053	[illegible]
478	M50	8in Dia. Duct	Sec 4 - min	0.031	8	-0.244	7	-0.299	8	-2.516	8	1.151	5	-5.819	8	-0.777	5	-140.129	6	-0.123	6	0.004	0.180	0.416	[illegible]	5.819	[illegible]	0.015	0.037	[illegible]
1767	M187	5in Dia. Duct	Sec 4 - max	0.062	7	-0.269	5	-0.051	8	-5.688	5	5.919	8	-1.126	7	1.499	6	237.203	6	0.309	6	0.009	0.470	0.119	[illegible]	5.919	[illegible]	0.043	0.038	[illegible]
1768	M187	5in Dia. Duct	Sec 4 - min	0.058	6	-0.290	8	-0.066	5	-5.919	8	5.888	5	-1.499	6	1.126	7	-31.177	7	-0.041	7	0.009	0.470	0.119	[illegible]	5.919	[illegible]	0.008	0.041	[illegible]
2534	M264	2in Dia. Duct	Sec 2 - min	0.072	8	-0.177	5	-0.389	5	1.701	8	-4.942	5	2.828	8	-10.727	5	0.000	1	0.000	1	0.016	0.183	0.397	[illegible]	10.727	[illegible]	0.000	0.025	[illegible]
427	M45	6in Dia. Duct	Sec 4 - max	0.110	6	0.457	5	-0.110	6	6.203	8	-3.263	5	-1.552	7	1.941	6	-1531.361	8	-1.282	8	0.014	0.443	0.139	[illegible]	6.203	[illegible]	0.158	0.056	[illegible]
428	M45	6in Dia. Duct	Sec 4 - min	-0.110	7	0.125	8	-0.140	7	3.283	5	-6.203	8	-1.941	6	1.652	7	-2100.134	5	-1.758	5	0.014	0.443	0.139	[illegible]	6.203	[illegible]	0.217	0.017	[illegible]
762	M89	5in Dia. Duct	Sec 1 - min	-0.142	6	-0.514	5	-0.214	8	-3.997	7	-4.783	6	-2.434	8	0.027	5	-676.104	6	-0.880	6	0.021	0.380	0.193	[illegible]	4.783	[illegible]	0.121	0.071	[illegible]
1939	M204	8in Dia. Duct	Sec 5 - max	0.271	1	-0.220	1	0.098	3	-6.135	1	6.738	2	8.145	5	-2.516	8	-935.256	8	-0.821	8	0.021	0.299	0.273	[illegible]	6.738	[illegible]	0.063	0.017	[illegible]
1389	M149	3in Dia. Duct	Sec 5 - max	0.507	7	-0.136	6	0.545	7	-2.898	6	3.355	7	8.642	7	-7.499	6	32.458	8	0.139	8	0.059	0.149	0.384	[illegible]	8.642	[illegible]	0.011	0.042	[illegible]
1186	M129	6in Dia. Duct	Sec 3 - min	-0.256	5	0.086	7	-0.139	5	0.542	5	-4.813	8	-3.022	5	2.554	8	-751.656	5	-0.629	5	0.032	0.344	0.216	[illegible]	4.813	[illegible]	0.078	0.017	[illegible]
1210	M131	6in Dia. Duct	Sec 5 - min	-0.152	5	0.171	8	-0.137	7	1.821	5	-5.824	8	-2.180	6	1.707	7	-1923.049	5	-1.610	5	0.019	0.416	0.156	[illegible]	5.824	[illegible]	0.199	0.021	[illegible]
1197	M130	8in Dia. Duct	Sec 4 - max	0.051	8	0.270	5	-0.113	8	5.386	8	-1.009	5	-2.317	7	2.794	6	-798.494	8	-0.668	8	0.006	0.385	0.200	[illegible]	5.386	[illegible]	0.082	0.033	[illegible]
784	M89	5in Dia. Duct	Sec 2 - min	-0.142	8	-0.515	5	-0.214	8	-3.980	7	-4.621	6	-2.540	8	-0.083	5	-676.104	6	-0.880	6	0.021	0.387	0.202	[illegible]	4.621	[illegible]	0.121	0.071	[illegible]
1194	M130	6in Dia. Duct	Sec 2 - min	-0.219	5	0.234	8	-0.138	5	0.752	5	-5.165	8	-2.684	6	2.191	7	-1415.751	5	-1.185	5	0.028	0.369	0.192	[illegible]	5.165	[illegible]	0.146	0.029	[illegible]
2189	M230	2in Dia. Duct	Sec 5 - max	0.198	5	-0.136	8	0.150	5	-4.347	8	14.696	5	0.000	1	0.000	1	-38.927	8	-0.531	8	0.044	0.544	0.000	[illegible]	14.696	[illegible]	0.034	0.010	[illegible]
438	M46	8in Dia. Duct	Sec 3 - min	-0.165	6	-0.322	5	0.109	5	-1.978	7	-2.482	6	-5.440	8	-0.997	5	-1940.300	8	-1.703	8	0.022	0.177	0.389	[illegible]	5.440	[illegible]	0.210	0.040	[illegible]
1169	M129	6in Dia. Duct	Sec 5 - max	0.001	8	0.255	8	-0.112	8	5.055	8	-0.623	5	-2.659	8	3.154	5	-205.660	8	-0.172	8	0.000	0.361	0.225	[illegible]	5.055	[illegible]	0.021	0.031	[illegible]
448	M47	8in Dia. Duct	Sec 4 - min	-0.130	6	-0.204	5	0.012	5	-2.993	7	-0.868	6	-4.991	8	-1.598	5	-1180.600	8	-1.036	8	0.016	0.214	0.357	[illegible]	4.991	[illegible]	0.128	0.025	[illegible]
435	M46	8in Dia. Duct	Sec 3 - max	0.163	7	0.041	8	0.333	8	2.482	6	1.976	7	0.997	5	5.440	8	13.131	5	0.012	5	0.020	0.177	0.389	[illegible]	5.440	[illegible]	0.001	0.041	[illegible]
786	M89	5in Dia. Duct	Sec 3 - min	-0.142	6	-0.515	5	-0.214	8	-3.964	7	-4.458	6	-2.646	8	-0.193	5	-676.104	6	-0.880	6	0.021	0.354	0.210	[illegible]	4.458	[illegible]	0.121	0.071	[illegible]
781	M89	5in Dia. Duct	Sec 1 - max	0.080	7	0.222	8	0.221	5	4.783	8	3.997	7	-0.027	5	2.434	8	1588.468	7	2.068	7	0.012	0.380	0.193	[illegible]	4.783	[illegible]	0.285	0.031	[illegible]
449	M47	8in Dia. Duct	Sec 5 - max	0.246	7	-0.002	8	0.428	8	0.848	6	3.121	7	1.606	5	4.643	8	240.400	5	0.211	5	0.030	0.223	0.332	[illegible]	4.643	[illegible]	0.028	0.053	[illegible]
1180	M128	8in Dia. Duct	Sec 5 - min	-0.254	5	-0.114	7	-0.140	5	0.459	5	-4.571	8	-3.151	5	2.395	8	-34.251	5	-0.029	5	0.032	0.327	0.226	[illegible]	4.571	[illegible]	0.004	0.017	[illegible]
1209	M131	6in Dia. Duct	Sec 5 - max	0.094	8	0.412	5	-0.113	6	5.824	8	-1.921	5	-1.707	7	2.180	6	-1317.657	8	-1.103	8	0.012	0.416	0.156	[illegible]	5.824	[illegible]	0.136	0.051	[illegible]
1765	M187	5in Dia. Duct	Sec 3 - max	0.062	7	-0.258	5	-0.051	8	-5.547	5	5.757	8	-1.090	7	1.470	6	237.203	6	0.309	6	0.009	0.457	0.117	[illegible]	5.757	[illegible]	0.043	0.036	[illegible]
1766	M187	5in Dia. Duct	Sec 3 - min	0.058	6	-0.295	8	-0.069	5	-5.757	8	5.547	5	-1.470	6	1.090	7	-31.177	7	-0.041	7	0.009	0.457	0.117	[illegible]	5.757	[illegible]	0.006	0.041	[illegible]
1940	M204	8in Dia. Duct	Sec 5 - min	0.121	2	-0.288	2	-0.098	4	-6.738	2	8.135	1	2.516	8	-6.145	5	-1045.519	5	-0.918	5	0.009	0.299	0.273	[illegible]	8.738	[illegible]	0.071	0.022	[illegible]
1208	M131	6in Dia. Duct	Sec 4 - min	-0.152	5	0.172	8	-0.138	7	1.726	5	-5.743	8	-2.127	6	1.642	7	-1923.049	5	-1.610	5	0.019	0.410	0.152	[illegible]	5.743	[illegible]	0.199	0.021	[illegible]
788	M89	5in Dia. Duct	Sec 4 - min	-0.142	6	-0.516	5	-0.215	8	-3.947	7	-4.294	6	-2.753	8	-0.303	5	-676.104	6	-0.880	6	0.021	0.341	0.218	[illegible]	4.294	[illegible]	0.121	0.071	[illegible]
783	M89	5in Dia. Duct	Sec 2 - max	0.080	7	0.221	8	0.221	5	4.621	6	3.980	7	0.083	5	2.540	8	1588.468	7	2.068	7	0.012	0.367	0.202	[illegible]	4.621	[illegible]	0.285	0.030	[illegible]
1387	M149	3in Dia. Duct	Sec 4 - max	0.507	7	-0.136	8	0.545	7	-2.848	6	3.280	7	8.442	7	-7.374	6	32.458	8	0.139	8	0.059	0.146	0.375	[illegible]	8.442	[illegible]	0.011	0.042	[illegible]

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_b	f_v/σ_v	f_t (ksi)	f_t/r_t	f_v/σ_v
425	M45	6in Dia. Duct	Sec 3 - max	0.110	6	0.459	5	-0.111	6	6.079	8	-2.831	5	-1.414	7	1.832	6	-1531.361	8	-1.282	8	0.014	0.434	0.131	6.079	0.158	0.057
426	M45	8in Dia. Duct	Sec 3 - min	-0.110	7	0.127	8	-0.139	7	2.831	5	-6.079	8	-1.832	6	1.414	7	-2100.134	5	-1.758	5	0.014	0.434	0.131	6.079	0.217	0.017
1195	M130	6in Dia. Duct	Sec 3 - max	0.051	8	0.271	5	-0.113	8	5.276	8	-0.881	5	-2.254	7	2.739	8	-798.494	8	-0.668	8	0.006	0.377	0.198	5.276	0.082	0.033
1184	M129	8in Dia. Duct	Sec 2 - min	-0.256	5	0.087	7	-0.140	5	0.501	5	-4.692	8	-2.956	5	2.502	8	-751.656	5	-0.629	5	0.032	0.335	0.211	4.692	0.078	0.017
1192	M130	6in Dia. Duct	Sec 1 - min	-0.220	5	0.234	8	-0.138	5	0.823	5	-5.055	8	-2.628	6	2.128	7	-1415.751	5	-1.185	5	0.028	0.381	0.188	5.055	0.146	0.029
790	M89	5in Dia. Duct	Sec 5 - min	-0.142	6	-0.517	5	-0.215	8	-3.931	7	-4.130	6	-2.860	8	-0.413	5	-676.104	6	-0.880	6	0.021	0.328	0.227	4.130	0.121	0.071
785	M89	5in Dia. Duct	Sec 3 - max	0.080	7	0.220	8	0.222	5	4.458	6	3.964	7	0.193	5	2.646	6	1588.468	7	2.068	7	0.012	0.354	0.210	4.458	0.285	0.031
1390	M149	3in Dia. Duct	Sec 5 - min	0.359	6	-0.204	7	0.342	6	-3.355	7	2.898	8	7.499	6	-8.642	7	28.548	5	0.122	5	0.042	0.149	0.384	8.642	0.009	0.026
1207	M131	6in Dia. Duct	Sec 4 - max	0.093	8	0.413	5	-0.114	6	5.743	8	-1.726	5	-1.642	7	2.127	6	-1317.657	8	-1.103	8	0.012	0.410	0.152	5.743	0.136	0.051
1187	M129	6in Dia. Duct	Sec 4 - max	0.000	8	0.255	6	-0.111	6	4.934	8	-0.583	5	-2.607	8	3.088	5	-205.860	8	-0.172	8	0.000	0.352	0.221	4.934	0.021	0.031
1208	M131	6in Dia. Duct	Sec 3 - min	-0.151	5	0.173	8	-0.136	7	1.530	5	-5.661	6	-2.073	6	1.578	7	-1923.049	5	-1.610	5	0.019	0.404	0.148	5.661	0.199	0.021
1178	M128	6in Dia. Duct	Sec 4 - min	-0.254	5	-0.114	7	-0.141	5	0.513	5	-4.460	8	-3.085	5	2.344	8	-34.251	5	-0.029	5	0.032	0.319	0.220	4.460	0.004	0.017
787	M89	5in Dia. Duct	Sec 4 - max	0.078	7	0.219	8	0.222	5	4.294	6	3.947	7	0.303	5	2.753	8	1588.468	7	2.068	7	0.012	0.341	0.218	4.294	0.285	0.031
438	M48	8in Dia. Duct	Sec 4 - min	-0.184	6	-0.324	5	0.111	5	-2.232	7	-2.509	6	-5.171	8	-1.086	5	-1940.300	8	-1.703	8	0.022	0.179	0.369	5.171	0.210	0.040
450	M47	8in Dia. Duct	Sec 5 - min	-0.129	6	-0.206	5	0.013	5	-3.121	7	-0.848	6	-4.643	8	-1.606	5	-1180.600	8	-1.336	8	0.016	0.223	0.332	4.643	0.126	0.025
437	M48	8in Dia. Duct	Sec 4 - max	0.163	7	0.038	8	0.332	8	2.509	6	2.232	7	1.086	5	5.171	8	13.131	5	0.012	5	0.020	0.179	0.369	5.171	0.001	0.041
1385	M149	3in Dia. Duct	Sec 3 - max	0.507	7	-0.136	8	0.545	7	-2.798	6	3.206	7	8.242	7	-7.249	6	32.458	8	0.139	8	0.059	0.142	0.366	8.242	0.011	0.042
1763	M187	5in Dia. Duct	Sec 2 - max	0.082	7	-0.256	5	-0.050	8	-5.406	5	5.596	8	-1.053	7	1.441	6	237.203	6	0.309	6	0.009	0.444	0.114	5.596	0.043	0.035
1193	M130	6in Dia. Duct	Sec 2 - max	0.050	8	0.272	5	-0.112	8	5.165	8	-0.752	5	-2.191	7	2.684	6	-798.494	8	-0.668	8	0.006	0.369	0.192	5.165	0.082	0.034
1764	M187	5in Dia. Duct	Sec 2 - min	0.057	6	-0.294	8	-0.069	5	-5.596	8	5.406	5	-1.441	6	1.053	7	-31.177	7	-0.041	7	0.008	0.444	0.114	5.596	0.006	0.041
789	M89	5in Dia. Duct	Sec 5 - max	0.079	7	0.218	8	0.222	5	4.130	6	3.931	7	0.413	5	2.860	8	1588.468	7	2.068	7	0.012	0.328	0.227	4.130	0.285	0.031
1182	M129	6in Dia. Duct	Sec 1 - min	-0.256	5	0.088	7	-0.140	5	0.459	5	-4.571	8	-2.890	5	2.450	8	-751.656	5	-0.629	5	0.032	0.327	0.206	4.571	0.078	0.017
1205	M131	6in Dia. Duct	Sec 3 - max	0.093	8	0.414	5	-0.114	6	5.661	8	-1.530	5	-1.578	7	2.073	6	-1317.657	8	-1.103	8	0.012	0.404	0.148	5.661	0.136	0.051
191	M20	5in Dia. Duct	Sec 1 - max	0.194	5	0.580	5	0.130	5	-3.293	5	4.098	8	-0.047	7	2.635	6	892.545	5	1.162	5	0.029	0.325	0.209	4.098	0.160	0.080
1388	M149	3in Dia. Duct	Sec 4 - min	0.359	6	-0.204	7	0.342	6	-3.280	7	2.848	6	7.374	6	-8.442	7	28.548	5	0.122	5	0.042	0.146	0.375	8.442	0.009	0.026
423	M45	6in Dia. Duct	Sec 2 - max	0.109	6	0.481	5	-0.112	6	5.953	8	-2.377	5	-1.276	7	1.722	6	-1531.361	6	-1.282	8	0.014	0.425	0.123	5.953	0.158	0.057
424	M45	6in Dia. Duct	Sec 2 - min	-0.109	7	0.129	8	-0.138	7	2.377	5	-5.953	8	-1.722	6	1.278	7	-2100.134	5	-1.758	5	0.014	0.425	0.123	5.953	0.217	0.017
1204	M131	6in Dia. Duct	Sec 2 - min	-0.151	5	0.174	8	-0.136	5	1.334	5	-5.579	8	-2.019	6	1.513	7	-1923.049	5	-1.610	5	0.019	0.399	0.144	5.579	0.199	0.021
111	M12	5in Dia. Duct	Sec 1 - max	0.102	8	0.239	8	-0.050	8	-5.221	5	5.379	8	1.507	5	-1.345	8	236.032	6	0.307	6	0.015	0.427	0.120	5.379	0.042	0.033
112	M12	5in Dia. Duct	Sec 1 - min	0.102	5	0.199	5	-0.067	5	-5.379	8	5.221	5	1.345	8	-1.507	5	-63.537	7	-0.083	7	0.015	0.427	0.120	5.379	0.011	0.027
2439	M254	6in Dia. Duct	Sec 5 - max	0.069	5	-0.063	5	0.156	7	0.335	6	3.764	7	3.954	7	-0.312	6	-206.352	6	-0.173	6	0.009	0.270	0.282	3.954	0.021	0.019
2440	M254	8in Dia. Duct	Sec 5 - min	-0.055	8	-0.159	8	-0.039	6	-3.784	7	-0.335	6	0.312	6	-3.954	7	-1666.024	7	-1.395	7	0.007	0.270	0.282	3.954	0.172	0.020
1185	M129	6in Dia. Duct	Sec 3 - max	0.000	8	0.255	6	-0.111	8	4.813	8	-0.542	5	-2.554	8	3.022	5	-205.860	8	-0.172	8	0.000	0.344	0.218	4.813	0.021	0.031
2200	M230	2in Dia. Duct	Sec 5 - min	0.064	8	-0.339	5	0.029	8	-14.696	5	4.347	8	0.000	1	0.000	1	-199.769	5	-2.724	5	0.014	0.544	0.000	14.696	0.175	0.022
1176	M128	6in Dia. Duct	Sec 3 - min	-0.255	5	-0.113	7	-0.141	5	0.587	5	-4.349	8	-3.018	5	2.292	8	-34.251	5	-0.029	5	0.032	0.311	0.216	4.349	0.004	0.017
1179	M128	6in Dia. Duct	Sec 5 - max	-0.050	8	0.235	6	-0.110	8	4.571	8	-0.459	5	-2.395	8	3.151	5	369.568	8	0.309	8	0.006	0.327	0.226	4.571	0.038	0.029
1383	M149	3in Dia. Duct	Sec 2 - max	0.507	7	-0.135	8	0.545	7	-2.748	6	3.131	7	8.042	7	-7.123	6	32.458	8	0.139	8	0.059	0.139	0.357	8.042	0.011	0.042
1191	M130	6in Dia. Duct	Sec 1 - max	0.050	8	0.274	5	-0.112	8	5.055	8	-0.023	5	-2.128	7	2.628	8	-798.494	8	-0.668	8	0.006	0.361	0.168	5.055	0.082	0.034
1215	M132	6in Dia. Duct	Sec 3 - max	0.079	6	-0.324	8	0.299	5	-3.746	6	5.501	7	2.128	5	-0.233	8	414.335	5	0.347	5	0.010	0.393	0.152	5.501	0.043	0.040
1216	M132	8in Dia. Duct	Sec 3 - min	-0.079	7	-0.357	5	0.087	8	-5.501	7	3.746	6	0.233	8	-2.128	5	85.602	8	0.072	8	0.010	0.393	0.152	5.501	0.009	0.044
1203	M131	6in Dia. Duct	Sec 2 - max	0.093	6	0.415	5	-0.114	8	5.579	8	-1.334	5	-1.513	7	2.019	6	-1317.657	8	-1.103	8	0.012	0.399	0.144	5.579	0.136	0.051
440	M48	8in Dia. Duct	Sec 5 - min	-0.183	6	-0.327	5	0.112	5	-2.491	7	-2.534	6	-4.902	8	-1.176	5	-1940.300	8	-1.703	8	0.022	0.181	0.350	4.902	0.210	0.040
193	M20	6in Dia. Duct	Sec 2 - max	0.194	6	0.576	5	0.133	5	-2.026	5	4.150	8	-0.036	7	2.460	6	892.545	5	1.162	5	0.029	0.329	0.195	4.150	0.160	0.079
1761	M187	5in Dia. Duct	Sec 1 - max	0.062	7	-0.255	5	-0.050	8	-5.200	5	5.435	8	-1.017	7	1.412	6	237.203	6	0.309	6	0.009	0.431	0.112	5.435	0.043	0.035
1202	M131	6in Dia. Duct	Sec 1 - min	-0.151	5	0.175	8	-0.136	5	1.137	5	-5.496	8	-1.564	8	1.449	7	-1923.048	5	-1.610	5	0.019	0.393	0.140	5.496	0.199	0.022
1762	M187	5in Dia. Duct	Sec 1 - min	0.057	6	-0.394	8	-0.069	5	-5.435	8	5.266	5	-1.412	6	1.017	7	-31.177	7	-0.041	7	0.008	0.431	0.112	5.435	0.008	0.041
798	M90	5in Dia. Duct	Sec 4 - min	-0.071	8	-0.518	5	-0.201	8	-4.682	5	-4.215	8	-2.138	8	-0.671	5	-570.018	6	-0.742	6	0.010	0.372	0.170	4.682	0.102	0.071
181	M18	5in Dia. Duct	Sec 1 - max	0.294	5	0.403	5	0.036	5	-0.155	6	2.324	7	-2.342	7	4.075	6	1003.349	5	1.306	5	0.043	0.164	0.323	4.075	0.180	0.056
439	M48	8in Dia. Duct	Sec 5 - max	0.182	7	0.036	8	0.331	8	2.534	6	2.491	7	1.176	5	4.902	8	13.131	5	0.012	5	0.020	0.181	0.350	4.902	0.001	0.041
787	M90	5in Dia. Duct	Sec 4 - max	0.063	5	0.183	8	0.211	5	4.215	8	4.682	5	0.671	5	2.138	8	1727.600	7	2.249	7	0.009	0.372	0.170	4.682	0.310	0.029
1386	M149	3in Dia. Duct	Sec 3 - min	0.358	6	-0.203	7	0.342	6	-3.206	7	2.798	6	7.249	8	-8.242	7	28.548	5	0.122	5	0.042	0.142	0.368	8.242	0.009	0.026
183	M19	5in Dia. Duct	Sec 2 - max	0.293	5	0.402	5	0.036	5	0.050	6	2.274	7	-2.326	7	4.099	6	1003.349	5	1.306	5	0.043	0.180	0.325	4.099	0.180	0.055
2437	M254	8in Dia. Duct	Sec 4 - max	0.069	5	-0.081	5	0.155	7	0.428	6	3.716	7	3.641	7	-0.340	6	-206.352	6	-0.173	6	0.008	0.265	0.274	3.641	0.021	0.019
2420	M252	8in Dia. Duct	Sec 5 - min	-0.085	8	-0.141	7	-0.033	6	-3.311	7	-0.883	6	0.601	6	-4.198	7	-287.881	7	-0.241	7	0.011	0.237	0.300	4.198	0.030	0.017
185	M19	5in Dia. Duct	Sec 3 - max	0.293	5	0.401	5	0.037	5	0.255	8	2.225	7	-2.313	7	4.123	6	1003.349	5	1.306	5	0.043	0.177	0.327	4.123	0.180	0.055
2438	M254	8in Dia. Duct	Sec 4 - min	-0.055	8	-0.158	8	-0.038	6	-3.716	7	-0.428	8	0.340	6	-3.641	7	-1666.024	7	-1.395	7	0.007	0.265	0.274	3.641	0.172	0.020
1183	M129	6in Dia. Duct	Sec 2 - max	0.000	8	0.255	8	-0.110	8	4.692	8	-0.501	5	-2.502	8	2.956	5	-205.880	8	-0.172	8	0.000	0.335	0.211	4.692	0.021	0.031
2197	M230	2in Dia. Duct	Sec 4 - max	0.190	5	-0.131	6	0.150	5	-3.537	8	12.655	5	-0.177	8	0.909	5	-36.927	8	-0.531	6	0.044	0.469	0.034	12.655	0.034	0.010
1174	M128	6in Dia. Duct	Sec 2 - min	-0.255	5	-0.112	7	-0.142	5	0.620	5	-4.238	8	-2.951	5	2.241	8	-34.251	5	-0.029	5	0.032	0.303	0.211	4.238	0.004	0.018
1177	M128	6in Dia. Duct	Sec 4 - max	-0.050	8	0.235	6	-0.109	8	4.460	8	-0.513	5	-2.344	8	3.085	5	369.568	8	0.309	8	0.006	0.319	0.220	4.460	0.038	0.029
187	M19	5in Dia. Duct	Sec 4 - max	0.293	5	0.400	5	0.037	5	0.458	6	2.178	7	-2.298	7	4.148	6	1003.349	5	1.306	5	0.043	0.173	0.329	4.148	0.160	0.055
421	M45	6in Dia. Duct	Sec 1 - max	0.109	6	0.463	5	-0.113	6	5.824	8	-1.921	5	-1.142	7	1.611	6	-1531.361	8	-1.282	8	0.014	0.416	0.116	5.824	0.158	0.057
422	M45	6in Dia. Duct	Sec 1 - min	-0.109	7	0.131	8	-0.137	7	1.921	5	-5.824	8	-1.611	0	1.142	7	-2100.134	5	-1.758	5	0.014	0.416	0.115	5.824	0.217	0.017
169	M19	5in Dia. Duct	Sec 5 - max	0.293	5	0.398	5	0.038	5	0.079	5	2.145	8	-2.282	7	4.173	6	1003.349	5	1.306	5	0.043	0.170	0.331	4.173	0.160	0.055
1201	M131	6in Dia. Duct	Sec 1 - max	0.092	8	0.416	5	-0.114	8	5.496	8	-1.137	5	-1.449	7	1.964	6	-1317.657	8	-1.103	8	0.012	0.393	0.140	5.496	0.136	0.051
2430	M253	6in Dia. Duct	Sec 5 - min	-0.068	8	-0.129	8	-0.038	8	-3.519	7	-0.698	6	0.479	6	-3.982	7	-1225.590	7	-1.026	7	0.008	0.251	0.284	3.982	0.127	0.016
195	M20	5in Dia. Duct	Sec 3 - max	0.194	8	0.573	5	0.135	5	-0.766	5	4.210	8	-0.026	7	2.284	6	892.545	5	1.162	5	0.029	0.334	0.161	4.210	0.160	0.079
2429	M253	6in Dia. Duct	Sec 5 - max	0.061	5	-0.082	5	0.153	7	0.688	6	3.519	7	3.932	7	-0.479	6	-153.457	6	-0.128	6	0.008	0.251	0.284	3.982	0.016	0.019
1381	M149	3in Dia. Duct	Sec 1 - max	0.507	7	-0.135	6	0.545	7	-2.699	6	3.057	7	7.843	7	-6.998	6	32.458	8	0.139	8	0.059	0.136	0.349	7.843	0.011	0.042
1379	M148	3in Dia. Duct	Sec 5 - max	0.294	7	-0.326	6	0.891	7	-3.601	6	4.106	7	7.347	7	-6.545	6	36.161	6	0.154	6	0.034	0.182	0.327	7.347	0.012	0.069
2419	M252	6in Dia. Duct	Sec 5 - max	0.041	5	-0.041	6	0.151	7	0.883	6	3.311	7	4.198	7	-0.601	6	-17.293	6	-0.014	6	0.005	0.237	0.300	4.198	0.002	0.019
451	M48	8in Dia. Duct	Sec 1 - max	0.267	7	0.123	8	0.447	8	-1.035	8	2.428	7	2.450	5	4.702	8	530.031	6	0.465	5	0.032	0.173	0.336	4.702	0.057	0.055
2239	M234	2in Dia. Duct	Sec 5 - max	0.331	5	-0.071	8	-0.060	6	-2.274	8	8.478	5	-1.588	8	4.095	5	8.083	5	0.110	5	0.074	0.314	0.152	8.478	0.007	0.005
1384	M149	3in Dia. Duct	Sec 2 - min	0.358	8	-0.203	7	0.342	6	-3.131	7	2.748	6	7.123	6	-8.042	7	28.548	5	0.122	5	0.042	0.139	0.397	8.042	0.009	0.026
2418	M252	6in Dia. Duct	Sec 4 - min	-0.085	8	-0.140	7	-0.033	8	-3.245	7	-0.902	6	0.617	6	-4.127	7	-287.881	7	-0.241	7	0.011	0.232	0.295	4.127	0.030	0.017
192	M20	5in Dia. Duct	Sec 1 - min	0.013	8	-0.023	8	-0.045	8	-4.088	8	3.293	5	-2.635	6	0.047	7	31.655	8	0.041	8	0.002	0.325	0.209	4.088	0.006	0.006
2435	M254	8in Dia. Duct	Sec 3 - max	0.068	5	-0.060	5	0.154	7	0.519	6	3.649	7	3.728	7	-0.367	6	-206.352	6	-0.173	6	0.009	0.261	0.266	3.728	0.021	0.019
2428	M253	8in Dia. Duct	Sec 4 - min	-0.067	8	-0.128	8	-0.035	6	-3.466	7	-0.745	6	0.496	6	-3.909	7	-1225.590	7	-1.026	7	0.008	0.248	0.279	3.909	0.127	0.016
187	M20	5in Dia. Duct	Sec 4 - max	0.194	6	0.570	5	0.138	5	0.487	5	4.277	8	-0.017	7	2.107	6	892.545	5	1.162	5	0.028	0.339	0.167	4.277	0.160	0.079
2427	M253	6in Dia. Duct	Sec 4 - max	0.061	5	-0.081	5	0.152	7	0.745	8	3.466	7	3.909	7	-0.496	6	-153.457	6	-0.128	6	0.008	0.248	0.279	3.909	0.016	0.019
1380	M148	3in Dia. Duct	Sec 5 - min	0.216	8	-0.476	7	0.592	6	-4.106	7	3.661	0	6.545	6	-7.347	7	33.102	7	0.141	7	0.026	0.162	0.327	7.347	0.011	0.046
2436	M254	6in Dia. Duct	Sec 3 - min	-0.055	8	-0.156	8	-0.037	6	-3.649	7	-0.519	6	0.367	6	-3.728	7	-1666.024	7	-1.395	7	0.007	0.261	0.268	3.728	0.172	0.019
1172	M128	6in Dia. Duct	Sec 1 - min	-0.256	5	-0.112	7	-0.142	5	0.673	5	-4.127	8	-2.893	5	2.190	8	-34.251	5	-0.029	5	0.032	0.295	0.206	4.127	0.004	0.018
1181	M129	6in Dia. Duct	Sec 1 - max	-0.001	8	0.256	6	-0.110	8	4.571	8	-0.459	5	-2.450	6	2.890	5	-205.860	8	-0.172	8	0.000	0.327	0.208	4.571	0.021	0.032
1175	M128	6in Dia. Duct	Sec 3 - max	-0.051	8	0.235	8	-0.109	8	4.349	8	-0.587	5	-2.292	8	3.018	5	369.568	8	0.309	8	0.006	0.311	0.218	4.349	0.038	0.029

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Tensional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_a	f_s/σ_a	f_t (ksi)	f_t/σ_t	f_t/σ_a
																						D-2230						
2417	M252	6in Dia. Duct	Sec 4 - max	0.041	5	-0.041	6	0.150	7	0.902	6	3.245	7	4.127	7	-0.617	6	-17.293	6	-0.014	6	0.005	0.232	0.295	4.127		0.002	0.019
481	M51	6in Dia. Duct	Sec 1 - max	-0.048	1	-0.006	8	0.025	8	1.257	5	0.887	8	6.054	7	0.649	6	1313.992	4	1.153	4	0.006	0.090	0.432	6.054		0.142	0.003
482	M51	6in Dia. Duct	Sec 1 - min	-0.048	6	-0.056	5	-0.100	7	-0.807	8	-1.257	5	-0.649	6	-6.054	7	1103.694	3	0.969	3	0.006	0.090	0.432	6.054		0.120	0.025
420	M44	6in Dia. Duct	Sec 5 - min	-0.240	5	0.107	8	-0.209	7	2.027	8	-2.639	5	0.673	5	-4.127	8	294.362	7	0.246	7	0.030	0.203	0.295	4.127		0.030	0.026
2416	M252	6in Dia. Duct	Sec 3 - min	-0.084	8	-0.138	7	-0.032	6	-2.179	7	-0.921	6	0.633	6	-4.056	7	-287.881	7	-0.241	7	0.011	0.227	0.290	4.056		0.030	0.017
199	M20	5in Dia. Duct	Sec 5 - max	0.195	6	0.567	5	0.141	5	1.733	5	4.353	8	-0.009	7	1.929	6	692.545	5	1.162	5	0.029	0.345	0.153	4.353		0.150	0.076
1391	M150	3in Dia. Duct	Sec 1 - max	0.585	7	0.020	2	0.002	2	-0.923	6	1.110	7	9.200	7	-7.869	6	19.426	4	0.083	4	0.068	0.049	0.409	9.200		0.006	0.002
2428	M253	6in Dia. Duct	Sec 3 - min	-0.067	8	-0.127	8	-0.035	6	-3.414	7	-0.791	6	0.512	6	-3.837	7	-1225.590	7	-1.026	7	0.008	0.244	0.274	3.837		0.127	0.016
194	M20	5in Dia. Duct	Sec 2 - min	0.011	7	-0.025	8	-0.048	8	-4.150	8	2.026	5	-2.460	6	0.036	7	31.655	8	0.041	8	0.002	0.329	0.195	4.150		0.006	0.007
1393	M150	3in Dia. Duct	Sec 2 - max	0.585	7	0.019	2	0.002	2	-0.920	6	1.103	7	9.205	7	-7.975	6	19.426	4	0.083	4	0.068	0.049	0.409	9.205		0.006	0.001
1382	M149	3in Dia. Duct	Sec 1 - min	0.358	6	-0.202	7	0.342	6	-3.057	7	2.699	6	6.098	8	-7.643	7	28.548	5	0.122	5	0.042	0.136	0.349	7.643		0.009	0.026
1395	M150	3in Dia. Duct	Sec 3 - max	0.585	7	0.019	2	0.002	2	-0.917	6	1.097	7	9.205	7	-7.950	6	19.426	4	0.083	4	0.068	0.049	0.409	9.205		0.006	0.001
1397	M150	3in Dia. Duct	Sec 4 - max	0.585	7	0.018	2	0.002	2	-0.914	6	1.092	7	9.205	7	-7.948	6	19.426	4	0.083	4	0.068	0.049	0.409	9.205		0.006	0.001
2425	M253	6in Dia. Duct	Sec 3 - max	0.060	5	-0.078	5	0.152	7	0.761	6	3.414	7	3.837	7	-0.512	6	-153.457	6	-0.128	6	0.008	0.244	0.274	3.837		0.015	0.019
1398	M150	3in Dia. Duct	Sec 5 - max	0.585	7	0.018	2	0.002	2	-0.911	6	1.086	7	9.205	7	-7.931	6	19.426	4	0.083	4	0.068	0.049	0.409	9.205		0.006	0.001
403	M43	6in Dia. Duct	Sec 2 - max	0.084	8	0.563	5	-0.066	8	-4.152	8	4.580	5	2.619	5	-0.223	6	414.335	5	0.347	5	0.011	0.327	0.187	4.580		0.043	0.070
404	M43	6in Dia. Duct	Sec 2 - min	-0.084	7	0.231	8	-0.184	5	-4.580	5	4.152	8	0.323	8	-2.619	5	85.682	8	0.072	8	0.011	0.327	0.187	4.580		0.009	0.029
792	M90	5in Dia. Duct	Sec 1 - min	-0.073	8	-0.512	5	-0.198	8	-3.382	7	-3.975	6	-2.496	6	-0.898	7	-570.018	6	-0.742	6	0.011	0.315	0.198	3.975		0.102	0.071
791	M90	5in Dia. Duct	Sec 1 - max	0.065	5	0.189	8	0.208	5	3.975	6	3.392	7	0.998	7	2.496	6	1727.600	7	2.249	7	0.010	0.315	0.198	3.975		0.310	0.029
2433	M254	6in Dia. Duct	Sec 2 - max	0.068	5	-0.058	5	0.154	7	0.609	6	3.563	7	3.616	7	-0.394	8	-208.352	8	-0.173	6	0.009	0.256	0.258	3.616		0.021	0.019
539	M56	6in Dia. Duct	Sec 5 - max	0.235	1	-0.188	1	0.067	5	-2.002	2	2.239	1	4.678	5	-3.984	8	-935.256	8	-0.821	8	0.028	0.160	0.334	4.678		0.181	0.024
2415	M252	6in Dia. Duct	Sec 2 - max	0.041	5	-0.040	8	0.150	7	0.921	6	3.179	7	4.056	7	-0.633	6	-17.293	6	-0.014	6	0.005	0.227	0.290	4.056		0.002	0.019
2434	M254	6in Dia. Duct	Sec 2 - min	-0.054	8	-0.155	8	-0.036	6	-3.553	7	-0.609	6	0.394	6	-3.616	7	-1666.024	7	-1.395	7	0.007	0.256	0.258	3.616		0.172	0.019
1377	M148	3in Dia. Duct	Sec 4 - max	0.294	7	-0.325	6	0.891	7	-3.541	6	3.932	7	7.020	7	-6.328	6	36.161	6	0.154	6	0.034	0.175	0.312	7.020		0.012	0.069
453	M48	6in Dia. Duct	Sec 2 - max	0.267	7	0.121	8	0.445	8	-1.019	6	2.452	7	2.367	5	4.388	8	530.031	5	0.465	5	0.032	0.175	0.313	4.388		0.057	0.055
1173	M126	6in Dia. Duct	Sec 2 - max	-0.051	8	0.234	6	-0.198	8	4.238	8	-0.620	5	-2.241	8	2.551	5	369.568	8	0.309	8	0.006	0.303	0.211	4.238		0.039	0.029
2523	M263	2in Dia. Duct	Sec 2 - max	0.130	5	-0.080	6	-0.058	6	5.643	5	-1.522	8	7.396	5	-1.472	8	0.000	1	0.000	1	0.029	0.217	0.274	7.396		0.000	0.004
2414	M252	6in Dia. Duct	Sec 2 - min	-0.084	8	-0.138	7	-0.032	6	-3.114	7	-0.940	6	0.648	6	-3.985	7	-287.881	7	-0.241	7	0.011	0.222	0.285	3.985		0.030	0.017
2424	M253	6in Dia. Duct	Sec 2 - min	-0.067	8	-0.126	8	-0.034	6	-3.362	7	-0.837	6	0.529	6	-3.766	7	-1225.590	7	-1.026	7	0.008	0.240	0.269	3.766		0.127	0.016
2195	M230	2in Dia. Duct	Sec 4 - min	0.065	8	-0.334	5	0.029	8	-12.855	5	3.537	8	-0.909	5	0.177	8	-199.789	5	-2.724	5	0.014	0.469	0.034	12.855		0.175	0.021
2423	M253	6in Dia. Duct	Sec 2 - max	0.060	5	-0.078	5	0.151	7	0.837	6	3.362	7	3.766	7	-0.529	8	-153.457	8	-0.128	6	0.006	0.240	0.269	3.766		0.016	0.019
196	M20	5in Dia. Duct	Sec 3 - min	0.009	7	-0.029	8	-0.051	8	-4.210	8	0.766	5	-2.284	6	0.026	7	31.655	8	0.041	8	0.001	0.334	0.181	4.210		0.006	0.007
1937	M204	4in Dia. Duct	Sec 4 - max	0.262	1	-0.214	1	0.092	3	-5.119	1	5.428	2	5.740	5	-2.922	8	-935.256	8	-0.821	8	0.020	0.241	0.255	5.740		0.063	0.016
452	M48	6in Dia. Duct	Sec 1 - min	-0.052	6	-0.132	5	-0.119	5	-2.428	7	1.035	6	-4.702	8	-2.450	5	-409.453	6	-0.359	6	0.006	0.173	0.336	4.702		0.044	0.016
1321	M143	6in Dia. Duct	Sec 1 - max	0.196	1	-0.146	2	0.094	5	1.499	7	-1.106	6	5.376	6	-3.486	7	-775.955	8	-0.681	8	0.024	0.107	0.384	5.376		0.084	0.018
1311	M142	6in Dia. Duct	Sec 1 - max	0.170	6	-0.176	2	0.172	5	1.425	7	-0.637	6	5.477	6	-3.691	7	-338.485	8	-0.297	8	0.020	0.102	0.391	5.477		0.037	0.022
2413	M252	6in Dia. Duct	Sec 2 - max	0.041	5	-0.040	8	0.149	7	0.940	6	3.114	7	3.985	7	-0.646	6	-17.293	6	-0.014	6	0.005	0.222	0.285	3.985		0.002	0.018
1378	M148	3in Dia. Duct	Sec 4 - min	0.218	8	-0.475	7	0.592	6	-3.932	7	3.541	6	6.328	6	-7.020	7	33.102	7	0.141	7	0.025	0.175	0.312	7.020		0.011	0.046
1313	M142	6in Dia. Duct	Sec 2 - max	0.171	6	-0.177	2	0.173	5	1.369	7	-0.560	6	5.511	6	-3.730	7	-338.485	8	-0.297	8	0.021	0.094	0.394	5.511		0.037	0.022
1323	M143	6in Dia. Duct	Sec 2 - max	0.196	1	-0.147	2	0.094	5	1.454	7	-1.061	6	5.380	6	-3.508	7	-775.955	8	-0.681	8	0.024	0.104	0.384	5.360		0.084	0.018
1315	M142	6in Dia. Duct	Sec 3 - max	0.171	6	-0.178	2	0.173	5	1.314	7	-0.522	6	5.544	6	-3.769	7	-338.485	8	-0.297	8	0.021	0.094	0.398	5.544		0.037	0.022
2431	M254	6in Dia. Duct	Sec 1 - max	0.067	5	-0.056	5	0.153	7	0.896	6	3.519	7	3.505	7	-0.420	6	-206.352	8	-0.173	6	0.008	0.251	0.250	3.519		0.021	0.019
540	M56	6in Dia. Duct	Sec 5 - min	0.128	2	-0.217	2	-0.067	6	-2.239	1	2.002	2	3.984	8	-4.678	5	-1045.519	5	-0.918	5	0.015	0.160	0.334	4.678		0.113	0.027
1325	M143	6in Dia. Duct	Sec 3 - max	0.197	1	-0.146	2	0.095	5	1.409	7	-1.014	6	5.383	6	-3.532	7	-775.955	8	-0.681	8	0.024	0.101	0.385	5.383		0.084	0.018
1317	M142	6in Dia. Duct	Sec 4 - max	0.172	6	-0.179	2	0.174	5	1.257	7	-0.464	6	5.577	6	-3.808	7	-338.485	8	-0.297	8	0.021	0.090	0.398	5.577		0.037	0.022
182	M18	5in Dia. Duct	Sec 1 - min	-0.006	8	0.010	8	-0.051	8	-3.324	7	0.155	6	-4.075	8	2.242	7	869.702	8	1.132	8	0.001	0.184	0.323	4.075		0.156	0.007
2422	M253	6in Dia. Duct	Sec 1 - min	-0.066	8	-0.125	8	-0.033	6	-3.311	7	-0.883	6	0.545	6	-3.694	7	-1225.590	7	-1.026	7	0.008	0.237	0.264	3.694		0.127	0.015
2432	M254	6in Dia. Duct	Sec 1 - min	-0.054	8	-0.153	8	-0.036	6	-3.519	7	-0.698	6	0.420	6	-3.505	7	-1666.024	7	-1.395	7	0.007	0.251	0.250	3.519		0.172	0.019
281	M32	6in Dia. Duct	Sec 1 - max	0.092	8	0.040	6	0.081	8	4.522	6	2.975	7	1.794	6	2.431	7	0.000	1	0.000	1	0.012	0.323	0.174	4.522		0.000	0.010
2421	M253	6in Dia. Duct	Sec 1 - max	0.060	6	-0.077	5	0.151	7	0.883	0	3.311	7	3.694	7	-0.545	6	-153.457	6	-0.128	6	0.008	0.237	0.264	3.694		0.016	0.019
2412	M252	6in Dia. Duct	Sec 1 - min	-0.083	8	-0.138	7	-0.031	6	-3.049	7	-0.959	6	0.663	6	-3.914	7	-287.881	7	-0.241	7	0.011	0.218	0.280	3.914		0.030	0.017
198	M20	5in Dia. Duct	Sec 4 - min	0.007	7	-0.033	8	-0.053	8	-4.277	8	-0.487	5	-2.107	6	0.017	7	31.655	8	0.041	8	0.001	0.339	0.167	4.277		0.006	0.007
292	M32	6in Dia. Duct	Sec 1 - min	-0.066	5	-0.208	7	-0.089	5	-2.975	7	-4.522	8	-2.431	7	-1.794	0	0.000	1	0.000	1	0.011	0.323	0.174	4.522		0.000	0.026
1171	M126	6in Dia. Duct	Sec 1 - max	-0.052	8	0.234	6	-0.107	8	4.127	8	-0.673	5	-2.190	8	2.863	5	369.568	6	0.309	8	0.007	0.295	0.206	4.127		0.039	0.029
1319	M142	6in Dia. Duct	Sec 5 - max	0.172	6	-0.180	2	0.174	5	1.201	7	-0.408	6	5.611	6	-3.647	7	-338.485	8	-0.297	8	0.021	0.086	0.401	5.611		0.037	0.022
1322	M143	6in Dia. Duct	Sec 1 - min	0.133	2	-0.178	1	0.001	8	1.106	8	-1.469	7	3.406	7	-5.376	6	-878.231	5	-0.771	5	0.016	0.107	0.364	5.376		0.065	0.022
419	M44	6in Dia. Duct	Sec 5 - max	-0.074	8	0.142	5	0.209	6	2.639	5	-2.027	8	4.127	8	-0.673	5	625.835	6	0.524	6	0.009	0.203	0.295	4.127		0.055	0.026
184	M19	5in Dia. Duct	Sec 2 - min	-0.006	8	0.009	8	-0.052	8	-2.274	7	-0.050	6	-4.099	6	2.326	7	869.702	8	1.132	8	0.001	0.180	0.325	4.099		0.156	0.007
1327	M143	6in Dia. Duct	Sec 4 - max	0.197	1	-0.149	2	0.095	5	1.364	7	-0.908	6	5.387	6	-3.555	7	-775.955	8	-0.681	8	0.024	0.097	0.385	5.387		0.084	0.018
1312	M142	6in Dia. Duct	Sec 1 - min	0.107	7	-0.228	1	0.087	8	0.637	8	-1.425	7	3.691	7	-5.477	8	-409.274	5	-0.359	5	0.013	0.102	0.391	5.477		0.044	0.028
1938	M204	4in Dia. Duct	Sec 4 - min	0.123	2	-0.271	2	-0.092	4	-5.428	2	5.119	1	2.922	0	-5.740	5	-1045.519	5	-0.918	5	0.009	0.241	0.255	5.740		0.071	0.021
796	M90	5in Dia. Duct	Sec 3 - min	-0.072	6	-0.516	5	-0.200	8	-4.132	5	-4.019	8	-2.103	6	-0.626	7	-570.018	6	-0.742	6	0.011	0.328	0.167	4.132		0.102	0.071
1392	M150	3in Dia. Duct	Sec 1 - min	0.403	6	0.006	1	-0.042	1	-1.110	7	0.923	6	7.969	6	-9.205	7	15.154	3	0.065	3	0.047	0.049	0.409	9.205		0.005	0.003
1394	M150	3in Dia. Duct	Sec 2 - min	0.403	6	0.006	1	-0.042	1	-1.103	7	0.920	6	7.975	6	-9.205	7	15.154	3	0.065	3	0.047	0.049	0.409	9.205		0.005	0.003
2195	M230	2in Dia. Duct	Sec 3 - max	0.195	5	-0.126	8	0.150	5	-2.758	8	10.645	5	-0.354	8	1.818	5	-38.927	8	-0.531	8	0.043	0.394	0.067	10.645		0.034	0.010
186	M19	5in Dia. Duct	Sec 3 - min	-0.007	8	0.009	8	-0.052	8	-2.225	7	-0.255	6	-4.123	6	2.313	7	869.702	8	1.132	8	0.001	0.177	0.327	4.123		0.156	0.007
1396	M150	3in Dia. Duct	Sec 3 - min	0.403	6	0.006	1	-0.042	1	-1.097	7	0.917	6	7.960	6	-9.205	7	15.154	3	0.065	3	0.047	0.049	0.409	9.205		0.005	0.003
1398	M150	3in Dia. Duct	Sec 4 - min	0.403	6	0.005	1	-0.042	1	-1.092	7	0.914	6	7.946	6	-9.205	7	15.154	3	0.065	3	0.047	0.049	0.409	9.205		0.005	0.003
1314	M142	6in Dia. Duct	Sec 2 - min	0.107	7	-0.229	1	0.087	8	0.560	6	-1.369	7	3.730	7	-5.511	6	-409.274	5	-0.359	5	0.013	0.098	0.394	5.511		0.044	0.028
795	M90	5in Dia. Duct	Sec 3 - max	0.064	5	0.185	8	0.210	5	4.018	8	4.132	5	0.628	7	2.103	6	1727.600	7	2.249	7	0.009	0.328	0.167	4.132		0.310	0.029
1400	M150	3in Dia. Duct	Sec 5 - min	0.403	6	0.005	1	-0.042	1	-1.090	7	0.911	6	7.931	6	-9.205	7	15.154	3	0.065	3	0.047	0.048	0.409	9.205		0.005	0.003
1324	M143	6in Dia. Duct	Sec 2 - min	0.133	2	-0.179	1	0.000	8	1.001	6	-1.454	7	3.509	7	-5.380	6	-878.231	5	-0.771	5	0.016	0.104	0.364	5.380		0.065	0.022
283	M32	6in Dia. Duct	Sec 2 - max	0.091	8	0.035	6	0.083	8	4.606	6	3.451	7	1.636	6	2.288	7	0.000	1	0.000	1	0.012	0.329	0.163	4.606		0.000	0.010
2207	M231	2in Dia. Duct	Sec 4 - max	0.209	5	-0.120	8	0.045	5	-4.395	8	11.732	5	-0.148	8	0.617	5	-10.064	6	-0.137	6	0.046	0.435	0.023	11.732		0.009	0.008
294	M32	6in Dia. Duct	Sec 2 - min	-0.065	5	-0.213	7	-0.090	5	-3.451	7	-4.606	6	-2.288	7	-1.636	0	0.000	1	0.000	1	0.011	0.329	0.163	4.606		0.000	0.026
188	M19	5in Dia. Duct	Sec 4 - min	-0.008	8	0.009	8	-0.053	8	-2.176	7	-0.458	6	-4.148	6	2.298	7	869.702	8	1.132	8	0.001	0.173	0.329	4.148		0.156	0.007
1329	M143	6in Dia. Duct	Sec 5 - max	0.198	1	-0.150	2	0.095	5	1.318	7	-0.922	6	5.391	6	-3.578	7	-775.955	8	-0.681	8	0.024	0.094	0.365	5.391		0.084	0.019
1316	M142	6in Dia. Duct	Sec 3 - min	0.107	7	-0.229	1	0.086	8	0.522	6	-1.314	7	3.769	7	-5.544	6	-409.274	5	-0.359	5	0.013	0.094	0.396	5.544		0.044	0.028
189	M19	5in Dia. Duct	Sec 5 - min	-0.008	8	0.008	8	-0.053	8	-2.145	8	-0.679	5	-4.173	6	2.282	7	869.702	8	1.132	8	0.001	0.170	0.331	4.173		0.156	0.007
2411	M252	6in Dia. Duct	Sec 1 - max	0.041	5	-0.039	6	0.149	7	0.958	6	3.049	7	3.914	7	-0.663	6	-17.293	6	-0.014	6	0.005	0.216	0.260	3.914		0.002	0.018
1328	M143	6in Dia. Duct	Sec 3 - min	0.133	2	-0.179	1	0.000	8	1.014	6	-1.409	7	3.532	7	-5.363	6	-878.231	5	-0.771	5	0.016	0.101	0.365	5.363		0.065	0.022
1318	M142	6in Dia. Duct	Sec 4 - min	0.107	7	-0.230	1	0.086	8	0.484	6	-1.257	7	3.808	7	-5.577	6	-409.274	5	-0.359	5	0.013	0.090	0.398	5.577		0.044	0.028
2524	M263	2in Dia. Duct	Sec 2 - min	0.047	8	-0.210	5	-0.267	5	1.522	8	-5.049	5	1.472	8	-7.396	5	0.000	1	0.000	1	0.010	0.217	0.274	7.396		0.000	0.017
2410	M251	6in Dia. Duct	Sec 5 - min	-0.089	8	-0.149	7	-0.031	8	-3.049	7	-0.959	6	0.624	6	-3.801	7	135.563	6	0.113	6	0.011	0.218	0.272	3.801		0.014	0.018
455	M48	6in Dia. Duct	Sec 3 - max	0.267	7	0.119	8	0.445	8	-1.004	6	2.477	7	2.265	5	4.075	8	530.031	5	0.465	5	0.032	0.177	0.291	4.075		0.057	0.055

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	D-2250 f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a	[illegible]	f_b (ksi)	[illegible]	f/v_t	f_t/σ_a	[illegible]
1320	M142	8in Dia. Duct	Sec 5 - min	0.107	7	-0.230	1	0.085	8	0.406	6	-1.201	7	3.847	7	-5.611	6	-409.274	5	-0.369	5	0.013	0.086	0.401	[illegible]	5.611	[illegible]	0.044	0.028	[illegible]
200	M20	5in Dia. Duct	Sec 5 - min	0.005	7	-0.038	8	-0.056	8	-4.353	8	-1.733	5	-1.929	6	0.009	7	31.655	8	0.041	8	0.001	0.345	0.153	[illegible]	4.353	[illegible]	0.006	0.009	[illegible]
2240	M234	2in Dia. Duct	Sec 6 - min	0.150	8	-0.281	5	-0.163	7	-8.478	5	2.274	8	-4.095	5	1.588	8	-0.009	8	0.000	8	0.033	0.314	0.152	[illegible]	8.478	[illegible]	0.000	0.018	[illegible]
531	M56	8in Dia. Duct	Sec 1 - max	0.202	1	-0.145	2	0.045	5	1.391	2	-1.211	1	5.254	6	-3.408	7	-935.256	8	-0.821	8	0.024	0.099	0.375	[illegible]	5.254	[illegible]	0.101	0.018	[illegible]
1375	M148	3in Dia. Duct	Sec 3 - max	0.294	7	-0.325	6	0.892	7	-3.422	8	3.758	7	6.693	7	-6.111	8	36.161	8	0.154	6	0.034	0.167	0.297	[illegible]	8.693	[illegible]	0.012	0.069	[illegible]
295	M32	6in Dia. Duct	Sec 3 - max	0.090	8	0.030	6	0.086	8	4.679	6	3.937	7	1.471	6	2.140	7	0.000	1	0.000	1	0.011	0.334	0.153	[illegible]	4.679	[illegible]	0.000	0.011	[illegible]
1328	M143	8in Dia. Duct	Sec 4 - min	0.133	2	-0.179	1	0.000	8	0.966	6	-1.364	7	3.555	7	-5.387	6	-878.231	5	-0.771	5	0.016	0.097	0.385	[illegible]	5.387	[illegible]	0.095	0.022	[illegible]
296	M32	6in Dia. Duct	Sec 3 - min	-0.084	5	-0.218	7	-0.093	5	-3.937	7	-4.679	6	-2.140	7	-1.471	6	0.000	1	0.000	1	0.011	0.334	0.153	[illegible]	4.679	[illegible]	0.000	0.027	[illegible]
2189	M229	2in Dia. Duct	Sec 5 - max	0.166	5	-0.086	8	0.040	5	-2.900	8	12.411	5	0.000	1	0.000	1	10.134	6	0.138	6	0.037	0.460	0.000	[illegible]	12.411	[illegible]	0.009	0.006	[illegible]
794	M90	5in Dia. Duct	Sec 2 - min	-0.072	8	-0.514	5	-0.199	8	-3.563	5	-3.820	8	-2.300	6	-0.812	7	-570.018	6	-0.742	6	0.011	0.303	0.183	[illegible]	3.820	[illegible]	0.102	0.071	[illegible]
1330	M143	8in Dia. Duct	Sec 5 - min	0.133	2	-0.180	1	0.000	8	0.922	6	-1.318	7	3.578	7	-5.391	6	-878.231	5	-0.771	5	0.016	0.094	0.385	[illegible]	5.391	[illegible]	0.095	0.022	[illegible]
783	M90	5in Dia. Duct	Sec 2 - max	0.084	5	0.187	8	0.209	5	3.820	8	3.583	5	0.812	7	2.300	6	1727.600	7	2.249	7	0.009	0.303	0.183	[illegible]	3.820	[illegible]	0.310	0.029	[illegible]
454	M48	8in Dia. Duct	Sec 2 - min	-0.051	6	-0.133	5	-0.116	5	-2.452	7	1.019	6	-4.388	8	-2.367	5	-409.453	8	-0.359	8	0.006	0.175	0.313	[illegible]	4.388	[illegible]	0.044	0.010	[illegible]
299	M32	6in Dia. Duct	Sec 5 - max	0.087	8	0.020	6	0.090	8	4.793	6	4.943	7	1.127	6	1.828	7	0.000	1	0.000	1	0.011	0.353	0.131	[illegible]	4.943	[illegible]	0.000	0.011	[illegible]
301	M33	6in Dia. Duct	Sec 1 - max	0.087	8	0.271	8	0.090	8	4.793	8	4.943	7	1.127	6	1.828	7	0.000	1	0.000	1	0.011	0.353	0.131	[illegible]	4.943	[illegible]	0.000	0.033	[illegible]
300	M32	6in Dia. Duct	Sec 5 - min	-0.081	5	-0.228	7	-0.098	5	-4.943	7	-4.793	6	-1.028	7	-1.127	6	0.000	1	0.000	1	0.010	0.353	0.131	[illegible]	4.943	[illegible]	0.000	0.028	[illegible]
302	M33	6in Dia. Duct	Sec 1 - min	-0.081	5	-0.270	5	-0.098	5	-4.943	7	-4.793	6	-1.828	7	-1.127	6	0.000	1	0.000	1	0.010	0.353	0.131	[illegible]	4.943	[illegible]	0.000	0.033	[illegible]
91	M10	3in Dia. Duct	Sec 1 - max	0.564	7	0.018	2	-0.248	6	0.324	2	-0.291	1	9.264	7	-7.979	6	10.088	4	0.043	4	0.066	0.014	0.412	[illegible]	9.264	[illegible]	0.003	0.019	[illegible]
297	M32	6in Dia. Duct	Sec 4 - max	0.088	8	0.025	6	0.088	8	4.741	6	4.435	7	1.302	6	1.987	7	0.000	1	0.000	1	0.011	0.339	0.142	[illegible]	4.741	[illegible]	0.000	0.011	[illegible]
2409	M251	6in Dia. Duct	Sec 5 - max	0.016	5	0.020	6	0.149	7	0.959	8	3.049	7	3.801	7	-0.624	8	628.821	7	0.528	7	0.002	0.218	0.272	[illegible]	3.801	[illegible]	0.065	0.016	[illegible]
298	M32	6in Dia. Duct	Sec 4 - min	-0.082	5	-0.223	7	-0.095	5	-4.435	7	-4.741	6	-1.987	7	-1.302	6	0.000	1	0.000	1	0.010	0.339	0.142	[illegible]	4.741	[illegible]	0.000	0.028	[illegible]
532	M56	8in Dia. Duct	Sec 1 - min	0.135	2	-0.172	1	-0.045	6	1.211	1	-1.391	2	3.408	7	-5.254	6	-1045.519	5	-0.918	5	0.016	0.099	0.375	[illegible]	5.254	[illegible]	0.113	0.021	[illegible]
2408	M251	6in Dia. Duct	Sec 4 - min	-0.088	8	-0.146	7	-0.031	6	-2.978	7	-0.950	6	0.838	6	-3.731	7	135.563	6	0.113	6	0.011	0.213	0.267	[illegible]	3.731	[illegible]	0.014	0.018	[illegible]
1376	M148	3in Dia. Duct	Sec 3 - min	0.218	6	-0.475	7	0.592	6	-3.758	7	3.422	6	6.111	6	-6.693	7	33.102	7	0.141	7	0.025	0.167	0.297	[illegible]	6.693	[illegible]	0.011	0.048	[illegible]
2069	M217	3in Dia. Duct	Sec 5 - max	0.084	5	-0.062	8	-0.013	5	-1.000	8	1.011	5	-2.652	5	9.723	8	-6.980	8	-0.030	8	0.010	0.045	0.432	[illegible]	9.723	[illegible]	0.002	0.005	[illegible]
2071	M218	3in Dia. Duct	Sec 1 - max	0.084	5	0.056	5	0.471	6	-1.000	8	1.011	5	-2.652	5	9.723	8	-6.980	8	-0.030	8	0.010	0.045	0.432	[illegible]	9.723	[illegible]	0.002	0.036	[illegible]
1301	M141	8in Dia. Duct	Sec 1 - max	0.122	6	-0.217	2	0.221	1	1.245	7	-0.243	6	5.323	6	-3.690	7	207.770	2	0.182	2	0.015	0.089	0.380	[illegible]	5.323	[illegible]	0.022	0.027	[illegible]
1303	M141	8in Dia. Duct	Sec 2 - max	0.123	6	-0.218	2	0.221	1	1.178	7	-0.168	6	5.378	6	-3.738	7	207.770	2	0.182	2	0.015	0.084	0.384	[illegible]	5.378	[illegible]	0.022	0.027	[illegible]
1305	M141	8in Dia. Duct	Sec 3 - max	0.123	6	-0.219	2	0.222	1	1.110	7	-0.093	6	5.432	6	-3.786	7	207.770	2	0.182	2	0.015	0.079	0.388	[illegible]	5.432	[illegible]	0.022	0.027	[illegible]
2407	M251	6in Dia. Duct	Sec 4 - max	0.017	5	0.020	6	0.148	7	0.950	6	2.978	7	3.731	7	-0.638	6	628.821	7	0.528	7	0.002	0.213	0.267	[illegible]	3.731	[illegible]	0.065	0.018	[illegible]
1307	M141	6in Dia. Duct	Sec 4 - max	0.123	6	-0.220	2	0.223	1	1.042	7	-0.018	6	5.487	6	-3.834	7	207.770	2	0.182	2	0.015	0.074	0.392	[illegible]	5.407	[illegible]	0.022	0.028	[illegible]
1309	M141	8in Dia. Duct	Sec 5 - max	0.124	6	-0.221	2	0.223	1	0.973	7	0.056	6	5.542	6	-3.882	7	207.770	2	0.182	2	0.015	0.070	0.396	[illegible]	5.542	[illegible]	0.022	0.028	[illegible]
2406	M251	6in Dia. Duct	Sec 3 - min	-0.088	8	-0.147	7	-0.030	6	-2.908	7	-0.940	6	0.653	6	-3.660	7	135.563	6	0.113	6	0.011	0.208	0.261	[illegible]	3.660	[illegible]	0.014	0.018	[illegible]
457	M48	8in Dia. Duct	Sec 4 - max	0.268	7	0.117	8	0.443	8	-0.989	6	2.503	7	2.204	5	3.763	8	530.031	5	0.465	5	0.032	0.179	0.269	[illegible]	3.763	[illegible]	0.057	0.055	[illegible]
2070	M217	3in Dia. Duct	Sec 5 - min	-0.023	8	-0.062	5	-0.143	8	-1.011	5	1.000	8	-9.723	8	2.652	5	-7.691	5	-0.033	5	0.003	0.045	0.432	[illegible]	9.723	[illegible]	0.003	0.011	[illegible]
2072	M218	3in Dia. Duct	Sec 1 - min	-0.023	8	0.051	8	0.122	7	-1.011	5	1.000	8	-9.723	8	2.652	5	-7.691	5	-0.033	5	0.003	0.045	0.432	[illegible]	9.723	[illegible]	0.003	0.009	[illegible]
2208	M231	2in Dia. Duct	Sec 4 - min	0.092	8	-0.265	5	0.011	8	-11.732	5	4.395	8	-0.617	5	0.146	8	-64.216	7	-0.875	7	0.020	0.435	0.023	[illegible]	11.732	[illegible]	0.056	0.018	[illegible]
1302	M141	8in Dia. Duct	Sec 1 - min	0.062	7	-0.292	1	0.147	2	0.243	8	-1.245	7	3.690	7	-5.323	6	140.992	1	0.124	1	0.007	0.089	0.380	[illegible]	5.323	[illegible]	0.015	0.036	[illegible]
2196	M230	2in Dia. Duct	Sec 3 - min	0.067	8	-0.329	5	0.029	8	-10.645	5	2.758	8	-1.818	5	0.354	8	-199.789	5	-2.724	5	0.015	0.394	0.067	[illegible]	10.645	[illegible]	0.175	0.021	[illegible]
1373	M148	3in Dia. Duct	Sec 2 - max	0.294	7	-0.324	8	0.892	7	-3.303	6	3.584	7	6.366	7	-5.894	6	36.161	6	0.154	8	0.034	0.159	0.283	[illegible]	6.366	[illegible]	0.012	0.069	[illegible]
1304	M141	8in Dia. Duct	Sec 2 - min	0.062	7	-0.293	1	0.147	2	0.168	6	-1.178	7	3.738	7	-5.378	6	140.992	1	0.124	1	0.007	0.084	0.384	[illegible]	5.378	[illegible]	0.015	0.036	[illegible]
1306	M141	8in Dia. Duct	Sec 3 - min	0.062	7	-0.294	1	0.146	2	0.093	6	-1.110	7	3.788	7	-5.432	6	140.992	1	0.124	1	0.007	0.079	0.388	[illegible]	5.432	[illegible]	0.015	0.036	[illegible]
456	M48	8in Dia. Duct	Sec 3 - min	-0.049	6	-0.134	5	-0.116	5	-2.477	7	1.004	6	-4.075	8	-2.285	5	-409.453	8	-0.359	8	0.006	0.177	0.291	[illegible]	4.075	[illegible]	0.044	0.017	[illegible]
1092	M120	6in Dia. Duct	Sec 1 - min	-0.175	5	-0.108	6	-0.175	6	-2.531	5	-2.130	8	-3.793	5	-3.029	8	-422.130	8	-0.353	6	0.022	0.181	0.271	[illegible]	3.793	[illegible]	0.044	0.022	[illegible]
1308	M141	8in Dia. Duct	Sec 4 - min	0.062	7	-0.294	1	0.145	2	0.018	6	-1.042	7	3.834	7	-5.487	6	140.992	1	0.124	1	0.007	0.074	0.392	[illegible]	5.467	[illegible]	0.015	0.036	[illegible]
1090	M119	6in Dia. Duct	Sec 5 - min	-0.166	5	-0.239	5	-0.137	8	-3.845	5	-3.254	8	-2.494	5	-1.770	8	-302.094	6	-0.253	6	0.021	0.275	0.178	[illegible]	3.845	[illegible]	0.031	0.030	[illegible]
1310	M141	8in Dia. Duct	Sec 5 - min	0.062	7	-0.295	1	0.145	2	-0.058	6	-0.973	7	3.882	7	-5.542	6	140.992	1	0.124	1	0.007	0.070	0.396	[illegible]	5.542	[illegible]	0.015	0.036	[illegible]
1094	M120	6in Dia. Duct	Sec 2 - min	-0.175	5	-0.108	6	-0.175	6	-2.516	5	-2.104	8	-3.777	5	-3.038	8	-422.130	6	-0.353	6	0.022	0.180	0.270	[illegible]	3.777	[illegible]	0.044	0.022	[illegible]
1088	M119	6in Dia. Duct	Sec 5 - max	0.148	8	0.185	7	0.127	7	3.254	8	3.845	5	1.770	8	2.494	5	57.844	7	0.048	7	0.019	0.275	0.178	[illegible]	3.846	[illegible]	0.006	0.023	[illegible]
2405	M251	6in Dia. Duct	Sec 3 - max	0.017	5	0.020	6	0.148	7	0.940	6	2.908	7	3.600	7	-0.653	6	628.821	7	0.520	7	0.002	0.208	0.281	[illegible]	3.660	[illegible]	0.065	0.018	[illegible]
92	M10	3in Dia. Duct	Sec 1 - min	0.384	6	0.000	1	-0.305	7	0.291	1	-0.324	2	7.979	6	-9.264	7	5.736	3	0.024	3	0.045	0.014	0.412	[illegible]	9.284	[illegible]	0.002	0.023	[illegible]
2404	M251	6in Dia. Duct	Sec 2 - min	-0.087	8	-0.146	7	-0.030	6	-2.839	7	-0.931	6	0.667	6	-3.591	7	135.563	6	0.113	8	0.011	0.203	0.257	[illegible]	3.591	[illegible]	0.014	0.018	[illegible]
320	M34	6in Dia. Duct	Sec 5 - min	-0.208	5	-0.098	7	-0.116	8	-2.565	7	-0.664	6	-3.650	6	-2.302	7	-444.321	6	-0.372	8	0.028	0.183	0.281	[illegible]	3.650	[illegible]	0.046	0.014	[illegible]
1091	M120	6in Dia. Duct	Sec 1 - max	0.146	8	0.080	7	0.162	7	2.130	8	2.531	5	3.028	8	3.793	5	96.528	7	0.081	7	0.018	0.181	0.271	[illegible]	3.793	[illegible]	0.010	0.020	[illegible]
1096	M120	6in Dia. Duct	Sec 3 - min	-0.176	5	-0.108	6	-0.175	6	-2.501	5	-2.079	8	-3.761	5	-2.987	8	-422.130	6	-0.353	6	0.022	0.179	0.269	[illegible]	3.761	[illegible]	0.044	0.022	[illegible]
2190	M229	2in Dia. Duct	Sec 5 - min	0.044	8	-0.253	5	-0.091	8	-12.411	5	2.000	8	0.000	1	0.000	1	-61.838	7	-0.843	7	0.010	0.460	0.000	[illegible]	12.411	[illegible]	0.054	0.016	[illegible]
1086	M119	6in Dia. Duct	Sec 4 - min	-0.168	5	-0.238	8	-0.137	6	-3.804	5	-3.233	8	-2.471	5	-1.751	8	-302.094	6	-0.253	6	0.021	0.272	0.177	[illegible]	3.804	[illegible]	0.031	0.029	[illegible]
1093	M120	6in Dia. Duct	Sec 2 - max	0.146	8	0.079	7	0.161	7	2.104	8	2.516	5	3.008	8	3.777	5	96.528	7	0.081	7	0.018	0.180	0.270	[illegible]	3.777	[illegible]	0.010	0.020	[illegible]
1374	M148	3in Dia. Duct	Sec 2 - min	0.218	6	-0.475	7	0.592	6	-3.584	7	3.303	6	5.894	6	-6.366	7	33.102	7	0.141	7	0.025	0.159	0.283	[illegible]	6.366	[illegible]	0.011	0.046	[illegible]
1098	M120	6in Dia. Duct	Sec 4 - min	-0.178	5	-0.108	6	-0.175	6	-2.487	5	-2.053	8	-3.745	5	-2.966	8	-422.130	6	-0.353	6	0.022	0.178	0.268	[illegible]	3.745	[illegible]	0.044	0.022	[illegible]
1087	M119	8in Dia. Duct	Sec 4 - max	0.148	8	0.186	7	0.127	7	3.233	8	3.804	5	1.751	8	2.471	5	57.844	7	0.046	7	0.019	0.272	0.177	[illegible]	3.804	[illegible]	0.000	0.023	[illegible]
341	M37	5in Dia. Duct	Sec 1 - max	0.015	7	0.060	5	0.030	8	2.562	6	3.069	7	1.982	5	2.777	8	1207.213	7	1.571	7	0.002	0.244	0.220	[illegible]	3.069	[illegible]	0.217	0.008	[illegible]
342	M37	5in Dia. Duct	Sec 1 - min	-0.015	6	0.060	2	-0.030	6	-3.069	7	-2.562	6	-2.777	8	-1.982	5	666.910	6	0.894	6	0.002	0.244	0.220	[illegible]	3.069	[illegible]	0.123	0.008	[illegible]
1095	M120	6in Dia. Duct	Sec 3 - max	0.145	8	0.078	7	0.161	7	2.079	8	2.501	5	2.987	8	3.761	5	96.528	7	0.081	7	0.018	0.179	0.269	[illegible]	3.761	[illegible]	0.010	0.020	[illegible]
1100	M120	6in Dia. Duct	Sec 5 - min	-0.177	5	-0.108	6	-0.175	8	-2.473	5	-2.027	8	-3.730	5	-2.945	8	-422.130	6	-0.353	8	0.022	0.177	0.266	[illegible]	3.730	[illegible]	0.044	0.022	[illegible]
2193	M230	2in Dia. Duct	Sec 2 - max	0.193	5	-0.121	8	0.150	5	-2.000	8	8.066	5	-0.531	6	2.727	5	-38.927	8	-0.531	8	0.043	0.321	0.101	[illegible]	8.666	[illegible]	0.034	0.610	[illegible]
1086	M119	8in Dia. Duct	Sec 3 - min	-0.168	5	-0.238	8	-0.137	6	-3.764	5	-3.212	8	-2.448	5	-1.732	8	-302.094	6	-0.253	6	0.021	0.269	0.175	[illegible]	3.764	[illegible]	0.031	0.029	[illegible]
1097	M120	6in Dia. Duct	Sec 4 - max	0.145	8	0.078	7	0.161	7	2.053	8	2.467	5	2.966	8	3.745	5	96.528	7	0.081	7	0.018	0.178	0.268	[illegible]	3.745	[illegible]	0.010	0.020	[illegible]
1085	M119	6in Dia. Duct	Sec 3 - max	0.149	8	0.187	7	0.126	7	3.212	8	3.764	5	1.732	8	2.448	5	57.844	7	0.048	7	0.019	0.269	0.176	[illegible]	3.764	[illegible]	0.006	0.023	[illegible]
2403	M251	6in Dia. Duct	Sec 2 - max	0.017	5	0.020	6	0.147	7	0.931	6	2.839	7	3.591	7	-0.667	6	628.821	7	0.526	7	0.002	0.203	0.257	[illegible]	3.591	[illegible]	0.065	0.018	[illegible]
1099	M120	6in Dia. Duct	Sec 5 - max	0.145	8	0.077	7	0.161	7	2.027	8	2.473	5	2.945	8	3.730	5	96.528	7	0.081	7	0.018	0.177	0.266	[illegible]	3.730	[illegible]	0.010	0.020	[illegible]
2402	M251	6in Dia. Duct	Sec 1 - min	-0.087	8	-0.145	7	-0.029	6	-2.770	7	-0.921	6	0.681	6	-3.521	7	135.563	6	0.113	6	0.011	0.198	0.252	[illegible]	3.521	[illegible]	0.014	0.018	[illegible]
1084	M119	6in Dia. Duct	Sec 2 - min	-0.165	5	-0.238	6	-0.137	6	-3.723	5	-3.191	8	-2.425	5	-1.713	8	-302.094	6	-0.253	6	0.021	0.260	0.173	[illegible]	3.723	[illegible]	0.031	0.029	[illegible]
459	M48	8in Dia. Duct	Sec 5 - max	0.268	7	0.115	8	0.442	8	-0.974	6	2.532	7	2.124	5	3.453	8	530.031	5	0.465	5	0.032	0.181	0.247	[illegible]	3.453	[illegible]	0.057	0.055	[illegible]
1213	M132	6in Dia. Duct	Sec 2 - max	0.078	8	-0.319	8	0.296	5	-2.985	8	4.799	7	1.484	5	-0.042	8	414.335	5	0.347	5	0.010	0.343	0.106	[illegible]	4.799	[illegible]	0.043	0.039	[illegible]
1214	M132	6in Dia. Duct	Sec 2 - min	-0.078	7	-0.352	5	0.089	6	-4.799	7	2.985	6	0.042	8	-1.484	5	85.682	8	0.072	8	0.010	0.343	0.106	[illegible]	4.799	[illegible]	0.009	0.043	[illegible]
1083	M119	6in Dia. Duct	Sec 2 - max	0.149	8	0.188	7	0.126	7	3.191	8	3.723	5	1.713	8	2.425	5	57.844	7	0.048	7	0.019	0.268	0.173	[illegible]	3.723	[illegible]	0.006	0.023	[illegible]
1751	M186	5in Dia. Duct	Sec 1 - max	0.109	5	-0.020	5	-0.021	8	3.694	8	-1.007	5	1.858	5	-0.139	8	15.687	8	0.020	8	0.016	0.293	0.147	[illegible]	3.694	[illegible]	0.003	0.003	[illegible]
319	M34	6in Dia. Duct	Sec 5 - max	0.097	8	0.027	6	0.104	5	0.864	6	2.505	7	2.302	7	3.650	6	113.974	7	0.095	7	0.012	0.183	0.281	[illegible]	3.650	[illegible]	0.012	0.013	[illegible]
1752	M186	5in Dia. Duct	Sec 1 - min	0.103	8	-0.134	8	-0.097	5	1.007	5	-3.694	8	0.139	8	-1.858	5	-156.808	5	-0.204	5	0.015	0.293	0.147	[illegible]	3.694	[illegible]	0.026	0.016	[illegible]
1082	M119	6in Dia. Duct	Sec 1 - min	-0.165	5	-0.238	6	-0.138	8	-3.643	5	-3.169	8	-2.403	5	-1.695	6	-302.094	6	-0.253	6	0.021	0.263	0.172	[illegible]	3.683	[illegible]	0.031	0.029	[illegible]
1371	M148	3in Dia. Duct	Sec 1 - max	0.294	7	-0.324	6	0.892	7	-3.184	6	3.410	7	6.039	7	-5.677	6	36.161	6	0.154	6	0.034	0.152	0.268	[illegible]	6.039	[illegible]	0.012	0.069	[illegible]
1081	M119	8in Dia. Duct	Sec 1 - max	0.149	8	0.168	7	0.126	7	3.169	8	3.683	5	1.695	8	2.403	5	57.844	7	0.048	7	0.019	0.263	0.172	[illegible]	3.683	[illegible]	0.008	0.023	[illegible]
458	M48	8in Dia. Duct	Sec 4 - min	-0.048	6	-0.136	5	-0.115	5	-2.503	7	0.989	6	-3.763	8	-2.204	5	-409.453	8	-0.369	8	0.006	0.179	0.289	[illegible]	3.763	[illegible]	0.044	0.017	[illegible]
2467	M259	6in Dia. Duct	Sec 4 - max	0.093	5	-0.104	6	0.070	6	-2.784	6	4.406	7	0.958	6	1.771	7	-179.120	6	-0.150	6	0.012	0.315	0.127	[illegible]	4.406	[illegible]	0.019	0.013	[illegible]

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_{by}/σ_a	f_{bz}/σ_a	f_t (ksi)	f_v/v_1	f_v/σ_v
2401	M251	6in Dia. Duct	Sec 1 - max	0.017	5	0.020	6	0.147	7	0.821	6	2.770	7	3.521	7	-0.681	6	628.821	7	0.526	7	0.002	0.198	0.252	3.521	0.065	0.018
2545	M285	2in Dia. Duct	Sec 3 - max	0.156	5	-0.111	8	-0.127	8	5.036	5	-1.969	8	8.193	5	-2.247	8	0.000	1	0.000	1	0.035	0.187	0.229	8.193	0.000	0.008
343	M37	5in Dia. Duct	Sec 2 - max	0.014	7	0.055	5	0.026	8	2.700	6	2.931	7	1.913	5	2.708	8	1207.213	7	1.571	7	0.002	0.233	0.215	2.931	0.217	0.008
344	M37	5in Dia. Duct	Sec 2 - min	-0.014	6	0.055	2	-0.026	6	-2.931	7	-2.700	8	-2.708	8	-1.913	5	686.910	6	0.894	6	0.002	0.233	0.215	2.931	0.123	0.008
1753	M186	5in Dia. Duct	Sec 2 - max	0.110	5	-0.020	5	-0.021	8	3.620	8	-0.996	5	1.805	5	-0.128	8	15.687	8	0.020	8	0.016	0.287	0.143	3.620	0.003	0.003
668	M69	12in Dia. Duct	Sec 3 - min	-0.258	1	-0.192	2	-0.088	3	6.758	1	-6.990	2	-2.625	6	0.730	7	-1879.512	6	-0.616	6	0.019	0.311	0.117	6.990	0.047	0.015
1754	M188	5in Dia. Duct	Sec 2 - min	0.103	8	-0.134	8	-0.097	5	0.996	5	-3.620	8	0.128	8	-1.805	5	-156.808	5	-0.204	5	0.015	0.287	0.143	3.620	0.028	0.018
2488	M259	6in Dia. Duct	Sec 4 - min	-0.035	8	-0.168	7	-0.019	7	-3.406	7	2.784	6	-1.771	7	-0.958	6	-325.274	7	-0.272	7	0.004	0.315	0.127	4.406	0.034	0.021
1372	M148	3in Dia. Duct	Sec 1 - min	0.218	8	-0.474	7	0.592	8	-3.410	7	3.184	6	5.677	6	-0.039	7	33.102	7	0.141	7	0.025	0.152	0.268	6.039	0.011	0.046
2099	M220	3in Dia. Duct	Sec 5 - max	0.244	6	0.006	5	0.218	8	0.078	5	0.000	8	9.299	8	-2.592	7	-15.506	8	-0.066	8	0.028	0.003	0.413	9.298	0.005	0.017
2097	M220	3in Dia. Duct	Sec 4 - max	0.244	8	0.007	5	0.218	8	0.075	5	0.000	8	9.300	8	-2.530	7	-15.505	8	-0.066	8	0.028	0.003	0.413	9.300	0.005	0.017
2089	M219	3in Dia. Duct	Sec 5 - max	0.173	8	0.008	5	0.405	8	0.258	5	-0.090	8	9.300	6	-2.344	7	-11.397	8	-0.049	8	0.020	0.011	0.413	9.300	0.004	0.031
2095	M220	3in Dia. Duct	Sec 3 - max	0.244	8	0.007	5	0.218	8	0.071	5	0.002	8	9.300	6	-2.408	7	-15.506	8	-0.060	8	0.028	0.003	0.413	9.300	0.005	0.017
349	M37	5in Dia. Duct	Sec 5 - max	0.011	7	0.042	5	0.021	8	3.053	6	2.578	7	1.737	5	2.531	8	1207.213	7	1.571	7	0.002	0.242	0.201	3.053	0.217	0.006
350	M37	5in Dia. Duct	Sec 5 - min	-0.011	6	0.042	2	-0.021	8	-2.578	7	-3.053	6	-2.531	8	-1.737	5	686.910	6	0.894	6	0.002	0.242	0.201	3.053	0.123	0.006
2093	M220	3in Dia. Duct	Sec 2 - max	0.244	6	0.008	5	0.218	8	0.087	5	0.003	8	9.300	8	-2.408	7	-15.506	8	-0.066	8	0.028	0.003	0.413	9.300	0.005	0.017
1935	M204	8in Dia. Duct	Sec 3 - max	0.254	1	-0.208	1	0.080	3	-4.132	1	4.202	2	5.360	5	-3.302	8	-935.256	8	-0.821	8	0.020	0.167	0.238	5.360	0.003	0.016
2081	M220	3in Dia. Duct	Sec 1 - max	0.244	6	0.008	5	0.217	8	0.063	5	0.005	8	9.300	6	-2.344	7	-15.506	8	-0.066	8	0.028	0.003	0.413	9.300	0.005	0.017
537	M56	8in Dia. Duct	Sec 4 - max	0.228	1	-0.190	1	0.062	5	-1.028	2	1.335	1	4.502	6	-4.160	7	-935.256	8	-0.021	8	0.027	0.095	0.322	4.502	0.101	0.023
1080	M118	8in Dia. Duct	Sec 5 - min	-0.113	5	-0.252	5	-0.107	6	-3.869	5	-3.330	8	-2.141	5	-1.354	8	-108.093	6	-0.090	8	0.014	0.276	0.153	3.869	0.011	0.031
1079	M118	6in Dia. Duct	Sec 5 - max	0.111	8	0.193	6	0.098	7	3.353	8	3.869	5	1.354	8	2.141	5	16.797	7	0.014	7	0.014	0.276	0.153	3.869	0.002	0.024
78	M8	6in Dia. Duct	Sec 4 - min	-0.338	1	-0.165	8	-0.218	8	-2.820	2	2.709	2	-2.761	8	0.936	5	83.143	7	0.070	7	0.043	0.202	0.197	2.826	0.009	0.027
2101	M221	3in Dia. Duct	Sec 1 - max	0.225	6	0.006	5	0.068	8	-0.043	5	0.051	8	9.299	6	-2.592	7	-14.328	8	-0.061	8	0.026	0.002	0.413	9.299	0.005	0.005
672	M70	12in Dia. Duct	Sec 1 - min	-0.143	1	-0.379	2	-0.158	3	6.447	6	-6.627	7	-3.073	6	1.501	7	-2480.349	6	-0.813	6	0.010	0.295	0.137	6.627	0.063	0.029
69	M9	3in Dia. Duct	Sec 5 - max	0.154	7	-0.378	8	0.987	7	-3.337	6	3.562	7	5.952	6	-5.589	6	34.434	6	0.147	6	0.018	0.158	0.265	5.952	0.011	0.078
347	M37	5in Dia. Duct	Sec 4 - max	0.012	7	0.047	5	0.023	8	2.946	8	2.685	7	1.791	5	2.585	8	1207.213	7	1.571	7	0.002	0.234	0.205	2.946	0.217	0.006
348	M37	5in Dia. Duct	Sec 4 - min	-0.012	6	0.047	2	-0.023	6	-2.885	7	-2.946	6	-2.585	8	-1.791	5	686.910	6	0.894	6	0.002	0.234	0.205	2.946	0.123	0.006
303	M33	6in Dia. Duct	Sec 2 - max	0.086	8	0.264	8	0.094	8	4.211	6	4.378	6	0.882	7	1.606	7	0.000	1	0.000	1	0.011	0.313	0.115	4.378	0.000	0.033
304	M33	6in Dia. Duct	Sec 2 - min	-0.080	5	-0.277	5	-0.101	5	-4.378	7	-4.211	6	-1.606	7	-0.882	6	0.000	1	0.000	1	0.010	0.313	0.115	4.378	0.000	0.034
90	M9	3in Dia. Duct	Sec 5 - min	0.123	6	-0.546	7	0.865	8	-3.562	7	3.337	6	5.589	6	-5.952	7	30.854	7	0.132	7	0.014	0.156	0.285	5.852	0.010	0.051
2184	M230	2in Dia. Duct	Sec 2 - min	0.088	8	-0.324	5	0.029	8	-8.666	5	2.009	8	-2.727	5	0.531	8	-199.789	5	-2.724	5	0.015	0.321	0.101	8.666	0.175	0.021
1755	M188	5in Dia. Duct	Sec 3 - max	0.110	5	-0.021	5	-0.021	8	3.547	8	-0.964	5	1.752	5	-0.116	8	15.687	8	0.020	8	0.016	0.282	0.139	3.547	0.003	0.003
475	M50	8in Dia. Duct	Sec 3 - max	0.259	6	-0.165	6	0.133	5	0.084	5	1.495	8	0.081	5	4.160	8	115.607	7	0.101	7	0.031	0.107	0.299	4.180	0.012	0.020
2087	M219	3in Dia. Duct	Sec 4 - max	0.173	6	0.009	5	0.405	8	0.253	5	-0.088	8	9.112	6	-2.261	7	-11.397	8	-0.049	8	0.020	0.011	0.405	9.112	0.004	0.031
345	M37	5in Dia. Duct	Sec 3 - max	0.013	7	0.051	5	0.026	8	2.828	8	2.603	7	1.649	5	2.644	8	1207.213	7	1.571	7	0.002	0.224	0.210	2.828	0.217	0.007
346	M37	5in Dia. Duct	Sec 3 - min	-0.013	6	0.051	2	-0.026	8	-2.803	7	-2.828	6	-2.644	6	-1.849	5	686.910	6	0.894	8	0.002	0.224	0.210	2.828	0.123	0.007
2109	M221	3in Dia. Duct	Sec 5 - max	0.222	6	-0.013	5	0.074	8	-0.098	5	0.181	8	9.050	6	-0.882	5	-14.326	8	-0.061	8	0.026	0.008	0.402	9.050	0.005	0.008
2111	M222	3in Dia. Duct	Sec 1 - max	0.222	6	0.008	8	-0.016	5	-0.098	5	0.181	8	9.050	8	-0.882	5	-14.328	8	-0.061	8	0.026	0.008	0.402	9.050	0.005	0.001
2259	M236	6in Dia. Duct	Sec 5 - max	0.119	5	0.163	7	0.014	7	5.046	5	-2.084	8	0.231	5	0.847	8	-217.737	5	-0.182	5	0.015	0.360	0.061	5.046	0.022	0.020
1756	M188	5in Dia. Duct	Sec 3 - min	0.104	8	-0.134	8	-0.096	5	0.984	5	-3.547	8	0.116	8	-1.752	5	-156.808	5	-0.204	5	0.015	0.282	0.139	3.547	0.028	0.018
685	M69	12in Dia. Duct	Sec 3 - max	-0.112	2	-0.156	1	0.247	4	6.990	2	-6.758	1	-0.730	7	2.625	6	-1083.896	7	-0.355	7	0.008	0.311	0.117	6.990	0.027	0.019
686	M69	12in Dia. Duct	Sec 4 - min	-0.258	1	-0.195	2	-0.066	3	8.650	1	-6.669	2	-2.502	6	0.754	7	-1879.512	6	-0.616	6	0.019	0.305	0.111	6.869	0.047	0.015
664	M69	12in Dia. Duct	Sec 2 - min	-0.258	1	0.888	8	-0.297	8	0.485	1	-6.751	2	-2.610	6	0.684	7	-1879.512	6	-0.616	6	0.019	0.300	0.118	6.751	0.047	0.068
1936	M204	8in Dia. Duct	Sec 3 - min	0.125	2	-0.253	2	-0.080	4	-4.202	2	4.132	1	3.302	8	-5.360	5	-1045.519	5	-0.910	5	0.010	0.187	0.238	5.360	0.071	0.019
1078	M118	6in Dia. Duct	Sec 4 - min	-0.113	5	-0.251	5	-0.106	6	-3.774	5	-3.257	8	-2.104	5	-1.320	8	-108.093	6	-0.090	6	0.014	0.270	0.150	3.774	0.011	0.031
2249	M235	6in Dia. Duct	Sec 5 - max	0.089	5	0.207	5	0.016	7	4.815	5	-1.550	8	0.055	5	1.105	8	-231.213	6	-0.194	6	0.011	0.344	0.079	4.815	0.024	0.026
1077	M118	6in Dia. Duct	Sec 4 - max	0.111	8	0.194	6	0.098	7	3.257	8	3.774	5	1.320	8	2.104	5	16.797	7	0.014	7	0.014	0.270	0.150	3.774	0.002	0.024
460	M48	8in Dia. Duct	Sec 5 - min	-0.047	6	-0.137	5	-0.113	5	-2.532	7	0.974	6	-3.453	8	-2.124	5	-409.453	8	-0.359	8	0.006	0.181	0.247	3.453	0.044	0.017
671	M70	12in Dia. Duct	Sec 1 - max	0.022	2	-0.310	1	0.151	4	6.627	7	-6.447	6	-1.501	7	3.073	6	-1713.003	7	-0.562	7	0.002	0.295	0.137	6.827	0.043	0.024
538	M56	8in Dia. Duct	Sec 4 - min	0.130	2	-0.199	2	-0.062	6	-1.335	1	1.028	2	4.160	7	-4.502	6	-1045.519	5	-0.916	5	0.018	0.095	0.322	4.502	0.113	0.025
533	M56	8in Dia. Duct	Sec 2 - max	0.210	1	-0.163	2	0.051	5	0.068	2	-0.390	1	5.029	6	-3.633	7	-935.255	8	-0.821	8	0.025	0.048	0.359	5.029	0.101	0.020
2548	M285	2in Dia. Duct	Sec 3 - min	0.073	8	-0.274	5	-0.337	5	1.969	8	-5.036	5	2.247	8	-6.193	5	0.000	1	0.000	1	0.018	0.187	0.229	6.193	0.000	0.022
2257	M236	6in Dia. Duct	Sec 4 - max	0.120	5	0.164	7	0.015	7	4.989	5	-2.026	8	0.227	5	0.830	8	-217.737	5	-0.182	5	0.015	0.356	0.059	4.989	0.022	0.020
61	M7	6in Dia. Duct	Sec 1 - max	0.097	8	0.261	1	-0.251	2	-0.794	7	1.932	6	3.908	6	-1.978	7	353.378	6	0.296	6	0.012	0.138	0.279	3.908	0.037	0.032
2151	M226	6in Dia. Duct	Sec 1 - max	0.097	8	0.083	6	0.083	6	-0.794	7	1.932	6	-1.978	7	3.908	6	353.378	6	0.296	6	0.012	0.138	0.279	3.906	0.037	0.011
2535	M284	2in Dia. Duct	Sec 3 - max	0.177	5	-0.064	8	-0.105	8	3.322	5	-1.107	8	7.179	5	-1.658	8	0.000	1	0.000	1	0.039	0.123	0.268	7.179	0.000	0.007
2085	M219	3in Dia. Duct	Sec 3 - max	0.173	6	0.010	5	0.405	8	0.248	5	-0.085	8	8.925	6	-2.177	7	-11.397	8	-0.049	8	0.020	0.011	0.397	8.925	0.004	0.031
1291	M140	8in Dia. Duct	Sec 1 - max	0.050	8	-0.244	2	0.249	1	1.009	5	0.057	8	4.830	6	-3.339	7	807.590	2	0.709	2	0.006	0.076	0.345	4.830	0.088	0.031
1757	M186	5in Dia. Duct	Sec 4 - max	0.110	5	-0.022	5	-0.022	8	3.474	8	-0.873	5	1.699	5	-0.104	8	15.687	8	0.020	8	0.016	0.276	0.135	3.474	0.003	0.003
2191	M230	2in Dia. Duct	Sec 1 - max	0.192	5	-0.116	8	0.150	5	-1.290	8	6.716	5	-0.708	8	3.635	5	-38.927	8	-0.531	8	0.043	0.249	0.135	6.716	0.034	0.010
1758	M186	5in Dia. Duct	Sec 4 - min	0.105	8	-0.133	8	-0.096	5	0.873	5	-3.474	8	0.104	8	-1.699	5	-156.808	5	-0.204	5	0.015	0.276	0.135	3.474	0.028	0.016
2247	M235	6in Dia. Duct	Sec 4 - max	0.089	5	0.207	5	0.017	7	4.717	5	-1.783	8	0.050	5	1.087	8	-231.213	8	-0.194	6	0.011	0.337	0.078	4.717	0.024	0.026
2255	M236	6in Dia. Duct	Sec 3 - max	0.120	5	0.165	7	0.015	7	4.931	5	-1.968	8	0.222	5	0.812	8	-217.737	5	-0.182	5	0.015	0.352	0.058	4.931	0.022	0.020
1293	M140	8in Dia. Duct	Sec 2 - max	0.050	6	-0.245	2	0.250	1	0.959	5	0.147	8	4.911	6	-3.400	7	807.590	2	0.709	2	0.006	0.069	0.351	4.911	0.068	0.031
2090	M219	3in Dia. Duct	Sec 5 - min	-0.003	7	0.004	8	0.096	5	0.090	8	-0.258	5	2.344	7	-9.300	6	-19.817	5	-0.085	5	0.000	0.011	0.413	9.300	0.007	0.007
2260	M236	8in Dia. Duct	Sec 5 - min	0.032	8	0.079	6	-0.041	6	2.084	8	-5.048	5	-0.847	8	-0.231	5	-607.000	8	-0.508	8	0.004	0.360	0.061	5.046	0.063	0.010
1076	M118	8in Dia. Duct	Sec 3 - min	-0.113	5	-0.250	5	-0.106	6	-3.679	5	-3.184	8	-2.067	5	-1.286	8	-108.093	6	-0.090	6	0.014	0.263	0.148	3.679	0.011	0.031
667	M69	12in Dia. Duct	Sec 4 - max	-0.112	2	-0.159	1	0.245	4	0.869	2	-6.660	1	-0.754	7	2.502	6	-1083.896	7	-0.355	7	0.008	0.305	0.111	6.869	0.027	0.019
670	M69	12in Dia. Duct	Sec 5 - min	-0.258	1	-0.188	2	-0.084	3	6.556	6	-6.752	7	-2.378	6	0.777	7	-1879.512	6	-0.610	6	0.019	0.300	0.108	6.752	0.047	0.015
1075	M118	6in Dia. Duct	Sec 3 - max	0.112	8	0.185	8	0.098	7	3.184	8	3.679	5	1.286	8	2.067	5	16.797	7	0.014	7	0.014	0.263	0.148	3.679	0.002	0.024
663	M69	12in Dia. Duct	Sec 2 - max	-0.112	2	1.033	5	-0.042	5	6.751	2	-6.485	1	-0.684	7	2.610	8	-1083.896	7	-0.355	7	0.008	0.300	0.116	6.751	0.027	0.079
2102	M221	3in Dia. Duct	Sec 1 - min	0.071	7	0.001	8	-0.188	5	-0.051	8	0.043	5	2.592	7	-9.299	6	-36.188	5	-0.155	5	0.008	0.002	0.413	9.299	0.012	0.014
2250	M235	6in Dia. Duct	Sec 5 - min	0.008	8	0.141	8	-0.043	6	1.850	8	-4.815	5	-1.105	8	-0.055	5	-401.710	7	-0.336	7	0.001	0.344	0.079	4.815	0.041	0.017
1295	M140	8in Dia. Duct	Sec 3 - max	0.050	6	-0.246	2	0.251	1	0.854	5	0.238	8	4.992	6	-3.461	7	807.590	2	0.709	2	0.006	0.061	0.357	4.992	0.088	0.031
534	M56	8in Dia. Duct	Sec 2 - min	0.133	2	-0.178	1	-0.051	6	0.390	1	-0.668	2	3.633	7	-5.029	6	-1045.519	5	-0.918	5	0.016	0.048	0.359	5.029	0.113	0.022
2100	M220	3in Dia. Duct	Sec 5 - min	0.053	7	0.001	8	-0.104	5	0.000	8	-0.078	5	2.592	7	-9.298	6	-35.372	5	-0.151	5	0.006	0.003	0.413	9.299	0.012	0.008
2098	M220	3in Dia. Duct	Sec 4 - min	0.053	7	0.002	8	-0.104	5	0.000	8	-0.075	5	2.530	7	-9.300	6	-35.372	5	-0.151	5	0.006	0.003	0.413	9.300	0.012	0.008
2096	M220	3in Dia. Duct	Sec 3 - min	0.053	7	0.002	8	-0.104	5	-0.002	8	-0.071	5	2.468	7	-9.300	6	-35.372	5	-0.151	5	0.006	0.003	0.413	9.300	0.012	0.008
1701	M181	4in Dia. Duct	Sec 1 - max	0.529	5	0.181	5	-0.025	6	-2.897	7	5.276	6	-1.023	6	3.089	7	271.447	7	0.597	7	0.051	0.234	0.137	5.276	0.046	0.014
2094	M220	3in Dia. Duct	Sec 2 - min	0.053	7	0.003	8	-0.104	5	-0.003	8	-0.067	5	2.406	7	-9.300	6	-35.372	5	-0.151	5	0.006	0.003	0.413	9.300	0.012	0.008
2092	M220	3in Dia. Duct	Sec 1 - min	0.053	7	0.004	8	-0.103	5	-0.005	8	-0.063	5	2.344	7	-9.300	6	-35.372	5	-0.151	5	0.006	0.003	0.413	9.300	0.012	0.008
1297	M140	8in Dia. Duct	Sec 4 - max	0.051	6	-0.247	2	0.252	1	0.748	5	0.329	8	5.074	6	-3.522	7	807.590	2	0.709	2	0.006	0.053	0.362	5.074	0.088	0.031
1292	M140	8in Dia. Duct	Sec 1 - min	0.003	7	-0.333	1	0.172	2	-0.057	8	-1.065	5	3.339	7	-4.830	6	746.243	1	0.655	1	0.000	0.076	0.345	4.830	0.081	0.041
1299	M140	8in Dia. Duct	Sec 5 - max	0.051	6	-0.248	2	0.252	1	0.656	7	0.434	6	5.155	6	-3.582	7	807.590	2	0.709	2	0.006	0.047	0.368	5.155	0.088	0.031
1703	M181	4in Dia. Duct	Sec 2 - max	0.529	5	0.180	5	-0.026	8	-2.863	7	5.223	6	-1.038	6	3.106	7	271.447	7	0.597	7	0.051	0.232	0.138	5.223	0.046	0.014

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_a	f_s/σ_a		f_t (ksi)		f_t/σ_1	f_t/σ_2
																						0.2250							
62	M7	6in Dia. Duct	Sec 1-min	0.029	5	0.031	2	-0.692	1	-1.932	6	0.794	7	1.978	7	-3.908	6	326.161	7	0.273	7	0.004	0.138	0.279		3.908		0.034	0.085
2152	M226	6in Dia. Duct	Sec 1-min	0.029	5	0.023	7	-0.007	7	-1.932	6	0.794	7	-3.908	6	1.978	7	326.161	7	0.273	7	0.004	0.138	0.279		3.908		0.034	0.003
288	M31	6in Dia. Duct	Sec 5-max	0.126	6	0.177	6	0.012	6	2.794	6	0.747	7	2.349	6	2.872	7	0.000	1	0.000	1	0.015	0.200	0.205		2.872		0.000	0.022
2107	M221	3in Dia. Duct	Sec 4-max	0.223	6	-0.005	5	0.072	8	-0.050	5	0.121	6	8.759	8	-1.663	5	-14.328	8	-0.061	6	0.026	0.003	0.369		8.759		0.005	0.006
2253	M236	6in Dia. Duct	Sec 2-max	0.121	5	0.167	7	0.016	7	4.874	5	-1.999	8	0.216	5	0.784	8	-217.737	5	-0.182	5	0.015	0.348	0.057		4.874		0.022	0.021
290	M31	6in Dia. Duct	Sec 5-min	-0.120	5	-0.071	7	-0.019	5	-0.747	7	-2.794	8	-2.872	7	-2.349	6	0.000	1	0.000	1	0.015	0.200	0.205		2.872		0.000	0.009
2258	M238	6in Dia. Duct	Sec 4-min	0.032	8	0.080	6	-0.042	6	2.026	8	-4.989	5	-0.830	6	-0.227	5	-607.000	8	-0.500	8	0.004	0.350	0.059		4.989		0.063	0.010
1294	M140	6in Dia. Duct	Sec 2-min	0.003	7	-0.334	1	0.171	2	-0.147	8	-0.959	5	3.400	7	-4.911	6	746.243	1	0.655	1	0.000	0.069	0.351		4.911		0.081	0.041
1705	M161	4in Dia. Duct	Sec 3-max	0.528	5	0.180	5	-0.026	8	-2.859	7	5.169	6	-1.053	6	3.124	7	271.447	7	0.597	7	0.051	0.230	0.139		5.169		0.046	0.014
2063	M219	3in Dia. Duct	Sec 2-max	0.173	8	0.010	5	0.405	8	0.243	5	-0.092	8	8.737	6	-2.094	7	-11.397	8	-0.049	8	0.020	0.011	0.368		8.737		0.004	0.031
2110	M221	3in Dia. Duct	Sec 5-min	0.074	7	-0.017	8	-0.196	5	-0.181	8	0.098	5	0.882	5	-9.050	8	-36.188	5	-0.155	5	0.009	0.008	0.402		9.050		0.012	0.013
2112	M222	3in Dia. Duct	Sec 1-min	0.074	7	0.006	5	-0.186	8	-0.181	6	0.098	5	0.882	5	-9.050	8	-36.188	5	-0.155	5	0.009	0.008	0.402		9.050		0.012	0.014
1295	M140	6in Dia. Duct	Sec 3-min	0.003	7	-0.335	1	0.170	2	-0.238	8	-0.954	5	3.461	7	-4.992	6	746.243	1	0.655	1	0.000	0.001	0.357		4.992		0.081	0.041
1707	M161	4in Dia. Duct	Sec 4-max	0.528	5	0.179	5	-0.026	8	-2.854	7	5.116	6	-1.066	6	3.141	7	271.447	7	0.597	7	0.051	0.227	0.140		5.116		0.046	0.014
2245	M235	6in Dia. Duct	Sec 3-max	0.069	5	0.208	5	0.017	7	4.619	5	-1.715	8	0.044	5	1.068	8	-231.213	6	-0.194	6	0.011	0.330	0.076		4.619		0.024	0.026
461	M49	6in Dia. Duct	Sec 1-max	0.261	7	0.171	8	0.339	8	-0.985	5	2.521	8	2.611	5	2.682	8	761.760	7	0.686	7	0.031	0.180	0.206		2.982		0.085	0.042
1759	M186	3in Dia. Duct	Sec 5-max	0.111	5	-0.023	5	-0.022	8	3.400	8	-0.960	5	1.646	5	-0.092	8	15.687	8	0.020	8	0.016	0.270	0.131		3.400		0.003	0.003
2088	M219	3in Dia. Duct	Sec 4-min	-0.003	7	0.004	8	0.096	5	0.088	8	-0.253	5	2.261	7	-9.112	6	-19.817	5	-0.085	5	0.000	0.011	0.405		9.112		0.007	0.007
1298	M140	6in Dia. Duct	Sec 4-min	0.003	7	-0.336	1	0.169	2	-0.329	8	-0.748	5	3.522	7	-5.074	6	746.243	1	0.655	1	0.000	0.053	0.362		5.074		0.081	0.041
1709	M161	4in Dia. Duct	Sec 5-max	0.528	5	0.179	5	-0.026	8	-2.840	7	5.063	6	-1.083	6	3.158	7	271.447	7	0.597	7	0.051	0.225	0.140		5.063		0.046	0.014
1760	M186	3in Dia. Duct	Sec 5-min	0.105	8	-0.133	8	-0.099	6	0.960	5	-2.400	8	0.092	8	-1.646	5	-156.808	5	-0.204	5	0.015	0.270	0.131		3.400		0.028	0.018
416	M44	6in Dia. Duct	Sec 4-min	-0.245	5	0.103	8	-0.204	7	1.555	8	-2.189	5	1.501	5	-3.199	8	294.362	7	0.346	7	0.031	0.156	0.229		3.199		0.030	0.025
1300	M140	6in Dia. Duct	Sec 5-min	0.003	7	-0.337	1	0.168	2	-0.434	6	-0.656	7	3.582	7	-5.155	6	746.243	1	0.655	1	0.000	0.047	0.368		5.155		0.081	0.042
1074	M118	6in Dia. Duct	Sec 2-min	-0.113	5	-0.249	5	-0.105	6	-3.565	5	-3.111	8	-2.030	5	-1.252	8	-108.093	6	-0.090	6	0.014	0.256	0.145		3.565		0.011	0.031
2248	M235	6in Dia. Duct	Sec 4-min	0.006	8	0.142	8	-0.044	6	1.783	8	-4.717	5	-1.087	8	-0.050	5	-401.710	7	-0.336	7	0.001	0.337	0.076		4.717		0.041	0.018
1073	M118	6in Dia. Duct	Sec 2-max	0.112	6	0.195	8	0.097	7	3.111	8	3.565	5	1.252	8	2.030	5	16.797	7	0.014	7	0.014	0.256	0.145		3.565		0.002	0.024
119	M12	5in Dia. Duct	Sec 5-max	0.094	5	0.213	8	-0.022	8	3.400	8	-0.960	5	-0.064	8	1.655	5	336.032	6	0.307	6	0.014	0.270	0.131		3.400		0.042	0.029
2251	M236	6in Dia. Duct	Sec 1-max	0.121	5	0.168	7	0.016	7	4.815	5	-1.650	8	0.211	5	0.775	8	-217.737	5	-0.182	5	0.015	0.344	0.055		4.815		0.022	0.021
2256	M238	6in Dia. Duct	Sec 3-min	0.032	8	0.080	6	-0.042	6	1.986	8	-4.931	5	-0.812	8	-0.222	5	-607.000	8	-0.500	8	0.004	0.352	0.058		4.931		0.063	0.010
669	M69	12in Dia. Duct	Sec 5-max	-0.112	2	-0.162	1	0.243	4	6.752	7	-0.556	8	-0.777	7	2.379	6	-1083.696	7	-0.355	7	0.008	0.300	0.106		6.752		0.027	0.019
77	M8	6in Dia. Duct	Sec 4-max	-0.114	2	-0.155	5	-0.035	5	-2.709	2	2.828	1	-0.930	5	2.761	8	129.532	8	0.117	8	0.014	0.202	0.197		2.828		0.014	0.019
2269	M237	6in Dia. Duct	Sec 5-max	0.131	5	0.101	7	0.012	7	5.084	5	-2.246	8	0.370	5	0.462	8	-148.287	5	-0.124	5	0.017	0.383	0.033		5.084		0.015	0.012
63	M7	6in Dia. Duct	Sec 2-max	0.097	8	0.260	1	-0.251	2	-0.758	7	1.674	6	3.729	6	-1.851	7	353.378	8	0.296	8	0.012	0.134	0.266		3.729		0.037	0.032
2400	M250	6in Dia. Duct	Sec 5-min	-0.079	8	-0.137	7	-0.029	8	-2.770	7	-0.021	6	0.542	6	-2.850	7	260.956	6	0.235	6	0.010	0.198	0.204		2.850		0.029	0.017
2271	M238	6in Dia. Duct	Sec 1-max	0.125	5	0.036	6	0.012	7	5.084	5	-2.246	8	0.452	7	-0.042	6	-52.468	5	-0.044	5	0.016	0.353	0.032		5.084		0.005	0.005
2493	M260	6in Dia. Duct	Sec 2-max	0.062	5	0.299	5	0.047	7	-1.947	6	4.014	7	1.139	6	1.596	7	-179.120	8	-0.150	6	0.010	0.207	0.114		4.014		0.018	0.037
2267	M237	6in Dia. Duct	Sec 4-max	0.132	5	0.102	7	0.013	7	5.075	5	-2.206	8	0.366	5	0.445	8	-148.287	5	-0.124	5	0.017	0.383	0.032		5.075		0.015	0.013
120	M12	5in Dia. Duct	Sec 5-min	0.064	8	0.120	5	-0.096	5	0.960	5	-3.400	8	-1.656	5	0.064	8	-63.537	7	-0.083	7	0.009	0.270	0.131		3.400		0.011	0.017
2081	M219	3in Dia. Duct	Sec 1-max	0.172	6	0.011	5	0.405	8	0.237	5	-0.079	8	8.546	6	-2.011	7	-11.397	8	-0.049	8	0.020	0.011	0.380		8.546		0.004	0.031
2281	M239	6in Dia. Duct	Sec 1-max	0.112	5	0.127	5	0.037	6	-2.315	8	4.930	5	-0.104	6	0.609	7	0.908	5	0.000	5	0.014	0.352	0.044		4.930		0.000	0.018
121	M13	5in Dia. Duct	Sec 1-max	0.065	1	0.065	5	0.065	8	0.500	8	1.362	5	-1.252	7	3.674	6	-6.000	8	-0.008	8	0.010	0.106	0.292		3.674		0.001	0.009
122	M13	5in Dia. Duct	Sec 1-min	0.065	1	-0.065	8	-0.065	7	-1.362	5	-0.500	8	-3.674	6	1.252	7	-418.045	5	-0.544	5	0.010	0.106	0.292		3.674		0.075	0.009
2243	M235	6in Dia. Duct	Sec 2-max	0.090	5	0.209	5	0.018	7	4.520	5	-1.647	8	0.037	5	1.049	8	-231.213	6	-0.194	6	0.011	0.323	0.075		4.520		0.024	0.026
2265	M237	6in Dia. Duct	Sec 3-max	0.132	5	0.103	7	0.013	7	5.065	5	-2.166	8	0.362	5	0.428	8	-148.287	5	-0.124	5	0.017	0.382	0.031		5.065		0.015	0.013
2254	M236	6in Dia. Duct	Sec 2-min	0.032	8	0.081	6	-0.043	8	1.909	8	-4.874	5	-0.794	8	-0.216	5	-607.000	8	-0.500	8	0.004	0.348	0.057		4.874		0.063	0.010
2273	M238	6in Dia. Duct	Sec 2-max	0.124	5	0.037	6	0.012	7	5.045	5	-2.264	8	0.458	7	-0.023	6	-52.468	5	-0.044	5	0.016	0.360	0.033		5.045		0.005	0.005
2103	M221	3in Dia. Duct	Sec 2-max	0.225	8	0.001	5	0.068	8	-0.029	5	0.055	8	8.542	6	-2.859	7	-14.328	8	-0.061	8	0.026	0.002	0.380		8.542		0.005	0.005
478	M50	6in Dia. Duct	Sec 3-min	0.023	8	-0.292	7	-0.307	8	-1.495	8	-0.084	5	-4.180	8	-0.081	5	-140.129	6	-0.123	6	0.003	0.107	0.298		4.180		0.015	0.038
2086	M219	3in Dia. Duct	Sec 3-min	-0.003	7	0.005	8	0.096	5	0.085	8	-0.246	5	2.177	7	-8.925	6	-19.817	5	-0.085	5	0.000	0.011	0.397		8.925		0.007	0.007
2263	M237	6in Dia. Duct	Sec 2-max	0.133	5	0.104	7	0.014	7	5.056	5	-2.125	8	0.356	5	0.411	8	-148.287	5	-0.124	5	0.017	0.361	0.029		5.056		0.015	0.013
2248	M235	6in Dia. Duct	Sec 3-min	0.005	8	0.143	8	-0.044	6	1.715	8	-4.619	5	-1.068	8	-0.044	5	-401.710	7	-0.336	7	0.001	0.330	0.076		4.619		0.041	0.018
2275	M238	6in Dia. Duct	Sec 3-max	0.124	5	0.036	8	0.011	7	5.007	5	-2.281	8	0.463	7	-0.005	6	-52.468	5	-0.044	5	0.018	0.358	0.033		5.007		0.005	0.004
2105	M221	3in Dia. Duct	Sec 3-max	0.224	6	-0.003	5	0.070	8	-0.033	5	0.079	8	8.475	8	-2.437	5	-14.328	8	-0.061	8	0.028	0.004	0.377		8.475		0.005	0.005
1072	M118	6in Dia. Duct	Sec 1-min	-0.113	5	-0.246	5	-0.105	6	-3.491	5	-3.037	8	-1.993	5	-1.219	8	-108.093	6	-0.090	6	0.014	0.249	0.142		3.491		0.011	0.031
1071	M116	6in Dia. Duct	Sec 1-max	0.112	6	0.196	8	0.097	7	3.037	8	3.491	5	1.219	8	1.993	5	16.797	7	0.014	7	0.014	0.249	0.142		3.491		0.002	0.024
2538	M264	2in Dia. Duct	Sec 3-min	0.076	8	-0.180	5	-0.392	5	1.107	8	-3.322	5	1.658	8	-7.179	5	0.000	1	0.000	1	0.017	0.123	0.266		7.179		0.000	0.025
2499	M260	6in Dia. Duct	Sec 5-max	0.068	5	0.241	5	0.018	7	4.421	5	-1.579	8	-0.051	5	1.135	8	-179.120	6	-0.150	6	0.009	0.316	0.081		4.421		0.019	0.030
2261	M237	6in Dia. Duct	Sec 1-max	0.133	5	0.105	7	0.014	7	5.040	5	-2.084	8	0.351	5	0.394	8	-148.287	5	-0.124	5	0.017	0.360	0.028		5.040		0.015	0.013
64	M7	6in Dia. Duct	Sec 2-min	0.029	8	0.031	2	-0.692	1	-1.874	6	0.758	7	1.851	7	-3.728	6	326.161	7	0.273	7	0.004	0.134	0.266		3.728		0.034	0.085
2277	M238	6in Dia. Duct	Sec 4-max	0.123	5	0.030	8	0.011	7	4.968	5	-2.298	6	0.468	7	0.013	8	-52.468	5	-0.044	5	0.016	0.355	0.033		4.968		0.005	0.004
2494	M260	6in Dia. Duct	Sec 2-min	-0.024	6	0.203	8	-0.074	6	-4.014	7	1.947	8	-1.596	7	-1.139	6	-325.274	7	-0.272	7	0.003	0.287	0.114		4.014		0.034	0.028
2282	M239	6in Dia. Duct	Sec 1-min	0.064	8	-0.010	8	-0.010	7	-4.930	5	2.315	8	-0.609	7	0.104	8	-787.950	8	-0.660	6	0.008	0.352	0.044		4.930		0.081	0.001
2272	M238	6in Dia. Duct	Sec 1-min	0.064	8	-0.082	5	-0.039	6	2.246	8	-5.084	5	0.042	6	-0.452	7	-602.531	8	-0.672	8	0.008	0.383	0.032		5.084		0.083	0.010
2079	M216	3in Dia. Duct	Sec 5-max	0.093	5	0.011	6	0.453	8	0.264	5	-0.110	8	8.548	6	-2.011	7	-6.950	6	-0.030	8	0.011	0.013	0.380		8.548		0.002	0.035
2252	M238	6in Dia. Duct	Sec 1-min	0.032	8	0.081	6	-0.043	8	1.850	8	-4.815	5	-0.775	8	-0.211	5	-607.000	8	-0.500	8	0.004	0.344	0.055		4.815		0.063	0.010
2108	M221	3in Dia. Duct	Sec 4-min	0.074	7	-0.013	8	-0.194	5	-0.121	8	0.056	5	1.663	5	-6.759	8	-36.188	5	-0.155	5	0.009	0.005	0.369		8.759		0.012	0.015
1160	M126	6in Dia. Duct	Sec 5-min	-0.269	5	0.134	7	-0.164	5	0.016	8	-4.522	7	-0.646	8	0.065	5	215.326	7	0.181	7	0.034	0.323	0.045		4.522		0.022	0.020
662	M69	12in Dia. Duct	Sec 1-min	-0.256	1	0.691	8	-0.296	8	5.864	1	-6.175	2	-2.465	8	0.618	7	-1679.512	6	-0.616	6	0.019	0.274	0.110		6.175		0.047	0.069
2270	M237	6in Dia. Duct	Sec 3-min	0.052	8	0.002	6	-0.039	6	2.246	8	-5.084	5	-0.462	8	-0.370	5	-754.433	8	-0.631	8	0.007	0.363	0.032		5.084		0.078	0.005
2399	M250	6in Dia. Duct	Sec 5-max	-0.009	5	0.074	6	0.147	7	0.921	6	2.770	7	2.850	7	-0.542	6	1365.839	7	1.160	7	0.001	0.198	0.204		2.850		0.143	0.016
309	M33	6in Dia. Duct	Sec 5-max	0.081	8	0.245	8	0.104	8	3.049	8	3.505	5	1.188	8	1.977	5	0.000	1	0.000	1	0.010	0.250	0.141		3.505		0.000	0.030
2398	M250	6in Dia. Duct	Sec 4-min	-0.078	8	-0.136	7	-0.029	6	-2.705	7	-0.688	6	0.556	6	-2.761	7	260.956	6	0.235	6	0.010	0.193	0.199		2.761		0.029	0.017
2279	M238	6in Dia. Duct	Sec 5-max	0.123	5	0.035	8	0.010	7	4.930	5	-2.315	8	0.473	7	0.031	6	-52.468	5	-0.044	5	0.016	0.352	0.034		4.930		0.005	0.004
674	M70	12in Dia. Duct	Sec 2-min	-0.143	1	-0.387	2	-0.152	3	5.836	6	-5.926	7	-2.866	6	1.722	7	-2480.349	6	-0.813	6	0.010	0.263	0.127		5.926		0.003	0.030
310	M33	6in Dia. Duct	Sec 5-min	-0.075	5	-0.298	5	-0.111	5	-3.505	5	-3.049	8	-1.977	5	-1.188	8	0.000	1	0.000	1	0.009	0.250	0.141		3.505		0.009	0.037
2274	M238	6in Dia. Duct	Sec 2-min	0.063	8	-0.082	5	-0.039	6	2.264	8	-5.045	5	0.023	6	-0.452	7	-602.531	8	-0.672	8	0.008	0.350	0.033		5.045		0.083	0.010
2268	M237	6in Dia. Duct	Sec 4-min	0.052	8	0.002	6	-0.040	6	2.206	8	-5.075	5	-0.445	8	-0.366	5	-754.433	6	-0.631	8	0.007	0.363	0.032		5.075		0.078	0.005
2241	M235	6in Dia. Duct	Sec 1-max	0.090	5	0.210	5	0.018	7	4.421	5	-1.579	8	0.031	5	1.030	8	-231.213	6	-0.194	6	0.011	0.316	0.074		4.421		0.024	0.028
635	M56	6in Dia. Duct	Sec 3-max	0.219	1	-0.150	8	0.056	5	-0.138	2	0.459	1	4.778	6	-3.884	7	-935.256	8	-0.821	8	0.028	0.033	0.341		4.778		0.101	0.022
2084	M219	3in Dia. Duct	Sec 2-min	-0.003	7	0.006	8	0.095	5	0.082	8	-0.243	5	2.094	7	-8.737	6	-19.817	5	-0.085	5	0.000	0.011	0.386		8.737		0.007	0.007
2266	M237	6in Dia. Duct	Sec 3-max	0.052	8	0.002	6	-0.040	6	2.166	8	-5.065	5	-0.426	8	-0.362	5	-754.433	8	-0.631	8	0.007	0.362	0.031		5.065		0.078	0.005
2192	M230	2in Dia. Duct	Sec 1-min	0.070	8	-0.310	5	0.029	8	-6.716	5	1.280	8	-3.635	5	0.706	8	-199.789	5	-2.724	5	0.016	0.249	0.135		6.716		0.175	0.020
2276	M238	6in Dia. Duct	Sec 3-min	0.063	8	-0.082	5	-0.038	6	2.281	8	-5.007	5	0.005	6	-0.463	7	-602.531	8	-0.672	8	0.008	0.356	0.033		5.007		0.083	0.010
2244	M235	6in Dia. Duct	Sec 2-min	0.005	8	0.144	8	-0.045	6	1.647	8	-4.520	5	-1.049	8	-0.037	5	-401.710	7	-0.336	7	0.001	0.323	0.075		4.520		0.041	0.018
2500	M260	6in Dia. Duct	Sec 5-min	-0.009	5	0.145	8	-0.045	6	1.579	8	-4.421	5	-1.135	8	0.051	5	-325.274	7	-0.272	7	0.001	0.316	0.081		4.421		0.034	0.018

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a	f_t (ksi)	f_t/η_1	f_t/σ_a
																		D-2250									
529	M55	6in Dia. Duct	Sec 5 - max	0.020	6	-0.005	5	0.251	1	0.821	5	0.297	8	4.709	6	-3.213	7	1028.609	7	0.903	7	0.002	0.059	0.336	4.709	0.111	0.031
530	M55	6in Dia. Duct	Sec 5 - min	-0.020	5	-0.088	8	0.174	2	-0.297	8	-0.821	5	3.213	7	-4.709	6	956.930	6	0.840	6	0.002	0.059	0.336	4.709	0.104	0.021
2264	M237	6in Dia. Duct	Sec 2 - min	0.052	8	0.002	6	-0.041	6	2.125	8	-5.056	5	-0.411	8	-0.358	5	-754.433	8	-0.631	8	0.007	0.361	0.029	5.056	0.078	0.005
2060	M219	3in Dia. Duct	Sec 5 - min	-0.032	8	0.000	8	0.140	7	0.110	8	-0.264	5	2.011	7	-8.548	6	-7.691	5	-0.033	5	0.004	0.013	0.380	8.548	0.003	0.011
2276	M238	6in Dia. Duct	Sec 4 - min	0.002	8	-0.081	5	-0.038	8	2.298	8	-4.969	5	-0.013	6	-0.468	7	-402.531	8	-0.672	8	0.008	0.355	0.033	4.968	0.063	0.010
1158	M126	6in Dia. Duct	Sec 4 - min	-0.270	5	0.135	7	-0.164	5	-0.108	8	-4.456	7	-0.606	8	0.007	5	216.326	7	0.181	7	0.034	0.316	0.043	4.456	0.022	0.020
65	M7	6in Dia. Duct	Sec 3 - max	0.097	8	0.259	1	-0.252	2	-0.723	7	1.815	6	3.550	6	-1.725	7	353.378	6	0.296	6	0.012	0.130	0.254	3.550	0.037	0.032
2262	M237	6in Dia. Duct	Sec 1 - min	0.053	8	0.002	6	-0.041	6	2.084	8	-5.046	5	-0.304	8	-0.353	5	-754.433	8	-0.631	8	0.007	0.360	0.028	5.046	0.078	0.005
417	M44	6in Dia. Duct	Sec 4 - max	-0.079	8	0.147	5	0.204	6	2.189	5	-1.555	8	3.199	8	-1.601	5	625.935	8	0.524	6	0.010	0.156	0.229	3.199	0.065	0.025
659	M68	12in Dia. Duct	Sec 5 - max	0.020	7	0.978	7	0.004	3	7.715	2	-7.423	1	-0.012	7	1.134	6	-211.895	8	-0.069	6	0.001	0.343	0.050	7.715	0.005	0.015
660	M68	12in Dia. Duct	Sec 5 - min	-0.018	6	0.837	8	-0.143	4	7.423	1	-7.715	2	-1.134	6	0.012	7	-1303.365	5	-0.427	5	0.001	0.343	0.050	7.715	0.033	0.064
2260	M238	6in Dia. Duct	Sec 5 - min	0.062	8	-0.081	5	-0.037	6	2.315	8	-4.930	5	-0.031	6	-0.473	7	-402.531	8	-0.672	8	0.008	0.352	0.034	4.930	0.063	0.010
2397	M250	6in Dia. Duct	Sec 4 - max	-0.009	8	0.074	8	0.146	7	0.866	6	2.705	7	2.781	7	-0.556	6	1385.839	7	1.160	7	0.001	0.193	0.189	2.781	0.143	0.018
1659	M200	4in Dia. Duct	Sec 5 - max	0.534	5	-0.040	8	0.008	6	-3.343	8	5.961	5	1.213	6	1.719	7	130.227	8	0.287	8	0.051	0.260	0.070	5.961	0.022	0.003
873	M70	12in Dia. Duct	Sec 2 - max	0.022	2	-0.319	1	0.145	4	5.926	7	-5.836	6	-1.722	7	2.666	6	-1713.893	7	-0.562	7	0.002	0.263	0.127	5.926	0.043	0.025
2396	M250	6in Dia. Duct	Sec 3 - min	-0.076	8	-0.135	7	-0.028	6	-2.641	7	-0.852	6	0.570	6	-2.712	7	280.956	6	0.235	6	0.010	0.169	0.194	2.712	0.029	0.017
661	M69	12in Dia. Duct	Sec 1 - max	-0.112	2	1.036	5	-0.043	5	8.175	2	-5.864	1	-0.618	7	2.465	6	-1083.696	7	-0.355	7	0.008	0.274	0.110	8.175	0.027	0.050
462	M49	8in Dia. Duct	Sec 1 - min	0.041	6	-0.185	5	-0.165	5	-2.521	8	0.985	5	-2.882	8	-2.611	5	-30.646	6	-0.027	6	0.005	0.160	0.206	2.882	0.003	0.023
2062	M219	3in Dia. Duct	Sec 1 - min	-0.003	7	0.000	8	0.095	5	0.079	8	-0.237	5	2.011	7	-8.548	6	-19.817	5	-0.065	5	0.000	0.011	0.380	8.548	0.007	0.007
2104	M221	3in Dia. Duct	Sec 2 - min	0.072	7	-0.003	8	-0.190	5	-0.055	8	0.029	5	2.859	7	-8.542	6	-36.188	5	-0.155	5	0.008	0.002	0.380	8.542	0.012	0.015
2187	M235	3in Dia. Duct	Sec 4 - max	0.163	5	-0.075	8	0.040	5	-1.792	8	9.012	5	0.018	8	0.551	5	10.134	6	0.038	6	0.035	0.334	0.020	9.012	0.009	0.005
2242	M235	3in Dia. Duct	Sec 1 - max	0.005	8	0.145	8	-0.045	8	1.578	8	-4.421	5	-1.030	8	-0.031	5	-401.710	7	-0.336	7	0.001	0.318	0.074	4.421	0.041	0.018
538	M56	6in Dia. Duct	Sec 3 - min	0.132	2	-0.185	5	-0.056	6	-0.459	1	0.138	2	3.884	7	-4.776	6	-1045.519	5	-0.918	5	0.016	0.033	0.341	4.776	0.113	0.023
169	M18	3in Dia. Duct	Sec 5 - min	-0.041	7	-0.092	5	-0.039	6	-1.739	5	0.659	8	-3.098	8	1.164	7	258.010	5	0.338	5	0.008	0.138	0.246	3.098	0.046	0.011
2106	M221	3in Dia. Duct	Sec 3 - min	0.073	7	-0.008	8	-0.192	5	-0.079	8	0.033	5	2.437	5	-8.475	8	-36.188	5	-0.155	5	0.008	0.004	0.377	8.475	0.012	0.015
1156	M126	6in Dia. Duct	Sec 3 - min	-0.270	5	0.136	7	-0.165	5	-0.232	6	-4.394	7	-0.565	8	-0.071	5	216.326	7	0.181	7	0.034	0.314	0.040	4.394	0.022	0.020
68	M7	6in Dia. Duct	Sec 3 - min	0.029	5	0.030	2	-0.691	1	-1.815	6	0.723	7	1.725	7	-3.550	6	326.161	7	0.273	7	0.004	0.130	0.254	3.550	0.034	0.085
1150	M125	6in Dia. Duct	Sec 5 - min	-0.223	5	0.265	8	-0.166	5	-0.481	6	-4.265	7	-0.744	8	-0.028	5	183.441	7	0.154	7	0.028	0.305	0.053	4.265	0.019	0.033
179	M18	3in Dia. Duct	Sec 5 - max	-0.014	6	-0.027	8	0.039	5	-0.659	8	1.739	5	-1.164	7	3.098	8	760.461	8	1.016	8	0.002	0.130	0.246	3.098	0.140	0.005
2205	M231	2in Dia. Duct	Sec 3 - max	0.205	5	-0.108	8	0.045	5	-2.830	8	7.694	5	-0.296	8	1.235	5	-10.064	5	-0.137	6	0.046	0.192	0.046	7.694	0.009	0.007
2395	M250	6in Dia. Duct	Sec 3 - max	-0.008	5	0.073	5	0.146	7	0.852	8	2.641	7	2.712	7	-0.570	6	1385.839	7	1.160	7	0.001	0.189	0.194	2.712	0.143	0.018
2394	M250	6in Dia. Duct	Sec 2 - min	-0.077	8	-0.135	7	-0.028	6	-2.577	7	-0.817	6	0.583	6	-2.643	7	280.956	6	0.235	6	0.010	0.164	0.189	2.643	0.029	0.017
305	M33	6in Dia. Duct	Sec 3 - max	0.064	8	0.258	8	0.097	8	3.609	8	3.833	7	0.628	6	1.373	7	0.000	1	0.000	1	0.011	0.274	0.098	3.833	0.000	0.032
1933	M204	6in Dia. Duct	Sec 2 - max	0.245	1	-0.202	1	0.073	5	-3.060	2	3.172	1	5.006	5	-2.656	6	-935.256	6	-0.621	8	0.019	0.141	0.222	5.006	0.063	0.016
306	M33	6in Dia. Duct	Sec 3 - min	-0.078	5	-0.283	5	-0.104	5	-3.633	7	-3.609	6	-1.373	7	-0.628	6	0.000	1	0.000	1	0.010	0.274	0.098	3.633	0.000	0.035
1154	M126	6in Dia. Duct	Sec 2 - min	-0.270	5	0.137	7	-0.165	5	-0.357	6	-4.330	7	-0.525	8	-0.149	5	216.326	7	0.181	7	0.034	0.309	0.038	4.330	0.022	0.020
1170	M127	6in Dia. Duct	Sec 5 - min	-0.273	5	-0.085	7	-0.162	5	0.437	6	-4.363	7	-0.466	8	0.203	5	262.242	7	0.220	7	0.035	0.312	0.033	4.363	0.027	0.020
1169	M127	6in Dia. Duct	Sec 4 - min	-0.273	5	-0.084	7	-0.162	5	0.331	6	-4.403	7	-0.425	8	0.127	5	262.242	7	0.220	7	0.035	0.315	0.030	4.403	0.027	0.020
1166	M127	6in Dia. Duct	Sec 3 - min	-0.274	5	-0.084	7	-0.163	5	0.226	6	-4.443	7	-0.383	8	0.050	5	262.242	7	0.220	7	0.035	0.317	0.027	4.443	0.027	0.020
1164	M127	6in Dia. Duct	Sec 2 - min	-0.274	5	-0.083	7	-0.163	5	0.121	6	-4.483	7	-0.342	8	-0.028	5	262.242	7	0.220	7	0.035	0.320	0.024	4.483	0.027	0.020
1162	M127	6in Dia. Duct	Sec 1 - min	-0.274	5	-0.082	7	-0.164	5	0.016	6	-4.522	7	-0.301	8	-0.105	5	262.242	7	0.220	7	0.035	0.323	0.022	4.522	0.027	0.020
67	M7	6in Dia. Duct	Sec 4 - max	0.097	8	0.259	1	-0.252	2	-0.688	7	1.757	6	3.371	6	-1.599	7	353.378	6	0.296	6	0.012	0.126	0.241	3.371	0.037	0.032
1702	M161	4in Dia. Duct	Sec 1 - min	0.062	8	0.000	8	-0.061	5	-5.275	6	2.897	7	-3.085	7	1.023	6	169.585	6	0.373	6	0.006	0.234	0.137	5.275	0.029	0.005
1704	M161	4in Dia. Duct	Sec 2 - min	0.061	8	0.000	8	-0.061	5	-5.223	6	2.883	7	-3.106	7	1.036	6	169.585	6	0.373	6	0.006	0.232	0.138	5.223	0.029	0.005
405	M43	8in Dia. Duct	Sec 3 - max	0.086	6	0.553	5	-0.071	8	-2.032	7	3.281	6	1.827	5	-0.025	8	414.335	5	0.347	5	0.011	0.234	0.131	3.281	0.043	0.068
408	M43	8in Dia. Duct	Sec 3 - min	-0.096	7	0.221	8	-0.179	5	-3.281	6	2.032	7	0.025	8	-1.827	5	85.682	8	0.072	8	0.011	0.234	0.131	3.281	0.009	0.027
123	M13	5in Dia. Duct	Sec 2 - max	0.062	1	0.062	5	0.062	8	0.290	8	1.152	5	-1.462	7	3.464	8	-0.000	8	0.000	8	0.009	0.091	0.275	3.464	0.001	0.009
124	M13	5in Dia. Duct	Sec 2 - min	0.062	1	-0.062	8	-0.062	7	-1.152	5	-0.290	8	-3.464	6	3.462	7	-418.045	5	-0.544	5	0.009	0.091	0.275	3.464	0.075	0.009
1706	M161	4in Dia. Duct	Sec 3 - min	0.061	8	0.000	8	-0.061	5	-5.169	6	2.869	7	-3.124	7	1.053	6	169.585	6	0.373	6	0.006	0.230	0.139	5.169	0.029	0.005
483	M51	8in Dia. Duct	Sec 2 - max	-0.036	1	0.000	8	0.037	6	0.752	5	0.810	8	4.369	7	0.395	6	1313.992	4	1.153	4	0.004	0.058	0.312	4.369	0.142	0.005
484	M51	8in Dia. Duct	Sec 2 - min	-0.036	6	-0.068	5	-0.212	7	-0.810	8	-0.752	5	-0.395	6	-4.369	7	1103.694	3	0.969	3	0.004	0.058	0.312	4.369	0.120	0.028
2393	M250	6in Dia. Duct	Sec 2 - max	-0.008	5	0.073	8	0.145	7	0.817	6	2.577	7	2.643	7	-0.583	6	1385.839	7	1.160	7	0.001	0.164	0.189	2.643	0.143	0.018
1152	M126	6in Dia. Duct	Sec 1 - min	-0.270	5	0.138	7	-0.166	5	-0.481	6	-4.265	7	-0.465	8	-0.227	5	216.326	7	0.181	7	0.034	0.305	0.035	4.265	0.022	0.020
1934	M204	6in Dia. Duct	Sec 2 - min	0.126	2	-0.235	2	-0.073	6	-3.172	1	3.060	2	3.656	8	-5.006	5	-1045.519	5	-0.918	5	0.010	0.141	0.222	5.006	0.071	0.018
2392	M250	6in Dia. Duct	Sec 1 - min	-0.077	8	-0.134	7	-0.027	6	-2.513	7	-0.782	6	0.586	6	-2.574	7	280.956	6	0.235	6	0.010	0.160	0.184	2.574	0.029	0.017
1708	M161	4in Dia. Duct	Sec 4 - min	0.061	8	0.000	8	-0.060	5	-5.116	6	2.854	7	-3.141	7	1.068	6	169.585	6	0.373	6	0.006	0.227	0.140	5.116	0.029	0.005
2237	M234	2in Dia. Duct	Sec 4 - max	0.329	5	-0.063	8	-0.056	6	-1.569	8	5.562	5	-0.605	8	2.530	5	8.083	5	0.110	5	0.073	0.206	0.094	5.562	0.007	0.004
1159	M126	6in Dia. Duct	Sec 5 - max	-0.027	8	0.262	6	-0.086	8	4.522	7	-0.010	6	-0.085	5	0.646	8	532.193	6	0.445	6	0.003	0.323	0.046	4.522	0.055	0.032
1148	M125	6in Dia. Duct	Sec 4 - min	-0.223	5	0.265	8	-0.166	5	-0.607	6	-4.108	7	-0.704	8	-0.105	5	183.441	7	0.154	7	0.028	0.293	0.050	4.106	0.018	0.033
1710	M161	4in Dia. Duct	Sec 5 - min	0.060	8	0.000	8	-0.060	5	-5.063	8	2.840	7	-3.150	7	1.093	6	169.585	6	0.373	6	0.006	0.225	0.140	5.083	0.029	0.005
69	M7	6in Dia. Duct	Sec 4 - min	0.029	5	0.029	2	-0.691	1	-1.757	6	0.688	7	1.599	7	-3.371	6	326.161	7	0.273	7	0.004	0.126	0.241	3.371	0.034	0.085
97	M10	3in Dia. Duct	Sec 4 - max	0.569	7	-0.034	1	-0.256	5	-0.578	7	0.830	6	-5.523	5	6.101	8	10.088	4	0.043	4	0.066	0.028	0.271	6.101	0.003	0.020
1157	M126	6in Dia. Duct	Sec 4 - max	-0.026	8	0.262	6	-0.086	8	4.458	7	0.108	6	-0.007	5	0.606	8	532.193	6	0.445	6	0.004	0.318	0.043	4.458	0.055	0.032
2188	M229	2in Dia. Duct	Sec 4 - min	0.047	8	-0.242	5	-0.001	8	-9.012	5	1.792	8	-0.551	5	-0.018	8	-51.638	7	-0.843	7	0.010	0.334	0.020	9.012	0.054	0.016
2391	M250	6in Dia. Duct	Sec 1 - max	-0.007	5	0.073	5	0.145	7	0.782	6	2.513	7	2.574	7	-0.596	6	1385.839	7	1.160	7	0.001	0.160	0.184	2.574	0.143	0.018
307	M33	6in Dia. Duct	Sec 4 - max	0.082	8	0.261	8	0.100	8	2.987	8	3.307	7	0.879	8	1.646	5	0.000	1	0.000	1	0.010	0.236	0.118	3.307	0.000	0.031
412	M44	6in Dia. Duct	Sec 1 - min	-0.259	5	0.088	8	-0.190	7	0.107	5	-0.270	8	0.437	6	-4.363	7	294.362	7	0.240	7	0.033	0.019	0.312	4.363	0.030	0.023
1211	M132	8in Dia. Duct	Sec 1 - max	0.077	6	-0.314	8	0.294	5	-2.233	6	4.107	7	0.845	5	0.153	8	414.335	5	0.347	5	0.010	0.293	0.060	4.107	0.043	0.039
1212	M132	8in Dia. Duct	Sec 1 - min	-0.077	7	-0.348	6	0.092	8	-4.107	7	2.233	6	-0.153	8	-0.845	5	85.682	8	0.072	8	0.010	0.293	0.060	4.107	0.009	0.043
308	M33	6in Dia. Duct	Sec 4 - min	-0.076	5	-0.290	5	-0.107	5	-3.307	7	-2.987	6	-1.646	5	-0.879	6	0.000	1	0.000	1	0.010	0.236	0.118	3.307	0.000	0.038
676	M70	12in Dia. Duct	Sec 3 - min	-0.143	1	-0.395	2	-0.146	3	5.146	8	-5.273	5	-2.665	6	1.937	7	-2480.349	6	-0.813	6	0.010	0.234	0.118	5.273	0.063	0.030
1711	M182	4in Dia. Duct	Sec 1 - max	0.413	5	0.663	5	-0.026	8	-2.840	7	5.063	6	-0.503	8	2.200	5	593.913	7	1.307	7	0.040	0.225	0.098	5.063	0.101	0.053
399	M42	6in Dia. Duct	Sec 5 - max	0.069	6	-0.287	8	0.278	5	-2.233	6	4.107	7	0.845	5	0.153	8	414.335	5	0.347	5	0.009	0.293	0.060	4.107	0.043	0.035
400	M42	6in Dia. Duct	Sec 5 - min	-0.069	7	-0.315	5	0.108	8	-4.107	7	2.233	6	-0.153	8	-0.845	5	85.682	8	0.072	8	0.009	0.293	0.060	4.107	0.009	0.039
69	M7	6in Dia. Duct	Sec 5 - max	0.098	8	0.256	1	-0.252	2	-0.653	7	1.698	6	3.192	6	-1.472	7	353.378	6	0.296	6	0.012	0.121	0.228	3.192	0.037	0.032
1149	M125	6in Dia. Duct	Sec 5 - max	0.023	8	0.335	5	-0.064	8	4.265	7	0.481	6	0.026	5	0.744	8	449.066	6	0.376	6	0.003	0.305	0.053	4.265	0.046	0.041
2206	M231	2in Dia. Duct	Sec 3 - min	0.095	8	-0.274	5	0.011	8	-7.694	5	2.830	8	-1.235	5	0.296	8	-64.216	7	-0.875	7	0.021	0.292	0.046	7.694	0.056	0.018
2525	M263	2in Dia. Duct	Sec 2 - max	0.134	5	-0.057	8	-0.055	8	3.927	5	-0.087	8	4.958	5	-0.954	8	0.000	1	0.000	1	0.030	0.145	0.184	4.958	0.000	0.024
87	M9	3in Dia. Duct	Sec 4 - max	0.154	7	-0.376	6	0.087	7	-2.743	5	2.922	8	4.739	8	-4.593	5	34.434	6	0.147	6	0.018	0.130	0.211	4.739	0.011	0.076
113	M12	5in Dia. Duct	Sec 2 - max	0.100	5	0.233	8	-0.043	8	-3.069	8	3.389	5	0.934	6	-0.776	7	236.032	6	0.307	6	0.015	0.269	0.074	3.389	0.042	0.032
1146	M125	6in Dia. Duct	Sec 3 - min	-0.224	5	0.266	8	-0.167	5	-0.733	6	-3.947	7	-0.065	5	-0.184	5	183.441	7	0.154	7	0.028	0.262	0.048	3.947	0.019	0.033
1155	M126	6in Dia. Duct	Sec 3 - max	-0.026	8	0.262	8	-0.085	8	4.394	7	0.232	6	0.071	5	0.565	8	532.193	6	0.445	6	0.004	0.314	0.040	4.394	0.055	0.032
114	M12	5in Dia. Duct	Sec 2 - min	0.093	8	0.179	5	-0.074	5	-3.389	5	3.089	8	0.776	7	-0.934	6	-63.537	7	-0.083	7	0.014	0.269	0.074	3.389	0.011	0.025
88	M9	3in Dia. Duct	Sec 4 - min	0.123	6	-0.345	7	0.664	6	-2.922	8	2.743	5	4.593	5	-4.739	8	30.664	7	0.132	7	0.014	0.130	0.211	4.739	0.010	0.051
675	M70	12in Dia. Duct	Sec 1 - min	0.022	2	-0.327	1	0.139	4	5.273	5	-5.146	8	-1.937	7	2.665	6	-1713.893	7	-0.562	7	0.002	0.234	0.118	5.273	0.043	0.025

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_y/σ_a	f_z/σ_a		f_t (ksi)		f_t/σ_t	f_t/σ_a	
1331	M144	6in Dia. Duct	Sec 1 - max	0.070	8	0.256	1	-0.273	2	-0.551	7	1.573	6	3.262	6	-1.528	7	331.996	6	0.278	6	0.009	0.112	0.233		3.262		0.034	0.034	
1169	M127	6in Dia. Duct	Sec 5 - max	-0.073	8	0.223	5	-0.088	8	4.363	7	-0.437	6	-0.203	5	0.466	8	596.410	6	0.499	6	0.009	0.312	0.033		4.363		0.062	0.026	
1183	M127	6in Dia. Duct	Sec 2 - max	-0.075	8	0.222	6	-0.087	8	4.483	7	-0.121	6	0.028	5	0.342	8	596.410	6	0.499	6	0.009	0.320	0.024		4.483		0.062	0.027	
1167	M127	6in Dia. Duct	Sec 4 - max	-0.073	8	0.222	6	-0.088	8	4.403	7	-0.331	6	-0.127	5	0.425	8	596.410	6	0.499	6	0.009	0.316	0.030		4.403		0.062	0.027	
1165	M127	6in Dia. Duct	Sec 3 - max	-0.074	8	0.222	6	-0.087	8	4.443	7	-0.226	6	-0.050	5	0.383	8	596.410	6	0.499	6	0.009	0.317	0.027		4.443		0.062	0.027	
1181	M127	6in Dia. Duct	Sec 1 - max	-0.075	8	0.221	6	-0.086	8	4.522	7	-0.016	6	0.105	5	0.301	8	596.410	6	0.499	6	0.009	0.323	0.022		4.522		0.062	0.027	
1713	M182	4in Dia. Duct	Sec 2 - max	0.412	5	0.682	5	-0.028	8	-2.779	7	4.844	6	-0.513	8	2.223	5	593.913	7	1.307	7	0.040	0.215	0.099		4.644		0.101	0.052	
70	M7	6in Dia. Duct	Sec 5 - min	0.028	6	0.029	2	-0.691	1	-1.698	6	0.653	7	1.472	7	-3.192	8	326.161	7	0.273	7	0.004	0.121	0.228		3.192		0.034	0.085	
463	M49	6in Dia. Duct	Sec 2 - max	0.262	7	0.165	8	0.336	8	-1.344	5	2.197	8	2.297	5	2.231	8	781.760	7	0.686	7	0.032	0.157	0.164		2.297		0.085	0.041	
176	M18	5in Dia. Duct	Sec 4 - min	-0.037	7	-0.075	5	-0.035	6	-1.416	5	0.552	8	-2.947	8	1.316	7	258.010	5	0.336	5	0.005	0.113	0.234		2.947		0.046	0.010	
1153	M126	6in Dia. Duct	Sec 2 - max	-0.029	8	0.283	6	-0.085	8	4.330	7	0.357	6	0.149	5	0.525	8	532.193	6	0.445	6	0.004	0.305	0.038		4.330		0.055	0.032	
1332	M144	6in Dia. Duct	Sec 1 - min	-0.040	5	0.036	2	-0.699	1	-1.573	6	0.551	7	1.526	7	-3.262	6	299.994	7	0.251	7	0.005	0.112	0.233		3.262		0.031	0.066	
177	M18	5in Dia. Duct	Sec 4 - max	-0.012	6	-0.025	6	0.035	5	-0.552	8	1.418	5	-1.316	7	2.947	6	780.461	8	1.016	8	0.002	0.113	0.234		2.947		0.140	0.005	
98	M10	3in Dia. Duct	Sec 4 - min	0.410	6	-0.053	2	-0.297	8	-0.636	6	0.576	7	-6.101	8	5.523	5	5.736	3	0.024	3	0.048	0.028	0.271		6.101		0.002	0.023	
1900	M200	4in Dia. Duct	Sec 5 - min	0.059	6	-0.110	5	-0.029	7	-5.961	5	3.343	8	-1.719	7	-1.213	6	53.888	5	0.119	5	0.006	0.265	0.076		5.881		0.009	0.009	
1147	M125	6in Dia. Duct	Sec 4 - max	0.023	6	0.330	5	-0.084	8	4.106	7	0.607	6	0.105	5	0.704	8	449.066	6	0.376	6	0.003	0.293	0.050		4.106		0.046	0.041	
312	M34	6in Dia. Duct	Sec 1 - min	-0.163	5	-0.033	7	-0.157	8	-0.080	7	-0.046	6	-4.471	8	-3.574	6	-444.321	6	-0.372	6	0.021	0.006	0.319		4.471		0.046	0.019	
1715	M182	4in Dia. Duct	Sec 3 - max	0.412	5	0.881	5	-0.028	8	-2.718	7	4.626	6	-0.520	8	2.245	5	593.913	7	1.307	7	0.040	0.206	0.100		4.626		0.101	0.052	
1144	M125	6in Dia. Duct	Sec 2 - min	-0.224	5	0.267	8	-0.167	5	-0.859	6	-3.767	7	-0.620	8	-0.263	5	183.441	7	0.154	7	0.028	0.271	0.045		3.767		0.019	0.033	
125	M13	5in Dia. Duct	Sec 1 - min	0.059	1	0.059	5	0.059	8	0.090	8	0.952	5	-1.662	7	3.264	6	-6.000	8	-0.006	8	0.009	0.076	0.259		3.264		0.001	0.008	
128	M13	5in Dia. Duct	Sec 3 - min	0.059	1	-0.059	8	-0.059	7	-0.952	5	-0.090	8	-3.264	6	1.662	7	-418.045	5	-0.544	5	0.009	0.076	0.259		3.264		0.075	0.008	
1151	M126	6in Dia. Duct	Sec 1 - max	-0.029	8	0.283	6	-0.084	8	4.265	7	0.461	6	0.227	5	0.465	8	532.193	6	0.445	6	0.004	0.305	0.035		4.265		0.055	0.032	
411	M44	6in Dia. Duct	Sec 1 - max	-0.093	8	0.162	5	0.190	6	0.278	8	-0.107	5	4.363	7	-0.437	6	625.835	5	0.524	6	0.012	0.019	0.312		4.363		0.065	0.023	
311	M34	6in Dia. Duct	Sec 1 - max	0.129	8	0.016	6	0.145	5	0.046	6	0.088	7	3.574	8	4.471	5	113.974	7	0.095	7	0.016	0.006	0.319		4.471		0.012	0.018	
1021	M113	6in Dia. Duct	Sec 1 - max	0.272	7	0.186	8	0.328	8	-1.153	6	2.556	5	1.772	5	0.274	8	426.703	7	0.376	7	0.033	0.183	0.127		2.556		0.046	0.040	
414	M44	6in Dia. Duct	Sec 2 - min	-0.254	5	0.093	8	-0.195	7	0.676	6	-0.822	5	1.300	6	-3.500	7	394.362	7	0.246	7	0.032	0.059	0.250		3.500		0.030	0.024	
2526	M263	2in Dia. Duct	Sec 3 - min	0.051	8	-0.213	5	-0.270	5	0.967	8	-3.927	5	0.554	8	-4.958	5	0.000	1	0.000	1	0.011	0.145	0.184		4.958		0.000	0.017	
1333	M144	6in Dia. Duct	Sec 2 - max	0.070	8	0.255	1	-0.273	2	-0.520	7	1.521	6	3.099	6	-1.415	7	331.996	6	0.278	6	0.009	0.109	0.221		3.099		0.034	0.034	
287	M31	6in Dia. Duct	Sec 4 - max	0.130	8	0.190	8	0.006	6	1.700	6	0.381	7	2.333	6	2.813	7	0.000	1	0.000	1	0.016	0.121	0.201		2.813		0.000	0.023	
286	M31	6in Dia. Duct	Sec 4 - min	-0.124	5	-0.056	7	-0.013	7	-0.381	7	-1.700	6	-2.613	7	-2.333	6	0.000	1	0.000	1	0.016	0.121	0.201		2.613		0.000	0.007	
1717	M182	4in Dia. Duct	Sec 4 - max	0.412	5	0.881	5	-0.026	8	-2.657	7	4.407	6	-0.533	8	2.288	5	593.913	7	1.307	7	0.040	0.196	0.101		4.407		0.101	0.052	
2390	M249	6in Dia. Duct	Sec 5 - min	-0.068	8	-0.027	6	-0.100	8	0.493	6	-2.072	7	-0.782	6	-2.513	7	345.041	6	0.289	6	0.009	0.146	0.180		2.513		0.030	0.012	
279	M30	6in Dia. Duct	Sec 5 - max	0.139	8	-0.027	7	0.025	6	0.337	7	2.045	6	2.054	6	2.405	7	0.000	1	0.000	1	0.018	0.146	0.172		2.405		0.000	0.003	
281	M31	6in Dia. Duct	Sec 1 - max	0.139	8	0.228	6	0.025	6	0.337	7	2.045	6	2.054	6	2.405	7	0.000	1	0.000	1	0.018	0.146	0.172		2.405		0.000	0.020	
1334	M144	6in Dia. Duct	Sec 2 - min	-0.040	5	0.037	2	-0.699	1	-1.521	6	0.520	7	1.415	7	-3.099	6	299.994	7	0.251	7	0.005	0.109	0.221		3.099		0.031	0.086	
269	M30	6in Dia. Duct	Sec 6 - min	-0.133	5	-0.075	6	-0.032	7	-2.045	6	-0.337	7	-2.405	7	-2.054	6	0.000	1	0.000	1	0.017	0.146	0.172		2.405		0.000	0.009	
282	M31	6in Dia. Duct	Sec 1 - min	-0.133	5	-0.020	7	-0.032	7	-2.045	6	-0.337	7	-2.405	7	-2.054	6	0.000	1	0.000	1	0.017	0.146	0.172		2.405		0.000	0.004	
678	M70	12in Dia. Duct	Sec 4 - min	-0.143	1	-0.403	2	-0.140	3	4.406	2	-4.637	1	-2.641	5	1.975	6	-2460.349	6	-0.813	6	0.010	0.206	0.117		4.637		0.063	0.031	
316	M34	6in Dia. Duct	Sec 4 - min	-0.197	5	-0.082	7	-0.126	8	-1.715	7	-0.620	6	-2.602	6	-1.387	7	-444.321	6	-0.372	6	0.025	0.123	0.166		2.602		0.046	0.016	
2238	M234	2in Dia. Duct	Sec 4 - min	0.151	8	-0.272	5	-0.186	7	-5.562	5	1.569	8	-2.530	5	0.805	8	-0.000	8	0.000	8	0.034	0.206	0.094		5.562		0.000	0.017	
1145	M125	6in Dia. Duct	Sec 3 - max	0.022	8	0.337	5	-0.083	8	3.947	7	0.733	6	0.184	5	0.665	8	449.066	6	0.376	6	0.003	0.282	0.048		3.947		0.046	0.042	
2153	M228	6in Dia. Duct	Sec 2 - max	0.093	8	0.043	8	0.085	6	-0.669	7	1.416	6	-2.000	7	3.044	6	353.374	6	0.265	6	0.012	0.101	0.217		3.044		0.037	0.010	
1140	M124	6in Dia. Duct	Sec 5 - min	-0.142	5	0.231	8	-0.158	5	-0.986	6	-3.627	7	-0.744	6	-0.113	5	157.598	8	0.132	8	0.018	0.259	0.053		3.627		0.016	0.029	
2389	M249	6in Dia. Duct	Sec 5 - max	-0.020	5	0.145	7	0.127	5	2.072	7	-0.493	6	2.513	7	0.782	8	1659.205	7	1.389	7	0.003	0.146	0.180		2.513		0.171	0.018	
1289	M137	6in Dia. Duct	Sec 5 - max	0.006	2	0.017	4	0.009	8	1.931	8	-1.214	5	-1.569	8	2.675	5	753.983	5	0.662	5	0.001	0.136	0.191		2.675		0.082	0.002	
1270	M137	6in Dia. Duct	Sec 5 - min	-0.006	1	0.017	1	-0.009	5	1.214	5	-1.931	8	-2.675	5	1.569	8	174.142	8	0.153	8	0.001	0.136	0.191		2.675		0.019	0.002	
1142	M125	6in Dia. Duct	Sec 1 - min	-0.224	5	0.267	8	-0.168	5	-0.860	8	-3.627	7	-0.567	8	-0.342	5	183.441	7	0.154	7	0.028	0.259	0.042		3.627		0.019	0.033	
1023	M113	6in Dia. Duct	Sec 2 - max	0.273	7	0.193	8	0.327	8	-1.077	6	2.500	7	1.649	5	0.011	8	426.703	7	0.376	7	0.033	0.179	0.118		2.500		0.046	0.040	
1287	M137	6in Dia. Duct	Sec 4 - max	0.006	2	0.018	4	0.010	8	1.924	8	-1.200	5	-1.573	8	2.671	5	753.983	5	0.662	5	0.001	0.137	0.191		2.671		0.082	0.002	
1268	M137	6in Dia. Duct	Sec 4 - min	-0.006	1	0.018	1	-0.010	5	1.206	5	-1.924	8	-2.671	5	1.573	8	174.142	8	0.153	8	0.001	0.137	0.191		2.671		0.019	0.002	
509	M53	6in Dia. Duct	Sec 5 - max	0.006	2	0.022	7	0.012	8	1.923	8	-1.394	5	-1.587	8	2.657	5	625.175	5	0.549	5	0.001	0.137	0.190		2.657		0.068	0.003	
510	M53	6in Dia. Duct	Sec 5 - min	-0.006	1	0.022	6	-0.012	5	1.394	5	-1.923	8	-2.657	5	1.587	8	-16.984	8	-0.015	8	0.001	0.137	0.190		2.657		0.002	0.003	
1265	M137	6in Dia. Duct	Sec 3 - max	0.006	2	0.019	4	0.011	8	1.916	8	-1.199	5	-1.577	8	2.666	5	753.983	5	0.662	5	0.001	0.137	0.190		2.666		0.082	0.003	
1266	M137	6in Dia. Duct	Sec 3 - min	-0.006	1	0.019	1	-0.011	5	1.199	5	-1.916	8	-2.666	5	1.577	8	174.142	8	0.153	8	0.001	0.137	0.190		2.666		0.019	0.002	
1712	M182	4in Dia. Duct	Sec 1 - min	0.032	8	0.061	8	-0.060	5	-5.063	8	2.840	7	-2.200	5	0.503	8	269.942	6	0.594	6	0.005	0.225	0.098		5.063		0.046	0.005	
1719	M182	4in Dia. Duct	Sec 5 - max	0.412	5	0.680	5	-0.026	8	-2.597	7	4.189	6	-0.542	8	2.290	5	593.913	7	1.307	7	0.040	0.186	0.102		4.189		0.101	0.052	
1283	M137	6in Dia. Duct	Sec 2 - max	0.007	2	0.020	4	0.012	8	1.908	8	-1.191	5	-1.582	8	2.662	5	753.983	5	0.662	5	0.001	0.136	0.190		2.662		0.082	0.002	
1264	M137	6in Dia. Duct	Sec 2 - min	-0.007	1	0.020	1	-0.012	5	1.191	5	-1.908	8	-2.662	5	1.582	8	174.142	8	0.153	8	0.001	0.136	0.190		2.662		0.019	0.002	
418	M44	6in Dia. Duct	Sec 3 - min	-0.249	5	0.098	8	-0.199	7	1.105	8	-1.916	5	2.185	8	-2.615	7	294.362	7	0.246	7	0.032	0.108	0.187		2.615		0.030	0.025	
464	M49	6in Dia. Duct	Sec 2 - min	0.044	6	-0.187	5	-0.162	5	-2.197	8	1.344	5	-2.231	8	-2.297	5	-30.646	6	-0.027	6	0.005	0.157	0.164		2.297		0.003	0.023	
1261	M137	6in Dia. Duct	Sec 1 - max	0.007	2	0.022	4	0.012	8	1.899	8	-1.182	5	-1.587	8	2.657	5	753.983	5	0.662	5	0.001	0.136	0.190		2.657		0.082	0.003	
1262	M137	6in Dia. Duct	Sec 1 - min	-0.007	1	0.022	1	-0.012	5	1.182	5	-1.899	8	-2.657	5	1.587	8	174.142	8	0.153	8	0.001	0.136	0.190		2.657		0.019	0.003	
1931	M204	6in Dia. Duct	Sec 1 - max	0.236	1	-0.196	1	0.067	5	-2.002	2	2.739	1	4.678	5	-3.984	8	-935.256	8	-0.821	8	0.018	0.100	0.208		4.678		0.063	0.015	
2451	M256	6in Dia. Duct	Sec 1 - max	0.114	7	0.024	7	-0.026	7	0.772	7	-0.666	6	3.580	7	-1.907	6	52.117	6	0.044	6	0.014	0.055	0.256		3.580		0.005	0.003	
2453	M256	6in Dia. Duct	Sec 2 - max	0.115	7	0.023	7	-0.026	7	0.783	7	-0.666	6	3.567	7	-1.886	6	52.117	6	0.044	6	0.015	0.058	0.255		3.567		0.005	0.003	
2455	M256	6in Dia. Duct	Sec 3 - max	0.115	7	0.022	7	-0.026	7	0.793	7	-0.670	6	3.555	7	-1.865	6	52.117	6	0.044	6	0.015	0.057	0.254		3.555		0.005	0.003	
677	M70	12in Dia. Duct	Sec 4 - max	0.022	2	-0.335	1	0.133	4	4.637	1	-4.406	2	-1.975	8	2.641	5	-1713.993	7	-0.562	7	0.002	0.206	0.117		4.637		0.043	0.026	
2457	M256	6in Dia. Duct	Sec 4 - max	0.115	7	0.021	7	-0.026	7	0.803	7	-0.671	6	3.543	7	-1.843	6	52.117	6	0.044	6	0.015	0.057	0.253		3.543		0.005	0.003	
2459	M256	6in Dia. Duct	Sec 5 - max	0.116	7	0.020	7	-0.026	7	0.813	7	-0.671	6	3.530	7	-1.822	6	52.117	6	0.044	6	0.015	0.058	0.252		3.530		0.005	0.003	
1891	M200	4in Dia. Duct	Sec 1 - max	0.595	5	-0.047	8	0.069	6	2.655	7	-1.305	6	3.358	7	2.070	6	100.227	8	0.287	8	0.057	0.118	0.149		3.358		0.022	0.005	
657	M66	12in Dia. Duct	Sec 4 - max	0.022	7	0.983	7	-0.001	3	6.234	8	-6.045	5	0.089	7	1.016	6	-211.895	8	-0.069	8	0.002	0.277	0.045		6.234		0.005	0.076	
658	M66	12in Dia. Duct	Sec 4 - min	-0.020	8	0.843	6	-0.139	4	6.045	5	-6.234	8	-1.016	6	-0.089	7	-1303.365	5	-0.427	5	0.001	0.277	0.045		6.234		0.033	0.055	
2449	M255	6in Dia. Duct	Sec 5 - max	0.111	7	0.024	7	0.064	7	0.753	7	-0.562	6	3.580	7	-1.907	6	200.487	6	0.168	6	0.014	0.054	0.256		3.580		0.021	0.008	
1335	M144	6in Dia. Duct	Sec 3 - max	0.070	8	0.255	1	-0.273	2	-0.489	7	1.468	6	2.937	6	-1.301	7	331.996	6	0.278	6	0.009	0.105	0.210		2.937		0.034	0.034	
2154	M228	6in Dia. Duct	Sec 2 - min	0.033	5	0.002	7	0.002	7	-1.416	6	0.669	7	-3.044	6	2.000	7	326.161	7	0.273	7	0.004	0.101	0.217		3.044		0.034	0.000	
317	M34	6in Dia. Duct	Sec 4 - max	0.105	8	0.024	6	0.114	5	0.620	6	1.715	7	1.367	7	2.602	6	113.974	7	0.095	7	0.013	0.123	0.166		2.602		0.012	0.014	
1139	M124	6in Dia. Duct	Sec 5 - max	0.071	8	0.465	5	-0.062	8	3.627	7	0.986	6	0.113	5	0.744	6	370.941	5	0.310	5	0.009	0.259	0.053		3.627		0.038	0.060	
2113	M222	3in Dia. Duct	Sec 2 - max	0.218	6	-0.008	8	-0.023	5	-0.128	5	0.185	8	6.468	8	-0.604	5	-14.328	8	-0.061	8	0.025	0.008	0.287		6.468		0.005	0.002	
277	M30	6in Dia. Duct	Sec 4 - max	0.140	8	-0.022	7	0.027	6	0.385	7	1.902	6	2.003	6	2.340	7	0.000	1	0.000	1	0.018	0.136	0.167		2.340		0.000	0.003	
2447	M255	6in Dia. Duct	Sec 4 - max	0.110	7	0.025	7	0.063	7	0.742	7	-0.589	6	3.550	7	-1.905	6	200.487	6	0.168	6	0.014	0.053	0.254		3.550		0.021	0.008	
278	M30	6in Dia. Duct	Sec 4 - min	-0.134	5	-0.071	6	-0.034	7	-1.902	6	-0.385	7	-2.340	7	-2.003	6	0.000	1	0.000	1	0.017	0.136	0.167		2.340		0.000	0.009	
413	M44	6in Dia. Duct	Sec 2 - max	-0.088	8	0.157	5	0.195	6	0.822	5	-0.676	8	3.500	7	-1.300	6	625.835	5	0.524	6	0.011	0.059	0.250		3.500		0.045	0.024	
1336	M144	6in Dia. Duct	Sec 3 - min	-0.040	5	0.037	2	-0.699	1	-1.463	6	0.489	7	1.301	7	-2.937	6	299.994	7	0.251	7	0.005	0.105	0.210		2.937		0.031	0.086	
1714	M182	4in Dia. Duct	Sec 2 - min	0.052	8	0.061	8	-0.060	5	-4.844	6	2.770	7	-2.223	5	0.513	8	269.942	6	0.594	6	0.005	0.215	0.099		4.844		0.046	0.005	
2452	M256	6in Dia. Duct	Sec 1 - min	0.059	6	0.005	6	-0.045	6	0.668	6	-0.772	7	1.907	6	-3.580	7	-62.152	7	-0.052	7	0.007	0.055	0.256		3.580		0.006	0.000	

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a	D-2250	f_t (ksi)		f/σ_t	f/σ_a
465	M49	6in Dia. Duct	Sec 3 - max	0.263	7	0.159	6	0.333	6	-1.568	6	2.023	7	1.988	5	1.596	8	781.760	7	0.686	7	0.032	0.145	0.142		2.023		0.085	0.041
2454	M256	6in Dia. Duct	Sec 2 - min	0.059	6	0.004	6	-0.045	6	0.609	6	-0.793	7	1.860	6	-3.567	7	-62.152	7	-0.052	7	0.007	0.056	0.255		3.567		0.006	0.005
2456	M256	6in Dia. Duct	Sec 3 - min	0.059	6	0.003	6	-0.045	6	0.670	6	-0.793	7	1.865	6	-3.555	7	-62.152	7	-0.052	7	0.007	0.057	0.254		3.555		0.006	0.005
1143	M125	6in Dia. Duct	Sec 2 - max	0.022	6	0.336	5	-0.083	8	3.787	7	0.659	6	0.263	5	0.626	8	449.056	6	0.376	6	0.003	0.271	0.045		3.787		0.046	0.042
2458	M256	6in Dia. Duct	Sec 4 - min	0.059	6	0.002	6	-0.045	6	0.671	6	-0.803	7	1.843	6	-3.543	7	-62.152	7	-0.052	7	0.007	0.057	0.253		3.543		0.006	0.005
2450	M255	6in Dia. Duct	Sec 5 - min	0.064	6	0.005	6	0.004	6	0.562	6	-0.753	7	1.907	6	-3.560	7	119.033	7	0.100	7	0.008	0.054	0.256		3.560		0.012	0.001
2460	M256	6in Dia. Duct	Sec 5 - min	0.058	6	0.000	6	-0.045	6	0.671	6	-0.813	7	1.822	6	-3.530	7	-62.152	7	-0.052	7	0.007	0.056	0.252		3.530		0.006	0.005
176	M16	5in Dia. Duct	Sec 3 - min	-0.033	7	-0.087	5	-0.031	8	-1.129	5	0.456	8	-2.811	6	1.452	7	258.010	5	0.335	5	0.005	0.090	0.223		2.811		0.045	0.009
2445	M255	6in Dia. Duct	Sec 3 - max	0.110	7	0.026	7	0.083	7	0.730	7	-0.577	6	3.520	7	-1.903	6	200.487	6	0.168	6	0.014	0.052	0.251		3.520		0.021	0.008
1932	M204	6in Dia. Duct	Sec 1 - min	0.128	2	-0.217	2	-0.067	6	-2.239	1	2.002	2	3.984	8	-4.678	5	-1045.519	5	-0.918	5	0.010	0.100	0.206		4.678		0.071	0.017
1025	M113	6in Dia. Duct	Sec 3 - max	0.374	7	0.191	8	0.325	8	-0.971	6	2.446	7	1.527	5	-0.252	8	428.703	7	0.376	7	0.033	0.175	0.109		2.446		0.046	0.040
1279	M138	6in Dia. Duct	Sec 5 - max	0.003	7	0.012	7	0.009	2	1.734	8	-0.711	5	-1.556	8	2.688	5	946.784	7	0.831	7	0.000	0.124	0.192		2.688		0.103	0.001
1280	M138	6in Dia. Duct	Sec 5 - min	-0.003	6	0.012	3	-0.009	1	0.711	5	-1.734	8	-2.689	5	1.556	8	538.124	6	0.472	6	0.000	0.124	0.192		2.689		0.058	0.001
2461	M257	6in Dia. Duct	Sec 1 - max	0.102	7	0.020	7	-0.088	6	0.711	7	-0.654	6	3.530	7	-1.622	6	-105.306	6	-0.088	6	0.013	0.051	0.252		3.530		0.011	0.011
1277	M138	6in Dia. Duct	Sec 4 - max	0.004	7	0.013	7	0.010	2	1.728	8	-0.706	5	-1.559	8	2.685	5	946.784	7	0.831	7	0.000	0.123	0.192		2.685		0.103	0.002
1278	M138	6in Dia. Duct	Sec 4 - min	-0.004	6	0.013	3	-0.010	1	0.706	5	-1.728	8	-2.685	5	1.559	8	538.124	8	0.472	6	0.000	0.123	0.192		2.685		0.059	0.002
467	M49	6in Dia. Duct	Sec 4 - max	0.264	7	0.153	8	0.331	8	-1.374	6	2.204	7	1.604	5	0.948	8	781.760	7	0.686	7	0.032	0.103	0.120		2.204		0.065	0.041
1275	M138	6in Dia. Duct	Sec 3 - max	0.004	7	0.014	7	0.011	2	1.723	8	-0.701	5	-1.562	8	2.682	5	946.784	7	0.831	7	0.000	0.123	0.192		2.682		0.103	0.002
1276	M138	6in Dia. Duct	Sec 3 - min	-0.004	6	0.014	3	-0.011	1	0.701	5	-1.723	8	-2.682	5	1.562	8	538.124	6	0.472	6	0.000	0.123	0.192		2.682		0.059	0.002
2446	M255	6in Dia. Duct	Sec 4 - min	0.064	6	0.006	6	0.004	6	0.580	6	-0.743	7	1.905	6	-3.550	7	119.033	7	0.100	7	0.008	0.053	0.254		3.550		0.012	0.001
507	M53	6in Dia. Duct	Sec 4 - max	0.009	7	0.034	7	0.019	8	1.800	8	-1.271	5	-1.654	8	2.590	5	625.175	5	0.549	5	0.001	0.129	0.185		2.590		0.066	0.004
508	M53	6in Dia. Duct	Sec 4 - min	-0.009	6	0.034	6	-0.019	5	1.271	5	-1.800	8	-2.590	5	1.654	6	-16.984	8	-0.015	8	0.001	0.129	0.185		2.590		0.002	0.004
680	M70	12in Dia. Duct	Sec 5 - min	-0.143	1	-0.412	2	-0.135	3	3.641	2	-3.999	1	-2.844	5	1.787	8	-2480.349	6	-0.613	6	0.010	0.178	0.128		3.999		0.063	0.032
1273	M138	6in Dia. Duct	Sec 2 - max	0.004	7	0.016	7	0.012	2	1.717	8	-0.694	5	-1.565	8	2.678	5	946.784	7	0.831	7	0.000	0.123	0.191		2.678		0.103	0.002
1274	M138	6in Dia. Duct	Sec 2 - min	-0.004	6	0.016	3	-0.012	1	0.694	5	-1.717	8	-2.678	5	1.565	8	538.124	6	0.472	6	0.000	0.123	0.191		2.678		0.058	0.002
175	M16	5in Dia. Duct	Sec 3 - max	-0.011	6	-0.022	8	0.031	5	-0.456	8	1.129	5	-1.452	7	2.811	6	760.461	8	1.016	8	0.002	0.090	0.223		2.811		0.140	0.004
2443	M255	6in Dia. Duct	Sec 2 - max	0.109	7	0.027	7	0.063	7	0.717	7	-0.574	6	3.490	7	-1.901	6	200.487	6	0.168	6	0.014	0.051	0.249		3.490		0.021	0.008
2465	M259	6in Dia. Duct	Sec 3 - max	0.100	5	-0.078	6	0.058	6	-1.723	6	2.598	7	0.210	6	1.622	7	-178.120	6	-0.150	6	0.013	0.186	0.115		2.598		0.019	0.010
1271	M138	6in Dia. Duct	Sec 1 - max	0.005	7	0.017	7	0.013	2	1.710	8	-0.688	5	-1.569	8	2.675	5	946.784	7	0.831	7	0.001	0.122	0.191		2.675		0.103	0.002
1272	M138	6in Dia. Duct	Sec 1 - min	-0.005	8	0.017	3	-0.013	1	0.688	5	-1.710	8	-2.675	5	1.569	8	538.124	6	0.472	6	0.001	0.122	0.191		2.675		0.059	0.002
469	M49	6in Dia. Duct	Sec 5 - max	0.269	7	0.147	8	0.328	8	-1.183	6	2.556	7	1.386	5	0.311	8	781.760	7	0.686	7	0.032	0.183	0.099		2.556		0.065	0.040
1022	M113	6in Dia. Duct	Sec 1 - min	0.030	6	0.006	5	-0.153	5	-2.556	7	1.103	6	-0.274	8	-1.772	5	30.937	6	0.027	6	0.004	0.163	0.127		2.556		0.003	0.019
2463	M257	6in Dia. Duct	Sec 2 - max	0.102	7	0.019	7	-0.085	6	0.720	7	-0.654	6	3.477	7	-1.782	6	-105.306	6	-0.088	6	0.013	0.051	0.248		3.477		0.011	0.010
127	M13	5in Dia. Duct	Sec 4 - max	0.056	1	0.056	5	0.056	6	-0.101	8	0.761	5	-1.652	7	3.073	6	-6.000	8	-0.006	6	0.008	0.060	0.244		3.073		0.001	0.005
128	M13	5in Dia. Duct	Sec 4 - min	0.056	1	-0.056	6	-0.056	7	-0.761	5	0.101	8	-3.073	6	1.652	7	-416.045	5	-0.544	5	0.008	0.060	0.244		3.073		0.076	0.003
2448	M255	6in Dia. Duct	Sec 3 - min	0.064	6	0.007	6	0.004	6	0.577	6	-0.730	7	1.903	6	-3.520	7	119.033	7	0.100	7	0.008	0.052	0.251		3.520		0.012	0.001
2441	M255	6in Dia. Duct	Sec 1 - max	0.109	7	0.028	7	0.063	7	0.704	7	-0.570	6	3.460	7	-1.899	6	200.487	6	0.168	6	0.014	0.050	0.247		3.460		0.021	0.008
1138	M124	6in Dia. Duct	Sec 4 - min	-0.142	5	0.232	6	-0.166	5	-1.095	6	-3.398	7	-0.706	8	-0.193	5	157.598	8	0.132	8	0.018	0.243	0.050		3.398		0.016	0.029
1718	M162	4in Dia. Duct	Sec 3 - min	0.051	6	0.061	8	-0.060	5	-4.626	6	2.718	7	-2.240	5	0.523	6	269.942	6	0.594	6	0.005	0.206	0.100		4.626		0.046	0.005
2455	M257	6in Dia. Duct	Sec 3 - max	0.102	7	0.017	7	-0.085	6	0.729	7	-0.653	6	3.423	7	-1.742	6	-105.306	6	-0.088	6	0.013	0.052	0.246		3.423		0.011	0.010
2444	M255	6in Dia. Duct	Sec 2 - min	0.065	6	0.008	6	0.004	6	0.574	8	-0.717	7	1.901	8	-3.490	7	119.033	7	0.100	7	0.008	0.051	0.249		3.490		0.012	0.001
2462	M257	6in Dia. Duct	Sec 1 - min	0.045	8	0.000	6	-0.113	7	0.654	6	-0.711	7	1.822	6	-3.530	7	-243.217	7	-0.204	7	0.006	0.051	0.252		3.530		0.026	0.014
1337	M144	6in Dia. Duct	Sec 4 - max	0.070	8	0.254	1	-0.273	2	-0.459	7	1.416	6	2.774	6	-1.168	7	331.898	6	0.278	6	0.009	0.101	0.198		2.774		0.034	0.034
471	M50	6in Dia. Duct	Sec 1 - max	0.244	5	-0.149	6	0.149	5	2.426	5	-0.677	6	-0.736	6	1.476	7	115.607	7	0.101	7	0.029	0.173	0.105		2.426		0.012	0.018
1027	M113	6in Dia. Duct	Sec 4 - max	0.275	7	0.189	8	0.324	8	-0.829	8	2.431	5	1.406	5	-0.514	8	428.703	7	0.376	7	0.033	0.174	0.100		2.431		0.046	0.040
2466	M259	6in Dia. Duct	Sec 3 - min	-0.041	6	-0.143	7	-0.006	7	-2.598	7	1.723	6	-1.622	7	-0.210	6	-325.274	7	-0.272	7	0.005	0.186	0.116		2.598		0.034	0.018
2467	M257	6in Dia. Duct	Sec 4 - max	0.103	7	0.016	7	-0.084	6	0.737	7	-0.652	6	3.369	7	-1.701	6	-105.306	6	-0.088	6	0.013	0.053	0.241		3.369		0.011	0.010
275	M30	6in Dia. Duct	Sec 3 - max	0.141	8	-0.016	7	0.029	6	0.424	7	1.767	6	1.946	6	2.271	7	0.000	1	0.000	1	0.018	0.126	0.162		2.271		0.000	0.004
679	M70	12in Dia. Duct	Sec 5 - max	0.022	2	-0.343	1	0.127	4	3.999	1	-3.641	2	-1.787	8	2.844	5	-1713.993	7	-0.562	7	0.002	0.178	0.128		3.999		0.043	0.026
2442	M255	6in Dia. Duct	Sec 1 - min	0.065	6	0.009	6	0.004	6	0.570	6	-0.704	7	1.899	6	-3.460	7	119.033	7	0.100	7	0.008	0.050	0.247		3.460		0.012	0.001
415	M44	6in Dia. Duct	Sec 3 - max	-0.083	8	0.152	5	0.189	8	1.516	5	-1.105	8	2.815	7	-2.185	6	625.035	6	0.524	6	0.011	0.108	0.187		2.645		0.065	0.025
279	M30	6in Dia. Duct	Sec 3 - min	-0.135	5	-0.067	6	-0.037	7	-1.767	6	-0.424	7	-2.271	7	-1.946	6	0.000	1	0.000	1	0.017	0.126	0.162		2.271		0.000	0.008
2464	M257	6in Dia. Duct	Sec 2 - min	0.045	6	0.000	6	-0.113	7	0.654	6	-0.720	7	1.782	6	-3.477	7	-243.217	7	-0.204	7	0.006	0.051	0.248		3.477		0.026	0.014
2114	M222	3in Dia. Duct	Sec 2 - min	0.078	7	-0.010	5	-0.179	8	-0.165	8	0.128	5	0.604	5	-6.465	8	-38.188	5	-0.165	5	0.009	0.008	0.287		6.465		0.012	0.014
1338	M144	6in Dia. Duct	Sec 4 - min	-0.040	5	0.036	2	-0.599	1	-1.416	6	0.459	7	1.108	7	-2.774	6	299.994	7	0.251	7	0.005	0.101	0.198		2.774		0.031	0.086
1141	M125	6in Dia. Duct	Sec 1 - max	0.021	8	0.339	5	-0.082	8	3.627	7	0.906	6	0.342	5	0.557	8	449.056	6	0.376	6	0.003	0.259	0.042		3.627		0.045	0.042
2469	M257	6in Dia. Duct	Sec 6 - max	0.103	7	0.015	7	-0.084	8	0.744	7	-0.651	6	3.315	7	-1.682	6	-105.306	6	-0.088	6	0.013	0.053	0.237		3.315		0.011	0.010
2466	M257	6in Dia. Duct	Sec 3 - min	0.045	6	-0.001	6	-0.114	7	0.653	6	-0.729	7	1.742	6	-3.423	7	-243.217	7	-0.204	7	0.006	0.052	0.245		3.423		0.026	0.014
1137	M124	6in Dia. Duct	Sec 4 - max	0.070	8	0.486	5	-0.061	8	3.356	7	1.095	6	0.193	5	0.706	8	370.941	5	0.310	5	0.008	0.243	0.050		3.356		0.038	0.060
1718	M162	4in Dia. Duct	Sec 4 - min	0.051	8	0.061	8	-0.060	5	-4.407	6	2.657	7	-2.250	5	0.533	8	269.942	6	0.594	6	0.005	0.196	0.101		4.407		0.046	0.005
1024	M113	6in Dia. Duct	Sec 2 - min	0.032	6	0.006	5	-0.152	5	-2.500	7	1.077	6	-0.011	8	-1.849	5	30.937	6	0.027	6	0.004	0.179	0.118		2.500		0.003	0.019
473	M50	6in Dia. Duct	Sec 2 - max	0.251	5	-0.157	6	0.141	5	1.276	5	0.430	8	-0.657	5	2.498	6	115.607	7	0.101	7	0.030	0.091	0.178		2.498		0.012	0.019
2179	M228	6in Dia. Duct	Sec 5 - max	0.089	7	0.028	7	0.142	7	0.574	7	-0.398	6	3.460	7	-1.699	6	315.448	6	0.264	6	0.011	0.041	0.247		3.460		0.033	0.018
2468	M257	6in Dia. Duct	Sec 4 - min	0.044	6	-0.003	6	-0.114	7	0.652	6	-0.737	7	1.701	6	-3.369	7	-243.217	7	-0.204	7	0.006	0.053	0.241		3.369		0.025	0.014
1029	M113	6in Dia. Duct	Sec 6 - max	0.276	7	0.187	6	0.323	8	-0.677	8	2.426	5	1.266	7	-0.774	6	428.703	7	0.376	7	0.033	0.173	0.092		2.426		0.046	0.040
1740	M184	5in Dia. Duct	Sec 5 - min	-0.025	7	-0.032	5	-0.023	8	-0.715	7	0.167	6	-2.062	6	2.064	7	-255.320	5	-0.332	5	0.004	0.057	0.237		2.962		0.046	0.004
1739	M184	5in Dia. Duct	Sec 4 - min	-0.025	7	-0.031	5	-0.023	8	-0.719	7	0.158	6	-2.975	6	2.071	7	-255.320	5	-0.332	5	0.004	0.057	0.236		2.975		0.046	0.004
1736	M184	5in Dia. Duct	Sec 3 - min	-0.024	7	-0.031	5	-0.023	8	-0.723	7	0.149	6	-2.969	6	2.077	7	-255.320	5	-0.332	5	0.004	0.057	0.235		2.969		0.046	0.004
1739	M184	5in Dia. Duct	Sec 5 - max	-0.020	5	0.014	8	0.023	7	-0.167	6	0.715	7	-2.064	7	2.962	6	208.456	8	0.271	8	0.003	0.057	0.237		2.962		0.037	0.003
1734	M184	5in Dia. Duct	Sec 2 - min	-0.024	7	-0.031	5	-0.022	8	-0.727	7	0.140	6	-2.902	6	2.084	7	-255.320	5	-0.332	5	0.004	0.056	0.235		2.962		0.046	0.004
1737	M184	5in Dia. Duct	Sec 4 - max	-0.020	5	0.014	8	0.023	7	-0.158	6	0.719	7	-2.071	7	2.975	6	208.456	8	0.271	8	0.003	0.057	0.236		2.975		0.037	0.003
1732	M184	5in Dia. Duct	Sec 1 - min	-0.024	7	-0.030	5	-0.022	8	-0.730	7	0.132	6	-2.956	6	2.090	7	-255.320	5	-0.332	5	0.004	0.056	0.235		2.956		0.046	0.004
1735	M184	5in Dia. Duct	Sec 3 - max	-0.020	5	0.013	8	0.023	7	-0.149	6	0.723	7	-2.077	7	2.969	6	208.456	8	0.271	8	0.003	0.057	0.236		2.969		0.037	0.003
1733	M184	5in Dia. Duct	Sec 2 - max	-0.020	5	0.013	8	0.022	7	-0.140	6	0.727	7	-2.064	7	2.962	6	208.456	8	0.271	8	0.003	0.056	0.235		2.962		0.037	0.003
2180	M228	6in Dia. Duct	Sec 5 - min	0.059	6	0.003	6	0.054	6	0.398	6	-0.574	7	1.699	6	-3.460	7	270.965	7	0.227	7	0.007	0.041	0.247		3.460		0.028	0.007
2470	M257	6in Dia. Duct	Sec 5 - min	0.044	8	-0.004	6	-0.115	7	0.651	6	-0.744	7	1.662	6	-3.315	7	-243.217	7	-0.204	7	0.006	0.053	0.237		3.315		0.025	0.014
1731	M184	5in Dia. Duct	Sec 1 - max	-0.020	5	0.013	8	0.022	7	-0.132	6	0.730	7	-2.050	7	2.956	6	208.456	8	0.271	8	0.003	0.056	0.235		2.956		0.037	0.003
505	M53	6in Dia. Duct	Sec 3 - max	0.013	7	0.047	7	0.027	4	1.621	8	-1.092	5	-1.752	8	2.492	5	625.175	5	0.549	5	0.002	0.116	0.178		2.492		0.066	0.005
506	M53	6in Dia. Duct	Sec 3 - min	-0.013	6	0.047	6	-0.027	3	1.092	5	-1.621	8	-2.492	5	1.752	8	-16.984	8	-0.015	8	0.002	0.116	0.178		2.492		0.002	0.005
2471	M258	6in Dia. Duct	Sec 1 - max	0.060	7	0.015	7	-0.100	6	0.651	7	-0.604	6	3.315	7	-1.682	6	-179.120	8	-0.150	8	0.011	0.047	0.237		3.315		0.019	0.012
129	M13	5in Dia. Duct	Sec 5 - max	0.054	1	0.054	5	0.054	8	-0.152	6	0.710	7	-2.033	7	2.892	6	-6.000	8	-0.008	8	0.008	0.056	0.230		2.892		0.001	0.007
130	M13	5in Dia. Duct	Sec 5 - min	0.054	1	-0.054	8	-0.054	7	-0.710	7	0.152	6	-2.892	6	2.033	7	-419.045	5	-0.544	5	0.008	0.056	0.230		2.892		0.075	0.007
397	M42	6in Dia. Duct	Sec 4 - max	0.066	6	-0.278	8	0.278	5	-1.700	8	3.621	7	0.389	5	0.341	8	414.735	5	0.347	5	0.008	0.259	0.026		3.621		0.043	0.034
398	M42	6in Dia. Duct	Sec 4 - min	-0.066	7	-0.311	5	0.110	8	-3.621	7	1.700	6	-0.341	8	-0.389	5	65.682	8	0.072	8	0.009	0.259	0.026		3.621		0.009	0.036
2177	M228	6in Dia. Duct	Sec 4 - max	0.088	7	0.029	7	0.141	7	0.561	7	-0.393	6	3.393	7	-1.674	6	315.448	6	0.264	6	0.011	0.040	0.242		3.393		0.033	0.017

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_b	f_{bz}/σ_b	f_t (ksi)	f_v/τ_v	f_t/σ_t
1339	M144	6in Dia. Duct	Sec 5 - max	0.071	6	0.254	1	-0.274	2	-0.429	7	1.364	6	2.612	6	-1.074	7	331.598	6	0.278	6	0.009	0.097	0.187	2.612	0.034	0.034
1720	M102	4in Dia. Duct	Sec 5 - min	0.051	8	0.060	8	-0.060	5	-4.189	6	2.597	7	-2.290	5	0.542	8	269.942	6	0.594	8	0.005	0.186	0.102	4.189	0.046	0.005
468	M49	8in Dia. Duct	Sec 3 - min	0.047	6	-0.169	5	-0.159	5	-2.023	7	1.568	6	-1.586	8	-1.983	5	-30.648	8	-0.027	6	0.006	0.145	0.142	2.023	0.003	0.023
273	M30	6in Dia. Duct	Sec 2 - max	0.142	8	-0.014	7	0.032	6	0.456	7	1.641	6	1.888	8	2.197	7	0.000	1	0.000	1	0.018	0.117	0.157	2.197	0.000	0.004
1342	M145	6in Dia. Duct	Sec 1 - min	-0.170	5	0.024	2	-0.653	1	-0.999	6	0.193	7	1.178	7	-2.787	6	241.509	7	0.202	7	0.022	0.071	0.199	2.787	0.025	0.081
1136	M124	6in Dia. Duct	Sec 3 - min	-0.142	5	0.232	8	-0.169	5	-1.206	6	-3.168	7	-0.667	8	-0.273	5	157.558	8	0.132	8	0.018	0.226	0.048	3.168	0.016	0.029
2229	M233	2in Dia. Duct	Sec 5 - max	0.324	5	0.024	5	0.110	2	2.636	5	0.001	8	3.288	2	-0.420	1	8.083	5	0.110	5	0.072	0.098	0.122	3.288	0.007	0.007
2231	M234	2in Dia. Duct	Sec 1 - max	0.324	5	-0.038	8	-0.046	8	2.636	5	0.001	8	3.288	2	-0.420	1	8.083	5	0.110	5	0.072	0.098	0.122	3.288	0.007	0.003
274	M30	6in Dia. Duct	Sec 2 - min	-0.136	5	-0.063	6	-0.039	7	-1.641	6	-0.450	7	-2.197	7	-1.888	6	0.000	1	0.000	1	0.017	0.117	0.157	2.197	0.000	0.006
730	M83	6in Dia. Duct	Sec 5 - min	-0.346	7	-0.104	7	-0.229	7	-1.451	6	-2.128	5	-1.336	7	-1.025	8	-219.491	7	-0.164	7	0.044	0.152	0.095	2.128	0.023	0.028
85	M9	3in Dia. Duct	Sec 3 - max	0.154	7	-0.375	6	0.988	7	-2.104	7	2.331	8	3.812	6	-3.310	7	34.434	8	0.147	8	0.018	0.104	0.169	3.812	0.011	0.078
2087	M217	3in Dia. Duct	Sec 4 - max	0.078	6	-0.031	8	-0.025	5	0.223	8	-0.217	5	-2.142	5	6.100	8	-6.950	8	-0.030	8	0.009	0.010	0.271	6.100	0.002	0.002
2178	M228	6in Dia. Duct	Sec 4 - min	0.060	8	0.010	8	0.054	6	0.393	8	-0.561	7	1.874	6	-3.393	7	270.985	7	0.227	7	0.008	0.040	0.242	3.393	0.028	0.007
2185	M229	2in Dia. Duct	Sec 3 - max	0.160	5	-0.064	8	0.040	5	-0.839	8	5.769	5	0.036	8	1.101	5	10.134	6	0.138	6	0.036	0.214	0.041	5.769	0.009	0.004
468	M49	8in Dia. Duct	Sec 4 - min	0.050	6	-0.191	5	-0.156	5	-2.204	7	1.374	6	-0.940	8	-1.664	5	-30.648	6	-0.027	6	0.006	0.163	0.120	2.204	0.003	0.024
169	M17	5in Dia. Duct	Sec 5 - max	-0.022	1	0.022	7	0.022	5	-0.132	6	0.730	7	-2.054	7	2.872	6	-6.000	8	-0.008	8	0.003	0.058	0.228	2.872	0.001	0.003
170	M17	5in Dia. Duct	Sec 5 - min	-0.022	2	-0.022	8	-0.022	8	-0.730	7	0.132	6	-2.872	6	2.054	7	-418.045	5	-0.544	5	0.003	0.058	0.228	2.872	0.075	0.003
1340	M144	6in Dia. Duct	Sec 6 - min	-0.040	6	0.035	2	-0.698	1	-1.364	6	0.429	7	1.074	7	-2.612	6	299.994	7	0.251	7	0.005	0.097	0.187	2.612	0.031	0.086
167	M17	5in Dia. Duct	Sec 4 - max	-0.018	1	0.018	7	0.018	5	-0.034	6	0.828	7	-2.151	7	2.774	6	-6.000	8	-0.008	8	0.003	0.066	0.220	2.774	0.001	0.002
168	M17	5in Dia. Duct	Sec 4 - min	-0.018	2	-0.018	6	-0.018	6	-0.828	7	0.034	6	-2.774	7	2.151	7	-418.045	5	-0.544	5	0.003	0.066	0.220	2.774	0.075	0.002
470	M49	8in Dia. Duct	Sec 5 - min	0.053	6	-0.193	5	-0.153	5	-2.556	7	1.183	6	-0.311	8	-1.386	5	-30.646	6	-0.027	6	0.006	0.183	0.099	2.556	0.003	0.024
165	M17	5in Dia. Duct	Sec 3 - max	-0.013	1	0.013	7	0.013	5	0.042	6	0.904	7	-2.227	7	2.698	6	-6.000	8	-0.008	8	0.002	0.072	0.214	2.698	0.001	0.002
166	M17	5in Dia. Duct	Sec 3 - min	-0.013	2	-0.013	6	-0.013	6	-0.904	7	-0.042	6	-2.698	6	2.227	7	-418.045	5	-0.544	5	0.002	0.072	0.214	2.698	0.075	0.002
2175	M228	6in Dia. Duct	Sec 3 - max	0.088	7	0.030	7	0.141	7	0.547	7	-0.389	6	3.326	7	-1.848	8	319.448	6	0.264	6	0.011	0.039	0.238	3.320	0.033	0.017
1026	M113	8in Dia. Duct	Sec 3 - min	0.033	6	0.006	5	-0.151	5	-2.446	7	0.971	8	0.252	8	-1.527	5	30.937	8	0.027	6	0.004	0.175	0.100	2.446	0.003	0.019
2472	M258	6in Dia. Duct	Sec 1 - min	0.035	6	-0.004	6	-0.153	5	0.604	6	-0.651	6	1.662	6	-3.315	7	-325.274	7	-0.272	7	0.004	0.047	0.237	3.315	0.034	0.019
86	M9	3in Dia. Duct	Sec 3 - min	0.122	6	-0.543	7	0.663	8	-2.331	6	2.104	7	3.310	7	-3.812	8	30.864	7	0.132	7	0.014	0.104	0.169	3.812	0.010	0.051
141	M15	5in Dia. Duct	Sec 1 - max	0.009	1	0.009	5	0.009	8	0.094	6	0.956	7	-2.280	7	2.646	6	-6.000	8	-0.008	8	0.001	0.076	0.210	2.646	0.001	0.001
142	M15	5in Dia. Duct	Sec 1 - min	0.009	1	-0.009	7	-0.009	5	-0.956	7	-0.094	6	-2.646	6	2.260	7	-418.045	5	-0.544	5	0.001	0.076	0.210	2.648	0.075	0.001
163	M17	5in Dia. Duct	Sec 2 - max	-0.009	1	0.009	7	0.009	5	0.087	6	0.959	7	-2.282	7	2.643	6	-6.000	8	-0.008	8	0.001	0.076	0.210	2.643	0.001	0.001
164	M17	5in Dia. Duct	Sec 2 - min	-0.009	2	-0.009	6	-0.009	8	-0.959	7	-0.097	8	-2.643	6	2.282	7	-418.045	5	-0.544	5	0.001	0.076	0.210	2.643	0.075	0.001
174	M10	5in Dia. Duct	Sec 2 - min	-0.030	7	-0.059	7	-0.028	8	-0.872	5	0.370	8	-2.690	6	1.573	7	258.010	5	0.336	5	0.004	0.069	0.213	2.690	0.046	0.008
1288	M139	8in Dia. Duct	Sec 5 - max	0.002	7	0.007	5	0.008	2	1.321	8	-0.117	5	-1.549	8	2.695	5	1031.360	7	0.905	7	0.000	0.094	0.193	2.695	0.112	0.001
1280	M139	8in Dia. Duct	Sec 5 - min	-0.002	6	0.007	3	-0.008	1	0.117	5	-1.321	8	-2.695	5	1.549	8	840.402	6	0.738	6	0.000	0.094	0.193	2.695	0.091	0.001
527	M55	8in Dia. Duct	Sec 4 - max	0.016	6	0.016	5	0.239	1	0.785	5	-0.256	8	3.206	8	-1.675	5	1028.609	7	0.003	7	0.002	0.056	0.229	3.206	0.111	0.030
528	M55	6in Dia. Duct	Sec 4 - min	-0.016	5	-0.067	8	0.186	7	0.256	8	-0.785	5	1.675	5	-3.206	8	956.930	6	0.840	6	0.002	0.056	0.229	3.206	0.104	0.023
143	M15	5in Dia. Duct	Sec 2 - max	0.007	1	0.007	5	0.007	6	0.115	6	0.977	7	-2.300	7	2.625	6	-6.000	8	-0.008	8	0.001	0.078	0.208	2.625	0.001	0.001
144	M15	5in Dia. Duct	Sec 2 - min	0.007	1	-0.007	7	-0.007	5	-0.877	7	-0.115	6	-2.625	6	2.300	7	-418.045	5	-0.544	5	0.001	0.078	0.208	2.625	0.075	0.001
1287	M139	8in Dia. Duct	Sec 4 - max	0.002	7	0.008	5	0.007	2	1.317	8	-0.114	6	-1.550	8	2.694	5	1031.360	7	0.905	7	0.000	0.094	0.192	2.694	0.112	0.001
1288	M139	8in Dia. Duct	Sec 4 - min	-0.002	6	0.008	3	-0.007	1	0.114	5	-1.317	8	-2.694	5	1.550	8	840.402	8	0.738	6	0.000	0.094	0.192	2.694	0.091	0.001
145	M15	5in Dia. Duct	Sec 3 - max	0.005	1	0.005	5	0.005	6	0.129	8	0.991	7	-2.315	7	2.611	6	-6.000	8	-0.008	8	0.001	0.079	0.207	2.611	0.001	0.001
146	M15	5in Dia. Duct	Sec 3 - min	0.005	1	-0.005	7	-0.005	5	-0.991	7	-0.129	6	-2.611	6	2.315	7	-418.045	5	-0.544	5	0.001	0.079	0.207	2.611	0.075	0.001
159	M16	5in Dia. Duct	Sec 5 - max	-0.005	1	0.005	7	0.005	5	0.130	6	0.992	7	-2.315	7	2.610	6	-6.000	8	-0.008	8	0.001	0.079	0.207	2.610	0.001	0.001
160	M16	5in Dia. Duct	Sec 5 - min	-0.005	1	-0.005	5	-0.005	6	-0.892	7	-0.130	6	-2.610	6	2.315	7	-418.045	5	-0.544	5	0.001	0.079	0.207	2.610	0.075	0.001
161	M17	5in Dia. Duct	Sec 1 - max	-0.005	1	0.005	7	0.005	5	0.130	6	0.992	7	-2.315	7	2.610	6	-6.000	8	-0.008	8	0.001	0.079	0.207	2.610	0.001	0.001
162	M17	5in Dia. Duct	Sec 1 - min	-0.005	2	-0.005	8	-0.005	8	-0.992	7	-0.130	8	-2.810	6	2.315	7	-418.045	5	-0.544	5	0.001	0.079	0.207	2.610	0.075	0.001
1265	M139	8in Dia. Duct	Sec 3 - max	0.002	7	0.009	5	0.008	2	1.314	8	-0.110	5	-1.552	8	2.692	5	1031.360	7	0.905	7	0.000	0.094	0.192	2.692	0.112	0.001
1286	M139	8in Dia. Duct	Sec 3 - min	-0.002	6	0.009	3	-0.008	1	0.110	5	-1.314	8	-2.692	5	1.552	8	840.402	6	0.738	6	0.000	0.094	0.192	2.692	0.091	0.001
1750	M165	5in Dia. Duct	Sec 5 - min	-0.027	8	-0.047	8	-0.024	8	-0.723	7	0.219	6	-2.835	6	1.873	7	89.263	5	0.116	5	0.004	0.057	0.225	2.835	0.016	0.006
157	M18	5in Dia. Duct	Sec 4 - max	-0.003	1	0.003	7	0.003	5	0.135	6	0.897	7	-2.320	7	2.605	6	-6.000	8	-0.008	8	0.000	0.079	0.207	2.605	0.001	0.000
158	M16	5in Dia. Duct	Sec 4 - min	-0.003	1	-0.003	5	-0.003	8	-0.997	7	-0.135	6	-2.605	6	2.320	7	-418.045	5	-0.544	5	0.000	0.079	0.207	2.605	0.075	0.000
147	M15	5in Dia. Duct	Sec 4 - max	0.002	1	0.002	5	0.002	8	0.138	6	1.000	7	-2.324	7	2.602	6	-6.000	8	-0.008	8	0.000	0.079	0.207	2.602	0.001	0.000
148	M15	5in Dia. Duct	Sec 4 - min	0.002	1	-0.002	7	-0.002	5	-1.000	7	-0.138	6	-2.602	6	2.324	7	-418.045	5	-0.544	5	0.000	0.079	0.207	2.602	0.075	0.000
155	M16	5in Dia. Duct	Sec 3 - max	-0.002	1	0.002	7	0.002	5	0.138	8	1.000	7	-2.324	7	2.602	6	-6.000	8	-0.008	8	0.000	0.079	0.207	2.602	0.001	0.000
156	M16	5in Dia. Duct	Sec 3 - min	-0.002	1	-0.002	5	-0.002	6	-1.000	7	-0.138	6	-2.602	6	2.324	7	-418.045	5	-0.544	5	0.000	0.079	0.207	2.602	0.075	0.000
153	M18	5in Dia. Duct	Sec 2 - max	-0.001	1	0.001	7	0.001	5	0.140	6	1.002	7	-2.320	7	2.600	6	-6.000	8	-0.008	8	0.000	0.080	0.206	2.600	0.001	0.000
154	M16	5in Dia. Duct	Sec 2 - min	-0.001	1	-0.001	5	-0.001	6	-1.002	7	-0.140	6	-2.000	6	2.326	7	-418.045	5	-0.544	5	0.000	0.080	0.206	2.600	0.075	0.000
2283	M239	6in Dia. Duct	Sec 2 - max	0.097	5	0.112	5	0.022	6	-2.347	8	3.189	5	0.325	6	0.643	7	0.908	5	0.000	5	0.012	0.228	0.046	3.189	0.000	0.014
1283	M139	8in Dia. Duct	Sec 2 - max	0.002	7	0.011	5	0.009	2	1.310	8	-0.106	5	-1.554	8	2.690	5	1031.360	7	0.905	7	0.000	0.094	0.192	2.690	0.112	0.001
1284	M139	8in Dia. Duct	Sec 2 - min	-0.002	6	0.011	3	-0.009	1	0.106	5	-1.310	8	-2.690	5	1.554	8	640.402	6	0.738	6	0.000	0.094	0.192	2.690	0.091	0.001
149	M15	5in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.141	6	1.003	7	-2.326	7	2.599	6	-6.000	8	-0.008	8	0.000	0.080	0.206	2.599	0.001	0.000
150	M15	5in Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	-1.003	7	-0.141	6	-2.599	6	2.326	7	-418.045	5	-0.544	5	0.000	0.080	0.206	2.599	0.075	0.000
151	M16	5in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.141	6	1.003	7	-2.326	7	2.599	6	-6.000	8	-0.008	8	0.000	0.080	0.206	2.599	0.001	0.000
152	M16	5in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	-1.003	7	-0.141	6	-2.599	6	2.326	7	-418.045	5	-0.544	5	0.000	0.080	0.206	2.599	0.075	0.000
1748	M185	5in Dia. Duct	Sec 4 - min	-0.027	8	-0.048	6	-0.024	8	-0.721	7	0.205	6	-2.829	6	1.880	7	69.263	5	0.116	5	0.004	0.057	0.225	2.829	0.016	0.006
1281	M139	8in Dia. Duct	Sec 1 - max	0.003	7	0.012	5	0.010	2	1.305	8	-0.101	5	-1.556	8	2.688	5	1031.360	7	0.905	7	0.000	0.093	0.192	2.688	0.112	0.001
1282	M139	8in Dia. Duct	Sec 1 - min	-0.003	6	0.012	3	-0.010	1	0.101	5	-1.305	8	-2.668	5	1.556	8	840.402	6	0.738	6	0.000	0.093	0.192	2.688	0.091	0.001
1746	M185	5in Dia. Duct	Sec 3 - min	-0.026	8	-0.046	8	-0.024	8	-0.719	7	0.192	6	-2.822	6	1.887	7	89.263	5	0.116	5	0.004	0.057	0.224	2.822	0.016	0.006
1849	M195	16in Dia. Duct	Sec 5 - max	0.265	2	-0.080	2	0.012	4	-2.522	2	2.647	1	-0.004	7	0.921	6	1234.847	3	0.245	3	0.030	0.189	0.068	2.647	0.030	0.010
1749	M185	6in Dia. Duct	Sec 5 - max	-0.013	6	-0.007	7	0.024	5	-0.219	6	0.723	7	-1.873	7	2.835	6	609.251	8	0.793	8	0.002	0.057	0.225	2.835	0.109	0.003
2176	M228	6in Dia. Duct	Sec 3 - min	0.060	6	0.011	6	0.055	6	0.389	6	-0.547	7	1.848	6	-3.326	7	270.985	7	0.227	7	0.008	0.039	0.238	3.326	0.028	0.007
173	M18	5in Dia. Duct	Sec 2 - max	-0.010	6	-0.020	8	0.028	5	-0.370	8	0.872	5	-1.573	7	2.690	6	780.481	8	1.018	8	0.001	0.069	0.213	2.690	0.140	0.004
1744	M185	6in Dia. Duct	Sec 2 - min	-0.026	8	-0.045	6	-0.023	8	-0.717	7	0.180	6	-2.815	6	1.693	7	89.263	5	0.116	5	0.004	0.057	0.223	2.815	0.016	0.006
729	M83	6in Dia. Duct	Sec 5 - max	0.287	6	0.020	6	0.161	6	2.128	6	1.451	7	1.025	6	1.336	7	457.131	6	0.383	6	0.036	0.152	0.095	2.128	0.047	0.022
1747	M185	5in Dia. Duct	Sec 4 - max	-0.013	6	-0.007	7	0.024	5	-0.205	8	0.721	7	-1.880	7	2.829	6	609.251	8	0.793	8	0.002	0.057	0.225	2.829	0.109	0.003
395	M42	6in Dia. Duct	Sec 3 - max	0.067	6	-0.274	6	0.274	5	-1.173	8	3.141	7	0.075	7	0.710	6	414.335	5	0.347	5	0.008	0.224	0.051	3.141	0.043	0.034
396	M42	6in Dia. Duct	Sec 3 - min	-0.067	7	-0.307	5	0.112	8	-3.141	7	1.173	6	-0.710	6	-0.075	7	85.682	8	0.072	8	0.008	0.224	0.051	3.141	0.009	0.036
1742	M185	5in Dia. Duct	Sec 1 - min	-0.026	8	-0.045	8	-0.023	8	-0.715	7	0.187	6	-2.809	6	1.900	7	89.263	5	0.116	5	0.004	0.057	0.223	2.809	0.016	0.006
1850	M195	16in Dia. Duct	Sec 5 - min	0.253	1	-0.126	1	-0.017	3	-2.647	1	2.622	2	-0.921	6	0.604	7	-61.561	4	-0.012	4	0.028	0.189	0.068	2.647	0.001	0.016
2068	M217	3in Dia. Duct	Sec 4 - min	-0.017	8	-0.031	5	-0.131	8	0.217	5	-0.223	8	-6.100	8	2.142	5	-7.691	5	-0.033	5	0.002	0.010	0.271	6.100	0.003	0.010
1745	M185	5in Dia. Duct	Sec 3 - max	-0.013	6	-0.007	7	0.024	5	-0.192	6	0.719	7	-1.887	7	2.822	6	609.251	8	0.793	8	0.002	0.057	0.224	2.822	0.109	0.003
2073	M218	3in Dia. Duct	Sec 2 - max	0.088	5	0.045	5	0.466	6	-0.524	5	0.559	8	-1.060	5	5.562	8	-6.980	8	-0.030	8	0.010	0.025	0.248	5.582	0.002	0.036
1135	M124	6in Dia. Duct	Sec 3 - max	0.070	8	0.487	5	-0.081	8	3.168	7	1.200	6	0.273	5	0.667	8	370.041	5	0.310	5	0.009	0.226	0.048	3.168	0.038	0.060
1743	M185	6in Dia. Duct	Sec 2 - max	-0.013	6	-0.007	7	0.023	5	-0.180	6	0.717	7	-1.893	7	2.815	6	609.251	8	0.793	8	0.002	0.057	0.223	2.815	0.109	0.003
2173	M228	6in Dia. Duct	Sec 2 - max	0.088	7	0.031	7	0.141	7	0.533	7	-0.383	6	3.259	7	-1.822	6	315.448	6	0.264	6	0.011	0.038	0.233	3.259	0.033	0.017

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a		f_t (ksi)			f/σ_t	f/σ_c
314	M34	6in Dia. Duct	Sec 2 - min	-0.175	5	-0.049	7	-0.146	8	-0.476	7	-0.211	6	-3.157	5	-2.148	8	-444.321	6	-0.372	8	0.022	0.034	0.226		3.157			0.046	0.018
1741	M165	5in Dia. Duct	Sec 1 - max	-0.013	6	-0.006	7	0.023	5	-0.167	6	0.715	7	+1.900	7	2.809	6	609.251	6	0.793	8	0.002	0.037	0.223		2.809			0.109	0.003
1847	M155	16in Dia. Duct	Sec 4 - max	0.263	2	-0.078	2	0.014	4	-2.483	2	2.586	1	-0.595	7	0.927	6	1234.847	3	0.245	3	0.030	0.185	0.066		2.586			0.030	0.010
2284	M239	6in Dia. Duct	Sec 2 - min	0.046	8	0.006	8	0.005	7	-3.169	5	2.347	8	-0.643	7	-0.325	8	-787.550	8	-0.650	8	0.006	0.228	0.046		3.169			0.051	0.001
472	M50	6in Dia. Duct	Sec 1 - min	0.007	8	-0.268	7	-0.323	8	0.677	8	-2.426	5	+1.476	7	0.736	6	-140.129	6	-0.123	6	0.001	0.173	0.105		2.426			0.015	0.040
1848	M195	16in Dia. Duct	Sec 4 - min	0.251	1	-0.127	1	-0.019	3	-2.586	1	2.483	2	-0.927	6	0.595	7	-61.561	4	-0.012	4	0.028	0.185	0.066		2.586			0.001	0.016
393	M42	6in Dia. Duct	Sec 2 - max	0.068	6	-0.270	8	0.272	5	-0.653	6	2.668	7	-0.177	7	1.121	6	414.335	5	0.347	5	0.008	0.191	0.080		2.668			0.043	0.034
394	M42	6in Dia. Duct	Sec 2 - min	-0.066	7	-0.304	5	0.114	8	-2.668	7	0.653	6	-1.121	6	0.177	7	85.682	8	0.072	8	0.008	0.191	0.080		2.668			0.009	0.038
1892	M200	4in Dia. Duct	Sec 1 - min	0.121	8	-0.109	7	-0.090	7	1.305	6	-2.655	7	-2.070	6	-3.358	7	53.888	5	0.119	5	0.012	0.118	0.149		3.358			0.009	0.008
2174	M228	6in Dia. Duct	Sec 2 - min	0.060	8	0.012	6	0.055	8	0.383	6	-0.533	7	1.822	6	-3.259	7	270.985	7	0.227	7	0.008	0.036	0.233		3.259			0.028	0.007
271	M30	6in Dia. Duct	Sec 1 - max	0.144	8	-0.010	7	0.034	8	0.479	7	1.523	6	1.825	6	2.120	7	0.000	1	0.000	1	0.016	0.109	0.151		2.120			0.000	0.004
1028	M113	6in Dia. Duct	Sec 4 - min	0.034	8	0.000	5	-0.150	5	-2.431	5	0.829	8	0.514	8	-1.406	5	30.937	6	0.027	6	0.004	0.174	0.100		2.431			0.003	0.019
1344	M145	6in Dia. Duct	Sec 2 - min	-0.170	5	0.023	2	-0.052	1	-0.961	6	0.174	7	1.070	7	-2.627	6	241.509	7	0.202	7	0.002	0.069	0.166		2.627			0.025	0.050
272	M30	6in Dia. Duct	Sec 1 - min	-0.138	5	-0.058	6	-0.041	7	-1.523	6	-0.478	7	-2.120	7	-1.825	6	0.000	1	0.000	1	0.017	0.109	0.151		2.120			0.000	0.007
1845	M195	16in Dia. Duct	Sec 3 - max	0.282	2	-0.075	2	0.015	4	-2.446	2	2.524	1	-0.586	7	0.934	6	1234.847	3	0.245	3	0.029	0.180	0.067		2.524			0.030	0.009
2171	M228	6in Dia. Duct	Sec 1 - max	0.088	7	0.032	7	0.140	7	0.516	7	-0.378	6	3.193	7	-1.796	6	315.448	6	0.284	6	0.011	0.037	0.228		3.193			0.033	0.017
2074	M216	3in Dia. Duct	Sec 2 - min	-0.025	8	0.040	8	0.126	7	-0.559	8	0.524	5	-5.582	8	1.060	5	-7.691	5	-0.033	5	0.003	0.026	0.246		5.582			0.003	0.010
1848	M195	16in Dia. Duct	Sec 3 - min	0.250	1	-0.126	1	-0.021	3	-2.524	1	2.446	2	-0.934	6	0.586	7	-61.561	4	-0.012	4	0.028	0.180	0.067		2.524			0.001	0.016
313	M34	6in Dia. Duct	Sec 2 - max	0.121	8	0.019	6	0.134	5	0.211	6	0.476	7	2.148	8	3.157	5	113.974	7	0.095	7	0.015	0.034	0.226		3.157			0.012	0.017
391	M42	6in Dia. Duct	Sec 1 - max	0.065	6	-0.267	8	0.270	5	-0.139	6	2.201	7	-0.432	7	1.530	6	414.335	5	0.347	5	0.008	0.157	0.109		2.201			0.043	0.033
392	M42	6in Dia. Duct	Sec 1 - min	-0.065	7	-0.300	5	0.115	8	-2.201	7	0.139	6	-1.530	6	0.432	7	85.682	8	0.072	8	0.008	0.157	0.109		2.201			0.009	0.037
2349	M245	6in Dia. Duct	Sec 5 - max	0.060	7	-0.016	5	0.118	8	0.450	5	1.388	8	2.326	7	-0.640	6	661.406	7	0.554	7	0.008	0.099	0.166		2.326			0.068	0.014
2172	M228	6in Dia. Duct	Sec 1 - min	0.060	8	0.013	8	0.055	6	0.378	6	-0.518	7	1.796	6	-3.193	7	270.985	7	0.227	7	0.008	0.037	0.228		3.193			0.028	0.007
1134	M124	6in Dia. Duct	Sec 2 - min	-0.141	5	0.233	8	-0.169	5	-1.316	6	-2.937	7	-0.629	8	-0.353	5	157.598	8	0.132	8	0.018	0.210	0.045		2.937			0.016	0.029
1843	M195	16in Dia. Duct	Sec 2 - max	0.261	2	-0.073	2	0.017	4	-2.410	2	2.461	1	-0.576	7	0.941	6	1234.847	3	0.245	3	0.029	0.176	0.067		2.461			0.030	0.009
250	M25	4in Dia. Duct	Sec 5 - min	-0.051	8	0.002	5	-0.050	6	1.305	6	-2.655	7	-2.070	6	-3.358	7	53.888	5	0.119	5	0.005	0.118	0.149		3.358			0.005	0.007
869	M87	6in Dia. Duct	Sec 5 - max	0.000	1	0.041	5	-0.107	6	1.278	6	-0.917	7	-1.019	5	2.530	8	-687.343	6	-0.575	6	0.000	0.091	0.181		2.530			0.071	0.013
870	M87	6in Dia. Duct	Sec 5 - min	0.000	1	0.007	8	-0.273	7	0.917	7	-1.278	6	-2.530	6	1.019	5	-992.905	7	-0.831	7	0.000	0.091	0.181		2.530			0.103	0.034
871	M88	6in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	1.278	6	-0.917	7	-1.019	5	2.530	8	-687.343	6	-0.575	6	0.000	0.091	0.181		2.530			0.071	0.000
872	M88	6in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.917	7	-1.278	6	-2.530	6	1.019	5	-992.905	7	-0.831	7	0.000	0.091	0.181		2.530			0.103	0.000
873	M88	6in Dia. Duct	Sec 2 - max	0.000	6	-0.002	1	0.000	5	1.277	6	-0.916	7	-1.019	5	2.530	8	-687.343	6	-0.575	6	0.000	0.091	0.181		2.530			0.071	0.000
874	M88	6in Dia. Duct	Sec 2 - min	0.000	5	-0.002	1	0.000	7	0.916	7	-1.277	6	-2.530	6	1.019	5	-992.905	7	-0.831	7	0.000	0.091	0.181		2.530			0.103	0.000
875	M88	6in Dia. Duct	Sec 3 - max	0.000	6	-0.004	1	0.002	5	1.274	6	-0.914	7	-1.017	5	2.531	8	-687.343	6	-0.575	6	0.000	0.091	0.181		2.531			0.071	0.000
876	M88	6in Dia. Duct	Sec 3 - min	0.000	5	-0.004	1	-0.002	7	0.914	7	-1.274	6	-2.531	8	1.017	5	-992.905	7	-0.831	7	0.000	0.091	0.181		2.531			0.103	0.000
877	M88	6in Dia. Duct	Sec 4 - max	0.001	6	-0.006	1	0.003	5	1.270	6	-0.910	7	-1.015	5	2.533	8	-687.343	6	-0.575	6	0.000	0.091	0.181		2.533			0.071	0.001
878	M88	6in Dia. Duct	Sec 4 - min	-0.001	5	-0.006	1	-0.003	7	0.910	7	-1.270	6	-2.533	8	1.015	5	-992.905	7	-0.831	7	0.000	0.091	0.181		2.533			0.103	0.001
879	M98	6in Dia. Duct	Sec 5 - max	0.002	6	-0.008	1	0.004	5	1.264	6	-0.904	7	-1.012	5	2.536	8	-687.343	6	-0.575	6	0.000	0.090	0.181		2.536			0.071	0.001
880	M98	6in Dia. Duct	Sec 5 - min	-0.002	5	-0.008	1	-0.004	7	0.904	7	-1.264	6	-2.536	8	1.012	5	-992.905	7	-0.831	7	0.000	0.090	0.181		2.536			0.103	0.001
881	M99	6in Dia. Duct	Sec 1 - max	0.002	8	-0.008	7	0.004	6	1.264	6	-0.904	7	-1.012	5	2.536	8	-687.343	6	-0.575	6	0.000	0.090	0.181		2.536			0.071	0.001
882	M99	6in Dia. Duct	Sec 1 - min	-0.002	5	-0.008	6	-0.004	7	0.904	7	-1.264	6	-2.536	8	1.012	5	-992.905	7	-0.831	7	0.000	0.090	0.181		6.103			0.103	0.001
1341	M145	6in Dia. Duct	Sec 1 - max	0.009	8	0.176	1	-0.290	2	-0.193	7	0.999	6	2.707	6	-1.178	7	283.879	6	0.238	6	0.001	0.071	0.199		2.707			0.028	0.036
883	M99	6in Dia. Duct	Sec 2 - max	0.002	6	-0.010	7	0.005	8	1.255	6	-0.894	7	-1.008	5	2.541	8	-687.343	6	-0.575	6	0.000	0.090	0.182		2.541			0.071	0.001
884	M99	6in Dia. Duct	Sec 2 - min	-0.002	5	-0.010	6	-0.005	7	0.894	7	-1.255	6	-2.541	8	1.008	5	-992.905	7	-0.831	7	0.000	0.090	0.182		2.541			0.103	0.001
474	M50	6in Dia. Duct	Sec 2 - min	0.015	8	-0.280	7	-0.315	8	-0.430	8	-1.276	5	-2.498	8	0.657	5	-140.129	6	-0.123	6	0.002	0.091	0.176		2.498			0.015	0.039
249	M25	4in Dia. Duct	Sec 5 - max	-0.041	5	0.081	8	0.080	7	2.655	7	-1.305	6	3.358	7	2.070	6	130.227	8	0.287	8	0.004	0.118	0.149		3.358			0.022	0.007
885	M89	6in Dia. Duct	Sec 3 - max	0.003	6	-0.012	7	0.006	5	1.243	6	-0.882	7	-1.002	5	2.547	8	-687.343	6	-0.575	6	0.000	0.089	0.182		2.547			0.071	0.001
886	M89	6in Dia. Duct	Sec 3 - min	-0.003	5	-0.012	6	-0.006	7	0.882	7	-1.243	6	-2.547	8	1.002	5	-992.905	7	-0.831	7	0.000	0.089	0.182		2.547			0.103	0.001
1644	M195	16in Dia. Duct	Sec 2 - min	0.248	1	-0.130	1	-0.023	3	-2.461	1	2.410	2	-0.941	6	0.576	7	-61.561	4	-0.012	4	0.028	0.176	0.067		2.461			0.001	0.016
887	M89	6in Dia. Duct	Sec 4 - max	0.004	6	-0.015	7	0.007	8	1.228	6	-0.868	7	-0.994	5	2.554	8	-687.343	6	-0.575	6	0.001	0.088	0.182		2.554			0.071	0.002
888	M89	6in Dia. Duct	Sec 4 - min	-0.004	5	-0.015	1	-0.007	7	0.868	7	-1.228	6	-2.554	8	0.994	5	-992.905	7	-0.831	7	0.001	0.088	0.182		2.554			0.103	0.002
2350	M245	6in Dia. Duct	Sec 5 - min	-0.041	6	-0.080	8	-0.010	5	-1.388	8	-0.453	5	0.640	6	-2.326	7	-266.028	8	-0.224	6	0.005	0.098	0.166		2.326			0.028	0.010
889	M89	6in Dia. Duct	Sec 5 - max	0.004	6	-0.017	7	0.009	6	1.211	6	-0.851	7	-0.986	5	2.563	8	-687.343	6	-0.575	6	0.001	0.087	0.183		2.563			0.071	0.002
890	M89	6in Dia. Duct	Sec 5 - min	-0.004	5	-0.017	1	-0.008	7	0.851	7	-1.211	6	-2.563	8	0.986	5	-992.905	7	-0.831	7	0.001	0.087	0.183		2.563			0.103	0.002
503	M53	6in Dia. Duct	Sec 2 - max	0.016	7	0.060	7	0.036	4	1.386	8	-0.857	5	-1.881	8	2.363	5	625.175	5	0.549	5	0.002	0.099	0.169		2.363			0.068	0.007
504	M53	6in Dia. Duct	Sec 2 - min	-0.016	6	0.060	6	-0.036	3	0.857	5	-1.386	8	-2.363	5	1.881	8	-16.964	8	-0.015	8	0.002	0.099	0.169		2.363			0.002	0.007
2203	M231	2in Dia. Duct	Sec 2 - max	0.202	5	-0.097	8	0.051	1	-1.419	8	4.212	5	-0.444	8	1.852	5	-10.064	6	-0.137	6	0.045	0.156	0.069		4.212			0.009	0.006
1030	M113	6in Dia. Duct	Sec 5 - min	0.036	6	0.006	5	-0.149	5	-2.426	5	0.677	8	0.774	6	-1.286	7	30.937	6	0.027	6	0.004	0.173	0.092		2.426			0.003	0.016
1841	M195	16in Dia. Duct	Sec 1 - max	0.280	2	-0.071	2	0.019	4	-2.368	4	2.403	3	-0.566	7	0.948	6	1234.847	3	0.245	3	0.029	0.172	0.068		2.403			0.030	0.009
1839	M194	16in Dia. Duct	Sec 5 - max	0.259	2	-0.070	2	0.019	4	-2.368	4	2.403	3	-0.566	7	0.948	6	1234.693	3	0.245	3	0.029	0.172	0.068		2.403			0.030	0.009
517	M54	6in Dia. Duct	Sec 4 - max	0.000	7	0.002	8	0.002	2	1.051	8	0.190	5	-1.546	8	2.698	5	1028.609	7	0.903	7	0.000	0.075	0.193		2.698			0.111	0.000
518	M54	6in Dia. Duct	Sec 4 - min	0.000	6	0.002	7	-0.002	1	-0.190	5	-1.051	8	-2.698	5	1.546	8	956.930	6	0.840	6	0.000	0.075	0.193		2.696			0.104	0.000
519	M54	6in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	1.051	8	0.189	5	-1.545	8	2.698	5	1028.609	7	0.903	7	0.000	0.075	0.193		2.698			0.111	0.000
520	M54	6in Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	-0.189	5	-1.051	8	-2.698	5	1.545	8	956.930	6	0.840	6	0.000	0.075	0.193		2.698			0.104	0.000
2501	M261	6in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	1.051	8	0.189	5	-1.545	8	2.698	5	1028.609	7	0.903	7	0.000	0.075	0.193		2.698			0.111	0.000
2502	M261	6in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	-0.189	5	-1.051	8	-2.698	5	1.545	8	956.930	6	0.840	6	0.000	0.075	0.193		2.698			0.104	0.000
2503	M261	6in Dia. Duct	Sec 2 - max	0.000	6	-0.002	1	0.002	1	1.051	8	0.190	5	-1.546	8	2.698	5	1028.609	7	0.903	7	0.000	0.075	0.193		2.698			0.111	0.000
2504	M261	6in Dia. Duct	Sec 2 - min	0.000	5	-0.002	1	-0.002	2	-0.190	5	-1.051	8	-2.698	5	1.546	8	956.930	6	0.840	6	0.000	0.075	0.193		2.698			0.104	0.000
515	M54	6in Dia. Duct	Sec 3 - max	0.000	7	0.004	6	0.003	2	1.049	8	0.191	5	-1.546	8	2.697	5	1028.609	7	0.903	7	0.000	0.075	0.193		2.697			0.111	0.000
516	M54	6in Dia. Duct	Sec 3 - min	0.000	6	0.004	7	-0.003	1	-0.191	5	-1.049	8	-2.697	5	1.546	8	956.930	6	0.840	6	0.000	0.075	0.193		2.697			0.104	0.000
2505	M261	6in Dia. Duct	Sec 3 - max	0.000	6	-0.004	1	0.003	1	1.049	6	0.192	5	-1.546	6	2.697	5	1028.609	7	0.903	7	0.000	0.075	0.193		2.697			0.111	0.000
2506	M261	6in Dia. Duct	Sec 3 - min	0.000	5	-0.004	1	-0.003	2	-0.192	5	-1.049	6	-2.697	5	1.546	8	956.930	6	0.840	6	0.000	0.075	0.193		2.697			0.104	0.000
513	M54	6in Dia. Duct	Sec 2 - max	0.001	7	0.005	6	0.005	2	1.047	8	0.194	5	-1.547	8	2.696	5	1028.609	7	0.903	7	0.000	0.075	0.193		2.696			0.111	0.001
514	M54	6in Dia. Duct	Sec 2 - min	-0.001	8	0.005	7	-0.005	1	-0.194	5	-1.047	8	-2.696	5	1.547	8	956.930	6	0.840	6	0.000	0.075	0.193		2.696			0.104	0.001
2507	M261	6in Dia. Duct	Sec 4 - max	0.001	6	-0.008	1	0.005	1	1.046	8	0.195	5	-1.548	8	2.696	5	1028.609	7	0.903	7	0.000	0.075	0.193		2.696			0.111	0.001
2508	M261	6in Dia. Duct	Sec 4 - min	-0.001	5	-0.008	1	-0.005	2	-0.195	6	-1.046	8	-2.696	5	1.548	8	956.930	8	0.640	6	0.000	0.075	0.193		2.696			0.104	0.001
2169	M227	6in Dia. Duct	Sec 5 - max	0.072	7	0.032	7	0.172	7	0.420	7	-0.267	6	3.193	7	-1.796	6	353.378	6	0.298	6	0.009	0.030	0.228		3.193			0.037	0.021
511	M54	6in Dia. Duct	Sec 1 - max	0.001	7	0.007	6	0.008	2	1.043	8	0.198	5	-1.549	8	2.695	5	1028.609	7	0.903	7	0.000	0.075	0.193		2.695			0.111	0.001
512	M54	6in Dia. Duct	Sec 1 - min	-0.001	6	0.007	7	-0.008	1	-0.198	5	-1.043	8	-2.695	5	1.549	8	956.930	6	0.840	6	0.000	0.075	0.193		2.695			0.104	0.001
1842	M195	16in Dia. Duct	Sec 1 - min	0.247	1	-0.131	1	-0.025	3	-2.403	3	2.368	4	-0.948	6	0.566	7	-61.561	4	-0.012	4	0.028	0.172	0.068		2.403			0.001	0.016
2509	M261	6in Dia. Duct	Sec 5 - max	0.002	6	-0.008	1	0.007	1	1.041	8	0.199	5	-1.549	8	2.694	5	1028.609	7	0.903	7	0.000	0.074	0.192		2.694			0.111	0.001
2510	M261	6in Dia. Duct	Sec 5 - min	-0.002	5	-0.008	1	-0.007	2	-0.199	5	-1.041	8	-2.694	5	1.549	8	956.930	6	0.640	6	0.000	0.074	0.192		2.694			0.104	0.001
2511	M262	6in Dia. Duct	Sec 1 - max	0.002	6	-0.008	3	0.007	1	1.041	8	0.199	5	-1.549	8	2.694	5	1028.609	7	0.903	7	0.000	0.074	0.192		2.694			0.111	0.001
2512	M262	6in Dia. Duct	Sec 1 - min	-0.002	5	-0.008	1	-0.007	2	-0.199	5	-1.041	8	-2.694	5	1.549	8	956.930	6	0.840	6	0.000	0.074	0.192		2.694			0.104	0.001
2347	M245	6in Dia. Duct	Sec 4 - max	0.060	7	-0.014	5	0.116	8	0.450	5	1.350	8	2.282	7	-0.633	6	661.406	7	0.554	7	0.008	0.096	0.163		2.282			0.068	0.014
1840	M194	16in Dia. Duct	Sec 5 - min	0.245	1	-0.130	1	-0.025	3	-2.403	3	2.368	4	-0.948	6	0.566	7	-61.524	4	-0.012	4	0.028	0.172	0.068		2.403			0.001	0.016

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_b	f_b/σ_b	(shaded)	f_t (ksi)	(shaded)	t/n	f/σ_s	(shaded)
93	M10	3in Dia. Duct	Sec 2 - max	0.566	7	-0.005	2	-0.256	6	0.436	2	-0.178	1	4.081	2	-3.540	1	10.088	4	0.043	4	0.066	0.019	0.181	[illegible]	4.081	[illegible]	0.003	0.020	[illegible]
2513	M262	6in Dia. Duct	Sec 2 - max	0.002	8	-0.010	3	0.008	1	1.036	8	0.205	5	-1.552	8	2.692	5	1028.609	7	0.903	7	0.000	0.074	0.192	[illegible]	2.692	[illegible]	0.111	0.001	[illegible]
2514	M262	8in Dia. Duct	Sec 2 - min	-0.002	5	-0.010	1	-0.008	2	-0.205	5	-1.036	8	-2.692	5	1.552	8	956.930	6	0.840	6	0.000	0.074	0.192	[illegible]	2.692	[illegible]	0.104	0.001	[illegible]
1851	M196	16in Dia. Duct	Sec 1 - max	0.228	7	-0.277	5	0.025	2	0.848	6	-0.557	7	-2.191	4	2.526	3	-2204.300	3	-0.453	3	0.025	0.001	0.160	[illegible]	2.526	[illegible]	0.056	0.034	[illegible]
728	M83	6in Dia. Duct	Sec 4 - min	-0.346	7	-0.101	7	-0.231	7	-1.309	7	-2.098	6	-1.018	7	-0.774	6	-219.491	7	-0.184	7	0.044	0.150	0.073	[illegible]	2.098	[illegible]	0.023	0.029	[illegible]
172	M16	5in Dia. Duct	Sec 1 - min	-0.026	7	-0.051	5	-0.024	8	-0.723	7	0.219	8	-2.583	6	1.679	7	258.010	5	0.336	5	0.004	0.057	0.205	[illegible]	2.583	[illegible]	0.046	0.007	[illegible]
2388	M249	6in Dia. Duct	Sec 4 - min	-0.064	8	-0.023	6	-0.096	8	0.562	5	-1.550	8	-0.427	6	-2.055	7	345.041	6	0.269	6	0.008	0.111	0.147	[illegible]	2.055	[illegible]	0.038	0.012	[illegible]
2515	M262	8in Dia. Duct	Sec 3 - max	0.002	8	-0.011	3	0.010	1	1.029	8	0.211	5	-1.554	8	2.689	5	1028.609	7	0.903	7	0.000	0.074	0.192	[illegible]	2.689	[illegible]	0.111	0.001	[illegible]
2516	M262	8in Dia. Duct	Sec 3 - min	-0.002	5	-0.011	1	-0.010	2	-0.211	5	-1.020	8	-2.689	5	1.554	8	956.930	6	0.840	6	0.000	0.074	0.192	[illegible]	2.689	[illegible]	0.104	0.001	[illegible]
2186	M229	2in Dia. Duct	Sec 3 - min	0.051	8	-0.231	5	-0.001	8	-5.769	5	0.839	6	-1.101	5	-0.036	6	-61.836	7	-0.843	7	0.011	0.214	0.041	[illegible]	5.769	[illegible]	0.054	0.015	[illegible]
2517	M262	8in Dia. Duct	Sec 4 - max	0.003	6	-0.013	3	0.012	1	1.022	8	0.219	5	-1.557	8	2.660	5	1028.609	7	0.903	7	0.000	0.073	0.192	[illegible]	2.666	[illegible]	0.111	0.002	[illegible]
2518	M262	8in Dia. Duct	Sec 4 - min	-0.003	5	-0.013	1	-0.012	2	-0.219	5	-1.022	8	-2.086	5	1.557	8	958.930	6	0.840	6	0.000	0.073	0.192	[illegible]	2.666	[illegible]	0.104	0.002	[illegible]
1837	M194	16in Dia. Duct	Sec 4 - max	0.257	2	-0.068	2	0.021	4	-2.318	4	2.350	3	-0.554	7	0.957	6	1234.893	3	0.245	3	0.029	0.168	0.068	[illegible]	2.350	[illegible]	0.030	0.008	[illegible]
1852	M196	16in Dia. Duct	Sec 1 - min	0.214	6	-0.304	8	-0.025	1	0.557	7	-0.846	6	-2.526	3	2.191	4	-3382.935	4	-0.671	4	0.024	0.061	0.180	[illegible]	2.526	[illegible]	0.033	0.036	[illegible]
2170	M227	6in Dia. Duct	Sec 5 - min	0.054	6	0.013	8	0.078	6	0.287	6	-0.420	7	1.798	6	-3.193	7	326.161	7	0.273	7	0.007	0.030	0.228	[illegible]	3.193	[illegible]	0.034	0.010	[illegible]
739	M84	6in Dia. Duct	Sec 5 - max	0.271	7	0.020	8	0.115	8	2.128	6	1.451	7	0.769	6	1.095	7	219.491	7	0.184	7	0.034	0.152	0.078	[illegible]	2.126	[illegible]	0.023	0.014	[illegible]
2348	M245	8in Dia. Duct	Sec 4 - min	-0.040	8	-0.079	8	-0.010	5	-1.350	6	-0.460	5	0.633	6	-2.282	7	-268.028	6	-0.224	6	0.005	0.096	0.163	[illegible]	2.282	[illegible]	0.026	0.010	[illegible]
521	M55	8in Dia. Duct	Sec 1 - max	0.003	6	0.079	5	0.247	2	1.013	8	0.228	5	-1.501	8	2.683	5	1028.609	7	0.903	7	0.000	0.072	0.192	[illegible]	2.883	[illegible]	0.111	0.030	[illegible]
522	M55	8in Dia. Duct	Sec 1 - min	-0.003	5	-0.004	8	0.178	1	-0.228	5	-1.013	8	-2.683	5	1.561	8	956.930	6	0.840	6	0.000	0.072	0.192	[illegible]	2.683	[illegible]	0.104	0.022	[illegible]
2519	M262	6in Dia. Duct	Sec 5 - max	0.003	6	-0.015	3	0.013	1	1.013	6	0.220	5	-1.581	8	2.683	5	1026.609	7	0.903	7	0.000	0.072	0.192	[illegible]	2.883	[illegible]	0.111	0.002	[illegible]
2520	M262	6in Dia. Duct	Sec 5 - min	-0.003	5	-0.015	1	-0.013	2	-0.228	5	-1.013	8	-2.683	5	1.581	8	956.930	6	0.840	6	0.000	0.072	0.192	[illegible]	2.683	[illegible]	0.104	0.002	[illegible]
171	M16	5in Dia. Duct	Sec 1 - max	-0.009	8	-0.017	8	0.024	5	-0.219	6	0.723	7	-1.679	7	2.583	6	760.451	8	1.016	8	0.001	0.057	0.205	[illegible]	2.583	[illegible]	0.140	0.003	[illegible]
1346	M145	6in Dia. Duct	Sec 3 - min	-0.170	5	0.022	2	-0.652	1	-0.923	6	0.155	7	0.962	7	-2.487	6	241.509	7	0.202	7	0.022	0.066	0.176	[illegible]	2.467	[illegible]	0.025	0.080	[illegible]
1838	M194	16in Dia. Duct	Sec 4 - min	0.244	1	-0.132	1	-0.027	3	-2.350	3	2.316	4	-0.957	6	0.554	7	-61.524	4	-0.012	4	0.027	0.168	0.068	[illegible]	2.350	[illegible]	0.001	0.016	[illegible]
1133	M124	6in Dia. Duct	Sec 2 - max	0.070	8	0.488	5	-0.080	8	2.937	7	1.316	6	0.353	5	0.629	6	370.941	5	0.310	5	0.009	0.210	0.045	[illegible]	2.937	[illegible]	0.038	0.060	[illegible]
2339	M244	6in Dia. Duct	Sec 5 - max	0.083	7	0.009	5	0.114	8	0.479	5	1.239	6	2.327	7	-0.512	6	411.135	6	0.344	8	0.008	0.089	0.166	[illegible]	2.327	[illegible]	0.042	0.014	[illegible]
1835	M194	18in Dia. Duct	Sec 3 - max	0.256	2	-0.065	2	0.023	4	-2.259	1	2.303	2	-0.542	7	0.966	6	1234.893	3	0.245	3	0.029	0.165	0.069	[illegible]	2.303	[illegible]	0.030	0.008	[illegible]
2345	M245	6in Dia. Duct	Sec 3 - max	0.060	7	-0.013	5	0.115	8	0.467	5	1.313	8	2.239	7	-0.626	6	661.406	7	0.554	7	0.008	0.094	0.160	[illegible]	2.239	[illegible]	0.068	0.014	[illegible]
1836	M194	16in Dia. Duct	Sec 3 - min	0.242	1	-0.133	1	-0.029	3	-2.303	2	2.259	1	-0.966	6	0.542	7	-61.524	4	-0.012	4	0.027	0.165	0.069	[illegible]	2.303	[illegible]	0.001	0.016	[illegible]
1833	M194	16in Dia. Duct	Sec 2 - max	0.255	2	-0.063	2	0.025	4	-2.189	1	2.270	2	-0.529	7	0.976	6	1234.893	3	0.245	3	0.029	0.162	0.070	[illegible]	2.270	[illegible]	0.030	0.008	[illegible]
2387	M249	8in Dia. Duct	Sec 4 - max	-0.016	5	0.141	7	0.123	5	1.556	8	-0.562	5	2.055	7	0.427	6	1659.205	7	1.389	7	0.002	0.111	0.147	[illegible]	2.055	[illegible]	0.171	0.017	[illegible]
2340	M244	6in Dia. Duct	Sec 5 - min	-0.034	8	-0.067	8	-0.008	5	-1.239	8	-0.479	5	0.512	6	-2.327	7	-347.366	5	-0.291	5	0.004	0.089	0.166	[illegible]	2.327	[illegible]	0.036	0.011	[illegible]
1834	M194	16in Dia. Duct	Sec 2 - min	0.241	1	-0.134	1	-0.031	3	-2.270	2	2.189	1	-0.976	6	0.529	7	-61.524	4	-0.012	4	0.027	0.162	0.070	[illegible]	2.270	[illegible]	0.001	0.017	[illegible]
727	M83	6in Dia. Duct	Sec 4 - max	0.287	8	0.023	6	0.163	6	2.098	6	1.309	7	0.774	6	1.018	7	457.131	6	0.383	6	0.035	0.150	0.073	[illegible]	2.098	[illegible]	0.047	0.023	[illegible]
1831	M194	16in Dia. Duct	Sec 1 - max	0.254	2	-0.060	2	0.027	4	-2.118	1	2.236	2	-0.516	7	0.987	6	1234.893	3	0.245	3	0.029	0.160	0.071	[illegible]	2.238	[illegible]	0.030	0.007	[illegible]
2346	M245	6in Dia. Duct	Sec 3 - min	-0.040	6	-0.078	6	-0.009	5	-1.313	8	-0.467	5	0.626	8	-2.239	7	-268.028	8	-0.724	6	0.005	0.094	0.160	[illegible]	2.239	[illegible]	0.028	0.010	[illegible]
655	M68	12in Dia. Duct	Sec 3 - max	0.023	7	0.990	7	-0.008	3	4.874	6	-4.526	7	0.195	7	0.903	6	-211.895	8	-0.069	8	0.002	0.217	0.040	[illegible]	4.874	[illegible]	0.005	0.076	[illegible]
656	M68	12in Dia. Duct	Sec 3 - min	-0.021	6	0.850	8	-0.134	4	4.526	7	-4.874	6	-0.903	6	-0.195	7	-1303.365	5	-0.427	5	0.002	0.217	0.040	[illegible]	4.874	[illegible]	0.033	0.065	[illegible]
1828	M193	16in Dia. Duct	Sec 5 - max	0.224	2	-0.251	2	0.027	4	-2.116	1	2.238	2	-0.546	7	1.020	8	391.612	3	0.078	3	0.025	0.160	0.073	[illegible]	2.238	[illegible]	0.010	0.031	[illegible]
1343	M145	6in Dia. Duct	Sec 2 - max	0.009	8	0.178	1	-0.290	2	-0.174	7	0.961	6	2.627	6	-1.070	7	283.879	6	0.236	6	0.001	0.089	0.188	[illegible]	2.627	[illegible]	0.029	0.036	[illegible]
1832	M194	16in Dia. Duct	Sec 1 - min	0.239	1	-0.136	1	-0.033	3	-2.238	2	2.118	1	-0.987	8	0.516	7	-61.524	4	-0.012	4	0.027	0.160	0.071	[illegible]	2.238	[illegible]	0.001	0.017	[illegible]
1897	M200	4in Dia. Duct	Sec 4 - max	0.549	5	-0.055	6	0.023	6	-2.333	8	3.655	5	0.882	0	0.939	7	130.227	8	0.287	8	0.053	0.162	0.042	[illegible]	3.655	[illegible]	0.022	0.004	[illegible]
641	M95	6in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	1.983	8	1.058	7	1.113	6	1.631	8	1206.464	7	1.010	7	0.000	0.140	0.117	[illegible]	1.983	[illegible]	0.125	0.000	[illegible]
642	M95	6in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	-1.658	7	-1.983	0	-1.631	8	-1.113	5	686.056	6	0.575	6	0.000	0.140	0.117	[illegible]	1.963	[illegible]	0.071	0.000	[illegible]
843	M95	6in Dia. Duct	Sec 2 - max	0.000	8	-0.003	5	0.001	6	1.962	6	1.659	7	1.114	5	1.632	8	1208.464	7	1.010	7	0.000	0.140	0.117	[illegible]	1.962	[illegible]	0.125	0.000	[illegible]
844	M95	6in Dia. Duct	Sec 2 - min	0.000	5	-0.003	6	-0.001	7	-1.669	7	-1.962	6	-1.632	8	-1.114	5	666.956	6	0.575	6	0.000	0.140	0.117	[illegible]	1.962	[illegible]	0.071	0.000	[illegible]
845	M95	6in Dia. Duct	Sec 3 - max	0.001	6	-0.005	5	0.003	5	1.957	6	1.664	7	1.116	5	1.634	8	1206.484	7	1.010	7	0.000	0.140	0.117	[illegible]	1.957	[illegible]	0.126	0.001	[illegible]
846	M95	6in Dia. Duct	Sec 3 - min	-0.001	5	-0.005	8	-0.003	7	-1.664	7	-1.957	6	-1.634	8	-1.116	5	686.956	6	0.575	6	0.000	0.140	0.117	[illegible]	1.957	[illegible]	0.071	0.001	[illegible]
847	M95	6in Dia. Duct	Sec 4 - max	0.002	8	-0.008	5	0.004	5	1.850	6	1.671	7	1.120	5	1.638	8	1208.484	7	1.010	7	0.000	0.139	0.117	[illegible]	1.950	[illegible]	0.125	0.001	[illegible]
848	M95	6in Dia. Duct	Sec 4 - min	-0.002	5	-0.008	6	-0.004	7	-1.871	7	-1.950	6	-1.638	8	-1.120	5	666.956	6	0.575	6	0.000	0.139	0.117	[illegible]	1.950	[illegible]	0.071	0.001	[illegible]
740	M84	6in Dia. Duct	Sec 5 - min	-0.206	8	-0.104	7	-0.167	7	-1.451	7	-2.128	6	-1.095	7	-0.769	6	-457.131	6	-0.383	6	0.026	0.152	0.078	[illegible]	2.126	[illegible]	0.047	0.021	[illegible]
849	M95	6in Dia. Duct	Sec 5 - max	0.003	8	-0.010	5	0.005	5	1.939	6	1.682	7	1.125	5	1.043	8	1206.484	7	1.010	7	0.000	0.139	0.117	[illegible]	1.939	[illegible]	0.125	0.001	[illegible]
850	M95	6in Dia. Duct	Sec 5 - min	-0.003	5	-0.010	6	-0.005	7	-1.682	7	-1.939	6	-1.643	8	-1.125	5	898.956	6	0.575	6	0.000	0.139	0.117	[illegible]	1.939	[illegible]	0.071	0.001	[illegible]
1853	M196	16in Dia. Duct	Sec 2 - max	0.227	7	-0.279	5	0.023	2	0.702	8	-0.419	7	-2.191	4	2.526	3	-2284.300	3	-0.453	3	0.026	0.050	0.180	[illegible]	2.526	[illegible]	0.056	0.034	[illegible]
76	M8	6in Dia. Duct	Sec 3 - min	-0.345	1	-0.146	8	-0.211	8	-1.741	1	1.607	2	-1.232	8	0.668	5	83.143	7	0.070	7	0.044	0.124	0.088	[illegible]	1.741	[illegible]	0.009	0.026	[illegible]
2343	M245	6in Dia. Duct	Sec 2 - max	0.060	7	-0.012	5	0.115	8	0.473	5	1.276	8	2.195	7	-0.619	6	601.406	7	0.554	7	0.008	0.091	0.157	[illegible]	2.195	[illegible]	0.068	0.014	[illegible]
1830	M193	16in Dia. Duct	Sec 5 - min	0.198	1	-0.310	1	-0.033	3	-2.238	2	2.118	1	-1.020	6	0.545	7	-758.873	4	-0.150	4	0.022	0.160	0.073	[illegible]	2.238	[illegible]	0.019	0.038	[illegible]
1854	M196	18in Dia. Duct	Sec 2 - min	0.215	8	-0.305	8	-0.023	1	0.419	7	-0.702	6	-2.526	3	2.191	4	-3382.935	4	-0.871	4	0.024	0.050	0.180	[illegible]	2.526	[illegible]	0.083	0.038	[illegible]
2230	M233	2in Dia. Duct	Sec 6 - min	0.157	8	-0.036	8	-0.022	1	-0.001	8	-2.636	5	0.420	1	-3.288	2	-0.009	8	0.000	8	0.035	0.098	0.122	[illegible]	3.288	[illegible]	0.000	0.002	[illegible]
2232	M234	2in Dia. Duct	Sec 1 - min	0.157	8	-0.248	5	-0.177	7	-0.001	8	-2.636	5	0.420	1	-3.288	2	-0.009	8	0.000	8	0.035	0.098	0.122	[illegible]	3.288	[illegible]	0.000	0.016	[illegible]
1132	M124	6in Dia. Duct	Sec 1 - min	-0.141	5	0.234	8	-0.170	5	-1.427	6	-2.700	7	-0.591	8	-0.433	5	157.596	8	0.132	8	0.018	0.193	0.042	[illegible]	2.706	[illegible]	0.016	0.029	[illegible]
407	M43	6in Dia. Duct	Sec 4 - max	0.088	6	0.544	5	-0.075	6	0.357	7	2.334	6	1.055	5	0.283	8	414.335	5	0.347	5	0.011	0.167	0.075	[illegible]	2.334	[illegible]	0.043	0.067	[illegible]
408	M43	6in Dia. Duct	Sec 4 - min	-0.088	7	0.212	8	-0.175	5	-2.334	6	-0.357	7	-0.293	8	-1.055	5	85.682	8	0.072	8	0.011	0.167	0.075	[illegible]	2.334	[illegible]	0.009	0.026	[illegible]
331	M38	5in Dia. Duct	Sec 1 - max	0.015	5	0.058	7	0.094	8	-0.658	6	1.516	7	1.548	5	1.645	8	401.076	7	0.522	7	0.002	0.120	0.131	[illegible]	1.645	[illegible]	0.072	0.013	[illegible]
332	M38	5in Dia. Duct	Sec 1 - min	-0.015	6	0.058	6	-0.100	5	-1.518	7	0.658	6	-1.645	8	-1.548	5	274.123	6	0.357	6	0.002	0.120	0.131	[illegible]	1.646	[illegible]	0.049	0.014	[illegible]
2344	M245	6in Dia. Duct	Sec 2 - min	-0.040	6	-0.078	8	-0.008	5	-1.276	6	-0.473	5	0.619	6	-2.195	7	-268.028	6	-0.224	6	0.005	0.091	0.157	[illegible]	2.195	[illegible]	0.028	0.010	[illegible]
283	M31	6in Dia. Duct	Sec 2 - max	0.138	6	0.218	8	0.019	6	0.181	7	0.720	8	2.188	6	2.560	7	0.000	1	0.000	1	0.017	0.051	0.184	[illegible]	2.580	[illegible]	0.000	0.027	[illegible]
284	M31	8in Dia. Duct	Sec 2 - min	-0.130	5	-0.033	7	-0.026	7	-0.720	6	-0.181	7	-2.580	7	-2.186	8	0.000	1	0.000	1	0.016	0.051	0.184	[illegible]	2.560	[illegible]	0.000	0.004	[illegible]
2155	M226	6in Dia. Duct	Sec 3 - max	0.089	8	0.022	6	0.076	6	-0.747	7	1.107	6	-1.942	7	2.281	6	353.378	6	0.296	6	0.011	0.079	0.162	[illegible]	2.281	[illegible]	0.037	0.009	[illegible]
409	M43	6in Dia. Duct	Sec 5 - max	0.091	8	0.535	5	-0.080	8	2.706	7	1.427	6	0.304	5	0.631	8	414.335	5	0.347	5	0.012	0.193	0.045	[illegible]	2.706	[illegible]	0.043	0.064	[illegible]
410	M43	8in Dia. Duct	Sec 5 - min	-0.081	7	0.203	8	-0.170	5	-1.427	8	-2.706	7	-0.831	8	-0.304	5	85.602	8	0.072	6	0.012	0.193	0.045	[illegible]	2.706	[illegible]	0.009	0.025	[illegible]
2341	M245	8in Dia. Duct	Sec 1 - max	0.059	7	-0.011	5	0.114	8	0.479	5	1.239	8	2.152	7	-0.812	6	861.406	7	0.554	7	0.007	0.089	0.154	[illegible]	2.152	[illegible]	0.068	0.014	[illegible]
1348	M145	6in Dia. Duct	Sec 4 - min	-0.170	5	0.022	2	-0.652	1	-0.886	8	0.137	5	0.854	7	-2.308	6	241.509	7	0.202	7	0.022	0.063	0.165	[illegible]	2.308	[illegible]	0.025	0.050	[illegible]
1827	M193	16in Dia. Duct	Sec 4 - max	0.223	2	-0.248	2	0.029	4	-1.956	1	2.107	2	-0.532	7	1.031	6	391.612	3	0.078	3	0.025	0.151	0.074	[illegible]	2.107	[illegible]	0.010	0.031	[illegible]
285	M31	6in Dia. Duct	Sec 3 - max	0.133	8	0.203	6	0.012	8	0.528	8	0.052	7	2.279	6	2.715	7	0.000	1	0.000	1	0.017	0.038	0.194	[illegible]	2.715	[illegible]	0.000	0.026	[illegible]
867	M97	6in Dia. Duct	Sec 4 - max	0.000	5	0.043	5	-0.108	6	1.232	6	-0.904	7	-0.855	5	2.245	8	-667.343	6	-0.575	8	0.000	0.088	0.160	[illegible]	2.246	[illegible]	0.071	0.013	[illegible]
868	M97	6in Dia. Duct	Sec 4 - min	0.000	8	0.010	6	-0.278	7	0.904	7	-1.232	6	-2.245	8	0.855	5	-992.905	7	-0.631	7	0.000	0.088	0.160	[illegible]	2.245	[illegible]	0.103	0.034	[illegible]
2360	M246	6in Dia. Duct	Sec 5 - min	-0.049	6	-0.098	7	-0.013	6	-1.483	8	-0.347	6	0.788	6	-1.901	7	-101.350	6	-0.085	6	0.006	0.106	0.138	[illegible]	1.901	[illegible]	0.010	0.012	[illegible]
288	M31	6in Dia. Duct	Sec 3 - min	-0.127	5	-0.045	7	-0.020	7	-0.052	7	-0.528	6	-2.715	7	-2.279	6	0.000	1	0.000	1	0.016	0.038	0.194	[illegible]	2.715	[illegible]	0.000	0.006	[illegible]
2359	M246	6in Dia. Duct	Sec 5 - max	0.048	7	-0.012	6	0.119	8	0.347	5	1.483	8	1.901	7	-0.788	6	1142.872	7	0.956	7	0.006	0.106	0.138	[illegible]	1.901	[illegible]	0.118	0.015	[illegible]
702	M81	6in Dia. Duct	Sec 1 - min	-0.358	7	-0.036	7	-0.221	6	-0.330	7	-1.259	6	-1.571	7	-1.318	6	-371.703	6	-0.311	6	0.045	0.090	0.112	[illegible]	1.571	[illegible]	0.038	0.027	[illegible]
2342	M245	6in Dia. Duct	Sec 1 - min	-0.039	6	-0.077	8	-0.008	5	-1.239	8	-0.479	5	0.612	6	-2.152	7	-268.028	6	-0.224	6	0.005	0.089	0.154	[illegible]	2.152	[illegible]	0.028	0.010	[illegible]
94	M10	3in Dia. Duct	Sec 2 - min	0.393	6	-0.012	1	-0.297	7	0.178	1	-0.436	2	3.540	1	-4.081	2	5.736	3	0.024	3	0.046	0.019	0.181	[illegible]	4.081	[illegible]	0.002	0.023	[illegible]
2204	M231	2in Dia. Duct	Sec 2 - min	0.098	8	-0.282	5	0.005	2	-4.212	5	1.419	8	-1.852	5	0.444	8	-64.216	7	-0.875	7	0.022	0.156	0.069	[illegible]	4.212	[illegible]	0.058	0.017	[illegible]
1826	M193	16in Dia. Duct	Sec 4 - min	0.194	1	-0.310	1	-0.035	3	-2.107	2	1.958	1	-1.031	6	0.632	7	-758.873	4	-0.150	4	0.022	0.151	0.074	[illegible]	2.107	[illegible]	0.019	0.038	[illegible]

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_b	f_s/σ_s		f_t (ksi)		f_t/σ_t	f_t/σ_t
737	M94	6in Dia. Duct	Sec 4 - max	0.270	7	0.023	6	0.116	6	2.098	6	1.309	7	0.610	6	0.864	7	219.491	7	0.184	7	0.034	0.150	0.062		2.098		0.023	0.014
1855	M196	16in Dia. Duct	Sec 3 - max	0.228	7	-0.282	5	0.021	2	0.555	6	-0.260	7	-2.191	4	2.525	3	-2284.300	3	-0.453	3	0.026	0.040	0.180		2.526		0.056	0.035
2156	M226	6in Dia. Duct	Sec 3 - min	0.037	5	-0.019	7	0.010	7	-1.107	6	0.747	7	-2.261	6	1.942	7	326.161	7	0.273	7	0.005	0.079	0.162		2.261		0.034	0.002
699	M80	6in Dia. Duct	Sec 5 - max	0.204	6	-0.014	7	0.048	6	0.575	7	1.161	6	1.662	6	1.918	7	0.000	1	0.000	1	0.025	0.083	0.137		1.918		0.000	0.006
1856	M196	16in Dia. Duct	Sec 3 - min	0.217	6	-0.306	6	-0.021	1	0.280	7	-0.555	6	-2.526	3	2.191	4	-3382.935	4	-0.671	4	0.024	0.040	0.180		2.526		0.083	0.038
2547	M265	2in Dia. Duct	Sec 4 - max	0.159	5	-0.108	6	-0.124	6	2.532	5	-0.971	6	3.110	5	-1.110	6	0.000	1	0.000	1	0.035	0.094	0.115		3.110		0.000	0.008
1131	M124	6in Dia. Duct	Sec 1 - max	0.062	6	0.489	5	-0.080	6	2.706	7	1.427	6	0.433	5	0.591	6	370.941	5	0.310	5	0.009	0.193	0.042		2.706		0.038	0.060
700	M80	6in Dia. Duct	Sec 5 - min	-0.198	5	-0.083	6	-0.058	7	-1.161	6	-0.575	7	-1.918	7	-1.662	6	0.000	1	0.000	1	0.024	0.083	0.137		1.918		0.000	0.010
1345	M145	6in Dia. Duct	Sec 3 - max	0.009	6	0.175	1	-0.290	2	-0.155	7	0.923	6	2.467	6	-0.962	7	283.679	6	0.238	6	0.001	0.066	0.176		2.467		0.029	0.036
2358	M246	6in Dia. Duct	Sec 4 - min	-0.046	6	-0.097	7	-0.012	5	-1.459	8	-0.374	5	0.792	6	-1.856	7	-101.350	6	-0.085	6	0.006	0.104	0.133		1.856		0.010	0.012
2357	M246	6in Dia. Duct	Sec 4 - max	0.046	7	-0.012	6	0.110	8	0.374	5	1.459	8	1.856	7	-0.792	6	1142.672	7	0.956	7	0.006	0.104	0.133		1.856		0.118	0.015
726	M83	6in Dia. Duct	Sec 3 - min	-0.347	7	-0.069	7	-0.233	7	-1.171	7	-2.084	6	-0.697	7	-0.520	6	-219.491	7	-0.184	7	0.044	0.147	0.050		2.084		0.023	0.028
1825	M193	16in Dia. Duct	Sec 3 - max	0.223	2	-0.245	2	0.031	4	-1.793	1	1.977	2	-0.517	7	1.043	6	391.612	3	0.078	3	0.025	0.141	0.075		1.977		0.010	0.030
639	M94	6in Dia. Duct	Sec 6 - max	0.054	5	0.058	3	0.389	5	-0.506	6	1.293	7	1.548	5	1.645	8	506.940	7	0.660	7	0.008	0.102	0.131		1.645		0.091	0.054
701	M81	6in Dia. Duct	Sec 1 - max	0.297	6	0.069	8	0.262	7	1.259	8	0.330	7	1.318	8	1.571	7	109.312	7	0.091	7	0.038	0.090	0.112		1.571		0.011	0.032
501	M53	6in Dia. Duct	Sec 1 - max	0.020	7	0.073	7	0.046	4	1.094	8	-0.565	5	-2.029	6	2.215	7	625.175	5	0.549	5	0.002	0.078	0.158		2.215		0.068	0.008
502	M53	6in Dia. Duct	Sec 1 - min	-0.020	6	0.073	8	-0.046	3	0.565	5	-1.094	8	-2.215	7	2.029	6	-16.984	8	-0.015	8	0.002	0.078	0.158		2.215		0.002	0.009
485	M51	6in Dia. Duct	Sec 3 - max	-0.024	1	0.018	8	0.049	6	0.148	5	0.715	8	2.565	7	0.042	6	1313.992	4	1.153	4	0.003	0.051	0.185		2.565		0.142	0.008
486	M51	6in Dia. Duct	Sec 3 - min	-0.024	6	-0.080	5	-0.224	7	-0.715	8	-0.148	5	-0.042	6	-2.565	7	1103.694	3	0.969	3	0.003	0.051	0.185		2.565		0.120	0.025
840	M94	5in Dia. Duct	Sec 5 - min	-0.041	6	0.058	6	-0.268	8	-1.203	7	0.506	6	-1.645	8	1.548	5	316.127	6	0.414	6	0.006	0.102	0.131		1.645		0.057	0.037
1350	M145	6in Dia. Duct	Sec 5 - min	-0.170	5	0.021	2	-0.652	1	-0.874	6	0.093	5	0.732	5	-2.162	8	241.509	7	0.202	7	0.022	0.062	0.154		2.162		0.025	0.030
2356	M246	6in Dia. Duct	Sec 3 - min	-0.047	6	-0.095	7	-0.011	5	-1.435	8	-0.401	5	0.776	6	-1.812	7	-101.350	6	-0.085	6	0.006	0.103	0.129		1.812		0.010	0.012
2355	M246	6in Dia. Duct	Sec 3 - max	0.046	7	-0.011	6	0.118	8	0.401	5	1.435	8	1.812	7	-0.776	6	1142.672	7	0.956	7	0.006	0.103	0.129		1.812		0.118	0.015
736	M94	6in Dia. Duct	Sec 4 - min	-0.205	6	-0.101	7	-0.168	7	-1.309	7	-2.098	6	-0.864	7	-0.610	6	-457.131	6	-0.383	6	0.020	0.150	0.062		2.098		0.047	0.021
1826	M193	16in Dia. Duct	Sec 3 - min	0.193	1	-0.310	1	-0.037	3	-1.977	2	1.793	1	-1.043	8	0.517	7	-758.673	4	-0.150	4	0.022	0.141	0.075		1.977		0.019	0.038
1721	M163	4in Dia. Duct	Sec 1 - max	0.187	5	1.001	5	-0.026	8	-2.597	7	4.109	6	0.180	6	0.733	5	764.901	7	1.683	7	0.018	0.186	0.033		4.189		0.129	0.077
2537	M294	2in Dia. Duct	Sec 4 - max	0.181	5	-0.061	8	-0.102	8	1.675	5	-0.540	8	3.603	5	-0.115	6	0.000	1	0.000	1	0.040	0.082	0.133		3.603		0.000	0.007
637	M94	5in Dia. Duct	Sec 4 - max	0.094	5	0.059	3	0.389	5	-0.522	6	1.209	7	1.438	5	1.569	8	506.940	7	0.660	7	0.009	0.103	0.125		1.569		0.091	0.054
1857	M196	16in Dia. Duct	Sec 4 - max	0.229	7	-0.284	5	0.019	2	0.409	6	-0.139	7	-2.191	4	2.526	3	-2284.300	3	-0.453	3	0.026	0.029	0.180		2.526		0.056	0.035
316	M34	6in Dia. Duct	Sec 2 - min	-0.186	5	-0.068	7	-0.126	8	-1.019	7	-0.402	6	-1.939	5	-0.817	8	-444.321	6	-0.372	6	0.024	0.073	0.139		1.939		0.046	0.017
1856	M196	16in Dia. Duct	Sec 4 - min	0.218	6	-0.306	8	-0.019	1	0.139	7	-0.409	6	-2.526	3	2.191	4	-3382.935	4	-0.671	4	0.024	0.029	0.180		2.526		0.083	0.038
638	M94	5in Dia. Duct	Sec 4 - min	-0.042	8	0.059	6	-0.267	6	-1.299	7	0.522	6	-1.569	8	-1.438	5	316.127	6	0.414	6	0.006	0.103	0.125		1.569		0.057	0.037
725	M83	6in Dia. Duct	Sec 3 - max	0.287	6	0.026	6	0.185	6	2.064	6	1.171	7	0.520	6	0.697	7	457.131	6	0.383	6	0.036	0.147	0.050		2.064		0.047	0.023
2354	M246	6in Dia. Duct	Sec 2 - min	-0.047	6	-0.094	7	-0.011	5	-1.411	8	-0.427	5	0.769	6	-1.769	7	-101.350	6	-0.085	6	0.006	0.101	0.126		1.769		0.010	0.012
2353	M246	6in Dia. Duct	Sec 2 - max	0.046	7	-0.011	6	0.117	8	0.427	5	1.411	8	1.769	7	-0.769	6	1142.672	7	0.956	7	0.006	0.101	0.126		1.769		0.118	0.014
1823	M193	16in Dia. Duct	Sec 2 - max	0.222	2	-0.242	2	0.033	4	-1.631	1	1.650	2	-0.502	7	1.055	6	391.612	3	0.078	3	0.025	0.132	0.075		1.650		0.010	0.030
2159	M228	6in Dia. Duct	Sec 5 - max	0.080	8	-0.020	6	0.068	8	-1.094	6	1.513	7	-0.940	6	1.581	7	353.378	6	0.298	6	0.010	0.108	0.113		1.581		0.037	0.008
2161	M227	6in Dia. Duct	Sec 1 - max	0.080	8	0.097	7	0.154	6	-1.094	6	1.513	7	-0.940	6	1.581	7	353.378	6	0.298	6	0.010	0.108	0.113		1.581		0.037	0.019
635	M94	5in Dia. Duct	Sec 3 - max	0.054	5	0.059	3	0.389	5	-0.539	6	1.316	7	1.327	5	1.494	8	506.940	7	0.660	7	0.008	0.104	0.110		1.494		0.091	0.054
2285	M239	6in Dia. Duct	Sec 3 - max	0.081	6	0.090	5	0.028	5	-1.275	6	2.554	7	0.525	6	0.449	7	0.908	5	0.000	5	0.010	0.182	0.036		2.554		0.000	0.012
704	M81	6in Dia. Duct	Sec 2 - min	-0.357	7	-0.039	7	-0.222	6	-0.382	7	-1.379	6	-1.208	7	-1.012	6	-371.703	6	-0.311	6	0.045	0.090	0.066		1.379		0.036	0.027
2009	M211	3in Dia. Duct	Sec 5 - max	0.220	7	-0.059	6	0.074	2	-1.197	8	1.206	7	3.386	8	-1.943	5	-13.162	5	-0.056	5	0.026	0.054	0.150		3.386		0.004	0.006
2011	M212	3in Dia. Duct	Sec 1 - max	0.220	7	0.070	8	-0.019	1	-1.197	8	1.206	7	3.386	8	-1.943	5	-13.162	5	-0.056	5	0.026	0.054	0.150		3.386		0.004	0.005
2497	M260	6in Dia. Duct	Sec 4 - max	0.073	5	0.281	5	0.028	7	2.167	5	-0.193	8	-0.025	6	0.916	7	-179.120	6	-0.150	6	0.009	0.155	0.066		2.167		0.019	0.032
63	M9	3in Dia. Duct	Sec 2 - max	0.155	7	-0.373	6	0.989	7	-1.379	7	1.831	6	2.925	6	-1.988	7	34.434	6	0.147	6	0.018	0.081	0.130		2.925		0.011	0.076
1347	M145	6in Dia. Duct	Sec 4 - max	0.009	6	0.175	1	-0.291	2	-0.137	5	0.086	8	2.308	6	-0.854	7	283.679	6	0.238	6	0.001	0.063	0.165		2.308		0.029	0.036
636	M94	5in Dia. Duct	Sec 3 - min	-0.042	8	0.059	6	-0.267	8	-1.316	7	0.539	6	-1.494	8	-1.327	5	316.127	6	0.414	6	0.006	0.104	0.119		1.494		0.057	0.037
1352	M146	6in Dia. Duct	Sec 1 - min	-0.273	5	-0.027	2	-0.509	1	-0.410	8	-0.141	5	0.761	5	-2.312	8	173.712	5	0.145	5	0.035	0.029	0.165		2.312		0.018	0.083
1824	M193	16in Dia. Duct	Sec 2 - min	0.191	1	-0.310	1	-0.039	3	-1.850	2	1.631	1	-1.055	6	0.502	7	-758.673	4	-0.150	4	0.021	0.132	0.075		1.850		0.019	0.038
2351	M246	6in Dia. Duct	Sec 1 - max	0.046	7	-0.010	8	0.118	8	0.453	5	1.388	8	1.725	7	-0.763	6	1142.672	7	0.956	7	0.006	0.099	0.123		1.725		0.118	0.014
2352	M246	6in Dia. Duct	Sec 1 - min	-0.046	6	-0.093	7	-0.010	5	-1.388	8	-0.453	5	0.763	6	-1.725	7	-101.350	6	-0.085	6	0.006	0.099	0.123		1.725		0.010	0.011
1879	M198	16in Dia. Duct	Sec 5 - max	0.057	7	-0.541	1	0.003	2	-1.958	6	1.951	7	-0.601	4	1.146	3	-5978.034	2	-1.185	2	0.006	0.139	0.082		1.951		0.146	0.067
1880	M198	16in Dia. Duct	Sec 5 - min	0.055	6	-0.555	2	-0.003	1	-1.951	7	1.958	6	-1.146	3	0.601	4	-6450.135	1	-1.278	1	0.006	0.139	0.082		1.951		0.158	0.069
75	M8	6in Dia. Duct	Sec 3 - max	-0.115	2	-0.145	5	-0.041	5	-1.607	2	1.741	1	-0.668	5	1.232	6	139.532	6	0.117	6	0.015	0.124	0.088		1.741		0.014	0.016
1260	M136	6in Dia. Duct	Sec 5 - min	-0.027	6	0.064	6	-0.046	3	0.564	5	-1.094	8	-2.036	2	1.918	1	210.306	8	0.185	8	0.003	0.078	0.145		2.036		0.023	0.008
2160	M228	6in Dia. Duct	Sec 5 - min	0.048	5	-0.060	7	0.018	5	-1.513	7	1.094	6	-1.581	7	0.940	6	326.161	7	0.273	7	0.006	0.108	0.113		1.581		0.034	0.007
2162	M227	6in Dia. Duct	Sec 1 - min	0.048	5	0.078	6	0.096	8	-1.513	7	1.094	6	-1.581	7	0.940	6	326.161	7	0.273	7	0.006	0.108	0.113		1.581		0.034	0.012
735	M84	6in Dia. Duct	Sec 3 - max	0.269	7	0.026	8	0.118	6	2.064	6	1.171	7	0.450	6	0.631	7	219.491	7	0.184	7	0.034	0.147	0.045		2.064		0.023	0.014
633	M94	5in Dia. Duct	Sec 2 - max	0.054	5	0.060	3	0.389	5	-0.556	6	1.333	7	1.217	5	1.418	8	506.940	7	0.660	7	0.008	0.106	0.113		1.418		0.091	0.054
2548	M265	2in Dia. Duct	Sec 4 - min	0.077	8	-0.377	5	-0.340	5	0.971	8	-2.532	5	1.110	8	-3.110	5	0.000	1	0.000	1	0.017	0.094	0.115		3.110		0.000	0.022
315	M34	6in Dia. Duct	Sec 3 - max	0.113	8	0.022	6	0.124	5	0.402	6	1.019	7	0.817	8	1.939	5	113.974	7	0.095	7	0.014	0.073	0.139		1.939		0.012	0.015
84	M9	3in Dia. Duct	Sec 2 - min	0.122	6	-0.542	7	0.663	8	-1.831	8	1.379	7	1.988	7	-2.925	6	30.864	7	0.132	7	0.014	0.081	0.130		2.925		0.010	0.051
1258	M136	6in Dia. Duct	Sec 4 - min	-0.027	6	0.065	6	-0.046	3	0.545	5	-1.073	8	-2.039	2	1.915	1	210.306	8	0.185	8	0.003	0.077	0.146		2.039		0.023	0.008
1259	M136	6in Dia. Duct	Sec 5 - max	0.012	7	0.078	7	0.046	4	1.094	8	-0.504	5	-1.916	1	2.036	2	858.129	5	0.753	5	0.001	0.078	0.145		2.036		0.093	0.010
1859	M196	16in Dia. Duct	Sec 5 - max	0.230	7	-0.266	5	0.017	2	0.261	6	0.002	7	-2.191	4	2.526	3	-2284.300	3	-0.453	3	0.026	0.019	0.180		2.526		0.056	0.035
865	M97	6in Dia. Duct	Sec 3 - max	0.001	6	0.046	5	-0.109	6	1.184	6	-0.866	7	-0.689	5	1.962	8	-697.343	6	-0.575	6	0.000	0.085	0.140		1.962		0.071	0.013
866	M97	6in Dia. Duct	Sec 3 - min	-0.001	8	0.012	8	-0.278	7	0.868	7	-1.184	6	-1.962	8	0.689	5	-992.905	7	-0.831	7	0.000	0.085	0.140		1.962		0.103	0.034
634	M94	5in Dia. Duct	Sec 2 - min	-0.042	8	0.060	6	-0.267	8	-1.333	7	0.550	6	-1.418	8	-1.217	5	316.127	6	0.414	6	0.006	0.106	0.113		1.418		0.057	0.037
1821	M193	16in Dia. Duct	Sec 1 - max	0.221	2	-0.238	2	0.035	4	-1.468	1	1.724	2	-0.480	7	1.068	6	391.612	3	0.078	3	0.025	0.123	0.075		1.724		0.010	0.029
1256	M136	6in Dia. Duct	Sec 3 - min	-0.027	6	0.065	6	-0.046	3	0.525	5	-1.052	6	-2.041	2	1.912	1	210.306	8	0.185	8	0.003	0.075	0.146		2.041		0.023	0.008
2266	M239	6in Dia. Duct	Sec 3 - min	0.033	6	0.021	8	0.001	6	-2.554	7	1.275	6	-0.449	7	-0.525	6	-787.950	8	-0.860	8	0.004	0.182	0.038		2.554		0.061	0.003
1257	M136	6in Dia. Duct	Sec 4 - max	0.013	7	0.080	7	0.046	4	1.073	8	-0.545	5	-1.915	1	2.039	2	858.129	5	0.753	5	0.002	0.077	0.146		2.039		0.093	0.010
1860	M196	16in Dia. Duct	Sec 5 - min	0.219	6	-0.307	8	-0.017	1	-0.002	7	-0.261	6	-2.526	3	2.191	4	-3382.935	4	-0.671	4	0.025	0.019	0.180		2.526		0.083	0.038
1723	M163	4in Dia. Duct	Sec 2 - max	0.187	5	1.001	5	-0.027	8	-2.596	7	3.864	6	0.170	6	0.755	5	764.901	7	1.683	7	0.018	0.172	0.034		3.864		0.129	0.077
1254	M136	6in Dia. Duct	Sec 2 - min	-0.028	6	0.066	6	-0.046	3	0.505	5	-1.031	8	-2.044	2	1.910	1	210.306	8	0.185	8	0.003	0.074	0.146		2.044		0.023	0.008
1869	M197	16in Dia. Duct	Sec 5 - max	0.156	7	-0.449	1	0.010	2	-0.617	6	0.882	7	-1.511	4	1.988	3	-4550.760	3	-0.902	3	0.019	0.063	0.142		1.988		0.111	0.055
1354	M146	6in Dia. Duct	Sec 2 - min	-0.273	5	-0.027	2	-0.508	1	-0.413	8	-0.145	5	0.654	5	-2.219	8	173.712	5	0.145	5	0.035	0.030	0.159		2.219		0.018	0.063
1255	M136	6in Dia. Duct	Sec 3 - max	0.013	7	0.081	7	0.046	4	1.052	8	-0.525	5	-1.912	1	2.041	2	858.129	5	0.753	5	0.002	0.075	0.146		2.041		0.093	0.010
700	M81	6in Dia. Duct	Sec 2 - max	0.298	6	0.086	6	0.263	7	1.379	6	0.382	7	1.012	6	1.208	7	109.312	7	0.091	7	0.037	0.090	0.066		1.379		0.011	0.032
1252	M136	6in Dia. Duct	Sec 1 - max	-0.028	8	0.067	8	-0.046	3	0.485	5	-1.010	8	-2.053	6	1.901	5	210.306	8	0.185	8	0.003	0.072	0.147		2.053		0.023	0.008
2498	M260	6in Dia. Duct	Sec 4 - min	-0.014	8	0.164	6	-0.055	8	0.193	9	-2.167	5	-0.018	7	0.025	6	-325.274	7	-0.272	7	0.002	0.155	0.066		2.167		0.034	0.020
1870	M197	16in Dia. Duct	Sec 5 - min	0.150	8	-0.461	2	-0.010	1	-0.862	7	0.617	6	-1.988	3	1.511	4	-5241.464	4	-1.039	4	0.017	0.063	0.142		1.988		0.128	0.057
631	M94	5in Dia. Duct	Sec 1 - max	0.054	5	0.060	3	0.388	5	-0.573	6	1.350	7	1.107	5	1.342	8	506.940	7	0.660	7	0.008	0.107	0.107		1.350		0.091	0.054
1722	M163	4in Dia. Duct	Sec 1 - min	0.029	8	0.103	8	-0.060	5	-4.189	8	2.597	7	-0.733	5	-0.160	8	305.086	6	0.671	6	0.003	0.186	0.033		4.189		0.052	0.006
1253	M136	6in Dia. Duct	Sec 2 - max	0.013	7	0.082	7	0.046	4	1.031	8	-0.505	5	-1.910	1	2.044	2	858.129	5	0.753	5	0.002	0.074	0.146		2.044		0.093	0.010

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f/σ_y	f_b/σ_y	f_s/σ_y	f_t (ksi)	f/σ_u	f/σ_u
1822	M193	16in Dia. Duct	Sec 1-min	0.189	1	-0.310	1	-0.041	3	-1.724	2	1.460	1	-1.068	6	0.486	7	-758.873	4	-0.150	4	0.021	0.123	0.076	1.724	0.019	0.038
2115	M222	3in Dia. Duct	Sec 3 - max	0.215	6	-0.025	6	-0.030	5	-0.391	5	0.422	8	3.979	8	-0.232	5	-14.228	8	-0.061	8	0.025	0.019	0.177	3.979	0.005	0.002
1251	M138	6in Dia. Duct	Sec 1 - max	0.013	7	0.083	7	0.046	4	1.010	8	-0.485	5	-1.901	5	2.053	8	858.129	5	0.753	5	0.002	0.072	0.147	2.053	0.002	0.010
832	M94	3in Dia. Duct	Sec 1 - min	-0.042	8	0.060	6	-0.265	6	-1.350	7	0.573	6	-1.342	8	-1.107	5	318.127	6	0.414	6	0.006	0.107	0.107	1.350	0.057	0.037
1121	M123	6in Dia. Duct	Sec 1 - max	0.141	5	0.182	5	0.041	7	-1.304	8	1.694	5	1.133	8	-0.662	5	936.444	6	0.826	6	0.018	0.121	0.081	1.694	0.102	0.022
728	M84	6in Dia. Duct	Sec 3 - min	-0.204	8	-0.098	7	-0.169	7	-1.171	7	-2.084	6	-0.631	7	-0.450	6	-457.131	6	-0.383	6	0.026	0.147	0.045	2.064	0.047	0.021
1349	M145	6in Dia. Duct	Sec 5 - max	0.009	8	0.174	1	-0.291	2	-0.093	5	0.874	8	2.162	8	-0.732	5	263.679	6	0.236	6	0.001	0.062	0.154	2.162	0.028	0.036
2495	M260	6in Dia. Duct	Sec 3 - max	0.077	5	0.280	5	0.038	7	0.069	8	1.695	7	0.514	6	1.213	7	-179.120	6	-0.150	6	0.010	0.121	0.087	1.695	0.019	0.035
951	M106	6in Dia. Duct	Sec 1 - max	0.034	8	-0.009	6	0.030	5	-0.837	7	1.190	6	1.775	8	-0.917	6	351.339	5	0.294	5	0.004	0.085	0.127	1.775	0.030	0.004
1356	M146	6in Dia. Duct	Sec 3 - min	-0.272	5	-0.028	2	-0.508	1	-0.416	8	-0.149	5	0.527	5	-2.125	8	173.712	5	0.145	5	0.034	0.030	0.152	2.125	0.018	0.063
953	M106	6in Dia. Duct	Sec 2 - max	0.034	8	-0.009	8	0.031	5	-0.865	7	1.200	6	1.760	8	-0.932	5	351.339	5	0.294	5	0.004	0.090	0.126	1.760	0.036	0.004
1122	M123	6in Dia. Duct	Sec 1 - min	0.109	8	0.070	8	-0.141	6	-1.694	5	1.304	8	0.662	5	-1.133	8	376.378	7	0.315	7	0.014	0.121	0.081	1.894	0.039	0.017
248	M25	4in Dia. Duct	Sec 4 - min	-0.045	8	0.007	5	-0.054	8	1.251	6	-2.069	7	-1.398	6	-2.685	7	53.888	6	0.119	5	0.004	0.092	0.119	2.685	-0.009	0.006
724	M83	6in Dia. Duct	Sec 2 - min	-0.347	7	-0.065	7	-0.235	7	-1.037	7	-2.027	6	-0.374	7	-0.263	6	-219.491	7	-0.184	7	0.044	0.145	0.037	2.027	0.023	0.029
953	M106	6in Dia. Duct	Sec 3 - max	0.035	8	-0.009	6	0.031	5	-0.894	7	1.204	6	1.746	8	-0.946	5	351.339	5	0.294	5	0.004	0.086	0.125	1.746	0.030	0.004
2473	M258	6in Dia. Duct	Sec 2 - max	0.094	7	0.000	7	-0.091	6	0.706	7	-0.516	6	2.136	7	-0.943	6	-179.120	6	-0.150	8	0.012	0.050	0.153	2.136	0.019	0.011
247	M25	4in Dia. Duct	Sec 4 - max	-0.035	5	0.075	8	0.084	7	2.069	7	-1.251	6	2.685	7	1.398	6	130.227	8	0.287	8	0.003	0.092	0.119	2.685	0.022	0.006
957	M106	6in Dia. Duct	Sec 4 - max	0.035	8	-0.009	6	0.032	5	-0.923	7	1.209	6	1.731	8	-0.961	5	351.339	5	0.294	5	0.004	0.086	0.124	1.731	0.036	0.004
711	M82	6in Dia. Duct	Sec 1 - max	0.249	7	0.080	6	0.186	7	1.259	6	0.330	7	1.032	6	1.301	7	371.703	6	0.311	6	0.032	0.090	0.093	1.301	0.038	0.023
952	M106	6in Dia. Duct	Sec 1 - min	0.017	5	-0.039	7	-0.030	6	-1.196	6	0.837	7	0.917	5	-1.775	8	-35.179	8	-0.029	8	0.002	0.085	0.127	1.775	0.004	0.007
2157	M226	6in Dia. Duct	Sec 4 - max	0.064	8	0.000	8	0.068	6	-0.978	2	1.049	1	-1.560	6	1.802	7	353.376	6	0.296	6	0.011	0.075	0.129	1.802	0.037	0.008
959	M106	6in Dia. Duct	Sec 5 - max	0.038	8	-0.009	8	0.032	5	-0.953	7	1.213	6	1.715	8	-0.977	5	351.339	5	0.294	5	0.005	0.087	0.123	1.715	0.036	0.004
954	M108	6in Dia. Duct	Sec 2 - min	0.017	5	-0.060	7	-0.031	6	-1.200	6	0.855	7	0.932	5	-1.760	8	-35.179	8	-0.029	8	0.002	0.086	0.126	1.760	0.004	0.007
2536	M264	2in Dia. Duct	Sec 4 - min	0.079	8	-0.163	5	-0.059	5	0.540	8	-1.675	5	0.915	8	-3.630	5	0.000	1	0.000	1	0.018	0.062	0.133	3.630	0.000	0.025
958	M106	6in Dia. Duct	Sec 3 - min	0.017	5	-0.061	7	-0.031	8	-1.204	6	0.894	7	0.946	5	-1.746	8	-35.179	8	-0.029	8	0.002	0.086	0.125	1.746	0.004	0.008
958	M106	6in Dia. Duct	Sec 4 - min	0.018	5	-0.062	7	-0.032	8	-1.209	6	0.923	7	0.961	5	-1.731	8	-35.179	8	-0.029	8	0.002	0.086	0.124	1.731	0.004	0.008
706	M81	6in Dia. Duct	Sec 3 - min	-0.358	7	-0.042	7	-0.222	6	-0.437	7	-1.495	6	-0.643	7	-0.705	6	-371.703	6	-0.311	6	0.045	0.107	0.060	1.495	0.038	0.027
1123	M123	6in Dia. Duct	Sec 2 - max	0.142	5	0.182	5	0.042	7	-1.278	8	1.626	5	1.085	8	-0.673	5	936.444	6	0.826	6	0.018	0.116	0.078	1.626	0.102	0.022
960	M100	6in Dia. Duct	Sec 5 - min	0.018	5	-0.063	7	-0.032	8	-1.213	6	0.853	7	0.977	5	-1.715	8	-35.179	8	-0.029	8	0.002	0.087	0.123	1.715	0.004	0.008
1698	M200	4in Dia. Duct	Sec 4 - min	0.075	8	-0.101	5	-0.044	7	-3.655	5	2.333	8	-0.939	7	-0.882	5	53.888	5	0.119	5	0.007	0.162	0.042	3.655	0.009	0.008
259	M26	4in Dia. Duct	Sec 5 - max	0.055	5	1.053	5	-0.029	8	4.309	5	2.198	6	0.323	8	0.296	5	776.135	7	1.712	7	0.003	0.102	0.014	4.309	0.132	0.001
2235	M234	2in Dia. Duct	Sec 3 - max	0.327	5	-0.054	8	-0.053	6	-0.954	8	2.737	5	0.015	8	1.002	5	8.083	5	0.110	5	0.073	0.101	0.037	2.737	0.007	0.003
2010	M211	3in Dia. Duct	Sec 5 - min	0.056	6	-0.060	7	0.001	1	-1.206	7	1.197	6	1.943	5	-3.386	8	-14.055	8	-0.050	8	0.007	0.054	0.150	3.386	0.003	0.005
2012	M212	3in Dia. Duct	Sec 1 - min	0.056	6	0.070	5	-0.103	2	-1.206	7	1.197	6	1.943	5	-3.386	8	-14.055	8	-0.050	8	0.007	0.054	0.150	3.386	0.003	0.008
2498	M260	6in Dia. Duct	Sec 3 - min	-0.019	8	0.163	6	-0.065	8	-1.695	7	-0.000	6	-1.213	7	-0.514	6	-325.274	7	-0.272	7	0.002	0.121	0.087	1.695	0.034	0.023
1725	M183	4in Dia. Duct	Sec 3 - max	0.187	5	1.000	5	-0.027	8	-2.416	7	3.539	6	0.160	8	0.777	5	764.901	7	1.663	7	0.018	0.157	0.035	3.539	0.129	0.077
1358	M146	6in Dia. Duct	Sec 4 - min	-0.272	5	-0.028	2	-0.508	1	-0.420	8	-0.154	5	0.400	5	-2.031	8	173.712	5	0.145	5	0.034	0.030	0.145	2.031	0.018	0.063
2158	M228	6in Dia. Duct	Sec 4 - min	0.042	5	-0.039	7	0.019	7	-1.049	1	0.978	2	-1.602	7	1.560	6	338.161	7	0.273	7	0.005	0.075	0.129	1.602	0.034	0.005
1677	M198	16in Dia. Duct	Sec 4 - max	0.059	7	-0.539	1	0.005	2	-1.403	6	1.682	7	-0.601	4	1.146	3	-5976.034	2	-1.185	2	0.007	0.120	0.082	1.682	0.146	0.067
2221	M233	2in Dia. Duct	Sec 1 - max	0.312	5	0.082	5	0.067	7	0.471	6	1.082	5	0.160	1	2.672	2	9.083	5	0.110	5	0.069	0.040	0.099	2.672	0.007	0.005
1819	M192	16in Dia. Duct	Sec 5 - max	0.159	2	-0.390	2	0.035	4	-1.458	1	1.724	2	-0.438	7	0.942	6	-437.059	3	-0.087	3	0.018	0.123	0.057	1.724	0.011	0.048
1724	M183	4in Dia. Duct	Sec 2 - min	0.029	6	0.100	8	-0.060	5	-3.864	6	2.506	7	-0.755	5	-0.170	6	305.086	6	0.671	8	0.003	0.172	0.034	3.864	0.052	0.008
1676	M198	16in Dia. Duct	Sec 4 - min	0.054	8	-0.553	2	-0.005	1	-1.082	7	1.403	6	-1.146	3	0.601	4	-6450.135	1	-1.278	1	0.008	0.120	0.082	1.682	0.156	0.068
723	M83	6in Dia. Duct	Sec 2 - max	0.288	6	0.029	6	0.166	6	2.027	6	1.037	7	0.263	6	0.374	7	457.131	6	0.383	6	0.038	0.145	0.027	2.027	0.047	0.023
949	M105	6in Dia. Duct	Sec 5 - max	0.030	8	-0.034	8	0.030	5	-0.837	7	-1.190	6	1.662	8	-0.622	5	604.595	7	0.506	7	0.004	0.085	0.119	1.662	0.062	0.004
947	M105	6in Dia. Duct	Sec 4 - max	0.029	8	-0.033	8	0.030	5	-0.806	7	1.180	6	1.677	8	-0.605	5	604.595	7	0.506	7	0.004	0.084	0.120	1.677	0.062	0.004
2227	M233	2in Dia. Duct	Sec 4 - max	0.321	5	0.038	5	0.097	2	2.090	5	-0.500	8	1.593	7	-0.561	6	8.083	5	0.110	5	0.071	0.077	0.059	2.090	0.007	0.006
945	M105	6in Dia. Duct	Sec 3 - max	0.029	6	-0.033	6	0.029	5	-0.774	7	1.165	6	1.691	8	-0.594	5	604.595	7	0.506	7	0.004	0.083	0.121	1.691	0.062	0.004
1362	M147	6in Dia. Duct	Sec 1 - min	-0.342	1	-0.101	5	-0.290	6	0.095	6	-0.301	5	0.248	5	-1.898	8	107.065	5	0.090	5	0.043	0.022	0.143	1.990	0.011	0.036
943	M105	6in Dia. Duct	Sec 2 - max	0.028	6	-0.032	6	0.029	5	-0.744	7	1.150	6	1.704	8	-0.580	5	604.595	7	0.506	7	0.004	0.082	0.122	1.704	0.062	0.004
1124	M123	6in Dia. Duct	Sec 2 - min	0.109	8	0.059	8	-0.141	6	-1.625	5	1.278	8	0.673	5	-1.085	8	376.378	7	0.315	7	0.014	0.116	0.076	1.625	0.039	0.017
941	M105	6in Dia. Duct	Sec 1 - max	0.028	6	-0.031	6	0.028	5	-0.714	7	1.136	6	1.716	8	-0.566	5	604.595	7	0.506	7	0.004	0.081	0.123	1.716	0.062	0.004
733	M84	6in Dia. Duct	Sec 2 - max	0.288	7	0.029	6	0.117	6	2.027	8	1.037	7	0.288	6	0.396	7	219.491	7	0.184	7	0.034	0.145	0.028	2.027	0.023	0.014
260	M26	4in Dia. Duct	Sec 6 - min	0.011	8	0.103	8	-0.057	5	-2.196	8	-4.309	5	-0.239	5	-0.323	8	295.530	6	0.050	6	0.001	0.192	0.014	4.309	0.050	0.008
2474	M258	6in Dia. Duct	Sec 2 - min	0.031	6	-0.020	6	-0.181	7	0.518	6	-0.706	7	0.943	6	-2.136	7	-325.274	7	-0.272	7	0.004	0.050	0.153	2.136	0.034	0.020
1867	M197	16in Dia. Duct	Sec 4 - max	0.157	7	-0.446	5	0.012	2	-0.306	6	0.660	7	-1.511	4	1.988	3	-4550.766	3	-0.902	3	0.018	0.047	0.142	1.988	0.111	0.035
2483	M259	6in Dia. Duct	Sec 2 - max	0.106	5	-0.053	6	0.045	6	-0.955	6	1.083	7	-0.331	6	1.620	7	-179.120	6	-0.150	6	0.013	0.077	0.116	1.620	0.019	0.007
712	M82	6in Dia. Duct	Sec 1 - min	-0.183	6	-0.038	7	-0.140	8	-0.330	7	-1.259	6	-1.301	7	-1.032	6	-109.312	7	-0.091	7	0.023	0.090	0.093	1.301	0.011	0.017
1660	M197	16in Dia. Duct	Sec 4 - min	0.148	6	-0.459	8	-0.012	1	-0.660	7	0.396	8	-1.988	3	1.511	4	-5241.484	4	-1.030	4	0.017	0.047	0.142	1.988	0.128	0.057
2116	M222	3in Dia. Duct	Sec 3 - min	0.081	7	-0.027	5	-0.172	8	-0.422	8	0.391	5	0.232	5	-3.979	8	-36.188	5	-0.155	5	0.009	0.019	0.177	3.979	0.012	0.013
950	M105	6in Dia. Duct	Sec 5 - min	0.004	7	-0.067	5	-0.030	7	-1.196	6	0.837	7	0.622	5	-1.662	8	302.846	6	0.253	6	0.001	0.085	0.119	1.662	0.031	0.008
948	M105	6in Dia. Duct	Sec 4 - min	0.004	7	-0.066	5	-0.030	7	-1.160	6	0.806	7	0.608	5	-1.677	8	302.846	6	0.253	6	0.001	0.084	0.120	1.677	0.031	0.008
946	M105	6in Dia. Duct	Sec 3 - min	0.004	7	-0.065	5	-0.029	7	-1.165	6	0.774	7	0.554	5	-1.691	8	302.846	6	0.253	6	0.001	0.083	0.121	1.691	0.031	0.008
705	M81	6in Dia. Duct	Sec 3 - max	0.296	6	0.063	6	0.264	7	1.405	6	0.437	7	0.705	6	0.643	7	109.312	7	0.091	7	0.037	0.107	0.060	1.405	0.011	0.033
713	M82	6in Dia. Duct	Sec 2 - max	0.249	7	0.086	6	0.186	7	1.379	6	0.362	7	0.837	6	1.042	7	371.703	6	0.311	6	0.032	0.099	0.074	1.379	0.038	0.023
944	M105	6in Dia. Duct	Sec 2 - min	0.004	7	-0.064	5	-0.029	7	-1.150	6	0.744	7	0.580	5	-1.704	8	302.846	6	0.253	6	0.001	0.082	0.122	1.704	0.031	0.008
942	M105	6in Dia. Duct	Sec 1 - min	0.004	7	-0.063	5	-0.028	7	-1.135	6	0.714	7	0.566	5	-1.718	8	302.846	6	0.253	6	0.001	0.081	0.123	1.718	0.031	0.008
2311	M242	6in Dia. Duct	Sec 1 - max	0.059	5	0.034	5	0.064	8	0.500	8	1.292	5	0.345	5	1.458	8	192.963	7	0.162	7	0.007	0.092	0.104	1.458	0.020	0.008
746	M85	6in Dia. Duct	Sec 4 - min	-0.368	7	-0.069	7	-0.039	5	-0.852	7	-2.081	6	-0.114	8	-0.075	5	-15.133	7	-0.013	7	0.047	0.149	0.008	2.081	0.002	0.011
1820	M192	16in Dia. Duct	Sec 5 - min	0.115	1	-0.431	1	-0.041	3	-1.724	2	1.466	1	-0.942	6	0.438	7	-1403.254	4	-0.278	4	0.013	0.123	0.067	1.724	0.034	0.053
746	M85	6in Dia. Duct	Sec 3 - min	-0.369	7	-0.086	7	-0.037	5	-0.730	7	-2.030	6	-0.162	8	-0.129	5	-15.133	7	-0.013	7	0.047	0.145	0.012	2.030	0.002	0.011
1125	M123	6in Dia. Duct	Sec 3 - max	0.142	5	0.183	5	0.042	7	-1.252	8	1.556	5	1.036	8	-0.584	5	936.444	6	0.826	6	0.018	0.111	0.074	1.556	0.102	0.023
1360	M146	6in Dia. Duct	Sec 5 - min	-0.272	5	-0.029	2	-0.508	1	-0.423	8	-0.158	5	0.274	5	-1.938	8	173.712	5	0.145	5	0.034	0.030	0.136	1.938	0.018	0.063
381	M41	6in Dia. Duct	Sec 1 - max	0.114	5	-0.151	6	0.094	6	1.696	7	-1.398	6	-0.463	5	0.044	8	859.016	6	0.720	6	0.014	0.121	0.067	1.696	0.089	0.019
750	M85	6in Dia. Duct	Sec 5 - min	-0.387	7	-0.092	7	-0.041	5	-0.979	7	-2.127	6	-0.063	8	-0.020	5	-15.133	7	-0.013	7	0.046	0.152	0.005	2.127	0.002	0.011
981	M107	6in Dia. Duct	Sec 1 - max	0.035	8	0.019	6	0.032	5	-0.953	7	1.213	6	1.562	8	-1.127	5	101.348	5	0.085	5	0.004	0.087	0.112	1.562	0.010	0.004
1242	M135	6in Dia. Duct	Sec 1 - min	-0.041	6	0.042	6	-0.046	3	0.389	7	-0.960	6	-1.003	8	1.131	5	633.536	6	0.556	6	0.005	0.069	0.129	1.600	0.059	0.006
2301	M241	6in Dia. Duct	Sec 1 - max	0.060	5	0.030	6	0.061	8	0.476	8	-1.273	5	0.308	5	1.452	8	-21.985	7	-0.018	7	0.008	0.091	0.104	1.452	0.002	0.008
2386	M249	6in Dia. Duct	Sec 3 - min	-0.060	8	-0.019	6	-0.091	8	0.558	6	-1.110	8	-0.066	6	-1.612	7	345.041	6	0.289	6	0.008	0.080	0.115	1.612	0.038	0.011
1250	M135	6in Dia. Duct	Sec 5 - min	-0.039	6	0.040	8	-0.045	3	0.485	5	-1.010	8	-1.755	8	1.160	5	633.536	6	0.556	6	0.005	0.072	0.125	1.755	0.059	0.006
1244	M135	6in Dia. Duct	Sec 2 - min	-0.040	8	0.041	6	-0.045	3	0.414	7	-0.972	6	-1.791	8	1.144	5	633.536	6	0.556	6	0.005	0.069	0.128	1.791	0.059	0.006
1246	M135	6in Dia. Duct	Sec 3 - min	-0.040	6	0.041	6	-0.045	3	0.439	7	-0.983	6	-1.779	8	1.156	5	633.536	6	0.556	6	0.005	0.070	0.127	1.779	0.059	0.008
1248	M135	6in Dia. Duct	Sec 4 - min	-0.039	6	0.040	6	-0.045	3	0.464	7	-0.995	6	-1.767	8	1.168	5	633.536	6	0.556	6	0.005	0.071	0.126	1.767	0.059	0.006
962	M107	6in Dia. Duct	Sec 1 - min	0.029	7	-0.045	7	-0.032	8	-1.213	6	0.953	7	1.127	5	-1.562	8	-424.601	8	-0.355	8	0.004	0.087	0.112	1.562	0.044	0.006
1103	M121	6in Dia. Duct	Sec 5 - max	0.148	5	-0.132	7	0.039	7	-1.233	6	1.720	5	-0.108	7	0.840	8	1097.171	8	0.918	8	0.019	0.123	0.060	1.720	0.113	0.010

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_t	f_{by}/σ_a	f_{bz}/σ_a	f_v (ksi)	f/f_v	f/σ_v
1351	M146	6in Dia. Duct	Sec 1 - max	-0.054	8	0.032	1	-0.287	2	0.141	5	0.410	8	2.312	8	-0.781	5	224.697	8	0.188	8	0.007	0.029	0.165	2.312	0.023	0.033
863	M97	8in Dia. Duct	Sec 2 - max	0.002	5	0.048	5	-0.111	6	1.133	6	-0.668	7	-0.522	5	1.681	8	-687.343	6	-0.575	6	0.000	0.081	0.120	1.681	0.071	0.014
864	M97	6in Dia. Duct	Sec 2 - min	-0.002	8	0.015	8	-0.275	7	0.868	7	-1.133	6	-1.681	8	0.622	5	-992.905	7	-0.831	7	0.000	0.081	0.120	1.681	0.103	0.034
963	M107	6in Dia. Duct	Sec 2 - max	0.038	8	0.019	6	0.033	5	-0.974	7	1.204	8	1.547	8	-1.143	5	101.348	5	0.085	5	0.005	0.088	0.111	1.547	0.010	0.004
382	M41	8in Dia. Duct	Sec 1 - min	0.098	6	-0.235	5	-0.094	7	1.398	8	-1.696	7	-0.944	6	0.483	5	202.160	7	0.169	7	0.012	0.121	0.067	1.696	0.021	0.029
2370	M247	6in Dia. Duct	Sec 5 - min	-0.056	8	-0.130	7	-0.015	5	-1.506	8	-0.176	5	0.816	6	-1.202	7	86.544	6	0.072	6	0.007	0.108	0.088	1.506	0.009	0.016
2303	M241	6in Dia. Duct	Sec 2 - max	0.060	5	0.030	6	0.062	8	0.482	8	1.277	5	0.410	5	1.423	6	-21.985	7	-0.018	7	0.008	0.091	0.102	1.423	0.002	0.008
2313	M242	6in Dia. Duct	Sec 2 - max	0.058	5	0.033	5	0.064	8	0.502	8	1.276	5	0.365	5	1.428	6	192.963	7	0.162	7	0.007	0.091	0.102	1.428	0.020	0.008
1364	M147	6in Dia. Duct	Sec 2 - min	-0.342	1	-0.102	5	-0.200	6	0.071	8	-0.272	5	0.191	5	-1.925	8	107.085	5	0.090	5	0.043	0.019	0.138	1.925	0.011	0.036
2077	M218	3in Dia. Duct	Sec 4 - max	0.091	5	0.022	5	0.457	6	0.123	5	0.004	8	4.143	6	-0.682	7	-6.960	8	-0.030	6	0.011	0.005	0.104	4.143	0.002	0.035
964	M107	6in Dia. Duct	Sec 2 - min	0.029	7	-0.045	7	-0.033	8	-1.204	6	0.974	7	1.143	5	-1.547	8	-424.601	8	-0.355	8	0.004	0.088	0.111	1.547	0.044	0.006
491	M52	8in Dia. Duct	Sec 1 - max	-0.058	1	0.051	6	0.053	3	-0.205	8	1.379	5	0.995	8	1.315	5	1313.992	4	1.153	4	0.007	0.099	0.094	1.379	0.142	0.007
492	M52	8in Dia. Duct	Sec 1 - min	-0.058	6	-0.051	7	-0.053	4	-1.379	5	0.205	8	-1.315	5	-0.995	8	1103.694	3	0.969	3	0.007	0.099	0.094	1.379	0.120	0.007
965	M107	6in Dia. Duct	Sec 3 - max	0.036	8	0.020	6	0.033	5	-0.996	7	1.194	6	1.531	8	-1.159	5	101.348	5	0.085	5	0.005	0.085	0.109	1.531	0.010	0.004
2464	M259	6in Dia. Duct	Sec 2 - min	-0.047	8	-0.117	7	0.006	7	-1.083	7	0.955	8	-1.620	7	0.391	8	-325.274	7	-0.272	7	0.008	0.077	0.118	1.620	0.034	0.014
1128	M123	6in Dia. Duct	Sec 3 - min	0.109	8	0.068	8	-0.142	6	-1.550	5	1.252	8	0.604	5	-1.036	8	378.378	7	0.315	7	0.014	0.111	0.074	1.556	0.039	0.018
759	M86	6in Dia. Duct	Sec 5 - max	0.280	7	0.032	6	0.032	8	2.127	6	0.979	7	0.125	6	0.161	7	15.133	7	0.013	7	0.035	0.152	0.012	2.127	0.002	0.004
744	M85	6in Dia. Duct	Sec 2 - min	-0.377	7	-0.051	7	-0.020	5	-0.657	7	-1.929	6	-0.185	8	-0.157	5	-15.133	7	-0.013	7	0.048	0.138	0.013	1.929	0.002	0.006
734	M84	6in Dia. Duct	Sec 2 - min	-0.203	6	-0.095	7	-0.170	7	-1.037	7	-2.027	6	-0.396	7	-0.288	6	-457.131	6	-0.383	6	0.026	0.145	0.028	2.027	0.047	0.021
2305	M241	6in Dia. Duct	Sec 3 - max	0.059	5	0.030	6	0.062	8	0.488	8	1.282	5	0.431	5	1.394	8	-21.985	7	-0.018	7	0.007	0.092	0.100	1.394	0.002	0.008
966	M107	8in Dia. Duct	Sec 3 - min	0.030	7	-0.048	7	-0.033	8	-1.194	6	0.996	7	1.159	5	-1.531	8	-424.601	6	-0.355	8	0.004	0.085	0.109	1.531	0.044	0.006
1127	M123	6in Dia. Duct	Sec 4 - max	0.142	5	0.183	5	0.043	7	-1.217	6	1.497	7	1.028	7	-0.655	6	980.444	6	0.826	6	0.018	0.107	0.073	1.497	0.102	0.023
757	M88	6in Dia. Duct	Sec 4 - max	0.279	7	0.035	6	0.030	8	2.081	6	0.852	7	0.107	6	0.198	7	15.133	7	0.013	7	0.035	0.149	0.014	2.081	0.002	0.004
1249	M135	8in Dia. Duct	Sec 5 - max	-0.004	7	0.087	7	0.046	4	1.010	8	-0.485	5	-1.180	5	1.765	8	1216.143	7	1.067	7	0.000	0.072	0.125	1.755	0.132	0.011
1241	M135	6in Dia. Duct	Sec 1 - max	-0.004	7	0.091	7	0.046	4	0.960	6	-0.389	7	-1.131	5	1.803	8	1216.143	7	1.067	7	0.000	0.069	0.129	1.803	0.132	0.011
1243	M135	8in Dia. Duct	Sec 2 - max	-0.004	7	0.090	7	0.046	4	0.972	6	-0.414	7	-1.144	5	1.791	8	1218.143	7	1.067	7	0.000	0.069	0.128	1.791	0.132	0.011
1245	M135	8in Dia. Duct	Sec 3 - max	-0.004	7	0.089	7	0.046	4	0.883	6	-0.439	7	-1.156	5	1.779	8	1216.143	7	1.067	7	0.000	0.070	0.127	1.779	0.132	0.011
1247	M135	8in Dia. Duct	Sec 4 - max	-0.004	7	0.088	7	0.046	4	0.995	6	-0.464	7	-1.168	5	1.767	8	1216.143	7	1.067	7	0.000	0.071	0.126	1.767	0.132	0.011
2312	M242	6in Dia. Duct	Sec 1 - min	-0.009	8	0.006	8	0.043	5	-1.292	5	-0.500	8	-1.458	8	-0.345	5	-452.030	6	-0.378	6	0.001	0.082	0.104	1.458	0.047	0.005
967	M107	6in Dia. Duct	Sec 4 - max	0.037	8	0.020	6	0.034	5	-1.016	7	1.165	6	1.515	8	-1.175	5	101.348	5	0.085	5	0.005	0.085	0.108	1.515	0.010	0.004
2369	M247	6in Dia. Duct	Sec 5 - max	0.029	5	0.026	6	0.121	8	0.178	5	1.506	8	1.202	7	-0.816	6	1490.159	7	1.247	7	0.004	0.108	0.086	1.508	0.154	0.015
755	M86	6in Dia. Duct	Sec 3 - max	0.278	7	0.036	6	0.029	8	2.030	6	0.730	7	0.200	8	0.234	7	15.133	7	0.013	7	0.035	0.145	0.017	2.030	0.002	0.005
2315	M242	6in Dia. Duct	Sec 3 - max	0.056	5	0.032	5	0.065	8	0.504	8	1.260	5	0.385	5	1.397	8	192.963	7	0.162	7	0.007	0.090	0.100	1.397	0.020	0.008
2368	M247	6in Dia. Duct	Sec 4 - min	-0.055	8	-0.129	7	-0.015	5	-1.500	8	-0.220	5	0.810	6	-1.158	7	86.544	6	0.072	6	0.007	0.107	0.063	1.500	0.009	0.016
2307	M241	6in Dia. Duct	Sec 4 - max	0.059	5	0.030	6	0.063	8	0.494	8	1.266	5	0.451	5	1.364	8	-21.985	7	-0.018	7	0.007	0.092	0.097	1.364	0.002	0.008
968	M107	6in Dia. Duct	Sec 4 - min	0.030	7	-0.047	7	-0.034	8	-1.185	6	1.018	7	1.175	5	-1.515	8	-424.601	6	-0.355	6	0.004	0.085	0.108	1.515	0.044	0.006
1727	M183	4in Dia. Duct	Sec 4 - max	0.187	5	0.999	5	-0.027	8	-2.325	7	3.215	6	0.150	8	0.800	5	764.901	7	1.683	7	0.018	0.143	0.036	3.215	0.129	0.077
379	M40	6in Dia. Duct	Sec 5 - max	0.122	5	-0.166	8	0.038	7	-1.015	8	1.497	5	-0.453	7	1.034	6	997.775	8	0.835	8	0.015	0.107	0.074	1.497	0.103	0.023
2527	M283	2in Dia. Duct	Sec 4 - max	0.138	5	-0.054	8	-0.052	8	1.977	5	-0.480	8	2.493	5	-0.403	8	0.000	1	0.000	1	0.031	0.073	0.092	2.493	0.000	0.003
2365	M249	6in Dia. Duct	Sec 3 - max	-0.012	5	0.138	7	0.119	5	1.113	8	-0.556	5	1.612	7	0.088	6	1659.205	7	1.389	7	0.002	0.080	0.115	1.612	0.171	0.017
714	M82	6in Dia. Duct	Sec 2 - min	-0.183	6	-0.039	7	-0.142	6	-0.382	7	-1.379	6	-1.042	7	-0.837	8	-109.312	7	-0.091	7	0.023	0.099	0.074	1.379	0.011	0.018
969	M107	6in Dia. Duct	Sec 5 - max	0.037	8	0.020	6	0.035	5	-1.040	7	1.175	6	1.499	8	-1.191	5	101.348	5	0.085	5	0.005	0.084	0.107	1.499	0.010	0.004
1129	M123	6in Dia. Duct	Sec 5 - max	0.143	5	0.183	5	0.043	7	-1.177	6	1.442	7	1.044	7	-0.601	6	980.444	6	0.826	6	0.018	0.103	0.075	1.442	0.102	0.023
2183	M229	2in Dia. Duct	Sec 2 - max	0.187	5	-0.052	8	0.040	5	-0.041	8	2.602	5	0.054	8	1.652	5	10.134	6	0.138	6	0.035	0.099	0.061	2.682	0.009	0.003
2302	M241	6in Dia. Duct	Sec 1 - min	-0.005	8	-0.026	7	0.045	5	-1.273	5	-0.476	8	-1.452	6	-0.388	5	-471.814	6	-0.395	6	0.001	0.091	0.104	1.452	0.049	0.006
747	M85	6in Dia. Duct	Sec 4 - max	0.304	6	0.035	6	0.035	8	2.081	6	0.852	7	0.075	5	0.114	8	11.733	6	0.010	6	0.038	0.149	0.008	2.081	0.001	0.004
745	M85	6in Dia. Duct	Sec 3 - max	0.305	8	0.038	6	0.034	8	2.030	8	0.730	7	0.129	5	0.162	8	11.733	6	0.010	6	0.039	0.145	0.012	2.030	0.001	0.005
2121	M223	3in Dia. Duct	Sec 1 - max	0.174	6	0.094	8	0.053	1	-2.498	5	2.523	8	1.411	2	0.956	1	-14.328	8	-0.061	8	0.020	0.112	0.063	2.523	0.005	0.007
2559	M266	3in Dia. Duct	Sec 5 - max	0.174	6	-0.094	5	0.049	8	-2.496	5	2.523	8	1.411	2	0.956	1	-14.328	8	-0.061	8	0.020	0.112	0.063	2.523	0.005	0.007
2309	M241	6in Dia. Duct	Sec 5 - max	0.059	5	0.030	8	0.064	8	0.500	8	1.292	5	0.471	5	1.334	8	-21.985	7	-0.018	7	0.007	0.092	0.095	1.334	0.002	0.008
1353	M146	6in Dia. Duct	Sec 2 - max	-0.054	8	0.032	1	-0.267	2	0.145	5	0.413	8	2.219	6	-0.654	5	224.697	8	0.188	8	0.007	0.030	0.159	2.219	0.023	0.033
970	M107	6in Dia. Duct	Sec 5 - min	0.030	7	-0.047	7	-0.035	8	-1.175	6	1.040	7	1.191	5	-1.499	8	-424.601	8	-0.355	8	0.004	0.084	0.107	1.499	0.044	0.006
749	M85	6in Dia. Duct	Sec 5 - max	0.303	6	0.032	6	0.037	8	2.127	6	0.979	7	0.020	5	0.063	8	11.733	6	0.010	6	0.038	0.152	0.005	2.127	0.001	0.005
1817	M192	18in Dia. Duct	Sec 4 - max	0.159	2	-0.386	2	0.037	4	-1.242	1	1.520	2	-0.421	7	0.956	6	-437.069	3	-0.087	3	0.018	0.109	0.068	1.520	0.011	0.048
1726	M183	4in Dia. Duct	Sec 3 - min	0.028	8	0.102	8	-0.059	5	-3.539	6	2.416	7	-0.777	5	-0.160	8	305.086	6	0.671	6	0.003	0.157	0.035	3.539	0.052	0.008
2314	M242	6in Dia. Duct	Sec 2 - min	-0.010	8	0.005	6	0.042	5	-1.276	5	-0.502	8	-1.428	8	-0.365	5	-452.030	6	-0.378	6	0.001	0.091	0.102	1.426	0.047	0.005
716	M82	6in Dia. Duct	Sec 3 - max	0.250	7	0.083	6	0.190	7	1.495	6	0.437	7	0.839	6	0.782	7	371.703	6	0.311	6	0.032	0.107	0.058	1.495	0.038	0.023
1128	M123	6in Dia. Duct	Sec 4 - min	0.110	8	0.068	8	-0.142	6	-1.497	7	1.217	6	0.655	8	-1.028	7	376.378	7	0.315	7	0.014	0.107	0.073	1.497	0.039	0.018
653	M68	12in Dia. Duct	Sec 2 - max	0.026	7	0.997	7	-0.011	3	3.533	6	-2.966	7	0.306	7	0.795	6	-211.895	8	-0.069	8	0.002	0.157	0.035	3.533	0.005	0.077
654	M68	12in Dia. Duct	Sec 2 - min	-0.023	6	0.857	6	-0.129	4	2.966	7	-3.533	6	-0.795	6	-0.306	7	-1303.385	5	-0.427	5	0.002	0.157	0.035	3.533	0.033	0.066
708	M81	6in Dia. Duct	Sec 4 - min	-0.355	7	-0.045	7	-0.223	6	-0.497	7	-1.607	6	-0.478	7	-0.397	6	-371.703	6	-0.311	6	0.045	0.115	0.034	1.607	0.038	0.028
1107	M121	6in Dia. Duct	Sec 4 - max	0.148	5	-0.131	7	0.039	7	-1.177	8	1.663	5	-0.122	7	0.788	6	1097.171	8	0.916	8	0.019	0.118	0.056	1.663	0.113	0.016
1110	M121	6in Dia. Duct	Sec 5 - min	0.085	8	-0.169	8	-0.139	8	-1.720	5	1.233	8	-0.640	6	0.108	7	557.911	5	0.487	5	0.011	0.123	0.060	1.720	0.058	0.021
2304	M241	6in Dia. Duct	Sec 2 - min	-0.006	8	-0.026	7	0.044	5	-1.277	5	-0.482	8	-1.423	8	-0.410	5	-471.814	6	-0.395	6	0.001	0.091	0.102	1.423	0.049	0.005
2317	M242	6in Dia. Duct	Sec 4 - max	0.056	5	0.031	5	0.066	8	0.506	8	1.245	5	0.404	5	1.366	8	192.963	7	0.162	7	0.007	0.089	0.098	1.366	0.020	0.008
2367	M247	6in Dia. Duct	Sec 4 - max	0.029	5	0.028	6	0.121	8	0.220	5	1.500	8	1.158	7	-0.810	6	1490.159	7	1.247	7	0.004	0.107	0.083	1.500	0.154	0.015
1959	M206	2in Dia. Duct	Sec 5 - max	0.157	5	-0.086	8	-0.114	6	-0.224	6	1.811	7	-0.592	8	2.469	5	-6.895	8	-0.080	8	0.035	0.067	0.091	2.469	0.005	0.007
1919	M202	8in Dia. Duct	Sec 5 - max	0.008	1	0.008	8	0.008	6	-0.205	8	1.379	5	0.995	8	1.315	5	1313.992	4	1.153	4	0.001	0.099	0.094	1.379	0.142	0.001
1920	M202	8in Dia. Duct	Sec 5 - min	0.008	1	-0.008	6	-0.008	5	-1.379	5	0.205	8	-1.315	5	-0.995	8	1103.694	3	0.969	3	0.001	0.099	0.094	1.379	0.120	0.001
2368	M247	6in Dia. Duct	Sec 3 - min	-0.055	8	-0.126	7	-0.014	5	-1.494	8	-0.262	5	0.805	6	-1.113	7	86.544	6	0.072	6	0.007	0.107	0.080	1.494	0.009	0.016
2076	M218	3in Dia. Duct	Sec 4 - min	-0.030	8	0.017	8	0.135	7	-0.004	8	-0.123	5	0.682	7	-4.143	6	-7.691	5	-0.033	5	0.003	0.005	0.184	4.143	0.003	0.010
742	M65	6in Dia. Duct	Sec 1 - min	-0.378	7	-0.047	7	-0.018	5	-0.589	7	-1.825	6	-0.207	8	-0.183	5	-15.133	7	-0.013	7	0.048	0.130	0.015	1.825	0.002	0.008
115	M12	5in Dia. Duct	Sec 3 - max	0.098	5	0.226	8	-0.036	8	-0.862	8	1.747	5	0.503	8	-0.063	5	236.032	6	0.307	6	0.014	0.139	0.040	1.747	0.042	0.031
1366	M147	8in Dia. Duct	Sec 3 - min	-0.342	1	-0.102	5	-0.290	6	0.047	8	-0.243	5	0.134	5	-1.852	8	107.085	5	0.090	5	0.043	0.017	0.132	1.852	0.011	0.036
1917	M202	8in Dia. Duct	Sec 4 - max	0.007	1	0.007	8	0.007	6	-0.210	8	1.373	5	0.990	8	1.309	5	1313.992	4	1.153	4	0.001	0.098	0.094	1.373	0.142	0.001
1918	M202	8in Dia. Duct	Sec 4 - min	0.007	1	-0.007	6	-0.007	5	-1.373	5	0.210	8	-1.309	5	-0.990	6	1103.694	3	0.969	3	0.001	0.098	0.094	1.373	0.120	0.001
2306	M241	6in Dia. Duct	Sec 3 - min	-0.006	8	-0.027	7	0.044	5	-1.282	5	-0.468	8	-1.394	6	-0.431	5	-471.614	6	-0.395	8	0.001	0.092	0.100	1.394	0.049	0.005
1915	M202	8in Dia. Duct	Sec 3 - max	0.006	1	0.006	8	0.006	6	-0.215	8	1.368	5	0.985	8	1.304	5	1313.992	4	1.153	4	0.001	0.098	0.093	1.368	0.142	0.001
1916	M202	8in Dia. Duct	Sec 3 - min	0.006	1	-0.006	6	-0.006	5	-1.368	5	0.215	8	-1.304	5	-0.985	8	1103.694	3	0.969	3	0.001	0.098	0.093	1.368	0.120	0.001
1130	M123	6in Dia. Duct	Sec 5 - min	0.110	8	0.067	8	-0.143	6	-1.442	7	1.177	6	0.601	6	-1.044	7	376.378	7	0.315	7	0.014	0.103	0.075	1.442	0.039	0.018
2021	M213	3in Dia. Duct	Sec 1 - max	0.233	7	-0.045	6	0.145	7	0.113	8	-0.105	5	-3.189	6	3.579	7	-9.047	1	-0.039	1	0.027	0.005	0.159	3.579	0.003	0.011
2316	M242	6in Dia. Duct	Sec 3 - min	-0.010	8	0.004	8	0.041	5	-1.260	5	-0.504	8	-1.397	8	-0.385	5	-452.030	6	-0.378	6	0.001	0.090	0.100	1.397	0.047	0.005
1865	M197	16in Dia. Duct	Sec 3 - max	0.157	7	-0.443	5	0.014	2	-0.176	6	0.439	7	-1.511	4	1.988	3	-4550.766	3	-0.802	3	0.018	0.031	0.142	1.988	0.111	0.055
1913	M202	8in Dia. Duct	Sec 2 - max	0.005	1	0.005	8	0.005	6	-0.219	8	1.364	5	0.981	8	1.300	5	1313.992	4	1.153	4	0.001	0.097	0.093	1.364	0.142	0.001
1914	M202	8in Dia. Duct	Sec 2 - min	0.005	1	-0.005	6	-0.005	5	-1.364	5	0.219	8	-1.300	5	-0.981	6	1103.694	3	0.969	3	0.001	0.097	0.093	1.364	0.120	0.001

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_b	f_v/σ_v		f_t (ksi)		f_t/v_t	f_v/σ_v	
743	M85	6in Dia. Duct	Sec 2 - max	0.314	6	0.074	6	0.016	8	1.929	6	0.657	7	0.157	5	0.186	8	11.733	6	0.010	6	0.040	0.138	0.013	[illegible]	1.929	[illegible]	0.001	0.009	[illegible]
116	M12	5in Dia. Duct	Sec 3 - min	0.083	8	0.159	5	-0.082	5	-1.747	5	0.862	8	0.063	5	-0.503	8	-63.537	7	-0.083	7	0.012	0.139	0.040	[illegible]	1.747	[illegible]	0.011	0.022	[illegible]
2019	M212	3in Dia. Duct	Sec 5 - max	0.243	7	-0.045	8	-0.031	2	0.073	8	-0.007	5	-3.189	6	3.579	7	-13.162	5	-0.056	5	0.028	0.003	0.159	[illegible]	3.579	[illegible]	0.004	0.003	[illegible]
2319	M242	6in Dia. Duct	Sec 6 - max	0.056	5	0.030	5	0.066	8	0.508	8	1.231	5	0.423	5	1.335	8	192.963	7	0.162	7	0.007	0.088	0.095	[illegible]	1.335	[illegible]	0.020	0.008	[illegible]
1909	M201	8in Dia. Duct	Sec 5 - max	0.004	1	0.004	7	0.004	6	-0.223	6	1.361	5	0.977	8	1.297	5	1313.992	4	1.153	4	0.000	0.097	0.093	[illegible]	1.361	[illegible]	0.142	0.000	[illegible]
1910	M201	8in Dia. Duct	Sec 5 - min	0.004	1	-0.004	6	-0.004	5	-1.361	5	0.223	6	-1.297	5	-0.977	8	1103.694	3	0.969	3	0.000	0.097	0.093	[illegible]	1.361	[illegible]	0.120	0.000	[illegible]
1911	M202	8in Dia. Duct	Sec 1 - max	0.004	1	0.004	6	0.004	6	-0.223	8	1.361	5	0.977	8	1.297	5	1313.992	4	1.153	4	0.000	0.097	0.093	[illegible]	1.361	[illegible]	0.142	0.000	[illegible]
1912	M202	8in Dia. Duct	Sec 1 - min	0.004	1	-0.004	6	-0.004	6	-1.361	5	0.223	8	-1.297	5	-0.977	8	1103.694	3	0.969	3	0.000	0.097	0.093	[illegible]	1.361	[illegible]	0.120	0.000	[illegible]
722	M83	6in Dia. Duct	Sec 1 - min	-0.348	7	-0.092	7	-0.237	7	-0.908	7	-1.985	8	-0.063	8	-0.020	5	-219.491	7	-0.184	7	0.044	0.142	0.005	[illegible]	1.985	[illegible]	0.023	0.029	[illegible]
2308	M241	6in Dia. Duct	Sec 4 - min	-0.007	8	-0.028	7	0.043	5	-1.286	5	-0.494	8	-1.364	8	-0.451	5	-471.814	6	-0.395	8	0.001	0.092	0.097	[illegible]	1.364	[illegible]	0.049	0.005	[illegible]
760	M86	6in Dia. Duct	Sec 5 - min	-0.210	8	-0.092	7	-0.036	5	-0.879	7	-2.127	6	-0.161	7	-0.125	6	-11.733	6	-0.010	8	0.027	0.152	0.012	[illegible]	2.127	[illegible]	0.001	0.011	[illegible]
2365	M247	6in Dia. Duct	Sec 3 - max	0.029	5	0.026	6	0.120	6	0.262	5	1.494	6	1.113	7	-0.805	6	1490.159	7	1.247	7	0.004	0.107	0.080	[illegible]	1.494	[illegible]	0.154	0.015	[illegible]
1886	M197	16in Dia. Duct	Sec 3 - min	0.147	6	-0.457	8	-0.014	1	-0.439	7	0.176	6	-1.988	3	1.511	4	-5241.484	4	-1.039	4	0.017	0.031	0.142	[illegible]	1.988	[illegible]	0.128	0.056	[illegible]
1907	M201	8in Dia. Duct	Sec 4 - max	0.003	1	0.003	7	0.003	6	-0.225	6	1.358	5	0.975	8	1.294	5	1313.992	4	1.153	4	0.003	0.097	0.092	[illegible]	1.358	[illegible]	0.142	0.000	[illegible]
1908	M201	8in Dia. Duct	Sec 4 - min	0.003	1	-0.003	5	-0.003	5	-1.358	5	0.225	8	-1.294	5	-0.975	8	1103.694	3	0.969	3	0.000	0.097	0.092	[illegible]	1.358	[illegible]	0.120	0.000	[illegible]
1816	M192	16in Dia. Duct	Sec 4 - min	0.114	1	-0.430	1	-0.042	3	-1.520	2	1.242	1	-0.956	6	0.421	7	-1403.254	4	-0.278	4	0.013	0.109	0.068	[illegible]	1.520	[illegible]	0.034	0.053	[illegible]
2364	M247	6in Dia. Duct	Sec 2 - min	-0.054	8	-0.128	7	-0.013	5	-1.489	8	-0.305	5	0.799	6	-1.068	7	86.544	6	0.072	6	0.007	0.106	0.076	[illegible]	1.489	[illegible]	0.009	0.016	[illegible]
1905	M201	8in Dia. Duct	Sec 3 - max	0.002	1	0.002	7	0.002	6	-0.227	8	1.356	5	0.973	8	1.292	5	1313.992	4	1.153	4	0.000	0.097	0.092	[illegible]	1.356	[illegible]	0.142	0.000	[illegible]
1906	M201	8in Dia. Duct	Sec 3 - min	0.002	1	-0.002	5	-0.002	5	-1.356	5	0.227	8	-1.292	5	-0.973	8	1103.694	3	0.969	3	0.000	0.097	0.092	[illegible]	1.356	[illegible]	0.120	0.000	[illegible]
1876	M198	16in Dia. Duct	Sec 3 - max	0.058	7	-0.536	1	0.006	2	-1.140	6	1.414	7	-0.601	4	1.146	3	-5976.034	2	-1.185	2	0.007	0.101	0.082	[illegible]	1.414	[illegible]	0.146	0.056	[illegible]
753	M88	8in Dia. Duct	Sec 2 - max	0.289	7	0.074	6	0.011	8	1.929	6	0.857	7	0.223	8	0.244	7	15.133	7	0.013	7	0.034	0.138	0.017	[illegible]	1.929	[illegible]	0.002	0.009	[illegible]
758	M86	8in Dia. Duct	Sec 4 - min	-0.209	6	-0.089	7	-0.034	5	-0.852	7	-2.081	6	-0.198	7	-0.167	6	-11.733	6	-0.010	8	0.026	0.149	0.014	[illegible]	2.081	[illegible]	0.001	0.011	[illegible]
2122	M223	3in Dia. Duct	Sec 1 - min	0.123	7	0.093	5	-0.058	2	-2.523	8	2.498	5	-0.956	1	-1.411	2	-38.188	5	-0.155	5	0.014	0.112	0.063	[illegible]	2.523	[illegible]	0.012	0.007	[illegible]
2560	M266	3in Dia. Duct	Sec 5 - min	0.123	7	-0.094	8	-0.036	5	-2.523	8	2.496	5	-0.956	1	-1.411	2	-36.188	5	-0.155	5	0.014	0.112	0.063	[illegible]	2.523	[illegible]	0.012	0.007	[illegible]
1903	M201	6in Dia. Duct	Sec 2 - max	0.001	1	0.001	7	0.001	8	-0.228	8	1.355	5	0.972	8	1.281	5	1313.992	4	1.153	4	0.000	0.097	0.092	[illegible]	1.355	[illegible]	0.142	0.000	[illegible]
1904	M201	6in Dia. Duct	Sec 2 - min	0.001	1	-0.001	5	-0.001	5	-1.355	5	0.228	8	-1.291	5	-0.972	8	1103.694	3	0.969	3	0.000	0.097	0.092	[illegible]	1.355	[illegible]	0.120	0.000	[illegible]
469	M51	8in Dia. Duct	Sec 5 - max	0.000	1	0.042	6	0.073	6	-0.229	8	1.355	5	0.971	6	1.281	5	1313.992	4	1.153	4	0.000	0.097	0.092	[illegible]	1.355	[illegible]	0.142	0.009	[illegible]
490	M51	8in Dia. Duct	Sec 5 - min	0.000	6	-0.104	5	-0.248	7	-1.355	5	0.229	8	-1.201	5	-0.971	8	1103.694	3	0.969	3	0.000	0.097	0.092	[illegible]	1.355	[illegible]	0.120	0.031	[illegible]
1901	M201	8in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	-0.229	8	1.355	5	0.971	8	1.291	5	1313.992	4	1.153	4	0.000	0.097	0.092	[illegible]	1.355	[illegible]	0.142	0.000	[illegible]
1902	M201	8in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	-1.355	5	0.229	8	-1.291	5	-0.971	8	1103.694	3	0.969	3	0.000	0.097	0.092	[illegible]	1.355	[illegible]	0.120	0.000	[illegible]
380	M40	8in Dia. Duct	Sec 5 - min	0.064	6	-0.219	5	-0.136	6	-1.497	5	1.015	8	-1.034	6	0.453	7	472.962	5	0.396	5	0.008	0.107	0.074	[illegible]	1.497	[illegible]	0.049	0.027	[illegible]
1876	M198	16in Dia. Duct	Sec 3 - min	0.053	8	-0.550	2	-0.008	1	-1.414	7	1.140	6	-1.146	3	0.601	4	-6450.135	1	-1.278	1	0.000	0.101	0.082	[illegible]	1.414	[illegible]	0.158	0.068	[illegible]
2310	M241	6in Dia. Duct	Sec 5 - min	-0.007	8	-0.029	7	0.043	5	-1.292	5	-0.500	8	-1.334	8	-0.471	5	-471.814	6	-0.395	6	0.001	0.092	0.095	[illegible]	1.334	[illegible]	0.049	0.005	[illegible]
1355	M146	6in Dia. Duct	Sec 3 - max	-0.054	8	0.031	1	-0.267	2	0.149	5	0.416	8	2.125	8	-0.527	5	224.697	8	0.188	8	0.007	0.030	0.152	[illegible]	2.125	[illegible]	0.023	0.033	[illegible]
758	M68	6in Dia. Duct	Sec 3 - min	-0.208	6	-0.066	7	-0.032	5	-0.730	7	-2.030	8	-0.234	7	-0.208	6	-11.733	6	-0.010	8	0.026	0.145	0.017	[illegible]	2.030	[illegible]	0.001	0.011	[illegible]
2316	M242	6in Dia. Duct	Sec 4 - min	-0.010	8	0.004	8	0.041	5	-1.245	5	-0.506	8	-1.366	8	-0.404	5	-452.030	6	-0.378	6	0.001	0.089	0.098	[illegible]	1.366	[illegible]	0.047	0.005	[illegible]
2023	M213	3in Dia. Duct	Sec 2 - max	0.233	7	-0.045	8	0.146	7	0.009	6	-0.080	5	-3.199	2	3.525	1	-9.047	1	-0.039	1	0.027	0.004	0.157	[illegible]	3.525	[illegible]	0.003	0.011	[illegible]
731	M84	6in Dia. Duct	Sec 1 - max	0.267	7	0.032	6	0.118	6	1.985	6	0.908	7	0.125	6	0.161	7	219.491	7	0.184	7	0.034	0.142	0.012	[illegible]	1.985	[illegible]	0.023	0.015	[illegible]
331	M36	5in Dia. Duct	Sec 1 - max	0.193	5	0.091	6	0.045	6	-0.204	7	0.535	6	1.004	5	1.463	8	650.492	7	0.847	7	0.028	0.042	0.116	[illegible]	1.463	[illegible]	0.117	0.013	[illegible]
2569	M267	16in Dia. Duct	Sec 6 - max	0.002	6	-0.011	1	0.008	1	-1.678	6	1.961	7	-0.103	4	0.651	3	-6235.746	2	-1.236	2	0.000	0.140	0.047	[illegible]	1.961	[illegible]	0.153	0.001	[illegible]
2570	M267	16in Dia. Duct	Sec 6 - min	-0.002	5	-0.011	1	-0.008	2	-1.961	7	1.678	6	-0.651	3	0.103	4	-6812.210	1	-1.350	1	0.000	0.140	0.047	[illegible]	1.961	[illegible]	0.167	0.001	[illegible]
2383	M247	6in Dia. Duct	Sec 2 - max	0.030	5	0.026	6	0.120	8	0.305	5	1.489	8	1.066	7	-0.799	6	1490.159	7	1.247	7	0.004	0.106	0.076	[illegible]	1.489	[illegible]	0.154	0.015	[illegible]
2567	M267	16in Dia. Duct	Sec 4 - max	0.002	6	-0.008	1	0.008	1	-1.673	6	1.956	7	-0.103	4	0.651	3	-6235.746	2	-1.236	2	0.000	0.140	0.047	[illegible]	1.956	[illegible]	0.153	0.001	[illegible]
2568	M267	16in Dia. Duct	Sec 4 - min	-0.002	5	-0.008	1	-0.006	2	-1.856	7	1.673	6	-0.651	3	0.103	4	-6812.210	1	-1.350	1	0.000	0.140	0.047	[illegible]	1.956	[illegible]	0.167	0.001	[illegible]
707	M61	6in Dia. Duct	Sec 4 - max	0.295	6	0.080	6	0.285	7	1.607	6	0.497	7	0.397	6	0.478	7	109.312	7	0.091	7	0.037	0.115	0.034	[illegible]	1.607	[illegible]	0.011	0.033	[illegible]
2025	M213	3in Dia. Duct	Sec 3 - max	0.233	7	-0.048	8	0.146	7	0.064	6	-0.056	5	-3.145	2	3.517	1	-9.047	1	-0.039	1	0.027	0.003	0.166	[illegible]	3.517	[illegible]	0.003	0.011	[illegible]
2565	M267	16in Dia. Duct	Sec 3 - max	0.001	6	-0.006	1	0.004	1	-1.660	6	1.952	7	-0.103	4	0.651	3	-6235.746	2	-1.236	2	0.000	0.139	0.047	[illegible]	1.952	[illegible]	0.153	0.001	[illegible]
2566	M267	16in Dia. Duct	Sec 3 - min	-0.001	5	-0.006	1	-0.004	2	-1.952	7	1.669	6	-0.651	3	0.103	4	-6812.210	1	-1.350	1	0.000	0.139	0.047	[illegible]	1.952	[illegible]	0.167	0.001	[illegible]
1105	M121	6in Dia. Duct	Sec 3 - max	0.147	5	-0.131	7	0.038	7	-1.121	6	1.607	5	-0.137	7	0.736	6	1097.171	8	0.918	8	0.019	0.115	0.053	[illegible]	1.607	[illegible]	0.113	0.016	[illegible]
716	M82	6in Dia. Duct	Sec 3 - min	-0.184	6	-0.042	7	-0.144	6	-0.437	7	-1.495	8	-0.782	7	-0.639	6	-109.312	7	-0.091	7	0.023	0.107	0.056	[illegible]	1.495	[illegible]	0.011	0.018	[illegible]
2382	M247	6in Dia. Duct	Sec 1 - min	-0.054	8	-0.125	7	-0.013	5	-1.463	8	-0.347	5	0.793	6	-1.024	7	86.544	6	0.072	6	0.007	0.106	0.073	[illegible]	1.483	[illegible]	0.009	0.015	[illegible]
1881	M199	16in Dia. Duct	Sec 1 - max	0.000	5	0.004	2	0.003	2	-1.668	6	1.951	7	-0.103	4	0.651	3	-6235.746	2	-1.235	2	0.000	0.139	0.047	[illegible]	1.951	[illegible]	0.153	0.000	[illegible]
1882	M199	16in Dia. Duct	Sec 1 - min	0.000	8	0.004	5	-0.003	1	-1.951	7	1.668	6	-0.651	3	0.103	4	-6812.210	1	-1.350	1	0.000	0.139	0.047	[illegible]	1.951	[illegible]	0.167	0.000	[illegible]
1108	M121	6in Dia. Duct	Sec 4 - min	0.085	8	-0.168	6	-0.138	6	-1.663	5	1.177	8	-0.788	6	0.122	7	557.911	5	0.467	5	0.011	0.119	0.056	[illegible]	1.663	[illegible]	0.056	0.021	[illegible]
1883	M199	16in Dia. Duct	Sec 2 - max	0.000	5	0.003	2	0.002	2	-1.667	8	1.950	7	-0.103	4	0.651	3	-6235.748	2	-1.236	2	0.000	0.139	0.047	[illegible]	1.950	[illegible]	0.153	0.000	[illegible]
1884	M199	16in Dia. Duct	Sec 2 - min	0.000	8	0.003	5	-0.002	1	-1.950	7	1.687	6	-0.651	3	0.103	4	-6812.210	1	-1.350	1	0.000	0.139	0.047	[illegible]	1.950	[illegible]	0.187	0.000	[illegible]
1885	M199	16in Dia. Duct	Sec 3 - max	0.000	5	0.002	2	0.001	2	-1.667	8	1.950	7	-0.103	4	0.651	3	-6235.748	2	-1.236	2	0.000	0.139	0.047	[illegible]	1.950	[illegible]	0.153	0.000	[illegible]
1886	M199	16in Dia. Duct	Sec 3 - min	0.000	8	0.002	5	-0.001	1	-1.950	7	1.667	6	-0.651	3	0.103	4	-6812.210	1	-1.350	1	0.000	0.139	0.047	[illegible]	1.950	[illegible]	0.167	0.000	[illegible]
1887	M199	16in Dia. Duct	Sec 4 - max	0.000	5	0.000	2	0.000	2	-1.666	6	1.950	7	-0.103	4	0.651	3	-6235.748	2	-1.236	2	0.000	0.138	0.047	[illegible]	1.950	[illegible]	0.153	0.000	[illegible]
1888	M199	16in Dia. Duct	Sec 4 - min	0.000	8	0.000	5	0.000	1	-1.950	7	1.666	6	-0.651	3	0.103	4	-6812.210	1	-1.350	1	0.000	0.139	0.047	[illegible]	1.950	[illegible]	0.167	0.000	[illegible]
1889	M199	16in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	-1.666	6	1.950	7	-0.103	4	0.651	3	-6235.746	2	-1.238	2	0.000	0.139	0.047	[illegible]	1.950	[illegible]	0.153	0.000	[illegible]
1890	M199	16in Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	-1.950	7	1.666	6	-0.651	3	0.103	4	-6812.210	1	-1.350	1	0.000	0.139	0.047	[illegible]	1.950	[illegible]	0.167	0.000	[illegible]
2561	M267	16in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	-1.666	6	1.950	7	-0.103	4	0.651	3	-6235.746	2	-1.236	2	0.000	0.138	0.047	[illegible]	1.950	[illegible]	0.153	0.000	[illegible]
2562	M267	16in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	-1.850	7	1.666	6	-0.651	3	0.103	4	-6812.210	1	-1.350	1	0.000	0.139	0.047	[illegible]	1.950	[illegible]	0.167	0.000	[illegible]
2563	M267	16in Dia. Duct	Sec 2 - max	0.000	6	-0.003	1	0.002	1	-1.887	6	1.950	7	-0.103	4	0.651	3	-6235.746	2	-1.236	2	0.000	0.139	0.047	[illegible]	1.950	[illegible]	0.153	0.000	[illegible]
2564	M267	16in Dia. Duct	Sec 2 - min	0.000	5	-0.003	1	-0.002	2	-1.950	7	1.667	6	-0.651	3	0.103	4	-6812.210	1	-1.350	1	0.000	0.139	0.047	[illegible]	1.950	[illegible]	0.167	0.000	[illegible]
1368	M147	8in Dia. Duct	Sec 4 - min	-0.342	1	-0.103	5	-0.290	6	0.022	6	-0.214	5	0.077	5	-1.779	8	107.085	5	0.090	5	0.043	0.015	0.127	[illegible]	1.779	[illegible]	0.011	0.036	[illegible]
979	M108	6in Dia. Duct	Sec 5 - max	0.038	5	0.038	8	0.036	6	-1.190	8	1.334	5	-1.024	8	1.192	5	-39.368	5	-0.033	5	0.005	0.095	0.085	[illegible]	1.334	[illegible]	0.004	0.005	[illegible]
980	M108	6in Dia. Duct	Sec 5 - min	0.038	2	-0.038	6	-0.038	7	-1.334	5	1.198	8	-1.192	5	1.024	8	-591.098	8	-0.495	8	0.005	0.095	0.085	[illegible]	1.334	[illegible]	0.001	0.005	[illegible]
741	M85	6in Dia. Duct	Sec 1 - max	0.314	6	0.077	8	0.015	6	1.825	6	0.509	7	0.183	5	0.207	8	11.733	6	0.010	6	0.040	0.130	0.015	[illegible]	1.825	[illegible]	0.001	0.010	[illegible]
971	M108	6in Dia. Duct	Sec 1 - max	0.035	5	0.035	8	0.035	6	-1.183	8	1.350	7	-1.040	7	1.175	6	-39.368	5	-0.033	5	0.004	0.096	0.084	[illegible]	1.350	[illegible]	0.004	0.004	[illegible]
972	M108	6in Dia. Duct	Sec 1 - min	0.035	2	-0.035	6	-0.035	7	-1.350	5	1.183	6	-1.175	8	1.040	7	-591.099	8	-0.495	8	0.004	0.096	0.084	[illegible]	1.350	[illegible]	0.061	0.004	[illegible]
2027	M213	3in Dia. Duct	Sec 4 - max	0.233	7	-0.047	8	0.146	7	0.039	8	-0.010	5	-3.100	2	3.508	1	-9.047	1	-0.039	1	0.027	0.002	0.156	[illegible]	3.508	[illegible]	0.003	0.011	[illegible]
2320	M242	6in Dia. Duct	Sec 5 - min	-0.011	8	0.003	8	0.040	5	-1.231	5	-0.508	8	-1.335	6	-0.423	5	-452.030	6	-0.378	6	0.001	0.088	0.095	[illegible]	1.335	[illegible]	0.047	0.005	[illegible]
697	M80	8in Dia. Duct	Sec 4 - max	0.209	8	0.005	7	0.057	8	0.605	7	0.697	6	1.333	6	1.525	7	0.000	1	0.000	1	0.025	0.050	0.109	[illegible]	1.525	[illegible]	0.000	0.007	[illegible]
525	M55	8in Dia. Duct	Sec 3 - max	0.011	8	0.037	5	0.231	8	0.876	3	-0.380	4	1.677	8	-0.162	5	1028.609	7	0.903	7	0.001	0.063	0.120	[illegible]	1.677	[illegible]	0.111	0.029	[illegible]
526	M55	8in Dia. Duct	Sec 3 - min	-0.011	5	-0.046	8	0.194	7	0.360	4	-0.876	3	0.162	5	-1.677	8	956.930	6	0.840	6	0.001	0.063	0.120	[illegible]	1.677	[illegible]	0.104	0.024	[illegible]
828	M93	5in Dia. Duct	Sec 5 - max	0.124	5	0.060	2	0.325	6	-0.212	6	0.742	7	1.107	5	1.342	8	666.772	8	0.868	7	0.018	0.059	0.107	[illegible]	1.342	[illegible]	0.120	0.045	[illegible]
72	M8	6in Dia. Duct	Sec 1 - min	-0.359	1	-0.128	1	-0.189	8	0.218	5	-0.239	8	0.030	5	-1.695	8	83.143	7	0.070	7	0.045	0.017	0.121	[illegible]	1.695	[illegible]	0.009	0.025	[illegible]
717	M82	6in Dia. Duct	Sec 4 - max	0.250	7	0.080	6	0.191	7	1.607	6	0.497	7	0.439	5	0.518	7	371.703	6	0.311	6	0.032	0.115	0.037	[illegible]	1.607	[illegible]	0.036	0.024	[illegible]
2029	M213	3in Dia. Duct	Sec 5 - max	0.233	7	-0.047	8	0.147	7	0.013	6	-0.005	5	-3.055	2	3.499	1	-9.047	1	-0.039	1	0.027	0.001	0.156	[illegible]	3.499	[illegible]	0.003	0.011	[illegible]
1729	M183	4in Dia. Duct	Sec 5 - max	0.188	5	0.999	5	-0.027	6	-2.235	8	2.891	6	0.140	8	0.822	5	764.901	7	1.683	7	0.018	0.128	0.037	[illegible]	2.891	[illegible]	0.129	0.077	[illegible]
2351	M247	6in Dia. Duct	Sec 1 - max	0.030	5	0.026	6	0.119	8	0.347	5	1.483	8	1.024	7	-0.793	6	1490.159	7	1.247	7	0.004	0.106	0.073	[illegible]	1.483	[illegible]	0.154	0.015	[illegible]
698	M80	6in Dia. Duct	Sec 4 - min	-0.200	5	-0.065	6	-0.067	7	-0.697	8	-0.605	7	-1.525	7	-1.333	6	0.000	1	0.000	1	0.024	0.050	0.108	[illegible]	1.525	[illegible]	0.000	0.008	[illegible]
2321	M243	6in Dia. Duct	Sec 1 - max	0.046	5	0.071	5	0.066	8	0.503	8	1.231	5	0.238	5	1.246	8	351.523	7	0.294	7	0.006	0.086	0.089	[illegible]	1.246	[illegible]	0.016	0.009	[illegible]

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{sy}/σ_a	f_{sz}/σ_a		f_b (ksi)		f/σ_b	f/σ_a	
721	M83	6in Dia. Duct	Sec 1 - max	0.288	6	0.032	6	0.188	6	1.985	6	0.908	7	0.020	5	0.063	8	457.131	6	0.383	6	0.036	0.142	0.005		1.985		0.047	0.023	
751	M86	6in Dia. Duct	Sec 1 - min	0.269	7	0.077	6	0.010	6	1.625	6	0.569	7	0.236	6	0.252	7	15.133	7	0.013	7	0.034	0.130	0.018		1.625		0.002	0.010	
710	M81	6in Dia. Duct	Sec 5 - min	-0.354	7	-0.047	7	-0.224	6	-0.560	7	-1.715	6	-0.207	8	-0.183	5	-371.703	6	-0.311	6	0.045	0.123	0.015		1.715		0.036	0.028	
1357	M146	6in Dia. Duct	Sec 4 - max	-0.054	8	0.031	1	-0.267	2	0.154	5	0.420	8	2.031	8	-0.480	5	224.697	8	0.188	8	0.007	0.030	0.145		2.031		0.023	0.033	
1815	M192	16in Dia. Duct	Sec 3 - max	0.159	2	-0.383	2	0.029	4	-1.017	1	1.318	2	-0.404	7	0.970	6	-437.069	3	-0.087	3	0.018	0.094	0.069		1.318		0.011	0.047	
493	M52	6in Dia. Duct	Sec 2 - max	-0.054	1	0.047	6	0.053	3	-0.329	8	1.255	5	0.871	8	1.191	5	1313.992	4	1.153	4	0.007	0.090	0.085		1.255		0.142	0.007	
494	M52	6in Dia. Duct	Sec 2 - min	-0.054	6	-0.047	7	-0.053	4	-1.255	5	0.329	8	-1.191	5	-0.871	8	1103.694	3	0.969	3	0.007	0.090	0.085		1.255		0.120	0.007	
1728	M183	4in Dia. Duct	Sec 4 - min	0.028	8	0.102	8	-0.059	5	-3.215	6	2.325	7	-0.800	5	-0.150	8	305.066	6	0.671	6	0.003	0.143	0.036		3.215		0.052	0.008	
1119	M122	6in Dia. Duct	Sec 5 - max	0.168	5	0.017	5	0.041	7	-1.304	8	1.694	5	0.534	7	0.120	6	1123.552	8	0.940	8	0.021	0.121	0.039		1.694		0.110	0.005	
754	M86	6in Dia. Duct	Sec 2 - min	-0.199	8	-0.051	7	-0.015	5	-0.657	7	-1.929	6	-0.244	7	-0.223	6	-11.733	8	-0.010	6	0.025	0.138	0.017		1.929		0.001	0.006	
973	M108	6in Dia. Duct	Sec 2 - max	0.035	5	0.035	8	0.035	6	-1.215	6	1.316	7	-1.072	7	1.144	6	-39.368	5	-0.033	5	0.004	0.094	0.082		1.316		0.004	0.004	
974	M108	6in Dia. Duct	Sec 2 - min	0.035	2	-0.035	6	-0.035	7	-1.316	7	1.215	6	-1.144	6	1.072	7	-591.099	8	-0.495	8	0.004	0.094	0.082		1.316		0.061	0.004	
383	M41	6in Dia. Duct	Sec 2 - max	0.116	5	-0.149	8	0.096	6	1.412	7	-1.086	6	-0.522	6	0.905	7	859.916	6	0.720	6	0.015	0.101	0.065		1.412		0.089	0.016	
827	M93	5in Dia. Duct	Sec 4 - max	0.124	5	0.061	2	0.325	6	-0.229	6	0.759	7	1.017	5	1.281	6	666.772	7	0.858	7	0.018	0.060	0.102		1.281		0.120	0.045	
977	M108	6in Dia. Duct	Sec 4 - max	0.037	5	0.037	8	0.037	8	-1.233	8	1.299	5	-1.056	8	1.157	5	-39.368	5	-0.033	5	0.005	0.093	0.083		1.299		0.004	0.005	
978	M108	6in Dia. Duct	Sec 4 - min	0.037	2	-0.037	6	-0.037	7	-1.299	5	1.233	8	-1.157	5	1.056	8	-591.099	8	-0.495	8	0.005	0.093	0.083		1.299		0.061	0.005	
939	M104	6in Dia. Duct	Sec 5 - max	0.019	6	-0.050	6	0.028	6	-0.714	7	1.135	6	1.349	6	-0.101	5	826.314	7	0.692	7	0.002	0.081	0.098		1.348		0.065	0.006	
1117	M122	6in Dia. Duct	Sec 4 - max	0.167	5	0.017	5	0.041	7	-1.286	8	1.700	5	0.519	7	0.067	6	1123.552	8	0.940	8	0.021	0.121	0.037		1.700		0.116	0.005	
1115	M122	6in Dia. Duct	Sec 3 - max	0.167	5	0.017	5	0.040	7	-1.268	8	1.707	5	0.504	7	0.014	6	1123.552	8	0.940	8	0.021	0.122	0.036		1.707		0.116	0.005	
937	M104	6in Dia. Duct	Sec 4 - max	0.019	6	-0.049	6	0.028	6	-0.685	7	1.111	6	1.361	6	-0.168	5	826.314	7	0.692	7	0.002	0.079	0.097		1.361		0.065	0.006	
712	M54	6in Dia. Duct	Sec 1 - min	-0.202	6	-0.092	7	-0.171	7	-0.906	7	-1.965	6	-0.161	7	-0.125	6	-457.131	6	-0.383	6	0.026	0.142	0.012		1.965		0.047	0.021	
2291	M240	6in Dia. Duct	Sec 1 - max	0.056	5	0.020	8	0.059	7	0.446	8	1.174	5	0.362	5	1.229	8	-42.065	5	-0.035	5	0.007	0.084	0.088		1.229		0.004	0.007	
830	M93	5in Dia. Duct	Sec 5 - min	-0.090	8	0.060	5	-0.222	7	-0.742	7	0.212	6	-1.342	8	-1.107	5	376.109	6	0.492	6	0.013	0.059	0.107		1.342		0.068	0.031	
859	M96	6in Dia. Duct	Sec 5 - max	0.011	5	0.083	5	-0.128	6	1.079	6	-0.846	7	-0.353	5	1.401	6	-687.343	6	-0.575	6	0.001	0.077	0.100		1.401		0.071	0.016	
860	M96	6in Dia. Duct	Sec 5 - min	-0.011	6	0.050	6	-0.257	7	0.846	7	-1.079	6	-1.401	8	0.353	5	-992.905	7	-0.831	7	0.001	0.077	0.100		1.401		0.103	0.032	
2293	M240	6in Dia. Duct	Sec 2 - max	0.055	5	0.020	6	0.059	8	0.453	8	1.199	5	0.384	5	1.202	8	-42.065	5	-0.035	5	0.007	0.086	0.086		1.202		0.004	0.007	
940	M104	6in Dia. Duct	Sec 5 - min	-0.008	5	-0.081	7	-0.028	8	-1.135	6	0.714	7	0.101	5	-1.348	6	534.257	6	0.447	6	0.001	0.081	0.096		1.348		0.055	0.008	
935	M104	6in Dia. Duct	Sec 3 - max	0.019	6	-0.049	6	0.027	6	-0.657	7	1.088	6	1.315	8	-0.155	5	826.314	7	0.692	7	0.002	0.078	0.098		1.375		0.065	0.005	
2322	M243	6in Dia. Duct	Sec 1 - min	-0.011	6	-0.006	6	0.040	5	-1.231	5	-0.508	8	-1.246	8	-0.238	5	-382.427	6	-0.320	6	0.001	0.086	0.089		1.246		0.040	0.005	
1113	M122	6in Dia. Duct	Sec 2 - max	0.166	5	0.017	5	0.040	7	-1.250	8	1.713	5	0.489	7	-0.038	6	1123.552	8	0.940	8	0.021	0.122	0.035		1.713		0.116	0.005	
1370	M147	6in Dia. Duct	Sec 5 - min	-0.341	1	-0.103	5	-0.291	6	-0.000	8	-0.185	5	0.021	5	-1.706	8	107.065	5	0.090	5	0.043	0.013	0.122		1.706		0.011	0.036	
1103	M121	6in Dia. Duct	Sec 2 - max	0.147	5	-0.130	7	0.038	7	-1.085	8	1.550	5	-0.151	7	0.884	6	1097.171	8	0.918	8	0.019	0.111	0.049		1.550		0.113	0.016	
1861	M197	16in Dia. Duct	Sec 1 - max	0.158	7	-0.438	5	0.017	2	0.261	6	0.002	7	-1.511	4	1.988	3	-4550.766	3	-0.902	3	0.018	0.019	0.142		1.988		0.111	0.054	
1106	M121	6in Dia. Duct	Sec 3 - min	0.085	8	-0.167	6	-0.138	6	-1.607	5	1.121	8	-0.756	6	0.137	7	557.911	5	0.467	5	0.011	0.115	0.053		1.607		-0.058	0.021	
2323	M243	6in Dia. Duct	Sec 2 - max	0.048	5	0.069	5	0.067	8	0.505	8	1.197	5	0.257	5	1.215	8	351.523	7	0.294	7	0.006	0.086	0.087		1.215		0.036	0.009	
2295	M240	6in Dia. Duct	Sec 3 - max	0.055	5	0.021	6	0.060	8	0.461	8	1.223	5	0.400	5	1.173	8	-42.065	5	-0.035	5	0.007	0.087	0.084		1.223		0.004	0.007	
364	M41	6in Dia. Duct	Sec 2 - min	0.093	8	-0.236	5	-0.096	7	1.086	6	-1.412	7	-0.905	7	0.322	6	202.160	7	0.169	7	0.013	0.101	0.065		1.412		0.021	0.029	
117	M12	5in Dia. Duct	Sec 4 - max	0.096	5	0.229	8	-0.029	8	1.301	8	0.298	5	0.185	8	0.762	5	236.032	6	0.207	6	0.014	0.103	0.060		1.301		0.042	0.030	
332	M38	5in Dia. Duct	Sec 1 - min	-0.131	8	0.091	7	-0.045	7	-0.535	6	0.204	7	-1.463	8	-1.004	5	320.811	6	0.410	6	0.019	0.042	0.116		1.463		0.058	0.013	
2297	M240	6in Dia. Duct	Sec 4 - max	0.054	5	0.021	6	0.061	8	0.466	8	1.248	5	0.429	5	1.145	8	-42.065	5	-0.035	5	0.007	0.089	0.082		1.248		0.004	0.008	
1111	M122	6in Dia. Duct	Sec 1 - max	0.166	5	0.018	5	0.039	7	-1.230	8	1.720	5	0.474	7	-0.091	6	1123.552	8	0.940	8	0.021	0.123	0.034		1.720		0.116	0.005	
938	M104	6in Dia. Duct	Sec 4 - min	-0.008	5	-0.080	7	-0.028	8	-1.111	6	0.685	7	0.188	5	-1.361	8	534.257	8	0.447	8	0.001	0.079	0.097		1.361		0.055	0.007	
2528	M263	2in Dia. Duct	Sec 4 - min	0.054	8	-0.218	5	-0.273	5	0.480	8	-1.077	5	0.463	8	-2.493	5	0.000	1	0.000	1	0.012	0.073	0.092		2.493		0.000	0.018	
861	M97	6in Dia. Duct	Sec 1 - max	0.003	5	0.051	5	-0.112	6	1.079	6	-0.846	7	-0.353	5	1.401	8	-687.343	6	-0.575	6	0.000	0.077	0.100		1.401		0.071	0.014	
862	M97	6in Dia. Duct	Sec 1 - min	-0.003	8	0.017	6	-0.274	7	0.846	7	-1.079	6	-1.401	8	0.353	5	-992.905	7	-0.831	7	0.000	0.077	0.100		1.401		0.103	0.034	
2299	M240	6in Dia. Duct	Sec 5 - max	0.054	5	0.022	6	0.061	6	0.478	8	1.273	5	0.450	5	1.115	8	-42.065	5	-0.035	5	0.007	0.091	0.080		1.273		0.004	0.008	
933	M104	6in Dia. Duct	Sec 2 - max	0.018	8	-0.047	6	0.027	8	-0.629	7	1.065	6	1.387	8	-0.142	5	826.314	7	0.692	7	0.002	0.076	0.099		1.387		0.065	0.006	
936	M104	6in Dia. Duct	Sec 3 - min	-0.008	5	-0.059	7	-0.027	8	-1.088	6	0.657	7	0.155	5	-1.375	8	534.257	6	0.447	6	0.001	0.078	0.098		1.375		0.055	0.007	
1862	M197	16in Dia. Duct	Sec 1 - min	0.145	6	-0.454	8	-0.017	1	-0.002	7	-0.281	6	-1.988	3	1.511	4	-5241.484	4	-1.039	4	0.016	0.019	0.142		1.988		0.128	0.056	
1361	M147	6in Dia. Duct	Sec 1 - max	-0.100	2	-0.085	8	-0.167	7	0.301	5	-0.095	8	1.999	8	-0.248	5	164.322	6	0.138	6	0.013	0.022	0.143		1.998		0.017	0.021	
931	M104	6in Dia. Duct	Sec 1 - max	0.018	8	-0.047	6	0.026	6	-0.602	7	1.043	8	1.400	8	-0.129	5	826.314	7	0.692	7	0.002	0.075	0.100		1.400		0.065	0.006	
826	M93	5in Dia. Duct	Sec 3 - max	0.124	5	0.061	2	0.325	6	-0.247	6	0.776	7	0.927	5	1.221	6	666.772	7	0.858	7	0.018	0.062	0.097		1.221		0.120	0.045	
975	M108	6in Dia. Duct	Sec 3 - max	0.036	5	0.036	6	0.036	6	-1.247	6	1.285	7	-1.092	6	1.124	5	-39.368	5	-0.033	5	0.005	0.092	0.080		1.285		0.004	0.004	
976	M108	6in Dia. Duct	Sec 3 - min	0.036	2	-0.036	6	-0.036	7	-1.285	7	1.247	6	-1.124	5	1.092	8	-591.099	8	-0.495	8	0.005	0.092	0.080		1.285		0.061	0.004	
2222	M233	2in Dia. Duct	Sec 1 - min	0.168	8	0.022	8	0.021	8	-1.082	5	-0.471	8	-2.672	2	-0.160	1	-0.009	8	0.000	8	0.037	0.040	0.099		2.672		0.000	0.001	
934	M104	6in Dia. Duct	Sec 2 - min	-0.008	5	-0.056	7	-0.027	8	-1.065	6	0.629	7	0.142	5	-1.387	8	534.257	6	0.447	6	0.001	0.076	0.099		1.387		0.055	0.007	
1818	M192	16in Dia. Duct	Sec 3 - min	0.112	1	-0.428	1	-0.044	3	-1.318	2	1.017	1	-0.970	6	0.404	7	-1403.254	4	-0.278	4	0.013	0.034	0.063		1.318		0.034	0.053	
2059	M216	3in Dia. Duct	Sec 5 - max	0.060	5	-0.055	5	0.075	3	-0.972	5	0.977	6	2.821	8	-1.333	5	-6.980	8	-0.030	8	0.007	0.043	0.125		2.821		0.002	0.005	
2061	M217	3in Dia. Duct	Sec 1 - max	0.060	5	0.061	8	-0.045	4	-0.972	5	0.977	6	2.821	8	-1.333	5	-6.980	8	-0.030	8	0.007	0.043	0.125		2.821		0.002	0.005	
932	M104	6in Dia. Duct	Sec 1 - min	-0.008	5	-0.057	7	-0.026	8	-1.043	6	0.602	7	0.129	5	-1.400	8	534.257	6	0.447	6	0.001	0.075	0.100		1.400		0.055	0.007	
1359	M146	6in Dia. Duct	Sec 5 - max	-0.054	8	0.030	1	-0.268	2	0.158	5	0.423	8	1.939	6	-0.274	5	224.697	8	0.188	8	0.007	0.030	0.138		1.939		0.023	0.033	
1863	M197	16in Dia. Duct	Sec 2 - max	0.157	7	-0.441	5	0.016	2	0.043	6	0.220	7	-1.511	4	1.988	3	-4550.766	3	-0.902	3	0.018	0.016	0.142		1.988		0.111	0.054	
1960	M206	2in Dia. Duct	Sec 5 - min	0.075	8	-0.251	5	-0.271	7	-1.811	7	0.224	6	-2.469	5	0.592	6	-24.608	5	-0.335	5	0.017	0.067	0.091		2.469		0.021	0.017	
828	M93	5in Dia. Duct	Sec 4 - min	-0.090	8	0.061	5	-0.222	7	-0.759	7	0.229	6	-1.281	8	-1.017	5	376.109	6	0.492	6	0.013	0.060	0.102		1.281		0.068	0.031	
718	M82	6in Dia. Duct	Sec 4 - min	-0.184	6	-0.045	7	-0.146	8	-0.497	7	-1.607	6	-0.516	7	-0.439	6	-109.312	7	-0.091	7	0.023	0.115	0.037		1.607		0.011	0.018	
116	M12	5in Dia. Duct	Sec 4 - min	0.074	8	0.140	5	-0.009	5	-0.298	5	-1.301	8	-0.762	5	-0.185	8	-63.537	7	-0.063	7	0.011	0.103	0.060		1.301		0.011	0.019	
709	M81	6in Dia. Duct	Sec 5 - max	0.204	6	0.077	8	0.266	7	1.715	6	0.560	7	0.103	5	0.207	8	105.312	7	0.091	7	0.037	0.123	0.015		1.715		0.011	0.033	
2481	M259	6in Dia. Duct	Sec 1 - max	0.112	5	-0.028	6	0.033	8	0.139	7	0.479	6	-0.846	6	1.765	7	-179.120	6	-0.150	6	0.014	0.034	0.128		1.765		0.019	0.004	
1864	M197	16in Dia. Duct	Sec 2 - min	0.149	8	-0.456	8	-0.016	1	-0.220	7	-0.043	6	-1.988	3	1.511	4	-5241.484	4	-1.039	4	0.016	0.016	0.142		1.988		0.128	0.056	
2479	M258	6in Dia. Duct	Sec 5 - max	0.106	7	-0.049	7	-0.067	6	0.139	7	0.479	6	-0.846	8	1.765	7	-179.120	6	-0.150	6	0.013	0.034	0.128		1.765		0.019	0.008	
2324	M243	6in Dia. Duct	Sec 2 - min	-0.011	8	-0.008	8	0.039	5	-1.197	5	-0.505	8	-1.215	8	-0.257	5	-382.427	6	-0.320	6	0.001	0.086	0.087		1.215		0.040	0.005	
752	M86	6in Dia. Duct	Sec 1 - min	-0.199	6	-0.047	7	-0.013	5	-0.589	7	-1.825	6	-0.252	7	-0.236	6	-11.733	6	-0.010	6	0.025	0.130	0.018		1.825		0.001	0.006	
2325	M243	6in Dia. Duct	Sec 3 - max	0.040	5	0.068	5	0.067	8	0.502	8	1.169	5	0.275	5	1.183	8	351.523	7	0.294	7	0.006	0.063	0.085		1.183		0.036	0.008	
1120	M122	6in Dia. Duct	Sec 5 - min	0.112	8	-0.049	8	-0.141	8	-1.694	5	1.304	8	-0.120	6	-0.534	7	592.931	5	0.496	5	0.014	0.121	0.038		1.694		0.051	0.017	
823	M93	5in Dia. Duct	Sec 2 - max	0.124	5	0.062	2	0.325	6	-0.264	6	0.794	7	0.837	5	1.169	8	666.772	7	0.858	7	0.018	0.063	0.092		1.169		0.120	0.045	
2031	M214	3in Dia. Duct	Sec 1 - max	0.125	5	-0.047	8	0.434	7	0.068	8	-0.059	5	-3.055	2	3.499	1	-5.815	8	-0.024	5	0.015	0.003	0.156		3.499		0.002	0.033	
1118	M122	6in Dia. Duct	Sec 4 - min	0.112	8	-0.048	8	-0.140	8	-1.700	5	1.286	8	-0.067	6	-0.519	7	592.931	5	0.496	5	0.014	0.121	0.037		1.700		0.061	0.017	
2267	M239	6in Dia. Duct	Sec 4 - max	0.065	5	0.080	5	0.041	5	-0.315	6	1.805	7	0.497	6	0.026	7	0.908	5	0.000	5	0.008	0.129	0.026		1.805		0.000	0.010	
2184	M229	2in Dia. Duct	Sec 2 - min	0.054	8	-0.219	5	-0.001	8	-2.662	5	0.041	8	-1.652	5	-0.054	8	-61.838	7	-0.843	7	0.012	0.099	0.061		2.662		0.054	0.014	
2238	M234	2in Dia. Duct	Sec 3 - min	0.153	8	-0.263	5	-0.170	7	-2.737	5	0.554	8	-1.002	5	-0.015	8	-0.003	8	0.000	8	0.034	0.101	0.037		2.737		0.000	0.017	
719	M82	6in Dia. Duct	Sec 5 - max	0.251	7	0.077	6	0.193	7	1.715	6	0.560	7	0.238	6	0.252	7	371.703	6	0.311	6	0.032	0.123	0.018		1.715		0.038	0.024	
1118	M122	6in Dia. Duct	Sec 3 - min	0.111	8	-0.047	8	-0.140	6	-1.707	5	1.266	8	-0.014	6	-0.504	7	592.931	5	0.496	5	0.014	0.122	0.036		1.707		0.061	0.017	
2228	M233	2in Dia. Duct	Sec 4 - min	0.160	8	-0.021	8	-0.009	1	0.500	8	-2.090	5	0.561	6	-1.593	7	-0.009	8	0.000	8	0.036	0.077	0.059		2.090		0.000	0.001	
826	M93	5in Dia. Duct	Sec 3 - min	-0.090	8	0.061	5	-0.222	7	-0.776	7	0.247	6	-1.221	8	-0.927	5	376.109	6	0.492	6	0.013	0.062	0.097		1.221		0.068	0.031	
2292	M240	6in Dia. Duct	Sec 1 - min	0.000	8	-0.056	7	0.047	6	-1.174	5	-0.446	8	-1.229	8	-0.362	5	-657.001	8	-0.550	8	0.000	0.084	0.088		1.229		0.068	0.007	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a		f_t (ksi)		f_v/v_t	f_t/σ_a	
2294	M240	6in Dia. Duct	Sec 2 - min	0.000	8	-0.056	7	0.047	5	-1.199	5	-0.453	8	-1.202	8	-0.384	5	-657.301	8	-0.550	8	0.000	0.086	0.066	[illegible]	1.202	[illegible]	0.068	0.007	[illegible]
339	M38	5in Dia. Duct	Sec 5 - max	0.198	5	0.068	6	0.033	8	0.600	7	-0.530	6	0.472	5	0.931	6	650.492	7	0.847	7	0.029	0.068	0.074	[illegible]	0.931	[illegible]	0.117	0.009	[illegible]
1114	M122	6in Dia. Duct	Sec 2 - min	0.111	8	-0.046	8	-0.139	6	-1.713	5	1.250	8	0.038	6	-0.489	7	592.931	5	0.496	5	0.014	0.122	0.035	[illegible]	1.713	[illegible]	0.061	0.017	[illegible]
2296	M240	6in Dia. Duct	Sec 3 - min	-0.001	8	-0.057	7	0.046	5	-1.223	5	-0.461	8	-1.173	8	-0.406	5	-657.301	8	-0.550	8	0.000	0.087	0.084	[illegible]	1.223	[illegible]	0.068	0.007	[illegible]
2298	M240	6in Dia. Duct	Sec 4 - min	-0.002	8	-0.058	7	0.046	5	-1.248	5	-0.468	8	-1.145	8	-0.428	5	-657.301	8	-0.550	8	0.000	0.089	0.082	[illegible]	1.248	[illegible]	0.068	0.007	[illegible]
385	M41	8in Dia. Duct	Sec 3 - max	0.118	5	-0.148	6	0.097	6	1.130	7	-0.771	6	-0.373	6	1.054	7	859.916	6	0.720	6	0.015	0.081	0.075	[illegible]	1.130	[illegible]	0.089	0.018	[illegible]
2300	M240	6in Dia. Duct	Sec 5 - min	-0.002	8	-0.059	7	0.045	5	-1.273	5	-0.476	8	-1.116	8	-0.450	5	-657.301	8	-0.550	8	0.000	0.091	0.080	[illegible]	1.273	[illegible]	0.068	0.007	[illegible]
1112	M122	6in Dia. Duct	Sec 1 - min	0.111	8	-0.045	8	-0.139	6	-1.720	5	1.233	8	0.091	6	-0.474	7	592.931	5	0.496	5	0.014	0.123	0.034	[illegible]	1.720	[illegible]	0.061	0.017	[illegible]
1101	M121	6in Dia. Duct	Sec 1 - max	0.147	5	-0.129	7	0.037	7	-1.010	8	1.494	5	-0.165	7	0.632	6	1097.171	8	0.918	8	0.019	0.107	0.045	[illegible]	1.494	[illegible]	0.113	0.018	[illegible]
1104	M121	6in Dia. Duct	Sec 2 - min	0.086	8	-0.166	6	-0.137	8	-1.550	5	1.065	6	-0.684	6	0.151	7	557.911	5	0.467	5	0.011	0.111	0.049	[illegible]	1.550	[illegible]	0.058	0.020	[illegible]
1873	M198	18in Dia. Duct	Sec 2 - max	0.058	7	-0.534	1	0.008	2	-0.878	6	1.147	7	-0.601	4	1.146	3	-5976.034	2	-1.185	2	0.007	0.082	0.082	[illegible]	1.147	[illegible]	0.146	0.066	[illegible]
821	M93	5in Dia. Duct	Sec 1 - max	0.124	5	0.062	2	0.325	8	-0.282	6	0.812	7	0.747	5	1.100	8	666.772	7	0.868	7	0.018	0.064	0.087	[illegible]	1.100	[illegible]	0.120	0.045	[illegible]
1979	M208	3in Dia. Duct	Sec 5 - max	0.187	7	-0.013	7	0.059	7	0.626	6	-0.596	7	2.704	5	-1.014	8	34.434	6	0.147	6	0.022	0.028	0.120	[illegible]	2.704	[illegible]	0.011	0.005	[illegible]
1874	M198	16in Dia. Duct	Sec 2 - min	0.052	6	-0.547	2	-0.008	1	-1.147	7	0.878	6	-1.146	3	0.601	4	-6450.135	1	-1.278	1	0.006	0.082	0.082	[illegible]	1.147	[illegible]	0.158	0.068	[illegible]
1363	M147	6in Dia. Duct	Sec 2 - max	-0.100	2	-0.065	8	-0.187	7	0.272	5	-0.071	6	1.925	8	-0.191	5	164.322	6	0.138	8	0.013	0.019	0.136	[illegible]	1.925	[illegible]	0.017	0.021	[illegible]
2022	M213	3in Dia. Duct	Sec 1 - min	0.048	6	-0.045	5	-0.046	6	0.105	5	-0.113	8	-3.579	7	3.189	6	-9.844	2	-0.042	2	0.005	0.005	0.159	[illegible]	3.579	[illegible]	0.003	0.004	[illegible]
2328	M243	6in Dia. Duct	Sec 3 - min	-0.011	8	-0.007	8	0.039	5	-1.165	5	-0.502	8	-1.183	8	-0.275	5	-382.427	6	-0.320	6	0.001	0.083	0.085	[illegible]	1.183	[illegible]	0.040	0.005	[illegible]
131	M14	6in Dia. Duct	Sec 1 - max	0.028	1	0.028	5	0.028	8	-0.098	6	0.457	7	-1.307	7	1.860	6	-6.000	8	-0.005	8	0.004	0.033	0.133	[illegible]	1.860	[illegible]	0.001	0.003	[illegible]
132	M14	6in Dia. Duct	Sec 1 - min	0.028	1	-0.028	8	-0.028	5	-0.457	7	0.098	6	-1.860	6	1.307	7	-418.045	5	-0.350	5	0.004	0.033	0.133	[illegible]	1.860	[illegible]	0.043	0.003	[illegible]
2327	M243	6in Dia. Duct	Sec 4 - max	0.048	5	0.067	5	0.068	8	0.488	8	1.133	5	0.294	5	1.151	8	351.523	7	0.294	7	0.008	0.081	0.082	[illegible]	1.151	[illegible]	0.038	0.008	[illegible]
2060	M216	3in Dia. Duct	Sec 5 - min	0.001	8	-0.055	8	0.014	4	-0.977	8	0.972	5	1.333	5	-2.821	8	-7.691	5	-0.033	5	0.000	0.043	0.125	[illegible]	2.821	[illegible]	0.003	0.004	[illegible]
2062	M217	3in Dia. Duct	Sec 1 - min	0.001	8	0.061	5	-0.111	3	-0.977	8	0.972	5	1.333	5	-2.821	8	-7.691	5	-0.033	5	0.000	0.043	0.125	[illegible]	2.821	[illegible]	0.003	0.009	[illegible]
353	M38	5in Dia. Duct	Sec 2 - max	0.011	5	0.045	7	0.087	8	-0.276	6	1.134	7	0.829	5	0.973	8	401.076	7	0.522	7	0.002	0.090	0.077	[illegible]	1.134	[illegible]	0.072	0.012	[illegible]
354	M38	5in Dia. Duct	Sec 2 - min	-0.011	8	0.045	6	-0.094	5	-1.134	7	0.276	6	-0.973	8	-0.829	6	274.123	6	0.357	8	0.002	0.090	0.077	[illegible]	1.134	[illegible]	0.049	0.013	[illegible]
366	M41	6in Dia. Duct	Sec 3 - min	0.101	5	-0.238	5	-0.097	7	0.771	6	-1.130	7	-1.054	7	0.373	6	202.160	7	0.169	7	0.013	0.081	0.075	[illegible]	1.130	[illegible]	0.021	0.029	[illegible]
133	M14	6in Dia. Duct	Sec 2 - max	0.026	1	0.026	5	0.026	8	-0.054	8	0.500	7	-1.351	7	1.816	6	-6.000	8	-0.005	8	0.003	0.036	0.130	[illegible]	1.816	[illegible]	0.001	0.003	[illegible]
134	M14	6in Dia. Duct	Sec 2 - min	0.026	1	-0.026	8	-0.026	5	-0.500	7	0.054	6	-1.816	6	1.351	7	-418.045	5	-0.350	5	0.003	0.036	0.130	[illegible]	1.816	[illegible]	0.043	0.003	[illegible]
135	M14	6in Dia. Duct	Sec 3 - max	0.024	1	0.024	5	0.024	8	-0.013	6	0.542	7	-1.392	7	1.775	6	-6.000	8	-0.005	8	0.003	0.039	0.127	[illegible]	1.776	[illegible]	0.001	0.003	[illegible]
136	M14	6in Dia. Duct	Sec 3 - min	0.024	1	-0.024	8	-0.024	5	-0.542	7	0.013	6	-1.775	6	1.392	7	-418.045	5	-0.350	5	0.003	0.039	0.127	[illegible]	1.776	[illegible]	0.043	0.003	[illegible]
824	M93	5in Dia. Duct	Sec 2 - min	-0.090	8	0.082	5	-0.222	7	-0.794	7	0.264	6	-1.160	8	-0.837	5	378.109	6	0.492	6	0.013	0.063	0.092	[illegible]	1.160	[illegible]	0.068	0.031	[illegible]
137	M14	6in Dia. Duct	Sec 4 - max	0.022	1	0.022	5	0.022	6	0.025	6	0.580	7	-1.431	7	1.737	6	-6.000	8	-0.005	8	0.003	0.041	0.124	[illegible]	1.737	[illegible]	0.001	0.003	[illegible]
138	M14	6in Dia. Duct	Sec 4 - min	0.022	1	-0.022	8	-0.022	5	-0.580	7	-0.025	6	-1.737	6	1.431	7	-418.045	5	-0.350	5	0.003	0.041	0.124	[illegible]	1.737	[illegible]	0.043	0.003	[illegible]
2017	M212	3in Dia. Duct	Sec 4 - max	0.238	7	-0.016	8	-0.049	2	0.829	6	-0.819	7	-1.406	6	2.338	7	-13.162	5	-0.056	5	0.028	0.037	0.104	[illegible]	2.338	[illegible]	0.004	0.004	[illegible]
1813	M192	16in Dia. Duct	Sec 2 - max	0.159	2	-0.379	2	0.041	4	-0.793	1	1.119	2	-0.386	7	0.965	6	-437.069	3	-0.087	3	0.018	0.060	0.070	[illegible]	1.119	[illegible]	0.011	0.047	[illegible]
139	M14	6in Dia. Duct	Sec 5 - max	0.021	1	0.021	5	0.021	6	0.061	8	0.615	7	-1.466	7	1.701	8	-6.000	8	-0.005	8	0.003	0.044	0.122	[illegible]	1.701	[illegible]	0.001	0.003	[illegible]
140	M14	6in Dia. Duct	Sec 5 - min	0.021	1	-0.021	8	-0.021	5	-0.615	7	-0.051	8	-1.701	6	1.466	7	-418.045	5	-0.350	5	0.003	0.044	0.122	[illegible]	1.701	[illegible]	0.043	0.003	[illegible]
81	M9	3in Dia. Duct	Sec 1 - max	0.155	7	-0.371	6	0.969	7	-0.655	7	1.333	6	2.039	8	-0.665	7	34.434	6	0.147	6	0.018	0.059	0.091	[illegible]	2.039	[illegible]	0.011	0.076	[illegible]
1981	M207	3in Dia. Duct	Sec 1 - max	0.155	7	0.051	6	0.041	1	-0.655	7	1.333	6	-0.665	7	2.039	6	34.434	6	0.147	6	0.018	0.059	0.091	[illegible]	2.039	[illegible]	0.011	0.004	[illegible]
1730	M183	4in Dia. Duct	Sec 5 - min	0.028	8	0.101	8	-0.059	5	-2.891	6	2.235	7	-0.822	5	-0.140	8	305.086	6	0.671	6	0.003	0.128	0.037	[illegible]	2.891	[illegible]	0.052	0.008	[illegible]
371	M40	6in Dia. Duct	Sec 1 - max	0.115	5	-0.162	6	0.023	7	1.247	6	-0.492	7	0.509	8	0.895	5	997.775	8	0.835	8	0.015	0.089	0.064	[illegible]	1.247	[illegible]	0.103	0.020	[illegible]
2482	M259	6in Dia. Duct	Sec 1 - min	-0.054	8	-0.092	7	0.019	7	-0.470	6	-0.139	7	-1.765	7	0.846	6	-325.274	7	-0.272	7	0.007	0.034	0.126	[illegible]	1.765	[illegible]	0.034	0.011	[illegible]
1981	M209	3in Dia. Duct	Sec 1 - max	0.153	7	-0.013	7	-0.119	6	0.651	6	-0.608	7	2.704	5	-1.014	8	-27.019	5	-0.115	5	0.018	0.029	0.120	[illegible]	2.704	[illegible]	0.009	0.009	[illegible]
2033	M214	3in Dia. Duct	Sec 2 - max	0.125	5	-0.048	8	0.434	7	0.042	8	-0.033	5	-2.916	2	3.386	1	-5.615	6	-0.024	6	0.015	0.002	0.150	[illegible]	3.386	[illegible]	0.002	0.033	[illegible]
2119	M222	3in Dia. Duct	Sec 5 - max	0.209	6	-0.058	8	-0.043	5	-1.594	6	1.615	5	0.077	7	1.588	6	-14.328	8	-0.061	8	0.024	0.072	0.071	[illegible]	1.615	[illegible]	0.005	0.004	[illegible]
2351	M266	3in Dia. Duct	Sec 1 - max	0.209	8	0.082	5	0.048	1	-1.594	8	1.615	5	0.077	7	1.588	6	-14.328	8	-0.061	8	0.024	0.072	0.071	[illegible]	1.615	[illegible]	0.005	0.000	[illegible]
2288	M239	8in Dia. Duct	Sec 4 - min	0.017	8	0.037	8	-0.014	8	-1.805	7	0.315	6	-0.026	7	-0.497	6	-787.950	8	-0.660	8	0.002	0.129	0.036	[illegible]	1.805	[illegible]	0.081	0.005	[illegible]
2020	M212	3in Dia. Duct	Sec 5 - min	0.033	6	-0.045	5	-0.091	1	0.067	5	-0.073	8	-3.579	7	3.189	6	-14.055	8	-0.060	8	0.004	0.003	0.159	[illegible]	3.579	[illegible]	0.005	0.007	[illegible]
2024	M213	3in Dia. Duct	Sec 2 - min	0.048	8	-0.045	5	-0.047	8	0.080	5	-0.089	8	-3.525	1	3.109	2	-9.844	2	-0.042	2	0.005	0.004	0.157	[illegible]	3.525	[illegible]	0.003	0.004	[illegible]
2201	M231	2in Dia. Duct	Sec 1 - max	0.199	5	-0.086	8	0.058	1	-0.041	6	0.809	7	-0.592	8	2.469	5	-10.064	6	-0.137	6	0.044	0.030	0.091	[illegible]	2.469	[illegible]	0.009	0.006	[illegible]
1232	M134	8in Dia. Duct	Sec 1 - min	-0.047	6	0.007	6	-0.047	5	0.297	7	-0.952	8	-1.286	8	0.184	5	960.974	6	0.843	6	0.006	0.058	0.092	[illegible]	1.286	[illegible]	0.104	0.006	[illegible]
822	M93	5in Dia. Duct	Sec 1 - min	-0.090	6	0.062	5	-0.222	7	-0.612	7	0.282	6	-1.100	8	-0.747	5	378.109	6	0.492	6	0.013	0.064	0.087	[illegible]	1.100	[illegible]	0.068	0.031	[illegible]
1234	M134	8in Dia. Duct	Sec 2 - min	-0.047	6	0.007	8	-0.048	6	0.320	7	-0.954	6	-1.273	8	0.197	5	960.974	6	0.843	6	0.006	0.064	0.091	[illegible]	1.273	[illegible]	0.104	0.006	[illegible]
2328	M243	6in Dia. Duct	Sec 4 - min	-0.011	8	-0.008	8	0.038	5	-1.133	5	-0.498	8	-1.151	8	-0.294	6	-392.427	6	-0.320	6	0.001	0.081	0.082	[illegible]	1.151	[illegible]	0.040	0.005	[illegible]
495	M52	8in Dia. Duct	Sec 3 - max	-0.051	1	0.043	6	0.053	3	-0.443	8	1.140	5	0.757	8	1.076	5	1313.892	4	1.153	4	0.006	0.081	0.077	[illegible]	1.140	[illegible]	0.142	0.007	[illegible]
496	M52	8in Dia. Duct	Sec 3 - min	-0.051	6	-0.043	7	-0.053	4	-1.140	5	0.443	8	-1.076	5	-0.757	8	1103.694	3	0.969	3	0.006	0.081	0.077	[illegible]	1.140	[illegible]	0.120	0.007	[illegible]
2329	M243	6in Dia. Duct	Sec 5 - max	0.048	5	0.066	5	0.059	8	0.494	8	1.101	5	0.312	5	1.119	8	351.523	7	0.294	7	0.006	0.079	0.080	[illegible]	1.119	[illegible]	0.038	0.009	[illegible]
2028	M213	3in Dia. Duct	Sec 3 - min	0.045	8	-0.046	5	-0.047	6	0.050	5	-0.064	8	-3.517	1	3.145	2	-9.844	2	-0.042	2	0.005	0.003	0.156	[illegible]	3.517	[illegible]	0.003	0.004	[illegible]
2382	M249	6in Dia. Duct	Sec 1 - min	-0.052	8	-0.011	6	-0.083	8	-0.008	7	-0.785	6	-0.106	5	-1.424	8	345.041	6	0.289	6	0.007	0.056	0.102	[illegible]	1.424	[illegible]	0.036	0.010	[illegible]
2372	M248	6in Dia. Duct	Sec 1 - min	-0.054	8	-0.137	7	-0.015	5	-1.506	8	-0.176	5	0.156	7	-0.698	6	266.455	6	0.223	6	0.007	0.108	0.050	[illegible]	1.506	[illegible]	0.028	0.017	[illegible]
82	M9	3in Dia. Duct	Sec 1 - min	0.122	8	-0.540	7	0.662	6	-1.333	8	0.655	7	0.665	7	-2.039	6	30.864	7	0.132	7	0.014	0.059	0.091	[illegible]	2.039	[illegible]	0.010	0.051	[illegible]
1962	M207	3in Dia. Duct	Sec 1 - min	0.122	6	0.040	7	-0.015	2	-1.333	6	0.655	7	-2.039	8	0.665	7	30.864	7	0.132	7	0.014	0.059	0.091	[illegible]	2.039	[illegible]	0.010	0.003	[illegible]
1236	M134	8in Dia. Duct	Sec 3 - min	-0.048	6	0.007	8	-0.046	3	0.344	7	-0.956	6	-1.260	8	0.209	5	960.974	6	0.843	6	0.006	0.068	0.090	[illegible]	1.250	[illegible]	0.104	0.006	[illegible]
720	M82	6in Dia. Duct	Sec 5 - min	-0.184	6	-0.047	7	-0.146	8	-0.560	7	-1.715	6	-0.252	7	-0.236	6	-109.312	7	-0.091	7	0.023	0.123	0.018	[illegible]	1.715	[illegible]	0.011	0.018	[illegible]
2374	M248	6in Dia. Duct	Sec 2 - min	-0.054	8	-0.138	7	-0.016	5	-1.491	8	-0.120	5	0.201	7	-0.704	6	266.455	6	0.223	6	0.007	0.107	0.050	[illegible]	1.491	[illegible]	0.028	0.017	[illegible]
1238	M134	8in Dia. Duct	Sec 4 - min	-0.040	6	0.007	8	-0.046	3	0.367	7	-0.958	6	-1.248	8	0.222	5	960.974	6	0.843	6	0.006	0.058	0.089	[illegible]	1.248	[illegible]	0.104	0.006	[illegible]
2376	M248	8in Dia. Duct	Sec 3 - min	-0.055	8	-0.139	7	-0.016	5	-1.476	8	-0.075	5	0.247	7	-0.709	6	266.455	6	0.223	6	0.007	0.105	0.051	[illegible]	1.476	[illegible]	0.028	0.017	[illegible]
248	M25	4in Dia. Duct	Sec 3 - min	-0.040	6	0.013	5	-0.078	6	1.154	6	-1.526	7	-0.768	6	-2.055	7	53.888	5	0.119	5	0.004	0.068	0.091	[illegible]	2.055	[illegible]	0.009	0.006	[illegible]
2026	M213	3in Dia. Duct	Sec 4 - min	0.045	6	-0.047	5	-0.047	6	0.030	5	-0.039	8	-3.508	1	3.100	2	-9.844	2	-0.042	2	0.005	0.002	0.156	[illegible]	3.508	[illegible]	0.003	0.004	[illegible]
2032	M214	3in Dia. Duct	Sec 1 - min	0.037	8	-0.047	5	0.030	6	0.059	5	-0.068	8	-3.499	1	3.055	2	-6.221	7	-0.027	7	0.004	0.003	0.156	[illegible]	3.499	[illegible]	0.002	0.004	[illegible]
1102	M121	6in Dia. Duct	Sec 1 - min	0.086	8	-0.166	8	-0.137	8	-1.404	5	1.010	8	-0.032	8	0.165	7	557.911	5	0.467	5	0.011	0.107	0.045	[illegible]	1.494	[illegible]	0.058	0.020	[illegible]
2460	M258	6in Dia. Duct	Sec 5 - min	0.018	8	-0.068	8	-0.185	7	-0.479	6	-0.139	7	-1.765	7	0.846	6	-325.274	7	-0.272	7	0.002	0.034	0.126	[illegible]	1.765	[illegible]	0.034	0.023	[illegible]
1814	M192	16in Dia. Duct	Sec 2 - min	0.110	1	-0.427	1	-0.046	3	-1.119	2	0.793	1	-0.965	6	0.386	7	-1403.254	4	-0.278	4	0.012	0.080	0.070	[illegible]	1.119	[illegible]	0.034	0.053	[illegible]
1231	M134	8in Dia. Duct	Sec 1 - max	-0.022	7	0.085	7	0.047	8	0.952	6	-0.297	7	-0.184	5	1.266	8	1387.337	7	1.218	7	0.003	0.068	0.092	[illegible]	1.266	[illegible]	0.150	0.010	[illegible]
2378	M248	6in Dia. Duct	Sec 4 - min	-0.056	8	-0.140	7	-0.017	5	-1.461	8	-0.024	5	0.292	7	-0.714	6	266.455	6	0.223	6	0.007	0.104	0.051	[illegible]	1.461	[illegible]	0.028	0.017	[illegible]
1385	M147	6in Dia. Duct	Sec 3 - max	-0.100	2	-0.086	8	-0.187	7	0.243	5	-0.047	6	1.652	8	-0.134	5	164.322	8	0.138	8	0.013	0.017	0.132	[illegible]	1.652	[illegible]	0.017	0.021	[illegible]
340	M38	5in Dia. Duct	Sec 5 - min	-0.137	8	0.066	7	-0.033	7	0.530	6	-0.860	7	-0.931	8	-0.472	5	320.911	6	0.418	6	0.020	0.058	0.074	[illegible]	0.931	[illegible]	0.058	0.009	[illegible]
1240	M134	8in Dia. Duct	Sec 5 - min	-0.045	6	0.007	6	-0.048	3	0.380	7	-0.960	6	-1.235	8	0.234	5	960.974	6	0.843	6	0.005	0.069	0.088	[illegible]	1.235	[illegible]	0.104	0.006	[illegible]
245	M25	4in Dia. Duct	Sec 3 - max	-0.030	5	0.070	8	0.078	7	1.520	7	-1.154	6	2.055	7	0.768	6	130.227	8	0.287	8	0.003	0.068	0.091	[illegible]	2.055	[illegible]	0.022	0.006	[illegible]
372	M40	6in Dia. Duct	Sec 1 - min	0.071	8	-0.185	5	-0.122	6	0.492	7	-1.247	8	-0.895	5	-0.509	8	472.962	5	0.396	5	0.009	0.089	0.064	[illegible]	1.247	[illegible]	0.049	0.024	[illegible]
337	M38	5in Dia. Duct	Sec 4 - max	0.198	5	0.072	6	0.038	6	0.625	7	-0.294	6	0.590	5	1.049	8	650.492	7	0.847	7	0.029	0.050	0.053	[illegible]	1.049	[illegible]	0.117	0.010	[illegible]
387	M41	6in Dia. Duct	Sec 4 - max	0.119	5	-0.148	8	0.099	8	0.850	7	-0.453	8	-0.221	6	1.206	7	859.916	6	0.720	6	0.015	0.061	0.088	[illegible]	1.206	[illegible]	0.069	0.018	[illegible]
2380	M248	6in Dia. Duct	Sec 5 - min	-0.056	8	-0.140	7	-0.018	5	-1.446	6	0.028	5	0.338	7	-0.718	6	266.455	8	0.223	8	0.007	0.103	0.051	[illegible]	1.446	[illegible]	0.028	0.017	[illegible]
1233	M134	8in Dia. Duct	Sec 2 - max	-0.021	7	0.084	7	0.046	8	0.954	6	-0.320	7	-0.197	5	1.273	8	1387.337	7	1.218	7	0.003	0.068	0.091	[illegible]	1.273	[illegible]	0.150	0.010	[illegible]
2030	M213	3in Dia. Duct	Sec 5 - min	0.045	6	-0.047	5	-0.048	6	0.005	5	-0.013	8	-3.499	1	3.055	2	-9.844	2	-0.042	2	0.005	0.001	0.156	[illegible]	3.499	[illegible]	0.003	0.004	[illegible]
857	M96	8in Dia. Duct	Sec 4 - max	0.011	5	0.085	5	-0.129	6	1.014	6	-0.803	7	-0.225	5	1.225	8	-687.343	6	-0.575	6	0.001	0.072	0.088	[illegible]	1.225	[illegible]	0.071	0.016	[illegible]

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	D-2250 f_b/σ_a	f_w/σ_a	[illegible]	f_c (ksi)	[illegible]	f/v_t	f/σ_s	[illegible]
858	M96	8in Dia. Duct	Sec 4 - min	-0.011	6	.0.052	8	-0.257	7	0.803	7	-1.014	6	-1.225	8	0.225	5	-992.905	7	-0.831	7	0.001	0.072	0.088	[illegible]	1.225	[illegible]	0.103	0.032	[illegible]
2065	M217	3in Dia. Duct	Sec 3 - max	0.072	5	0.000	8	-0.038	5	0.635	6	-0.632	7	-1.308	5	2.802	8	-6.980	8	-0.030	8	0.008	0.028	0.125	[illegible]	2.802	[illegible]	0.002	0.003	[illegible]
1235	M134	8in Dia. Duct	Sec 3 - max	-0.021	7	0.083	7	0.046	4	0.958	6	-0.344	7	-0.209	5	1.260	8	1387.337	7	1.218	7	0.003	0.068	0.090	[illegible]	1.260	[illegible]	0.150	0.010	[illegible]
1957	M206	2in Dia. Duct	Sec 4 - max	0.156	5	-0.084	8	-0.114	6	0.020	6	1.317	7	-0.126	2	2.088	1	-5.895	8	-0.080	8	0.035	0.048	0.077	[illegible]	2.088	[illegible]	0.005	0.007	[illegible]
2035	M214	3in Dia. Duct	Sec 3 - max	0.125	5	-0.048	6	0.434	7	0.016	8	-0.007	5	-2.778	2	3.273	1	-5.615	6	-0.024	6	0.015	0.001	0.145	[illegible]	3.273	[illegible]	0.002	0.033	[illegible]
2337	M244	6in Dia. Duct	Sec 4 - max	0.057	7	0.028	5	0.103	8	0.321	5	0.569	6	1.576	7	-0.351	6	411.135	8	0.344	8	0.007	0.041	0.113	[illegible]	1.578	[illegible]	0.042	0.013	[illegible]
1237	M134	8in Dia. Duct	Sec 4 - max	-0.021	7	0.082	7	0.046	4	0.958	8	-0.367	7	-0.222	5	1.248	8	1387.337	7	1.218	7	0.003	0.068	0.089	[illegible]	1.248	[illegible]	0.150	0.010	[illegible]
2330	M243	6in Dia. Duct	Sec 5 - min	-0.012	8	-0.009	8	0.038	5	-1.101	5	-0.494	8	-1.119	8	-0.312	5	-302.427	6	-0.320	6	0.002	0.079	0.080	[illegible]	1.119	[illegible]	0.040	0.005	[illegible]
2039	M214	3in Dia. Duct	Sec 5 - max	0.126	5	-0.050	8	0.435	7	-0.037	8	0.046	5	-2.321	7	3.226	6	-5.615	6	-0.024	6	0.015	0.002	0.143	[illegible]	3.226	[illegible]	0.002	0.033	[illegible]
388	M41	6in Dia. Duct	Sec 4 - min	0.103	8	-0.240	5	-0.099	7	0.453	6	-0.850	7	-1.206	7	0.221	6	202.160	7	0.169	7	0.013	0.061	0.086	[illegible]	1.206	[illegible]	0.021	0.030	[illegible]
2037	M214	3in Dia. Duct	Sec 4 - max	0.125	5	-0.049	8	0.435	7	-0.010	6	0.020	5	-2.557	7	3.242	6	-5.615	6	-0.024	6	0.015	0.001	0.144	[illegible]	3.242	[illegible]	0.002	0.033	[illegible]
1239	M134	8in Dia. Duct	Sec 5 - max	-0.021	7	0.081	7	0.046	4	0.960	6	-0.389	7	-0.234	5	1.235	8	1387.337	7	1.218	7	0.003	0.069	0.088	[illegible]	1.235	[illegible]	0.150	0.010	[illegible]
2371	M248	6in Dia. Duct	Sec 1 - max	0.009	5	0.062	6	0.121	8	0.176	5	1.506	8	0.698	6	-0.156	7	1651.601	7	1.382	7	0.001	0.108	0.050	[illegible]	1.506	[illegible]	0.171	0.015	[illegible]
523	M55	8in Dia. Duct	Sec 2 - max	0.007	6	0.058	5	0.228	2	0.915	6	-0.256	7	0.068	8	1.291	5	1026.609	7	0.903	7	0.001	0.065	0.092	[illegible]	1.291	[illegible]	0.111	0.028	[illegible]
524	M55	8in Dia. Duct	Sec 2 - min	-0.007	5	-0.025	8	0.197	1	0.256	7	-0.915	6	-1.291	5	-0.088	8	950.930	8	0.840	6	0.001	0.065	0.092	[illegible]	1.291	[illegible]	0.104	0.024	[illegible]
1980	M208	3in Dia. Duct	Sec 5 - min	0.069	6	-0.015	6	0.011	6	0.596	7	-0.626	6	1.014	8	-2.704	5	30.854	7	0.132	7	0.010	0.028	0.120	[illegible]	2.704	[illegible]	0.010	0.001	[illegible]
2381	M249	6in Dia. Duct	Sec 1 - max	-0.004	5	0.128	7	0.110	5	0.765	6	0.008	7	1.424	8	0.106	5	1659.205	7	1.389	7	0.001	0.056	0.102	[illegible]	1.424	[illegible]	0.171	0.016	[illegible]
2373	M248	6in Dia. Duct	Sec 2 - max	0.009	5	0.062	8	0.122	8	0.126	5	1.491	8	0.704	6	-0.201	7	1651.601	7	1.382	7	0.001	0.107	0.050	[illegible]	1.491	[illegible]	0.171	0.015	[illegible]
2289	M239	8in Dia. Duct	Sec 5 - max	0.050	5	0.075	7	0.057	5	0.660	5	1.073	8	1.039	5	0.174	8	0.908	5	0.000	5	0.006	0.077	0.074	[illegible]	1.073	[illegible]	0.000	0.009	[illegible]
2375	M248	6in Dia. Duct	Sec 3 - max	0.008	5	0.082	6	0.123	8	0.075	5	1.476	8	0.709	6	-0.247	7	1651.601	7	1.382	7	0.001	0.105	0.051	[illegible]	1.476	[illegible]	0.171	0.015	[illegible]
2338	M244	6in Dia. Duct	Sec 4 - min	-0.029	6	-0.069	8	0.004	5	-0.569	6	-0.321	5	0.351	6	-1.578	7	-347.356	5	-0.291	5	0.004	0.041	0.113	[illegible]	1.578	[illegible]	0.036	0.009	[illegible]
929	M103	6in Dia. Duct	Sec 5 - max	0.013	6	-0.053	3	0.026	5	-0.602	7	1.043	6	1.132	8	0.077	5	897.442	7	0.751	7	0.002	0.075	0.081	[illegible]	1.132	[illegible]	0.093	0.007	[illegible]
930	M103	6in Dia. Duct	Sec 5 - min	-0.013	7	-0.053	6	-0.026	8	-1.043	6	0.602	7	-0.077	5	-1.132	8	615.192	6	0.515	6	0.002	0.076	0.081	[illegible]	1.132	[illegible]	0.064	0.007	[illegible]
1982	M209	3in Dia. Duct	Sec 1 - min	0.067	6	-0.015	6	-0.223	7	0.609	7	-0.651	6	1.014	8	-2.704	5	-28.024	8	-0.120	8	0.008	0.029	0.120	[illegible]	2.704	[illegible]	0.009	0.017	[illegible]
2034	M214	3in Dia. Duct	Sec 2 - min	0.037	8	-0.048	5	0.030	6	0.033	5	-0.042	8	-1.386	1	2.916	2	-6.221	7	-0.027	7	0.004	0.002	0.160	[illegible]	3.386	[illegible]	0.002	0.004	[illegible]
2167	M227	6in Dia. Duct	Sec 4 - max	0.071	8	0.048	7	0.165	7	0.141	8	-0.088	5	1.926	7	-1.185	6	353.378	6	0.296	6	0.009	0.010	0.136	[illegible]	1.926	[illegible]	0.037	0.020	[illegible]
927	M103	6in Dia. Duct	Sec 4 - max	0.013	8	-0.052	3	0.026	5	-0.590	7	1.031	8	1.138	8	0.083	5	897.442	7	0.751	7	0.002	0.074	0.081	[illegible]	1.138	[illegible]	0.093	0.006	[illegible]
928	M103	6in Dia. Duct	Sec 4 - min	-0.013	7	-0.052	6	-0.028	8	-1.031	6	0.590	7	-0.083	5	-1.138	8	615.192	6	0.515	6	0.002	0.074	0.081	[illegible]	1.138	[illegible]	0.064	0.006	[illegible]
2377	M248	6in Dia. Duct	Sec 4 - max	0.008	5	0.063	6	0.123	8	0.024	5	1.461	8	0.714	6	-0.292	7	1651.601	7	1.382	7	0.001	0.104	0.051	[illegible]	1.461	[illegible]	0.171	0.015	[illegible]
1893	M200	4in Dia. Duct	Sec 2 - max	0.580	5	-0.062	6	0.054	6	0.604	8	0.020	5	1.599	7	0.760	6	130.227	6	0.287	8	0.056	0.030	0.071	[illegible]	1.599	[illegible]	0.022	0.005	[illegible]
925	M103	6in Dia. Duct	Sec 3 - max	0.013	8	-0.052	3	0.026	5	-0.578	7	1.019	6	1.144	8	0.089	5	897.442	7	0.751	7	0.002	0.073	0.082	[illegible]	1.144	[illegible]	0.093	0.006	[illegible]
928	M103	6in Dia. Duct	Sec 3 - min	-0.013	7	-0.052	6	-0.026	8	-1.019	6	0.578	7	-0.089	5	-1.144	8	615.192	6	0.515	8	0.002	0.073	0.082	[illegible]	1.144	[illegible]	0.064	0.006	[illegible]
923	M103	6in Dia. Duct	Sec 2 - max	0.013	6	-0.051	3	0.026	5	-0.566	7	1.007	6	1.150	8	0.095	5	897.442	7	0.751	7	0.002	0.072	0.082	[illegible]	1.150	[illegible]	0.093	0.006	[illegible]
924	M103	6in Dia. Duct	Sec 2 - min	-0.013	7	-0.051	6	-0.026	8	-1.007	6	0.566	7	-0.095	5	-1.150	8	615.192	6	0.515	6	0.002	0.072	0.082	[illegible]	1.150	[illegible]	0.064	0.006	[illegible]
251	M28	4in Dia. Duct	Sec 1 - max	0.052	5	1.062	5	-0.027	8	-2.235	7	2.891	8	0.496	6	-0.063	5	776.135	7	1.712	7	0.005	0.128	0.022	[illegible]	2.891	[illegible]	0.132	0.082	[illegible]
2379	M248	6in Dia. Duct	Sec 5 - max	0.007	5	0.063	6	0.124	8	-0.028	5	1.448	8	0.718	6	-0.338	7	1651.601	7	1.382	7	0.001	0.103	0.051	[illegible]	1.446	[illegible]	0.171	0.015	[illegible]
2331	M244	6in Dia. Duct	Sec 1 - max	0.040	7	0.083	5	0.069	6	0.494	8	1.101	5	0.202	5	1.004	8	411.135	8	0.344	6	0.005	0.079	0.072	[illegible]	1.101	[illegible]	0.042	0.010	[illegible]
921	M103	6in Dia. Duct	Sec 1 - max	0.013	6	-0.051	3	0.025	5	-0.554	7	0.995	6	1.156	8	0.101	5	897.442	7	0.751	7	0.002	0.071	0.083	[illegible]	1.156	[illegible]	0.093	0.006	[illegible]
922	M103	6in Dia. Duct	Sec 1 - min	-0.013	7	-0.051	6	-0.025	8	-0.995	6	0.554	7	-0.101	5	-1.156	8	615.192	6	0.515	8	0.002	0.071	0.083	[illegible]	1.156	[illegible]	0.064	0.006	[illegible]
1811	M192	16in Dia. Duct	Sec 1 - max	0.159	2	-0.376	2	0.043	4	-0.569	1	0.921	2	-0.368	7	1.000	8	-437.089	3	-0.087	3	0.018	0.066	0.071	[illegible]	1.000	[illegible]	0.011	0.046	[illegible]
1387	M147	6in Dia. Duct	Sec 4 - max	-0.100	2	-0.087	8	-0.166	7	0.214	5	-0.022	8	1.779	8	-0.077	5	164.322	6	0.138	8	0.013	0.015	0.127	[illegible]	1.779	[illegible]	0.017	0.020	[illegible]
2168	M227	6in Dia. Duct	Sec 4 - min	0.055	5	0.029	6	0.084	8	0.068	5	-0.141	6	1.185	8	-1.926	7	326.181	7	0.273	7	0.007	0.010	0.138	[illegible]	1.926	[illegible]	0.034	0.010	[illegible]
918	M102	6in Dia. Duct	Sec 5 - max	0.004	8	-0.018	2	0.009	5	-0.554	7	0.995	8	1.156	8	0.101	5	897.442	7	0.751	7	0.001	0.071	0.083	[illegible]	1.156	[illegible]	0.093	0.002	[illegible]
920	M102	6in Dia. Duct	Sec 5 - min	-0.004	5	-0.018	8	-0.009	7	-0.995	6	0.554	7	-0.101	5	-1.156	8	615.192	6	0.515	8	0.001	0.071	0.083	[illegible]	1.156	[illegible]	0.064	0.002	[illegible]
389	M41	6in Dia. Duct	Sec 5 - max	0.121	5	-0.144	8	0.101	8	0.682	6	-0.125	6	-0.066	8	1.361	7	859.916	6	0.720	8	0.015	0.042	0.097	[illegible]	1.361	[illegible]	0.089	0.018	[illegible]
2066	M217	3in Dia. Duct	Sec 3 - min	-0.011	8	0.000	5	-0.119	8	0.632	7	-0.635	6	-2.802	8	1.308	5	-7.691	5	-0.033	5	0.001	0.028	0.125	[illegible]	2.802	[illegible]	0.003	0.009	[illegible]
2223	M233	2in Dia. Duct	Sec 2 - max	0.315	5	0.087	5	0.073	7	0.736	8	-0.231	5	0.561	1	1.518	2	8.083	5	0.110	5	0.070	0.027	0.056	[illegible]	1.518	[illegible]	0.007	0.005	[illegible]
917	M102	6in Dia. Duct	Sec 4 - max	0.004	8	-0.016	2	0.008	5	-0.534	7	0.975	6	1.166	8	0.111	5	897.442	7	0.751	7	0.001	0.070	0.083	[illegible]	1.166	[illegible]	0.093	0.002	[illegible]
918	M102	8in Dia. Duct	Sec 4 - min	-0.004	5	-0.015	8	-0.008	7	-0.976	6	0.534	7	-0.111	5	-1.166	8	615.192	8	0.515	6	0.001	0.070	0.083	[illegible]	1.166	[illegible]	0.064	0.002	[illegible]
338	M36	5in Dia. Duct	Sec 4 - min	-0.138	8	0.072	7	-0.038	7	0.284	6	-0.625	7	-1.049	8	-0.590	5	320.911	6	0.418	8	0.020	0.050	0.083	[illegible]	1.049	[illegible]	0.058	0.010	[illegible]
71	M8	6in Dia. Duct	Sec 1 - max	-0.116	2	-0.112	2	-0.053	5	0.239	8	-0.218	5	1.695	8	0.000	5	139.532	8	0.117	6	0.015	0.017	0.121	[illegible]	1.695	[illegible]	0.014	0.014	[illegible]
915	M102	6in Dia. Duct	Sec 3 - max	0.003	8	-0.013	2	0.006	5	-0.517	7	0.958	6	1.174	8	0.119	5	897.442	7	0.751	7	0.000	0.068	0.084	[illegible]	1.174	[illegible]	0.093	0.002	[illegible]
916	M102	6in Dia. Duct	Sec 3 - min	-0.003	5	-0.013	8	-0.006	7	-0.956	6	0.517	7	-0.119	5	-1.174	8	615.192	6	0.516	6	0.000	0.068	0.084	[illegible]	1.174	[illegible]	0.064	0.002	[illegible]
2120	M222	3in Dia. Duct	Sec 5 - min	0.088	7	-0.060	5	-0.159	8	-1.615	5	1.594	8	-1.568	6	-0.077	7	-36.189	5	-0.155	5	0.010	0.072	0.071	[illegible]	1.615	[illegible]	0.012	0.012	[illegible]
2552	M266	3in Dia. Duct	Sec 1 - min	0.088	7	0.082	8	-0.034	2	-1.615	5	1.594	8	-1.588	6	-0.077	7	-38.188	5	-0.155	5	0.010	0.072	0.071	[illegible]	1.615	[illegible]	0.012	0.006	[illegible]
913	M102	8in Dia. Duct	Sec 2 - max	0.003	8	-0.010	2	0.005	5	-0.504	7	0.945	6	1.161	8	0.128	5	897.442	7	0.751	7	0.000	0.068	0.084	[illegible]	1.161	[illegible]	0.093	0.001	[illegible]
914	M102	8in Dia. Duct	Sec 2 - min	-0.003	5	-0.010	8	-0.005	7	-0.945	8	0.504	7	-0.128	5	-1.161	8	615.192	6	0.515	6	0.000	0.068	0.084	[illegible]	1.161	[illegible]	0.064	0.001	[illegible]
891	M100	6in Dia. Duct	Sec 1 - max	0.002	5	0.010	1	0.005	7	-0.502	7	0.944	6	1.182	8	0.126	5	897.442	7	0.751	7	0.000	0.067	0.084	[illegible]	1.182	[illegible]	0.093	0.001	[illegible]
892	M100	6in Dia. Duct	Sec 1 - min	-0.002	6	0.010	2	-0.005	5	-0.944	6	0.502	7	-0.126	5	-1.182	8	615.192	6	0.515	6	0.000	0.067	0.084	[illegible]	1.182	[illegible]	0.064	0.001	[illegible]
390	M41	6in Dia. Duct	Sec 5 - min	0.104	8	-0.241	5	-0.101	7	0.125	5	-0.582	8	-1.361	7	0.066	8	202.160	7	0.189	7	0.013	0.042	0.097	[illegible]	1.361	[illegible]	0.021	0.030	[illegible]
333	M36	5in Dia. Duct	Sec 2 - max	0.185	5	0.085	6	0.042	6	0.093	7	0.238	6	0.658	5	1.315	8	650.492	7	0.647	7	0.029	0.019	0.104	[illegible]	1.315	[illegible]	0.117	0.012	[illegible]
252	M28	4in Dia. Duct	Sec 1 - min	0.014	8	0.112	8	-0.059	5	-2.891	6	2.235	7	0.063	5	-0.496	8	295.530	6	0.650	6	0.001	0.128	0.022	[illegible]	2.891	[illegible]	0.050	0.009	[illegible]
2332	M244	6in Dia. Duct	Sec 1 - min	-0.012	6	-0.014	8	0.038	5	-1.101	5	-0.494	8	-1.004	8	-0.202	5	-347.386	5	-0.291	5	0.002	0.079	0.072	[illegible]	1.101	[illegible]	0.036	0.005	[illegible]
909	M101	6in Dia. Duct	Sec 5 - max	0.002	6	-0.008	1	0.004	5	-0.493	7	0.934	6	1.187	8	0.131	5	897.442	7	0.751	7	0.000	0.067	0.085	[illegible]	1.187	[illegible]	0.093	0.001	[illegible]
910	M101	6in Dia. Duct	Sec 5 - min	-0.002	5	-0.008	1	-0.004	7	-0.934	8	0.493	7	-0.131	5	-1.187	8	615.192	8	0.515	8	0.000	0.067	0.085	[illegible]	1.187	[illegible]	0.064	0.001	[illegible]
911	M102	8in Dia. Duct	Sec 1 - max	0.002	8	-0.008	2	0.004	5	-0.493	7	0.934	6	1.187	8	0.131	5	897.442	7	0.751	7	0.000	0.067	0.085	[illegible]	1.187	[illegible]	0.093	0.001	[illegible]
912	M102	6in Dia. Duct	Sec 1 - min	-0.002	5	-0.008	8	-0.004	7	-0.934	6	0.493	7	-0.131	5	-1.187	8	615.192	6	0.515	6	0.000	0.067	0.065	[illegible]	1.187	[illegible]	0.064	0.001	[illegible]
609	M91	5in Dia. Duct	Sec 5 - max	0.199	5	0.064	6	0.104	6	0.587	7	-0.431	6	0.524	5	0.956	8	702.447	7	0.914	7	0.029	0.047	0.078	[illegible]	0.956	[illegible]	0.126	0.014	[illegible]
893	M100	6in Dia. Duct	Sec 2 - max	0.002	6	0.007	1	0.004	7	-0.492	7	0.933	6	1.187	8	0.131	5	897.442	7	0.751	7	0.000	0.067	0.085	[illegible]	1.187	[illegible]	0.093	0.001	[illegible]
894	M100	6in Dia. Duct	Sec 2 - min	-0.002	8	0.007	2	-0.004	5	-0.933	6	0.492	7	-0.131	5	-1.187	8	615.192	6	0.515	6	0.000	0.067	0.085	[illegible]	1.187	[illegible]	0.064	0.001	[illegible]
335	M36	5in Dia. Duct	Sec 3 - max	0.196	5	0.078	6	0.039	6	0.369	7	-0.039	6	0.718	5	1.176	8	650.492	7	0.847	7	0.029	0.029	0.093	[illegible]	1.176	[illegible]	0.117	0.011	[illegible]
907	M101	6in Dia. Duct	Sec 4 - max	0.001	6	-0.006	1	0.003	5	-0.487	7	0.928	6	1.190	8	0.134	5	897.442	7	0.751	7	0.000	0.066	0.085	[illegible]	1.190	[illegible]	0.093	0.001	[illegible]
908	M101	6in Dia. Duct	Sec 4 - min	-0.001	5	-0.006	1	-0.003	7	-0.928	6	0.487	7	-0.134	5	-1.190	8	615.192	6	0.515	6	0.000	0.066	0.085	[illegible]	1.190	[illegible]	0.064	0.001	[illegible]
1871	M198	16in Dia. Duct	Sec 1 - max	0.058	7	-0.531	1	0.010	2	-0.617	6	0.682	7	-0.601	4	1.146	3	-5978.034	2	-1.185	2	0.007	0.063	0.082	[illegible]	1.146	[illegible]	0.146	0.068	[illegible]
895	M100	6in Dia. Duct	Sec 3 - max	0.001	5	0.005	1	0.002	7	-0.405	7	0.926	8	1.191	8	0.135	5	897.442	7	0.751	7	0.000	0.066	0.085	[illegible]	1.191	[illegible]	0.093	0.001	[illegible]
898	M100	6in Dia. Duct	Sec 3 - min	-0.001	6	0.005	2	-0.002	5	-0.928	6	0.465	7	-0.135	5	-1.191	8	615.192	8	0.515	6	0.000	0.066	0.085	[illegible]	1.191	[illegible]	0.064	0.001	[illegible]
905	M101	6in Dia. Duct	Sec 3 - max	0.000	6	-0.004	1	0.002	5	-0.483	7	0.924	6	1.192	8	0.136	5	897.442	7	0.751	7	0.000	0.066	0.085	[illegible]	1.192	[illegible]	0.093	0.000	[illegible]
906	M101	6in Dia. Duct	Sec 3 - min	0.000	5	-0.004	1	-0.002	7	-0.924	6	0.483	7	-0.136	5	-1.192	8	615.192	6	0.515	6	0.000	0.066	0.085	[illegible]	1.192	[illegible]	0.064	0.000	[illegible]
897	M100	6in Dia. Duct	Sec 4 - max	0.000	5	0.002	1	0.001	7	-0.481	7	0.922	6	1.193	8	0.137	6	897.442	7	0.751	7	0.000	0.066	0.085	[illegible]	1.193	[illegible]	0.093	0.000	[illegible]
898	M100	6in Dia. Duct	Sec 4 - min	0.000	6	0.002	2	-0.001	6	-0.922	6	0.481	7	-0.137	5	-1.193	8	615.192	8	0.515	6	0.000	0.066	0.085	[illegible]	1.193	[illegible]	0.064	0.000	[illegible]
903	M101	6in Dia. Duct	Sec 2 - max	0.000	6	-0.002	1	0.000	5	-0.480	7	0.921	6	1.193	8	0.138	5	897.442	7	0.751	7	0.000	0.066	0.085	[illegible]	1.193	[illegible]	0.093	0.000	[illegible]
904	M101	6in Dia. Duct	Sec 2 - min	0.000	5	-0.002	1	0.000	7	-0.921	6	0.460	7	-0.138	5	-1.193	8	615.192	6	0.515	6	0.000	0.066	0.085	[illegible]	1.193	[illegible]	0.084	0.000	[illegible]
2290	M239	6in Dia. Duct	Sec 5 - min	0.001	8	0.042	6	-0.030	8	-1.073	8	-0.660	5	-0.174	8	-1.039	5	-787.950	8	-0.660	8	0.000	0.077	0.074	[illegible]	1.073	[illegible]	0.081	0.005	[illegible]
899	M100	6in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	-0.479	7	0.920	6	1.193	8	0.138	5	897.442	7	0.751	7	0.000	0.066	0.085	[illegible]	1.193	[illegible]	0.093	0.000	[illegible]
900	M100	6in Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	-0.920	6	0.479	7	-0.138	5	-1.193	6	615.192	6	0.515	8	0.000	0.066	0.085	[illegible]	1.193	[illegible]	0.064	0.000	[illegible]

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	D-2250 f_a/σ_a	f_b/σ_a	f_s/σ_a	f_t (ksi)	f_t/σ_t	f_t/σ_a
901	M101	6in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	-0.479	7	0.920	6	1.193	8	0.138	5	697.442	7	0.751	7	0.000	0.066	0.065	1.193	0.093	0.000
902	M101	6in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	-0.920	6	0.479	7	-0.138	5	-1.193	8	615.192	6	0.515	6	0.000	0.066	0.065	1.193	0.064	0.000
1872	M198	16in Dia. Duct	Sec 1 - min	0.051	8	-0.545	2	-0.010	1	-0.882	7	0.617	6	-1.140	3	0.601	4	-6450.135	1	-1.278	1	0.006	0.063	0.082	1.146	0.158	0.087
2036	M214	3in Dia. Duct	Sec 3 - min	0.037	8	-0.049	5	0.030	6	0.007	5	-0.016	8	-3.273	1	2.778	2	-6.221	7	-0.027	7	0.004	0.001	0.145	3.273	0.002	0.004
2041	M215	3in Dia. Duct	Sec 1 - max	0.046	1	-0.050	8	0.489	7	-0.015	8	0.023	5	-2.321	7	3.226	6	-6.980	8	-0.030	8	0.005	0.001	0.143	3.226	0.002	0.038
807	M91	5in Dia. Duct	Sec 4 - max	0.199	5	0.065	8	0.104	6	0.569	7	-0.412	6	0.511	5	0.949	8	702.447	7	0.914	7	0.029	0.045	0.075	0.949	0.126	0.014
2040	M214	3in Dia. Duct	Sec 3 - min	0.037	8	-0.050	5	0.029	8	-0.046	5	0.037	8	-3.226	6	2.321	7	-0.221	7	-0.027	7	0.004	0.002	0.143	3.226	0.002	0.004
1812	M192	16in Dia. Duct	Sec 1 - min	0.109	1	-0.426	1	-0.048	3	-0.921	2	0.569	1	-1.000	6	0.368	7	-1403.254	4	-0.278	4	0.012	0.066	0.071	1.000	0.034	0.053
2038	M214	3in Dia. Duct	Sec 4 - min	0.037	8	-0.049	5	0.028	6	-0.020	5	0.010	8	-3.242	6	2.557	7	-6.221	7	-0.027	7	0.004	0.001	0.144	3.242	0.002	0.004
2129	M223	3in Dia. Duct	Sec 5 - max	0.178	5	-0.081	8	0.052	2	-1.568	8	1.655	5	0.927	2	1.237	1	-14.328	8	-0.061	8	0.021	0.074	0.055	1.655	0.005	0.006
2131	M224	3in Dia. Duct	Sec 1 - max	0.178	5	0.066	5	0.043	1	-1.568	6	1.655	5	0.927	2	1.237	1	-14.328	8	-0.061	8	0.021	0.074	0.055	1.655	0.005	0.005
2043	M215	3in Dia. Duct	Sec 2 - max	0.046	1	-0.051	8	0.489	7	-0.075	8	0.083	5	-1.744	7	3.150	6	-6.980	8	-0.030	8	0.005	0.004	0.140	3.150	0.002	0.038
497	M52	6in Dia. Duct	Sec 4 - max	-0.047	1	0.040	6	0.053	3	-0.548	8	1.035	5	0.652	8	0.971	5	1313.992	4	1.153	4	0.006	0.074	0.069	1.035	0.142	0.007
498	M52	6in Dia. Duct	Sec 4 - min	-0.047	6	-0.040	7	-0.053	4	-1.035	5	0.548	8	-0.971	5	-0.652	8	1103.694	3	0.969	3	0.006	0.074	0.069	1.036	0.120	0.007
2045	M215	3in Dia. Duct	Sec 3 - max	0.046	1	-0.052	8	0.490	7	-0.135	8	0.144	5	-1.167	7	3.075	8	-6.980	8	-0.030	8	0.005	0.006	0.137	3.075	0.002	0.038
2047	M215	3in Dia. Duct	Sec 4 - max	0.046	1	-0.054	8	0.490	7	-0.199	8	0.207	5	-0.588	7	3.001	6	-6.980	8	-0.030	8	0.005	0.009	0.133	3.001	0.002	0.038
2181	M229	3in Dia. Duct	Sec 1 - max	0.153	5	-0.041	8	0.045	1	0.871	6	0.021	7	0.072	8	2.203	5	10.134	6	0.138	6	0.034	0.032	0.082	2.203	0.009	0.003
805	M91	5in Dia. Duct	Sec 3 - max	0.199	5	0.065	8	0.104	6	0.551	7	-0.394	6	0.498	5	0.943	8	702.447	7	0.914	7	0.028	0.044	0.075	0.943	0.126	0.014
1369	M147	6in Dia. Duct	Sec 5 - max	-0.100	2	-0.067	8	-0.166	7	0.185	5	0.003	8	1.706	8	-0.021	5	164.322	8	0.138	8	0.013	0.013	0.122	1.706	0.017	0.020
1895	M200	4in Dia. Duct	Sec 3 - max	0.565	5	-0.070	8	0.039	6	-0.998	8	1.674	5	0.425	5	0.034	8	130.227	8	0.287	8	0.054	0.074	0.018	1.674	0.022	0.005
2049	M215	3in Dia. Duct	Sec 5 - max	0.046	1	-0.055	8	0.491	7	-0.263	8	0.271	5	-0.010	7	2.927	6	-6.980	8	-0.030	8	0.005	0.012	0.130	2.927	0.002	0.038
2051	M216	3in Dia. Duct	Sec 1 - max	0.046	1	0.037	5	0.090	8	-0.263	8	0.271	5	-0.010	7	2.927	6	-6.980	8	-0.030	8	0.005	0.012	0.130	2.927	0.002	0.007
2042	M215	3in Dia. Duct	Sec 1 - min	0.015	2	-0.050	5	0.065	6	-0.023	5	0.015	8	-3.226	6	2.321	7	-7.691	5	-0.033	5	0.002	0.001	0.143	3.226	0.003	0.005
803	M91	5in Dia. Duct	Sec 2 - max	0.199	5	0.066	6	0.104	6	0.532	7	-0.375	6	0.485	5	0.937	8	702.447	7	0.914	7	0.028	0.042	0.074	0.937	0.126	0.014
2233	M234	2in Dia. Duct	Sec 2 - max	0.325	5	-0.045	8	-0.049	6	-0.005	5	0.432	8	1.554	2	0.194	1	8.063	5	0.110	5	0.072	0.015	0.059	1.554	0.007	0.003
2235	M233	2in Dia. Duct	Sec 2 - max	0.318	5	0.053	5	0.085	2	1.288	7	-0.745	6	0.738	1	0.140	2	8.063	5	0.110	5	0.071	0.048	0.027	1.288	0.007	0.005
2044	M215	3in Dia. Duct	Sec 2 - min	0.015	2	-0.051	5	0.064	8	-0.083	5	0.075	8	-3.150	6	1.744	7	-7.691	5	-0.033	5	0.002	0.004	0.140	3.150	0.003	0.005
2018	M212	3in Dia. Duct	Sec 4 - min	0.039	6	-0.016	5	-0.073	1	0.619	7	-0.825	6	-2.338	7	1.406	6	-14.055	8	-0.060	8	0.005	0.037	0.104	2.338	0.005	0.006
253	M26	4in Dia. Duct	Sec 2 - max	0.053	5	1.060	5	-0.027	8	-0.611	5	2.696	8	0.454	8	0.028	5	778.135	7	1.712	7	0.005	0.120	0.020	2.696	0.132	0.002
2049	M215	3in Dia. Duct	Sec 3 - min	0.015	2	-0.053	5	0.063	8	-0.144	5	0.136	8	-3.075	6	1.167	7	-7.691	5	-0.033	5	0.002	0.006	0.137	3.075	0.003	0.005
2048	M215	3in Dia. Duct	Sec 4 - min	0.015	2	-0.054	5	0.063	8	-0.207	5	0.199	8	-3.001	6	0.588	7	-7.691	5	-0.033	5	0.002	0.009	0.133	3.001	0.003	0.005
2184	M249	6in Dia. Duct	Sec 2 - min	-0.056	8	-0.015	6	-0.087	8	0.468	7	-0.736	6	0.238	6	-1.185	7	345.041	6	0.289	6	0.007	0.053	0.065	1.185	0.036	0.011
855	M96	6in Dia. Duct	Sec 3 - max	0.012	5	0.087	5	-0.130	6	0.949	6	-0.760	7	0.096	5	1.049	8	-697.343	6	-0.575	6	0.002	0.066	0.075	1.049	0.071	0.016
856	M96	6in Dia. Duct	Sec 3 - min	-0.012	6	0.054	8	-0.256	7	0.760	7	-0.949	6	-1.049	8	0.096	5	592.805	7	-0.831	7	0.002	0.068	0.075	1.049	0.103	0.032
2050	M215	3in Dia. Duct	Sec 5 - min	0.015	2	-0.055	5	0.062	8	-0.271	5	0.263	8	-2.927	6	0.010	7	-7.691	5	-0.033	5	0.002	0.012	0.130	2.927	0.003	0.005
2052	M216	3in Dia. Duct	Sec 1 - min	0.015	2	0.037	8	0.000	7	-0.271	5	0.263	8	-2.927	6	0.010	7	-7.691	5	-0.033	5	0.002	0.012	0.130	2.927	0.003	0.003
801	M91	5in Dia. Duct	Sec 1 - max	0.199	5	0.066	8	0.104	6	0.513	7	-0.350	6	0.472	5	0.931	8	702.447	7	0.914	7	0.029	0.041	0.074	0.931	0.126	0.014
2202	M231	2in Dia. Duct	Sec 1 - min	0.101	8	-0.251	5	-0.002	2	-0.809	7	0.041	6	-2.469	5	0.592	8	-64.218	7	-0.875	7	0.022	0.030	0.091	2.469	0.056	0.016
1858	M208	2in Dia. Duct	Sec 4 - min	0.076	6	-0.249	5	-0.271	7	-1.317	7	-0.020	6	-2.088	1	0.126	2	-24.608	5	-0.335	5	0.017	0.049	0.077	2.088	0.021	0.017
334	M38	5in Dia. Duct	Sec 2 - min	-0.133	8	0.085	7	-0.042	7	-0.238	6	-0.093	7	-1.315	8	-0.856	5	320.911	6	0.418	6	0.020	0.019	0.104	1.315	0.058	0.012
810	M91	5in Dia. Duct	Sec 5 - min	-0.138	8	0.064	8	-0.079	7	0.431	6	-0.587	7	-0.956	8	-0.524	5	354.431	6	0.461	6	0.020	0.047	0.076	0.958	0.064	0.011
336	M36	5in Dia. Duct	Sec 3 - min	-0.134	8	0.078	7	-0.039	7	0.039	6	-0.369	7	-1.176	8	-0.718	5	320.911	6	0.418	6	0.020	0.029	0.093	1.176	0.056	0.011
2130	M223	3in Dia. Duct	Sec 5 - min	0.118	8	-0.082	5	-0.057	1	-1.655	5	1.568	8	-1.237	1	-0.927	2	-36.188	5	-0.155	5	0.014	0.074	0.055	1.655	0.012	0.006
2132	M224	3in Dia. Duct	Sec 1 - min	0.118	8	0.054	8	-0.018	2	-1.655	5	1.568	8	-1.237	1	-0.927	2	-36.188	5	-0.155	5	0.014	0.074	0.055	1.655	0.012	0.004
254	M26	4in Dia. Duct	Sec 2 - min	0.013	8	0.110	8	-0.059	5	-2.606	8	0.611	5	-0.028	5	-0.454	8	295.530	6	0.650	6	0.001	0.120	0.020	2.696	0.050	0.008
808	M91	5in Dia. Duct	Sec 4 - min	-0.138	8	0.065	8	-0.060	7	0.412	8	-0.569	7	-0.949	8	-0.511	5	354.431	6	0.461	6	0.020	0.045	0.076	0.949	0.064	0.011
257	M26	4in Dia. Duct	Sec 4 - max	0.054	5	1.055	5	-0.028	8	2.673	5	1.361	8	0.367	8	0.209	5	778.135	7	1.712	7	0.005	0.119	0.018	2.673	0.132	0.001
219	M22	4in Dia. Duct	Sec 5 - max	0.007	7	-0.029	8	0.014	7	-0.878	8	1.040	5	-0.859	8	2.097	5	-74.673	8	-0.164	8	0.001	0.046	0.093	2.097	0.013	0.002
220	M22	4in Dia. Duct	Sec 5 - min	-0.007	8	-0.029	1	-0.014	6	-1.040	5	0.878	8	-2.097	5	0.859	8	-188.824	5	-0.415	5	0.001	0.046	0.093	2.097	0.032	0.002
221	M23	4in Dia. Duct	Sec 1 - max	0.007	5	0.069	5	0.079	6	-0.878	8	1.040	5	-0.859	8	2.097	5	-74.673	8	-0.164	8	0.001	0.046	0.093	2.097	0.013	0.006
222	M23	4in Dia. Duct	Sec 1 - min	-0.007	8	0.048	8	0.003	7	-1.040	5	0.878	8	-2.097	5	0.859	8	-188.824	5	-0.415	5	0.001	0.046	0.093	2.097	0.032	0.004
1977	M208	3in Dia. Duct	Sec 4 - max	0.184	7	0.000	7	0.052	7	0.712	6	-0.050	7	1.948	5	-0.645	8	34.434	6	0.147	6	0.021	0.032	0.087	1.949	0.011	0.004
1999	M210	3in Dia. Duct	Sec 5 - max	0.197	7	-0.064	7	0.080	7	-0.933	7	0.077	8	-0.354	2	1.646	1	-13.162	5	-0.056	5	0.023	0.043	0.073	1.646	0.004	0.006
2001	M211	3in Dia. Duct	Sec 1 - max	0.197	7	0.055	6	0.072	1	-0.933	7	0.077	8	-0.354	2	1.646	1	-13.162	5	-0.056	5	0.023	0.043	0.073	1.646	0.004	0.006
695	M80	6in Dia. Duct	Sec 3 - max	0.213	8	0.023	7	0.066	8	0.519	7	0.349	6	0.946	6	1.074	7	0.000	1	0.000	1	0.026	0.037	0.077	1.074	0.000	0.008
806	M91	5in Dia. Duct	Sec 3 - min	-0.138	8	0.065	8	-0.080	7	0.394	6	-0.551	7	-0.943	8	-0.498	5	354.431	6	0.461	6	0.020	0.044	0.075	0.943	0.064	0.011
696	M80	6in Dia. Duct	Sec 3 - min	-0.205	5	-0.046	8	-0.078	7	-0.349	6	-0.519	7	-1.074	7	-0.946	6	0.000	1	0.000	1	0.025	0.037	0.077	1.074	0.000	0.009
2383	M249	6in Dia. Duct	Sec 2 - max	-0.008	5	0.132	7	0.114	5	0.736	6	-0.488	7	1.165	7	-0.236	6	1059.205	7	1.389	7	0.001	0.053	0.085	1.165	0.171	0.016
1991	M210	3in Dia. Duct	Sec 1 - max	0.192	7	-0.038	7	0.069	7	0.218	8	-0.214	5	-1.223	6	2.367	7	-13.162	5	-0.056	5	0.022	0.010	0.105	2.367	0.004	0.005
804	M91	5in Dia. Duct	Sec 2 - min	-0.138	8	0.066	8	-0.060	7	0.375	6	-0.532	7	-0.937	8	-0.485	5	354.431	6	0.461	6	0.020	0.042	0.074	0.937	0.064	0.011
258	M26	4in Dia. Duct	Sec 4 - min	0.012	8	0.106	8	-0.058	5	-2.381	8	-2.673	5	-0.209	5	-0.367	8	295.530	6	0.650	6	0.001	0.118	0.018	2.673	0.050	0.008
255	M26	4in Dia. Duct	Sec 3 - max	0.053	5	1.057	5	-0.028	8	1.033	5	2.626	8	0.411	8	0.110	5	778.135	7	1.712	7	0.005	0.112	0.018	2.520	0.132	0.001
1010	M111	6in Dia. Duct	Sec 5 - min	-0.037	6	0.036	8	-0.252	7	0.456	5	-0.742	8	-1.084	8	0.250	5	-907.768	7	-0.760	7	0.005	0.053	0.077	1.084	0.094	0.031
802	M91	5in Dia. Duct	Sec 1 - min	-0.138	8	0.066	8	-0.080	7	0.356	6	-0.513	7	-0.931	8	-0.472	5	354.431	6	0.461	6	0.020	0.041	0.074	0.931	0.064	0.011
499	M52	6in Dia. Duct	Sec 5 - max	-0.043	1	0.036	6	0.053	3	-0.644	8	0.540	5	0.550	8	0.876	5	1313.992	4	1.153	4	0.005	0.067	0.063	0.940	0.142	0.007
500	M52	6in Dia. Duct	Sec 5 - min	-0.043	6	-0.036	7	-0.053	4	-0.940	5	0.644	8	-0.876	5	-0.550	8	1103.694	3	0.969	3	0.005	0.067	0.063	0.940	0.120	0.007
377	M40	6in Dia. Duct	Sec 4 - max	0.121	5	-0.160	6	0.034	7	-0.437	6	0.862	7	-0.502	8	0.710	5	997.775	8	0.835	8	0.015	0.069	0.051	0.962	0.103	0.022
2117	M222	3in Dia. Duct	Sec 4 - max	0.212	6	-0.041	8	-0.036	5	-0.085	7	0.893	6	1.582	8	0.233	5	-14.328	8	-0.061	8	0.025	0.040	0.070	1.582	0.005	0.003
1020	M112	6in Dia. Duct	Sec 5 - min	-0.021	6	0.051	8	-0.254	7	0.639	5	-0.842	8	-0.998	8	0.078	5	-964.232	7	-0.807	7	0.003	0.060	0.071	0.998	0.100	0.031
217	M22	4in Dia. Duct	Sec 4 - max	0.006	7	-0.024	8	0.012	7	-0.787	8	0.949	5	-0.904	8	2.051	5	-74.673	8	-0.164	8	0.001	0.042	0.091	2.051	0.013	0.002
218	M22	4in Dia. Duct	Sec 4 - min	-0.006	6	-0.024	1	-0.012	6	-0.949	5	0.787	8	-2.051	5	0.904	8	-188.824	5	-0.415	5	0.001	0.042	0.091	2.051	0.032	0.002
1222	M133	6in Dia. Duct	Sec 1 - min	-0.047	6	-0.031	6	-0.049	5	0.325	7	-0.586	6	-0.570	8	-0.799	5	1134.202	3	0.995	3	0.006	0.070	0.057	0.586	0.123	0.006
1019	M112	6in Dia. Duct	Sec 5 - max	0.006	7	0.093	5	-0.132	6	0.842	8	-0.639	5	-0.078	5	0.998	8	-621.143	6	-0.520	6	0.001	0.060	0.071	0.998	0.064	0.016
1221	M133	6in Dia. Duct	Sec 1 - max	-0.038	7	0.065	7	0.049	8	0.986	6	-0.225	7	0.799	5	0.579	8	1355.624	4	1.190	4	0.005	0.070	0.057	0.986	0.147	0.008
256	M26	4in Dia. Duct	Sec 3 - min	0.012	8	0.108	8	-0.058	5	-2.526	8	-1.033	5	-0.119	5	-0.411	8	295.530	6	0.650	6	0.001	0.112	0.018	2.526	0.050	0.008
1224	M133	6in Dia. Duct	Sec 2 - min	-0.047	6	-0.031	6	-0.048	5	0.243	7	-0.977	6	-0.565	8	-0.765	5	1134.202	3	0.995	3	0.006	0.070	0.056	0.977	0.123	0.006
1009	M111	6in Dia. Duct	Sec 5 - max	-0.007	7	0.093	5	-0.134	6	0.742	8	-0.458	5	-0.250	5	1.084	8	-478.065	6	-0.400	6	0.001	0.053	0.077	1.084	0.049	0.017
1669	M177	12in Dia. Duct	Sec 5 - max	0.124	7	0.974	7	-0.018	3	2.182	0	-1.395	7	0.497	7	0.567	6	-97.854	8	-0.032	8	0.009	0.097	0.025	2.182	0.002	0.075
1059	M116	5in Dia. Duct	Sec 5 - max	0.004	6	-0.015	5	0.008	6	0.215	0	0.639	7	0.719	8	1.004	5	401.076	7	0.522	7	0.001	0.051	0.080	1.004	0.072	0.002
1060	M116	5in Dia. Duct	Sec 5 - min	-0.004	5	-0.015	1	-0.008	8	-0.639	7	-0.219	8	-1.004	5	-0.719	8	274.123	6	0.357	6	0.001	0.051	0.080	1.004	0.049	0.002
1955	M208	2in Dia. Duct	Sec 3 - max	0.156	5	-0.082	8	-0.113	6	0.259	8	0.827	7	0.398	2	1.763	1	-5.895	8	-0.060	8	0.035	0.031	0.065	1.763	0.005	0.007
1223	M133	6in Dia. Duct	Sec 2 - max	-0.037	7	0.064	7	0.048	8	0.977	8	-0.243	7	0.785	5	0.565	8	1355.624	4	1.190	4	0.004	0.070	0.056	0.977	0.147	0.008
1057	M116	5in Dia. Duct	Sec 4 - max	0.003	6	-0.013	5	0.007	6	0.233	8	0.625	7	0.726	0	1.011	5	401.076	7	0.522	7	0.000	0.050	0.080	1.011	0.072	0.002
1058	M116	5in Dia. Duct	Sec 4 - min	-0.003	5	-0.013	1	-0.007	8	-0.625	7	-0.233	8	-1.011	5	-0.726	8	274.123	6	0.357	6	0.000	0.050	0.080	1.011	0.049	0.002
1226	M133	6in Dia. Duct	Sec 3 - min	-0.048	6	-0.030	6	-0.048	5	0.281	7	-0.969	6	-0.552	8	-0.772	5	1134.202	3	0.995	3	0.006	0.069	0.055	0.969	0.123	0.006

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_b	f_{bz}/σ_b	f_t (ksi)	U/f_t	U/σ_v
1055	M116	5in Dia. Duct	Sec 3 - max	0.003	6	-0.011	5	0.006	6	0.248	6	0.612	7	0.732	6	1.018	5	401.076	7	0.522	7	0.000	0.049	0.081	1.018	0.072	0.002
1056	M116	5in Dia. Duct	Sec 3 - min	-0.003	5	-0.011	1	-0.006	8	-0.612	7	-0.246	6	-1.018	5	-0.732	8	274.123	6	0.357	6	0.000	0.049	0.081	1.018	0.049	0.002
362	M39	6in Dia. Duct	Sec 1 - min	-0.059	5	0.146	6	-0.039	6	-0.839	7	0.273	6	-0.165	8	-0.872	8	-678.610	7	-0.568	7	0.007	0.050	0.062	0.872	0.070	0.018
651	M68	12in Dia. Duct	Sec 1 - max	0.027	7	1.004	7	-0.016	3	2.182	8	-1.395	7	0.422	7	0.691	6	-211.895	8	-0.069	8	0.002	0.097	0.031	2.182	0.005	0.077
652	M68	12in Dia. Duct	Sec 1 - min	-0.025	6	0.864	8	-0.124	4	1.395	7	-2.162	6	-0.691	6	-0.422	7	-1303.365	5	-0.427	5	0.002	0.097	0.031	2.182	0.033	0.066
1053	M116	5in Dia. Duct	Sec 2 - max	0.002	8	-0.010	5	0.005	8	0.257	6	0.601	7	0.738	6	1.023	5	401.076	7	0.522	7	0.000	0.048	0.081	1.023	0.072	0.001
1054	M116	5in Dia. Duct	Sec 2 - min	-0.002	5	-0.010	1	-0.005	8	-0.601	7	-0.257	6	-1.023	5	-0.738	8	274.123	6	0.357	6	0.000	0.048	0.081	1.023	0.049	0.001
1978	M208	3in Dia. Duct	Sec 4 - min	0.093	8	0.004	6	0.018	6	0.650	7	-0.712	6	0.645	8	-1.948	5	30.864	7	0.132	7	0.011	0.032	0.087	1.948	0.010	0.001
215	M22	4in Dia. Duct	Sec 3 - max	0.005	7	-0.019	8	0.008	7	-0.713	8	0.875	5	-0.941	8	2.014	5	-74.673	8	-0.164	8	0.000	0.039	0.090	2.014	0.013	0.001
216	M22	4in Dia. Duct	Sec 3 - min	-0.005	6	-0.019	1	-0.008	6	-0.875	5	0.713	6	-2.014	8	0.841	8	-186.824	5	-0.415	5	0.000	0.039	0.090	2.014	0.032	0.001
1049	M115	5in Dia. Duct	Sec 5 - max	0.002	6	-0.008	1	0.004	5	0.266	6	0.592	7	0.742	6	1.028	5	401.076	7	0.522	7	0.000	0.047	0.082	1.028	0.072	0.001
1050	M115	5in Dia. Duct	Sec 5 - min	-0.002	5	-0.008	1	-0.004	7	-0.592	7	-0.288	6	-1.028	5	-0.742	8	274.123	6	0.357	6	0.000	0.047	0.082	1.028	0.049	0.001
1051	M116	5in Dia. Duct	Sec 1 - max	0.002	8	-0.008	5	0.004	6	0.266	6	0.592	7	0.742	8	1.028	5	401.076	7	0.522	7	0.000	0.047	0.082	1.028	0.072	0.001
1052	M116	5in Dia. Duct	Sec 1 - min	-0.002	5	-0.008	1	-0.004	8	-0.592	7	-0.266	6	-1.028	5	-0.742	8	274.123	6	0.357	6	0.000	0.047	0.082	1.028	0.049	0.001
1225	M133	8in Dia. Duct	Sec 3 - max	-0.037	7	0.083	7	0.048	8	0.969	6	-0.261	7	0.772	5	0.552	8	1355.824	4	1.190	4	0.004	0.069	0.055	0.969	0.147	0.008
819	M92	5in Dia. Duct	Sec 5 - max	0.176	5	0.062	6	0.232	8	0.194	8	0.164	5	0.747	5	1.100	8	735.306	7	0.957	7	0.026	0.015	0.067	1.100	0.132	0.032
1047	M115	5in Dia. Duct	Sec 4 - max	0.001	6	-0.008	1	0.003	5	0.273	6	0.565	7	0.746	8	1.031	5	401.076	7	0.522	7	0.000	0.046	0.082	1.031	0.072	0.001
1048	M115	5in Dia. Duct	Sec 4 - min	-0.001	5	-0.006	1	-0.003	7	-0.585	7	-0.273	6	-1.031	5	-0.746	8	274.123	6	0.357	6	0.000	0.046	0.082	1.031	0.049	0.001
1000	M110	6in Dia. Duct	Sec 5 - min	-0.048	6	0.012	8	-0.250	7	0.277	5	-0.672	8	-1.040	8	0.405	5	-821.601	7	-0.688	7	0.006	0.048	0.074	1.040	0.085	0.031
1228	M133	8in Dia. Duct	Sec 4 - min	-0.046	6	-0.030	8	-0.047	5	0.279	7	-0.960	6	-0.538	8	-0.759	5	1134.202	3	0.995	3	0.006	0.069	0.054	0.960	0.123	0.008
359	M38	5in Dia. Duct	Sec 5 - max	0.001	6	0.005	7	0.067	8	0.276	6	0.592	7	0.747	8	1.032	5	401.076	7	0.522	7	0.000	0.046	0.082	1.032	0.072	0.009
360	M38	5in Dia. Duct	Sec 5 - min	-0.001	6	0.005	6	-0.074	5	-0.582	7	-0.276	6	-1.032	5	-0.747	8	274.123	8	0.357	6	0.000	0.046	0.082	1.032	0.049	0.010
1031	M114	5in Dia. Duct	Sec 1 - max	0.001	6	0.005	1	0.002	8	0.276	6	0.582	7	0.747	8	1.032	5	401.076	7	0.522	7	0.000	0.046	0.082	1.032	0.072	0.001
1032	M114	5in Dia. Duct	Sec 1 - min	-0.001	6	0.005	8	-0.002	5	-0.582	7	-0.276	6	-1.032	5	-0.747	8	274.123	6	0.357	6	0.000	0.046	0.082	1.032	0.049	0.001
1045	M115	5in Dia. Duct	Sec 3 - max	0.000	6	-0.004	1	0.002	5	0.278	6	0.580	7	0.749	5	1.034	5	401.076	7	0.522	7	0.000	0.046	0.082	1.034	0.072	0.001
1046	M115	5in Dia. Duct	Sec 3 - min	0.000	5	-0.004	1	-0.002	7	-0.580	7	-0.278	6	-1.034	5	-0.749	8	274.123	6	0.357	6	0.000	0.046	0.082	1.034	0.049	0.001
1033	M114	5in Dia. Duct	Sec 2 - max	0.000	5	0.004	1	0.002	8	0.279	6	0.579	7	0.749	8	1.034	5	401.076	7	0.522	7	0.000	0.046	0.082	1.034	0.072	0.001
1034	M114	5in Dia. Duct	Sec 2 - min	0.000	6	0.004	8	0.002	5	-0.579	7	-0.279	6	-1.034	5	-0.749	8	274.123	6	0.357	6	0.000	0.046	0.082	1.034	0.049	0.001
1035	M114	5in Dia. Duct	Sec 3 - max	0.000	5	0.002	1	0.001	6	0.281	6	0.577	7	0.750	8	1.035	5	401.076	7	0.522	7	0.000	0.048	0.082	1.035	0.072	0.000
1036	M114	5in Dia. Duct	Sec 3 - min	0.000	8	0.002	8	-0.001	5	-0.577	7	-0.281	6	-1.035	5	-0.750	8	274.123	6	0.357	6	0.000	0.046	0.082	1.035	0.049	0.000
1043	M115	5in Dia. Duct	Sec 2 - max	0.000	6	-0.002	1	0.000	5	0.282	6	0.577	7	0.750	8	1.035	5	401.076	7	0.522	7	0.000	0.046	0.082	1.035	0.072	0.000
1044	M115	5in Dia. Duct	Sec 2 - min	0.000	5	-0.002	1	0.000	7	-0.577	7	-0.282	6	-1.035	5	-0.750	8	274.123	6	0.357	6	0.000	0.046	0.082	1.035	0.049	0.000
1037	M114	6in Dia. Duct	Sec 4 - max	0.000	6	0.001	1	0.000	8	0.282	6	0.576	7	0.750	8	1.035	5	401.076	7	0.522	7	0.000	0.046	0.082	1.035	0.072	0.000
1038	M114	5in Dia. Duct	Sec 4 - min	0.000	6	0.001	8	0.000	5	-0.576	7	-0.282	6	-1.035	5	-0.750	8	274.123	6	0.357	6	0.000	0.046	0.082	1.035	0.049	0.000
1039	M114	5in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.283	6	0.575	7	0.751	8	1.036	5	401.076	7	0.522	7	0.000	0.046	0.082	1.036	0.072	0.000
1040	M114	5in Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	-0.575	7	-0.283	6	-1.036	5	-0.751	8	274.123	6	0.357	6	0.000	0.046	0.082	1.036	0.049	0.000
1041	M115	5in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.283	6	0.575	7	0.751	8	1.036	5	401.076	7	0.522	7	0.000	0.046	0.082	1.036	0.072	0.000
1042	M116	5in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	-0.575	7	-0.283	6	-1.036	5	-0.751	8	274.123	6	0.357	6	0.000	0.046	0.082	1.036	0.049	0.000
378	M40	6in Dia. Duct	Sec 4 - min	0.066	8	-0.213	5	-0.133	6	-0.962	7	0.437	8	-0.710	5	0.502	8	472.902	5	0.396	5	0.008	0.069	0.051	0.962	0.049	0.026
361	M39	6in Dia. Duct	Sec 1 - max	-0.042	8	0.240	7	0.039	5	-0.273	6	0.839	7	0.872	8	0.185	5	-119.100	8	-0.100	6	0.005	0.060	0.062	0.872	0.012	0.030
653	M96	6in Dia. Duct	Sec 2 - max	0.012	5	0.089	5	-0.131	6	0.687	8	-0.709	5	0.033	5	0.874	8	-687.343	6	-0.575	8	0.002	0.063	0.062	0.887	0.071	0.016
654	M96	6in Dia. Duct	Sec 2 - min	-0.012	6	0.055	8	-0.255	7	0.709	5	-0.887	8	-0.874	8	-0.033	5	-992.905	7	-0.831	7	0.002	0.063	0.062	0.887	0.103	0.031
1227	M133	8in Dia. Duct	Sec 4 - max	-0.036	7	0.063	7	0.047	8	0.960	6	-0.279	7	0.759	5	0.538	8	1355.824	4	1.190	4	0.004	0.069	0.054	0.960	0.147	0.008
1989	M209	3in Dia. Duct	Sec 5 - max	0.180	7	-0.038	7	-0.111	8	0.072	1	-0.069	2	-1.223	6	2.367	7	-27.019	5	-0.115	5	0.019	0.003	0.105	2.367	0.009	0.009
1230	M133	8in Dia. Duct	Sec 5 - min	-0.045	6	-0.030	6	-0.047	5	0.296	7	-0.952	6	-0.525	8	-0.746	5	1134.202	3	0.995	3	0.005	0.068	0.053	0.952	0.123	0.006
1670	M177	12in Dia. Duct	Sec 5 - min	0.060	6	0.657	8	-0.124	4	1.395	7	-2.182	6	-0.567	6	-0.497	7	-1468.410	5	-0.481	5	0.004	0.097	0.025	2.182	0.037	0.066
1008	M111	6in Dia. Duct	Sec 4 - min	-0.037	6	0.036	8	-0.251	7	0.413	5	-0.725	6	-0.961	8	0.171	5	-907.788	7	-0.760	7	0.005	0.052	0.070	0.981	0.094	0.031
2182	M220	2in Dia. Duct	Sec 1 - min	0.057	8	-0.208	5	-0.006	2	-0.021	7	-0.871	6	-2.203	5	-0.072	8	-61.038	7	-0.843	7	0.013	0.032	0.082	2.203	0.054	0.013
1809	M191	16in Dia. Duct	Sec 5 - max	0.075	2	-0.469	2	0.043	4	-0.569	1	0.921	2	-0.268	7	0.727	6	-853.734	7	-0.169	7	0.008	0.066	0.052	0.921	0.021	0.058
2000	M210	3in Dia. Duct	Sec 5 - min	0.079	6	-0.066	6	-0.010	6	-0.977	8	0.933	7	-1.646	1	0.354	2	-14.055	8	-0.060	8	0.009	0.043	0.073	1.646	0.005	0.005
2002	M211	3in Dia. Duct	Sec 1 - min	0.079	8	0.054	7	0.002	2	-0.977	8	0.933	7	-1.046	1	0.354	2	-14.055	8	-0.050	8	0.009	0.043	0.073	1.646	0.005	0.004
1229	M133	8in Dia. Duct	Sec 5 - max	-0.036	7	0.062	7	0.047	8	0.952	6	-0.296	7	0.746	5	0.525	8	1355.824	4	1.190	4	0.004	0.068	0.053	0.952	0.147	0.008
213	M22	4in Dia. Duct	Sec 2 - max	0.004	7	-0.014	8	0.007	7	-0.656	8	0.818	5	-0.970	8	1.956	5	-74.673	8	-0.164	8	0.000	0.036	0.088	1.988	0.013	0.001
214	M22	4in Dia. Duct	Sec 2 - min	-0.004	8	-0.014	1	-0.007	6	-0.818	5	0.656	8	-1.986	5	0.970	8	-108.824	5	-0.415	5	0.000	0.036	0.088	1.986	0.032	0.001
1018	M112	6in Dia. Duct	Sec 4 - min	-0.021	8	0.052	8	-0.253	7	0.594	5	-0.818	8	-0.894	8	0.000	5	-964.232	7	-0.807	7	0.003	0.058	0.064	0.894	0.100	0.031
373	M40	6in Dia. Duct	Sec 2 - max	0.117	5	-0.168	8	0.027	7	0.702	8	-0.024	7	0.176	8	0.639	5	997.775	8	0.835	8	0.015	0.050	0.060	0.839	0.103	0.021
999	M110	6in Dia. Duct	Sec 5 - max	-0.020	7	0.079	5	-0.136	6	0.672	8	-0.277	5	-0.405	5	1.040	8	-320.560	8	-0.260	6	0.003	0.048	0.074	1.040	0.033	0.017
1992	M210	3in Dia. Duct	Sec 1 - min	0.084	6	-0.040	6	0.000	8	0.214	5	-0.218	8	-2.367	7	1.223	6	-14.055	8	-0.060	8	0.010	0.010	0.105	2.367	0.005	0.003
817	M92	5in Dia. Duct	Sec 4 - max	0.175	5	0.063	6	0.232	6	0.177	8	0.181	5	0.691	5	1.064	8	735.306	7	0.957	7	0.026	0.014	0.084	1.064	0.132	0.032
682	M71	16in Dia. Duct	Sec 1 - min	-0.033	1	-0.470	2	-0.061	3	0.680	2	-1.032	1	-0.659	6	0.054	7	-2517.459	6	-0.499	6	0.004	0.074	0.047	1.032	0.062	0.058
881	M71	16in Dia. Duct	Sec 1 - max	0.030	2	-0.456	1	0.056	4	1.032	1	-0.680	2	-0.054	7	0.659	6	-925.473	7	-0.183	7	0.003	0.074	0.047	1.032	0.023	0.056
1667	M177	12in Dia. Duct	Sec 4 - max	0.124	7	0.975	7	-0.016	3	2.020	6	-1.212	7	0.511	7	0.555	6	-97.854	8	-0.032	8	0.009	0.090	0.025	2.020	0.002	0.075
815	M92	5in Dia. Duct	Sec 3 - max	0.175	5	0.063	6	0.232	6	0.159	8	0.199	5	0.635	5	1.028	8	735.306	7	0.957	7	0.026	0.016	0.082	1.028	0.132	0.032
1017	M112	6in Dia. Duct	Sec 4 - max	0.008	7	0.094	5	-0.132	6	0.818	8	-0.594	5	0.000	5	0.894	8	-621.143	6	-0.520	6	0.001	0.058	0.064	0.894	0.064	0.016
1007	M111	6in Dia. Duct	Sec 4 - max	-0.007	7	0.094	5	-0.134	6	0.725	8	-0.413	5	-0.171	5	0.981	8	-478.065	6	-0.400	6	0.001	0.052	0.070	0.981	0.049	0.017
209	M21	4in Dia. Duct	Sec 5 - max	0.002	5	-0.009	1	0.005	7	-0.616	8	0.778	5	-0.990	8	1.966	5	-74.673	6	-0.164	8	0.000	0.035	0.087	1.966	0.013	0.001
210	M21	4in Dia. Duct	Sec 5 - min	-0.002	6	-0.009	1	-0.005	5	-0.778	5	0.618	8	-1.966	5	0.990	8	-188.824	5	-0.415	5	0.000	0.035	0.087	1.966	0.032	0.001
211	M22	4in Dia. Duct	Sec 1 - max	0.002	7	-0.009	8	0.005	7	-0.616	8	0.778	5	-0.990	8	1.966	5	-74.673	8	-0.164	8	0.000	0.035	0.087	1.966	0.013	0.001
212	M22	4in Dia. Duct	Sec 1 - min	-0.002	6	-0.009	1	-0.005	6	-0.778	5	0.616	8	-1.966	5	0.990	8	-188.824	5	-0.415	5	0.000	0.035	0.087	1.966	0.032	0.001
2475	M258	6in Dia. Duct	Sec 3 - max	0.098	7	-0.017	7	-0.063	6	0.639	7	-0.307	6	0.897	7	-0.286	6	-179.120	6	-0.150	8	0.012	0.048	0.064	0.897	0.018	0.010
1997	M210	3in Dia. Duct	Sec 4 - max	0.196	7	-0.057	7	0.077	7	-0.590	7	0.623	6	-0.789	2	1.609	1	-13.162	5	-0.056	5	0.023	0.028	0.072	1.609	0.004	0.006
2555	M286	3in Dia. Duct	Sec 3 - max	0.191	6	-0.006	5	0.020	2	1.259	1	-1.255	2	0.458	5	0.986	6	-14.328	8	-0.061	8	0.022	0.056	0.044	1.259	0.005	0.002
74	M8	6in Dia. Duct	Sec 2 - min	-0.352	1	-0.138	1	-0.205	8	-0.725	1	0.028	2	-0.356	5	-0.253	8	83.143	7	0.070	7	0.045	0.052	0.025	0.725	0.009	0.025
813	M92	5in Dia. Duct	Sec 2 - max	0.175	5	0.064	6	0.232	6	0.141	8	0.217	5	0.580	5	0.991	8	735.306	7	0.957	7	0.026	0.017	0.079	0.991	0.132	0.032
2149	M225	3in Dia. Duct	Sec 5 - max	0.199	5	-0.002	8	-0.020	6	0.207	8	0.856	5	-0.340	6	1.359	7	-14.328	8	-0.061	8	0.023	0.038	0.060	1.359	0.005	0.002
207	M21	4in Dia. Duct	Sec 4 - max	0.002	5	-0.007	1	0.003	7	-0.603	8	0.785	5	-0.996	8	1.960	5	-74.673	8	-0.164	8	0.000	0.034	0.087	1.960	0.013	0.001
208	M21	4in Dia. Duct	Sec 4 - min	-0.002	6	-0.007	1	-0.003	5	-0.765	5	0.603	8	-1.960	5	0.996	8	-188.824	5	-0.415	5	0.000	0.034	0.087	1.960	0.032	0.001
820	M92	5in Dia. Duct	Sec 5 - min	-0.124	8	0.062	8	-0.183	7	-0.164	5	-0.194	8	-1.100	8	-0.747	5	390.738	6	0.509	6	0.018	0.015	0.087	1.100	0.070	0.022
998	M110	6in Dia. Duct	Sec 4 - min	-0.048	6	0.012	8	-0.249	7	0.239	5	-0.606	8	-0.938	8	0.325	5	-821.801	7	-0.688	7	0.006	0.048	0.067	0.938	0.085	0.031
205	M21	4in Dia. Duct	Sec 3 - max	0.001	5	-0.005	1	0.002	7	-0.594	8	0.756	5	-1.000	8	1.955	5	-74.673	8	-0.164	8	0.000	0.034	0.087	1.955	0.013	0.000
206	M21	4in Dia. Duct	Sec 3 - min	-0.001	8	-0.005	1	-0.002	5	-0.756	5	0.594	8	-1.955	5	1.000	8	-188.824	5	-0.415	5	0.000	0.034	0.087	1.955	0.032	0.000
811	M92	5in Dia. Duct	Sec 1 - max	0.175	5	0.064	8	0.232	6	0.123	8	0.235	5	0.524	5	0.956	8	735.306	7	0.957	7	0.026	0.019	0.076	0.956	0.132	0.032
2224	M233	2in Dia. Duct	Sec 2 - min	0.165	8	0.008	8	0.016	6	0.231	5	-0.736	8	-1.518	2	-0.561	1	-0.009	8	0.000	8	0.037	0.027	0.056	1.518	0.000	0.001
203	M21	4in Dia. Duct	Sec 2 - max	0.000	5	-0.002	1	0.001	7	-0.589	8	0.751	5	-1.003	8	1.952	5	-74.673	6	-0.164	6	0.000	0.033	0.087	1.952	0.013	0.000
204	M21	4in Dia. Duct	Sec 2 - min	0.000	6	-0.002	1	-0.001	5	-0.751	5	0.589	8	-1.952	5	1.003	8	-100.624	5	-0.415	5	0.000	0.033	0.087	1.952	0.032	0.000

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{sy}/σ_a	f_{sz}/σ_a	f_b (ksi)	f_y/σ_y	f_z/σ_z
201	M21	4in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	-0.688	8	0.749	5	-1.004	8	1.952	8	-74.673	8	-0.164	8	0.000	0.033	0.087	1.952	0.013	0.000
202	M21	4in Dia. Duct	Sec 1- min	0.000	1	0.000	1	0.000	1	-0.749	5	0.587	8	-1.952	5	1.004	8	-188.824	5	-0.415	5	0.000	0.033	0.087	1.952	0.032	0.000
95	M10	3in Dia. Duct	Sec 3 - max	0.567	7	-0.023	1	-0.264	5	0.135	2	0.130	1	-0.922	4	1.080	3	10.089	4	0.043	4	0.066	0.006	0.048	1.080	0.003	0.020
1810	M191	16in Dia. Duct	Sec 5 - min	0.019	1	-0.477	1	-0.048	3	-0.921	2	0.569	1	-0.727	6	0.258	7	-2168.192	6	-0.430	6	0.002	0.060	0.052	0.921	0.035	0.059
2116	M222	3in Dia. Duct	Sec 4 - min	0.084	7	-0.043	5	-0.166	8	-0.893	6	0.885	7	-0.233	5	-1.582	8	-36.188	5	-0.155	5	0.010	0.040	0.070	1.582	0.012	0.013
1949	M205	3in Dia. Duct	Sec 5 - max	0.155	5	-0.014	6	0.064	2	0.643	1	-0.025	2	1.455	2	1.124	1	-5.895	8	-0.080	8	0.034	0.031	0.054	1.455	0.005	0.004
1951	M206	3in Dia. Duct	Sec 1 - max	0.155	5	-0.070	8	-0.112	6	0.643	1	-0.025	2	1.455	2	1.124	1	-5.895	8	-0.080	8	0.034	0.031	0.054	1.455	0.005	0.007
1668	M177	12in Dia. Duct	Sec 4 - min	0.060	6	0.858	6	-0.123	4	1.212	7	-2.020	6	-0.555	6	-0.511	7	-1468.410	5	-0.481	5	0.004	0.090	0.025	2.020	0.037	0.066
374	M40	6in Dia. Duct	Sec 2 - min	0.069	8	-0.201	5	-0.125	6	0.024	7	-0.702	6	-0.639	5	-0.176	8	472.962	5	0.396	5	0.009	0.050	0.060	0.639	0.049	0.025
1859	M176	12in Dia. Duct	Sec 6 - max	0.302	7	0.623	2	-0.018	3	1.536	6	-0.862	7	0.640	7	0.215	6	183.470	8	0.060	8	0.022	0.068	0.028	1.536	0.005	0.063
2125	M223	3in Dia. Duct	Sec 3 - max	0.181	5	0.006	8	0.001	5	1.266	8	-1.238	5	0.970	1	0.897	2	-14.328	8	-0.051	8	0.019	0.056	0.043	1.266	0.005	0.000
1006	M111	6in Dia. Duct	Sec 3 - min	-0.038	6	0.037	8	-0.251	7	0.368	5	-0.708	8	-0.878	8	0.091	5	-907.788	7	-0.760	7	0.005	0.051	0.063	0.878	0.084	0.031
487	M51	8in Dia. Duct	Sec 4 - max	-0.012	1	0.030	8	0.061	6	-0.377	2	0.696	1	0.926	4	-0.183	3	1313.992	4	1.153	4	0.001	0.050	0.068	0.928	0.142	0.008
488	M51	8in Dia. Duct	Sec 4 - min	-0.012	6	-0.092	5	-0.236	7	-0.688	1	0.377	2	0.185	3	-0.928	4	1103.694	3	0.969	3	0.001	0.050	0.068	0.928	0.120	0.029
997	M110	6in Dia. Duct	Sec 4 - max	-0.021	7	0.080	5	-0.136	6	0.666	8	-0.239	5	-0.325	5	0.938	8	-320.560	6	-0.268	6	0.003	0.048	0.087	0.938	0.033	0.017
616	M92	5in Dia. Duct	Sec 4 - min	-0.124	6	0.063	8	-0.163	7	-0.181	5	-0.177	8	-1.064	8	-0.691	5	390.738	6	0.509	6	0.018	0.014	0.084	1.064	0.070	0.022
2007	M211	3in Dia. Duct	Sec 4 - max	0.215	7	-0.031	6	0.056	2	-0.086	7	0.092	6	1.979	8	-1.518	5	-13.162	5	-0.056	5	0.025	0.004	0.088	1.979	0.004	0.004
244	M26	4in Dia. Duct	Sec 2 - min	-0.034	8	0.019	5	-0.073	6	0.969	8	-1.070	5	-0.181	6	-1.469	7	53.888	5	0.119	5	0.003	0.048	0.065	1.469	0.009	0.008
1685	M177	12in Dia. Duct	Sec 3 - max	0.124	7	0.976	7	-0.017	3	1.659	6	-1.029	7	0.525	7	0.543	6	-97.854	8	-0.032	8	0.009	0.083	0.024	1.659	0.002	0.075
1016	M112	6in Dia. Duct	Sec 5 - min	-0.021	6	0.053	8	-0.252	7	0.549	5	-0.793	8	-0.780	8	-0.079	5	-964.232	7	-0.807	7	0.003	0.057	0.056	0.793	0.100	0.031
816	M92	5in Dia. Duct	Sec 3 - min	-0.124	8	0.063	6	-0.163	7	-0.199	5	-0.159	8	-1.028	8	-0.635	5	390.738	6	0.509	6	0.018	0.016	0.062	1.028	0.070	0.022
1990	M209	3in Dia. Duct	Sec 5 - min	0.060	0	-0.040	6	-0.230	5	0.069	2	-0.072	1	-2.367	7	1.223	6	-28.024	8	-0.120	8	0.007	0.003	0.105	2.367	0.009	0.018
2128	M223	3in Dia. Duct	Sec 3 - min	0.138	8	0.006	5	-0.006	6	1.238	5	-1.266	8	-0.897	2	-0.970	1	-36.188	5	-0.155	5	0.016	0.056	0.043	1.266	0.012	0.000
990	M109	6in Dia. Duct	Sec 5 - min	-0.052	6	-0.017	8	-0.246	7	0.124	5	-0.649	8	-0.873	8	0.519	5	-718.478	7	-0.601	7	0.007	0.046	0.062	0.873	0.074	0.031
243	M25	4in Dia. Duct	Sec 2 - max	-0.024	5	0.064	8	0.073	7	1.070	5	-0.969	8	1.469	7	0.181	6	130.227	8	0.287	8	0.002	0.048	0.065	1.469	0.022	0.005
1005	M111	6in Dia. Duct	Sec 3 - max	-0.007	7	0.096	5	-0.135	6	0.700	8	-0.368	5	-0.091	5	0.878	8	-478.065	6	-0.400	6	0.001	0.051	0.063	0.878	0.049	0.017
614	M92	5in Dia. Duct	Sec 2 - min	-0.123	6	0.064	8	-0.163	7	-0.217	5	-0.141	8	-0.991	8	-0.550	5	390.738	6	0.509	6	0.018	0.017	0.079	0.991	0.070	0.022
1015	M112	6in Dia. Duct	Sec 3 - max	0.007	7	0.098	5	-0.133	6	0.793	8	-0.549	5	0.079	5	0.790	8	-621.143	6	-0.520	6	0.001	0.057	0.058	0.793	0.064	0.018
1657	M176	12in Dia. Duct	Sec 4 - max	0.303	7	0.824	2	-0.019	3	1.395	6	-0.610	7	0.654	7	0.203	6	183.470	8	0.060	8	0.022	0.062	0.029	1.395	0.005	0.063
2476	M256	6in Dia. Duct	Sec 3 - min	0.027	6	-0.038	6	-0.169	7	0.307	6	-0.639	7	0.286	6	-0.897	7	-325.274	7	-0.272	7	0.003	0.046	0.064	0.897	0.034	0.021
998	M110	6in Dia. Duct	Sec 2 - min	-0.049	6	0.012	6	-0.249	7	0.201	5	-0.660	8	-0.836	8	0.244	5	-621.801	7	-0.588	7	0.006	0.047	0.060	0.836	0.085	0.031
1995	M210	3in Dia. Duct	Sec 3 - max	0.195	7	-0.051	7	0.075	7	-0.284	7	0.306	6	-1.070	8	1.725	5	-13.162	5	-0.056	5	0.023	0.014	0.077	1.725	0.004	0.008
1956	M206	3in Dia. Duct	Sec 3 - min	0.076	8	-0.248	5	-0.272	7	-0.627	7	-0.259	6	-1.763	1	-0.398	2	-24.608	5	-0.335	5	0.017	0.031	0.065	1.763	0.021	0.017
664	M71	16in Dia. Duct	Sec 2 - min	-0.033	1	-0.472	2	-0.060	3	0.523	2	-0.860	1	-0.647	6	0.068	7	-2517.459	6	-0.499	6	0.004	0.063	0.045	0.860	0.062	0.058
1660	M178	12in Dia. Duct	Sec 5 - min	0.220	6	0.733	1	-0.122	4	0.662	7	-1.530	8	-0.215	6	-0.640	7	-1610.206	5	-0.528	5	0.016	0.068	0.028	1.536	0.041	0.056
989	M109	6in Dia. Duct	Sec 5 - max	-0.032	7	0.050	5	-0.136	6	0.648	8	-0.124	5	-0.519	5	0.673	8	-173.491	8	-0.145	6	0.004	0.046	0.062	0.673	0.016	0.017
612	M92	5in Dia. Duct	Sec 1- min	-0.123	8	0.064	8	-0.163	7	-0.235	5	-0.123	8	-0.956	8	-0.524	5	390.738	6	0.509	6	0.018	0.019	0.078	0.956	0.070	0.022
683	M71	16in Dia. Duct	Sec 2 - max	0.030	2	-0.458	1	0.054	4	0.680	1	-0.523	2	-0.008	7	0.647	6	-325.473	7	-0.183	7	0.003	0.063	0.046	0.860	0.023	0.057
2556	M266	3in Dia. Duct	Sec 3 - min	0.105	7	-0.006	8	-0.007	1	1.255	2	-1.259	1	-0.996	8	-0.458	5	-36.188	5	-0.155	5	0.012	0.036	0.044	1.259	0.012	0.001
851	M96	6in Dia. Duct	Sec 1 - max	0.012	5	0.090	5	-0.132	8	0.842	8	-0.839	5	0.163	5	0.700	8	-667.343	6	-0.575	6	0.002	0.060	0.050	0.842	0.071	0.016
852	M98	6in Dia. Duct	Sec 1- min	-0.012	6	0.057	8	-0.254	7	0.639	5	-0.842	8	-0.700	8	-0.163	5	-992.903	7	-0.831	7	0.002	0.060	0.050	0.842	0.103	0.031
1993	M210	3in Dia. Duct	Sec 2 - max	0.194	7	-0.044	7	0.072	7	-0.016	7	0.026	6	-1.225	6	1.967	7	-13.162	5	-0.056	5	0.023	0.001	0.067	1.967	0.004	0.006
1666	M177	12in Dia. Duct	Sec 3 - min	0.060	6	0.859	6	-0.123	4	1.029	7	-1.859	8	-0.543	8	-0.525	7	-1468.410	5	-0.481	5	0.004	0.083	0.024	1.859	0.037	0.066
1983	M209	3in Dia. Duct	Sec 2 - max	0.155	7	-0.019	7	-0.119	6	0.556	6	-0.523	7	1.538	5	-0.354	8	-27.018	5	-0.115	5	0.018	0.025	0.066	1.538	0.009	0.009
2228	M233	3in Dia. Duct	Sec 3 - min	0.162	8	-0.007	8	0.004	1	0.745	6	-1.289	7	-0.140	2	-0.730	1	-0.009	8	0.000	8	0.036	0.048	0.027	1.288	0.008	0.000
1941	M205	3in Dia. Duct	Sec 1 - max	0.142	5	0.052	6	0.016	3	0.322	7	0.805	6	-0.005	1	1.335	2	-5.895	8	-0.080	8	0.032	0.030	0.048	1.335	0.005	0.003
1894	M200	4in Dia. Duct	Sec 2 - min	0.105	6	-0.094	7	-0.075	7	-0.020	5	-0.684	8	-0.700	6	-1.599	7	53.888	5	0.119	5	0.010	0.030	0.071	1.599	0.009	0.007
1907	M191	16in Dia. Duct	Sec 4 - max	0.076	2	-0.456	2	0.045	4	-0.320	1	0.676	2	-0.239	7	0.743	6	-653.734	7	-0.169	7	0.009	0.046	0.053	0.743	0.021	0.058
1969	M207	3in Dia. Duct	Sec 5 - max	0.172	7	-0.037	6	0.040	2	-0.829	6	0.983	7	0.253	8	1.038	5	34.434	6	0.147	6	0.020	0.044	0.046	1.038	0.011	0.003
1971	M208	3in Dia. Duct	Sec 1 - max	0.172	7	0.062	7	0.073	5	-0.829	8	0.983	7	0.253	8	1.038	5	34.434	6	0.147	6	0.020	0.044	0.046	1.038	0.011	0.006
2150	M225	3in Dia. Duct	Sec 5 - min	0.097	8	-0.051	5	-0.064	7	-0.856	5	-0.207	8	-1.359	7	0.340	6	-36.188	5	-0.155	5	0.011	0.038	0.060	1.359	0.012	0.005
995	M110	6in Dia. Duct	Sec 3 - max	-0.021	7	0.081	5	-0.137	6	0.660	8	-0.201	5	-0.244	5	0.836	8	-320.560	6	-0.268	6	0.003	0.047	0.060	0.836	0.033	0.017
1004	M111	6in Dia. Duct	Sec 2 - min	-0.038	6	0.038	8	-0.250	7	0.323	5	-0.690	8	-0.775	8	0.011	5	-907.788	7	-0.760	7	0.005	0.049	0.055	0.775	0.084	0.031
1683	M177	12in Dia. Duct	Sec 2 - max	0.125	7	0.976	7	-0.016	3	1.698	6	-0.845	7	0.540	7	0.531	6	-97.854	8	-0.032	8	0.009	0.073	0.024	1.698	0.002	0.075
988	M109	6in Dia. Duct	Sec 4 - min	-0.052	6	-0.017	8	-0.247	7	0.100	5	-0.656	8	-0.772	8	0.438	5	-718.478	7	-0.601	7	0.007	0.047	0.055	0.772	0.074	0.030
1998	M210	3in Dia. Duct	Sec 4 - min	0.080	8	-0.059	6	-0.007	8	-0.623	6	0.590	7	-1.609	1	0.789	2	-14.055	8	-0.060	8	0.009	0.028	0.072	1.609	0.005	0.005
2234	M234	2in Dia. Duct	Sec 2 - min	0.155	8	-0.255	5	-0.173	7	-0.432	8	0.005	5	-0.194	1	-1.554	2	-0.009	8	0.000	8	0.034	0.016	0.056	1.554	0.000	0.016
1655	M176	12in Dia. Duct	Sec 3 - max	0.303	7	0.824	2	-0.019	3	1.254	6	-0.358	7	0.669	7	0.191	6	183.470	8	0.060	8	0.022	0.056	0.030	1.254	0.005	0.063
1658	M176	12in Dia. Duct	Sec 4 - min	0.220	6	0.734	1	-0.121	4	0.510	7	-1.395	6	-0.203	6	-0.654	7	-1610.206	5	-0.528	5	0.016	0.062	0.029	1.395	0.041	0.056
1014	M112	6in Dia. Duct	Sec 2 - min	-0.022	6	0.054	8	-0.252	7	0.504	5	-0.768	8	-0.606	8	-0.158	5	-964.232	7	-0.807	7	0.003	0.055	0.049	0.768	0.100	0.031
1953	M206	2in Dia. Duct	Sec 2 - max	0.156	5	-0.080	8	-0.112	6	0.495	8	0.341	7	0.924	2	1.442	1	-5.895	8	-0.080	8	0.035	0.018	0.053	1.442	0.005	0.007
997	M109	6in Dia. Duct	Sec 4 - max	-0.033	7	0.051	5	-0.138	8	0.656	8	-0.100	5	-0.438	5	0.772	8	-173.491	6	-0.145	6	0.004	0.047	0.055	0.772	0.018	0.017
641	M67	12in Dia. Duct	Sec 1 - max	0.526	7	0.068	6	-0.045	6	0.137	1	0.137	2	1.386	4	-1.011	3	872.092	8	0.286	8	0.038	0.006	0.092	1.386	0.027	0.005
1003	M111	6in Dia. Duct	Sec 2 - max	-0.007	7	0.097	5	-0.135	6	0.690	8	-0.323	5	-0.011	5	0.775	8	-478.065	6	-0.400	6	0.001	0.049	0.055	0.775	0.049	0.017
994	M110	6in Dia. Duct	Sec 2 - min	-0.049	8	0.013	8	-0.248	7	0.163	5	-0.654	8	-0.734	8	0.163	5	-621.801	7	-0.588	7	0.006	0.047	0.052	0.734	0.085	0.031
1949	M175	12in Dia. Duct	Sec 5 - max	0.435	7	0.549	2	-0.021	3	0.971	6	-0.054	7	0.682	7	-0.166	8	483.081	8	0.158	8	0.032	0.043	0.030	0.971	0.012	0.042
2553	M266	3in Dia. Duct	Sec 2 - max	0.200	6	0.038	5	0.023	6	0.659	8	-0.650	5	0.165	5	1.185	8	-14.328	8	-0.061	8	0.023	0.029	0.053	1.185	0.005	0.003
1963	M207	3in Dia. Duct	Sec 2 - max	0.159	7	0.028	6	0.031	6	-0.116	7	0.585	6	-0.859	7	1.365	6	34.434	6	0.147	6	0.018	0.026	0.061	1.365	0.011	0.002
223	M23	4in Dia. Duct	Sec 2 - max	0.009	5	0.060	5	0.075	6	-0.624	8	0.670	5	-0.815	8	1.668	5	-74.673	8	-0.164	8	0.001	0.030	0.074	1.668	0.013	0.005
224	M23	4in Dia. Duct	Sec 2 - min	-0.009	6	0.040	8	0.007	7	-0.670	5	0.624	8	-1.668	5	0.815	8	-188.824	5	-0.415	5	0.001	0.030	0.074	1.668	0.032	0.003
1013	M112	6in Dia. Duct	Sec 2 - max	0.007	7	0.097	5	-0.133	6	0.766	8	-0.504	5	0.159	5	0.696	8	-621.143	6	-0.520	6	0.001	0.055	0.049	0.768	0.064	0.018
1664	M177	12in Dia. Duct	Sec 2 - min	0.060	6	0.860	8	-0.122	4	0.845	7	-1.698	6	-0.531	6	-0.540	7	-1468.410	5	-0.481	5	0.004	0.075	0.024	1.698	0.037	0.066
375	M40	6in Dia. Duct	Sec 3 - max	0.119	5	-0.174	8	0.030	7	0.141	6	0.460	7	-0.159	6	0.777	5	997.775	8	0.635	8	0.015	0.033	0.056	0.777	0.103	0.021
1606	M191	16in Dia. Duct	Sec 4 - min	0.018	1	-0.474	1	-0.050	3	-0.676	2	0.320	1	-0.743	6	0.239	7	-2168.192	6	-0.430	6	0.002	0.046	0.053	0.743	0.053	0.059
2163	M227	6in Dia. Duct	Sec 2 - max	0.077	8	0.080	7	0.152	7	-0.571	8	0.647	7	-0.163	6	0.461	7	353.378	6	0.298	6	0.010	0.061	0.033	0.647	0.037	0.019
364	M39	6in Dia. Duct	Sec 2 - min	-0.058	5	0.144	8	-0.037	6	-0.518	7	0.080	6	-0.114	5	-0.822	8	-676.810	7	-0.568	7	0.007	0.037	0.059	0.822	0.070	0.018
1950	M205	2in Dia. Duct	Sec 5 - min	0.077	8	-0.035	7	-0.043	1	0.025	2	-0.843	1	-1.124	1	-1.455	2	-24.608	5	-0.335	5	0.017	0.031	0.054	1.455	0.021	0.003
1952	M206	2in Dia. Duct	Sec 1- min	0.077	8	-0.244	5	-0.274	7	0.029	2	-0.843	1	-1.124	1	-1.455	2	-24.608	5	-0.335	5	0.017	0.031	0.054	1.455	0.021	0.015
986	M109	6in Dia. Duct	Sec 3 - min	-0.053	8	-0.017	8	-0.247	7	0.076	5	-0.665	8	-0.671	8	0.396	5	-718.478	7	-0.601	7	0.007	0.046	0.048	0.671	0.074	0.030
1661	M177	12in Dia. Duct	Sec 1 - max	0.125	7	0.977	7	-0.018	3	1.536	6	-0.662	7	0.554	7	0.519	6	-97.854	8	-0.032	8	0.009	0.066	0.025	1.536	0.002	0.075
1656	M200	4in Dia. Duct	Sec 3 - min	0.090	8	-0.065	5	-0.060	7	-1.674	5	0.958	8	-0.034	8	-0.425	5	53.888	5	0.119	5	0.009	0.074	0.019	1.674	0.009	0.007
1653	M176	12in Dia. Duct	Sec 2 - max	0.303	7	0.825	2	-0.020	3	1.113	6	-0.206	7	0.683	7	0.179	8	183.470	8	0.060	8	0.022	0.049	0.030	1.113	0.005	0.063
1970	M207	3in Dia. Duct	Sec 5 - min	0.104	6	-0.048	7	-0.014	1	-0.983	7	0.826	6	-1.038	5	-0.253	8	30.864	7	0.132	7	0.012	0.044	0.046	1.038	0.010	0.004
1972	M208	3in Dia. Duct	Sec 1- min	0.104	6	0.060	6	-0.003	8	-0.983	7	0.826	6	-1.038	5	-0.253	8	30.864	7	0.132	7	0.012	0.044	0.046	1.038	0.010	0.005
993	M110	6in Dia. Duct	Sec 2 - max	-0.021	7	0.082	5	-0.137	6	0.654	8	-0.163	5	-0.163	5	0.734	8	-320.560	6	-0.268	6	0.003	0.047	0.052	0.734	0.033	0.017

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_b	f_{bz}/σ_b	[illegible]	f_c (ksi)	[illegible]	f/η	f/σ_v	[illegible]
2015	M212	3in Dia. Duct	Sec 3 - max	0.232	7	0.013	6	-0.055	8	0.865	6	-0.858	7	0.696	1	0.816	2	-13.182	5	-0.056	5	0.027	0.038	0.036	[illegible]	0.865	[illegible]	0.004	0.004	[illegible]
1658	M176	12in Dia. Duct	Sec 3 - min	0.220	6	0.735	1	-0.120	4	0.358	7	-1.254	6	-0.191	6	-0.669	7	-1610.208	5	-0.528	5	0.016	0.056	0.030	[illegible]	1.254	[illegible]	0.041	0.057	[illegible]
1647	M175	12in Dia. Duct	Sec 4 - max	0.436	7	0.549	2	-0.021	3	0.872	6	0.043	7	0.696	7	-0.178	6	483.081	8	0.158	8	0.032	0.039	0.031	[illegible]	0.872	[illegible]	0.012	0.042	[illegible]
686	M71	16in Dia. Duct	Sec 3 - min	-0.033	1	-0.474	2	-0.059	3	0.306	2	-0.728	1	-0.635	6	0.082	7	-2517.459	6	-0.499	6	0.004	0.052	0.045	[illegible]	0.728	[illegible]	0.062	0.059	[illegible]
642	M87	12in Dia. Duct	Sec 1 - min	0.456	6	-0.072	7	-0.095	7	-0.137	2	-0.137	1	1.011	3	-1.386	4	-872.071	5	-0.286	5	0.033	0.006	0.062	[illegible]	1.386	[illegible]	0.022	0.007	[illegible]
1002	M111	6in Dia. Duct	Sec 1 - min	-0.039	6	0.036	8	-0.250	7	0.277	5	-0.672	8	-0.672	8	-0.069	5	-907.788	7	-0.760	7	0.005	0.048	0.048	[illegible]	0.672	[illegible]	0.094	0.031	[illegible]
363	M39	6in Dia. Duct	Sec 2 - max	-0.041	8	0.242	7	0.037	5	-0.080	6	0.518	7	0.822	8	0.114	5	-119.100	6	-0.100	6	0.005	0.037	0.059	[illegible]	0.822	[illegible]	0.012	0.030	[illegible]
98	M10	3in Dia. Duct	Sec 3 - min	0.402	6	-0.029	2	-0.289	8	-0.130	1	-0.135	2	-1.080	3	0.922	4	5.736	3	0.024	3	0.047	0.006	0.046	[illegible]	1.080	[illegible]	0.002	0.022	[illegible]
685	M71	16in Dia. Duct	Sec 3 - max	0.030	2	-0.460	1	0.053	4	0.728	1	-0.386	2	-0.082	7	0.635	6	-925.473	7	-0.183	7	0.003	0.052	0.045	[illegible]	0.728	[illegible]	0.023	0.057	[illegible]
1943	M205	2in Dia. Duct	Sec 2 - max	0.145	5	0.036	8	0.020	2	0.774	7	-0.075	6	0.152	1	1.074	2	-5.895	8	-0.080	8	0.032	0.029	0.040	[illegible]	1.074	[illegible]	0.005	0.002	[illegible]
1984	M209	3in Dia. Duct	Sec 2 - min	0.065	6	-0.021	8	-0.223	7	0.523	7	-0.556	6	0.354	8	-1.538	5	-28.024	8	-0.120	8	0.008	0.025	0.068	[illegible]	1.538	[illegible]	0.009	0.017	[illegible]
1964	M207	3in Dia. Duct	Sec 2 - min	0.117	6	0.018	7	-0.006	7	-0.585	8	0.116	7	-1.365	6	0.859	7	30.864	7	0.132	7	0.014	0.026	0.061	[illegible]	1.365	[illegible]	0.010	0.001	[illegible]
643	M87	12in Dia. Duct	Sec 2 - max	0.522	7	0.065	6	-0.044	3	0.191	1	0.199	2	1.198	4	-0.915	3	872.092	8	0.286	8	0.038	0.009	0.053	[illegible]	1.198	[illegible]	0.022	0.005	[illegible]
1996	M210	3in Dia. Duct	Sec 3 - min	0.062	6	-0.053	6	-0.004	6	-0.306	6	0.284	7	-1.725	5	1.070	8	-14.055	8	-0.060	8	0.010	0.014	0.077	[illegible]	1.725	[illegible]	0.005	0.004	[illegible]
2164	M227	6in Dia. Duct	Sec 2 - min	0.049	5	0.061	6	0.097	6	-0.647	7	0.571	6	-0.461	7	0.180	6	326.181	7	0.273	7	0.006	0.061	0.033	[illegible]	0.847	[illegible]	0.034	0.012	[illegible]
985	M109	6in Dia. Duct	Sec 3 - max	-0.033	7	0.052	5	-0.139	8	0.665	8	-0.076	5	-0.356	5	0.671	8	-173.491	6	-0.145	6	0.004	0.048	0.048	[illegible]	0.671	[illegible]	0.018	0.017	[illegible]
1942	M205	2in Dia. Duct	Sec 1 - min	0.090	8	0.031	7	0.005	4	-0.805	6	-0.322	7	-1.335	2	0.005	1	-24.608	5	-0.335	5	0.020	0.030	0.049	[illegible]	1.335	[illegible]	0.021	0.002	[illegible]
2008	M211	3in Dia. Duct	Sec 4 - min	0.062	6	-0.031	7	0.019	1	-0.092	6	0.088	7	1.518	5	-1.979	8	-14.055	8	-0.060	8	0.007	0.004	0.088	[illegible]	1.979	[illegible]	0.005	0.002	[illegible]
1650	M175	12in Dia. Duct	Sec 5 - min	0.348	6	0.492	1	-0.119	4	0.054	7	-0.971	6	0.166	6	-0.682	7	-1491.663	5	-0.489	5	0.025	0.043	0.030	[illegible]	0.971	[illegible]	0.038	0.038	[illegible]
1994	M210	3in Dia. Duct	Sec 2 - min	0.083	6	-0.046	6	-0.002	6	-0.026	6	0.018	7	-1.967	7	1.225	6	-14.055	8	-0.060	8	0.010	0.001	0.087	[illegible]	1.967	[illegible]	0.005	0.004	[illegible]
355	M38	5in Dia. Duct	Sec 3 - max	0.008	5	0.031	7	0.081	8	0.007	8	0.851	7	0.180	6	0.371	7	401.076	7	0.522	7	0.001	0.068	0.029	[illegible]	0.851	[illegible]	0.072	0.011	[illegible]
358	M38	5in Dia. Duct	Sec 3 - min	-0.008	8	0.031	8	-0.087	5	-0.851	7	-0.607	6	-0.371	7	-0.180	6	274.123	6	0.357	6	0.001	0.068	0.029	[illegible]	0.851	[illegible]	0.049	0.012	[illegible]
992	M110	6in Dia. Duct	Sec 1 - min	-0.050	6	0.013	8	-0.248	7	0.124	5	-0.648	8	-0.633	8	0.082	5	-821.801	7	-0.688	7	0.006	0.046	0.045	[illegible]	0.648	[illegible]	0.085	0.031	[illegible]
1645	M175	12in Dia. Duct	Sec 3 - max	0.436	7	0.549	2	-0.022	3	0.773	6	0.130	7	0.711	7	-0.189	8	483.081	8	0.158	8	0.032	0.034	0.032	[illegible]	0.773	[illegible]	0.012	0.042	[illegible]
649	M87	12in Dia. Duct	Sec 5 - max	0.508	7	0.054	8	-0.025	3	0.407	6	0.439	7	0.924	5	-0.339	8	872.092	8	0.286	8	0.037	0.020	0.041	[illegible]	0.924	[illegible]	0.022	0.004	[illegible]
1012	M112	6in Dia. Duct	Sec 1 - min	-0.022	8	0.055	8	-0.252	7	0.458	5	-0.742	8	-0.582	8	-0.237	5	-964.232	7	-0.607	7	0.003	0.053	0.042	[illegible]	0.742	[illegible]	0.100	0.031	[illegible]
645	M67	12in Dia. Duct	Sec 3 - max	0.517	7	0.061	6	-0.039	3	0.232	1	0.249	2	1.092	5	-0.737	6	872.092	8	0.286	8	0.038	0.011	0.049	[illegible]	1.092	[illegible]	0.022	0.005	[illegible]
1662	M177	12in Dia. Duct	Sec 1 - min	0.060	6	0.860	6	-0.122	4	0.662	7	-1.536	6	-0.519	6	-0.554	7	-1468.410	5	-0.481	5	0.004	0.068	0.025	[illegible]	1.536	[illegible]	0.037	0.066	[illegible]
376	M40	6in Dia. Duct	Sec 3 - min	0.068	8	-0.207	5	-0.129	6	-0.460	7	-0.141	6	-0.777	5	0.159	8	472.862	5	0.396	5	0.009	0.033	0.056	[illegible]	0.777	[illegible]	0.049	0.026	[illegible]
1001	M111	6in Dia. Duct	Sec 1 - max	-0.007	7	0.098	5	-0.136	6	0.872	8	-0.277	5	0.669	5	0.672	6	-478.065	5	-0.400	6	0.001	0.048	0.048	[illegible]	0.672	[illegible]	0.049	0.017	[illegible]
1651	M176	12in Dia. Duct	Sec 1 - max	0.304	7	0.825	2	-0.021	3	0.971	6	-0.054	7	0.698	7	0.168	6	183.470	8	0.060	8	0.022	0.043	0.031	[illegible]	0.971	[illegible]	0.005	0.053	[illegible]
1639	M174	12in Dia. Duct	Sec 5 - max	0.503	7	0.222	6	-0.023	3	0.574	6	0.333	7	0.766	5	-0.367	8	754.811	8	0.247	8	0.037	0.026	0.034	[illegible]	0.766	[illegible]	0.019	0.017	[illegible]
647	M67	12in Dia. Duct	Sec 4 - max	0.513	7	0.058	6	-0.032	3	0.293	6	0.318	7	1.004	5	-0.541	8	872.092	8	0.286	8	0.037	0.014	0.045	[illegible]	1.004	[illegible]	0.022	0.004	[illegible]
1654	M176	12in Dia. Duct	Sec 2 - min	0.220	6	0.736	1	-0.120	4	0.206	7	-1.113	6	-0.179	6	-0.683	7	-1610.208	5	-0.528	5	0.016	0.049	0.030	[illegible]	1.113	[illegible]	0.041	0.057	[illegible]
984	M109	6in Dia. Duct	Sec 2 - min	-0.054	6	-0.018	8	-0.246	7	0.051	5	-0.673	8	-0.570	8	0.274	5	-716.478	7	-0.601	7	0.007	0.048	0.041	[illegible]	0.673	[illegible]	0.074	0.030	[illegible]
1801	M191	16in Dia. Duct	Sec 1 - max	0.078	2	-0.456	2	0.051	4	0.421	1	-0.050	2	-0.179	7	0.794	6	-853.734	7	-0.169	7	0.009	0.030	0.057	[illegible]	0.794	[illegible]	0.021	0.058	[illegible]
1011	M112	6in Dia. Duct	Sec 1 - max	0.007	7	0.098	5	-0.134	6	0.742	8	-0.450	5	0.237	5	0.582	8	-621.143	6	-0.520	6	0.001	0.053	0.042	[illegible]	0.742	[illegible]	0.064	0.017	[illegible]
1648	M175	12in Dia. Duct	Sec 4 - min	0.348	6	0.493	1	-0.119	4	-0.043	7	-0.872	6	0.178	6	-0.696	7	-1491.663	5	-0.489	5	0.025	0.039	0.031	[illegible]	0.872	[illegible]	0.038	0.038	[illegible]
644	M87	12in Dia. Duct	Sec 2 - min	0.452	6	-0.069	7	-0.096	4	-0.199	2	-0.191	1	0.915	3	-1.198	4	-872.071	5	-0.286	5	0.033	0.009	0.053	[illegible]	1.198	[illegible]	0.022	0.007	[illegible]
1637	M174	12in Dia. Duct	Sec 4 - max	0.503	7	0.223	6	-0.023	3	0.533	6	0.360	7	0.773	5	-0.388	8	754.611	8	0.247	8	0.037	0.024	0.034	[illegible]	0.773	[illegible]	0.019	0.017	[illegible]
2133	M224	3in Dia. Duct	Sec 2 - max	0.181	5	0.049	5	0.033	1	-0.843	5	0.920	8	0.738	2	0.703	1	-14.328	8	-0.061	8	0.021	0.041	0.033	[illegible]	0.920	[illegible]	0.005	0.004	[illegible]
370	M39	6in Dia. Duct	Sec 5 - min	-0.053	5	0.140	6	-0.033	8	0.391	5	-0.549	8	0.026	5	-0.681	8	-678.610	7	-0.568	7	0.007	0.039	0.049	[illegible]	0.681	[illegible]	0.070	0.017	[illegible]
991	M110	6in Dia. Duct	Sec 1 - max	-0.021	7	0.033	5	-0.138	6	0.648	8	-0.124	5	-0.082	5	0.633	8	-320.560	6	-0.268	6	0.003	0.046	0.045	[illegible]	0.648	[illegible]	0.033	0.017	[illegible]
1643	M175	12in Dia. Duct	Sec 2 - max	0.437	7	0.549	2	-0.022	3	0.674	6	0.236	7	0.726	7	-0.200	8	483.081	8	0.158	8	0.032	0.030	0.032	[illegible]	0.726	[illegible]	0.012	0.042	[illegible]
1805	M191	16in Dia. Duct	Sec 3 - max	0.076	2	-0.462	2	0.047	4	-0.072	1	0.432	2	-0.220	7	0.759	6	-853.734	7	-0.169	7	0.009	0.031	0.054	[illegible]	0.759	[illegible]	0.021	0.057	[illegible]
1635	M174	12in Dia. Duct	Sec 3 - max	0.503	7	0.223	6	-0.024	3	0.491	6	0.386	7	0.780	5	-0.405	8	754.611	8	0.247	8	0.037	0.022	0.035	[illegible]	0.780	[illegible]	0.019	0.017	[illegible]
2554	M266	3in Dia. Duct	Sec 2 - min	0.096	7	0.038	8	-0.010	7	0.650	5	-0.659	8	-1.165	8	-0.165	5	-38.188	5	-0.155	5	0.011	0.029	0.053	[illegible]	1.165	[illegible]	0.012	0.003	[illegible]
983	M109	6in Dia. Duct	Sec 2 - max	-0.034	7	0.052	5	-0.139	6	0.673	8	-0.051	5	-0.274	5	0.570	8	-173.491	6	-0.145	6	0.004	0.048	0.041	[illegible]	0.673	[illegible]	0.018	0.017	[illegible]
2013	M212	3in Dia. Duct	Sec 2 - max	0.226	7	0.042	8	-0.037	1	0.191	6	-0.183	7	1.304	6	-1.000	7	-13.162	5	-0.056	5	0.026	0.008	0.058	[illegible]	1.304	[illegible]	0.004	0.003	[illegible]
650	M67	12in Dia. Duct	Sec 5 - min	0.439	8	-0.056	7	-0.114	4	-0.439	7	-0.407	6	0.339	8	-0.924	5	-872.071	5	-0.286	5	0.032	0.020	0.041	[illegible]	0.924	[illegible]	0.022	0.009	[illegible]
389	M39	6in Dia. Duct	Sec 5 - max	-0.037	8	0.240	7	0.033	5	0.549	8	-0.391	5	0.681	8	-0.028	5	-119.100	6	-0.100	6	0.005	0.039	0.049	[illegible]	0.681	[illegible]	0.012	0.030	[illegible]
646	M67	12in Dia. Duct	Sec 3 - min	0.447	6	-0.065	7	-0.102	4	-0.249	2	-0.232	1	0.737	8	-1.092	5	-872.071	5	-0.286	5	0.033	0.011	0.049	[illegible]	1.092	[illegible]	0.022	0.008	[illegible]
73	M8	6in Dia. Duct	Sec 2 - max	-0.115	2	-0.129	2	-0.047	5	-0.626	2	0.725	1	0.253	8	0.356	5	139.532	6	0.117	6	0.015	0.052	0.025	[illegible]	0.725	[illegible]	0.014	0.016	[illegible]
1633	M174	12in Dia. Duct	Sec 2 - max	0.504	7	0.224	6	-0.025	3	0.449	6	0.413	7	0.787	5	-0.424	8	754.611	8	0.247	8	0.037	0.020	0.035	[illegible]	0.787	[illegible]	0.019	0.017	[illegible]
1831	M174	12in Dia. Duct	Sec 1 - max	0.504	7	0.224	6	-0.025	3	0.407	6	0.439	7	0.795	5	-0.444	8	754.611	8	0.247	8	0.037	0.020	0.035	[illegible]	0.795	[illegible]	0.019	0.017	[illegible]
1646	M175	12in Dia. Duct	Sec 3 - min	0.348	6	0.494	1	-0.118	4	-0.139	7	-0.773	6	0.189	6	-0.711	7	-1491.663	5	-0.489	5	0.025	0.034	0.032	[illegible]	0.773	[illegible]	0.038	0.038	[illegible]
648	M87	12in Dia. Duct	Sec 4 - min	0.443	6	-0.062	7	-0.108	4	-0.318	7	-0.293	6	0.541	8	-1.004	5	-872.071	5	-0.286	5	0.032	0.014	0.045	[illegible]	1.004	[illegible]	0.022	0.008	[illegible]
1975	M208	3in Dia. Duct	Sec 3 - max	0.180	7	0.025	7	0.058	5	0.496	6	-0.405	7	1.072	5	-0.395	8	34.434	6	0.147	6	0.021	0.022	0.048	[illegible]	1.072	[illegible]	0.011	0.004	[illegible]
1640	M174	12in Dia. Duct	Sec 5 - min	0.423	6	0.142	7	-0.117	4	-0.333	7	-0.574	6	0.367	8	-0.766	5	-1130.158	5	-0.370	5	0.031	0.026	0.034	[illegible]	0.766	[illegible]	0.028	0.011	[illegible]
1641	M175	12in Dia. Duct	Sec 1 - max	0.437	7	0.549	2	-0.023	3	0.574	8	0.333	7	0.741	7	-0.212	8	483.081	8	0.158	8	0.032	0.026	0.033	[illegible]	0.741	[illegible]	0.012	0.042	[illegible]
357	M38	5in Dia. Duct	Sec 4 - max	0.005	5	0.018	7	0.074	8	0.191	6	0.667	7	0.223	8	0.481	5	401.076	7	0.522	7	0.001	0.053	0.037	[illegible]	0.667	[illegible]	0.072	0.010	[illegible]
358	M38	5in Dia. Duct	Sec 4 - min	-0.005	8	0.018	6	-0.080	5	-0.667	7	-0.191	6	-0.461	5	-0.223	8	274.123	6	0.357	6	0.001	0.053	0.037	[illegible]	0.667	[illegible]	0.049	0.011	[illegible]
1652	M176	12in Dia. Duct	Sec 1 - min	0.220	6	0.737	1	-0.119	4	0.054	7	-0.971	6	-0.168	6	-0.698	7	-1610.208	5	-0.628	5	0.016	0.043	0.031	[illegible]	0.971	[illegible]	0.041	0.057	[illegible]
693	M80	8in Dia. Duct	Sec 2 - max	0.218	8	0.041	7	0.075	6	0.317	7	0.117	8	0.502	6	0.566	7	0.000	1	0.000	1	0.026	0.023	0.040	[illegible]	0.560	[illegible]	0.000	0.009	[illegible]
1945	M205	2in Dia. Duct	Sec 3 - max	0.149	5	0.019	6	0.035	2	0.996	5	-0.522	8	0.017	1	0.522	2	-5.895	8	-0.080	8	0.033	0.037	0.019	[illegible]	0.996	[illegible]	0.005	0.002	[illegible]
688	M71	16in Dia. Duct	Sec 4 - min	-0.033	1	-0.476	2	-0.057	3	0.208	2	-0.574	1	-0.623	6	0.096	7	-2517.459	6	-0.499	6	0.004	0.041	0.045	[illegible]	0.623	[illegible]	0.062	0.059	[illegible]
1838	M174	12in Dia. Duct	Sec 4 - min	0.424	6	0.142	7	-0.116	4	-0.360	7	-0.533	6	0.386	8	-0.773	5	-1130.158	5	-0.370	5	0.031	0.024	0.034	[illegible]	0.773	[illegible]	0.028	0.011	[illegible]
982	M109	6in Dia. Duct	Sec 1 - min	-0.054	6	-0.018	8	-0.246	7	0.026	5	-0.661	8	-0.469	8	0.192	5	-718.478	7	-0.601	7	0.007	0.049	0.034	[illegible]	0.681	[illegible]	0.074	0.030	[illegible]
687	M71	16in Dia. Duct	Sec 4 - max	0.030	2	-0.462	1	0.052	4	0.574	1	-0.208	2	-0.096	7	0.623	6	-925.473	7	-0.183	7	0.003	0.041	0.045	[illegible]	0.623	[illegible]	0.023	0.057	[illegible]
1069	M117	6in Dia. Duct	Sec 5 - max	0.014	8	-0.058	5	0.029	5	-0.181	6	0.732	7	0.302	8	0.485	5	401.076	7	0.336	7	0.002	0.052	0.035	[illegible]	0.732	[illegible]	0.041	0.007	[illegible]
1070	M117	6in Dia. Duct	Sec 5 - min	-0.014	5	-0.058	1	-0.029	8	-0.732	7	0.181	6	-0.485	5	-0.302	8	274.123	6	0.229	6	0.002	0.052	0.035	[illegible]	0.732	[illegible]	0.028	0.007	[illegible]
1954	M208	2in Dia. Duct	Sec 2 - min	0.078	8	-0.246	5	-0.273	7	-0.341	7	-0.495	6	-1.442	1	-0.924	2	-24.608	5	-0.335	5	0.017	0.018	0.053	[illegible]	1.442	[illegible]	0.021	0.018	[illegible]
1802	M191	16in Dia. Duct	Sec 1 - min	0.014	1	-0.407	1	-0.056	3	0.050	2	-0.421	1	-0.794	6	0.179	7	-2168.192	6	-0.430	6	0.002	0.030	0.057	[illegible]	0.794	[illegible]	0.053	0.058	[illegible]
694	M80	8in Dia. Duct	Sec 2 - min	-0.209	5	-0.028	6	-0.086	7	-0.117	6	-0.317	7	-0.566	7	-0.502	6	0.000	1	0.000	1	0.025	0.023	0.040	[illegible]	0.566	[illegible]	0.000	0.011	[illegible]
1944	M205	2in Dia. Duct	Sec 2 - min	0.087	8	0.014	7	0.000	1	0.075	8	-0.774	7	-1.074	2	-0.152	1	-24.608	5	-0.335	5	0.019	0.029	0.040	[illegible]	1.074	[illegible]	0.021	0.001	[illegible]
2057	M216	3in Dia. Duct	Sec 4 - max	0.055	5	-0.032	5	0.082	6	-0.112	7	0.114	6	1.715	8	-0.667	6	-6.980	8	-0.030	8	0.006	0.005	0.076	[illegible]	1.715	[illegible]	0.002	0.005	[illegible]
1644	M175	12in Dia. Duct	Sec 2 - min	0.346	8	0.495	1	-0.117	4	-0.230	7	-0.674	6	0.200	6	-0.726	7	-1491.663	5	-0.489	5	0.025	0.030	0.032	[illegible]	0.726	[illegible]	0.038	0.038	[illegible]
1638	M174	12in Dia. Duct	Sec 3 - min	0.424	6	0.141	7	-0.116	4	-0.356	7	-0.491	6	0.405	8	-0.780	5	-1130.158	5	-0.370	5	0.031	0.022	0.035	[illegible]	0.780	[illegible]	0.028	0.011	[illegible]
2134	M224	3in Dia. Duct	Sec 2 - min	0.115	8	0.036	8	-0.008	2	-0.920	8	0.843	5	-0.703	1	-0.738	2	-36.188	5	-0.155	5	0.013	0.041	0.033	[illegible]	0.920	[illegible]	0.012	0.003	[illegible]
1806	M191	16in Dia. Duct	Sec 3 - min	0.017	1	-0.472	1	-0.052	3	-0.432	2	0.072	1	-0.759	6	0.220	7	-2168.192	6	-0.430	6	0.002	0.031	0.054	[illegible]	0.759	[illegible]	0.053	0.058	[illegible]
2211	M232	3in Dia. Duct	Sec 1 - max	0.142	5	0.045	5	0.028	7	0.064	8	0.508	5	-0.045	1	0.988	2	6.083	5	0.035	5	0.017	0.026	0.044	[illegible]	0.988	[illegible]	0.003	0.003	[illegible]
981	M109	6in Dia. Duct	Sec 1 - max	-0.034	7	0.053	5	-0.140	6	0.681	8	-0.026	5	-0.192	5	0.469	8	-173.491	6	-0.145	6	0.004	0.049	0.034	[illegible]	0.681	[illegible]	0.018	0.017	[illegible]
2075	M216	3in Dia. Duct	Sec 3 - max	0.069	5	0.033	5	0.462	6	-0.146	5	0.227	8	0.577	5	1.485	8	-6.980	8	-0.030	8	0.010	0.010	0.068	[illegible]	1.485	[illegible]	0.002	0.036	[illegible]
1700	M180	4in Dia. Duct	Sec 5 - min	-0.036	8	-0.078	7	0.024	5	-0.925	7	0.362	6	0.626	8	-0.935	5	-1.169	5	-0.003	5	0.003	0.041	0.042	[illegible]	0.936	[illegible]	0.000	0.006	[illegible]
1634	M174	12in Dia. Duct	Sec 2 - min	0.425	6	0.141	7	-0.115	4	-0.413	7	-0.449	6	0.424	8	-0.787	5	-1130.158	5	-0.370	5	0.031	0.020	0.035	[illegible]	0.787	[illegible]	0.028	0.011	[illegible]

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a		f_c (ksi)		f_t/σ_t	f_s/σ_s
1632	M174	12in Dia. Duct	Sec 1-min	0.425	6	0.141	7	-0.114	4	-0.439	7	-0.407	6	0.444	8	-0.795	5	-1130.156	5	-0.370	5	0.031	0.020	0.035		0.795		0.026	0.011
1067	M117	6in Dia. Duct	Sec 4 - max	0.014	8	-0.055	5	0.027	5	-0.092	6	0.644	7	0.346	8	0.529	5	401.076	7	0.336	7	0.002	0.046	0.038		0.644		0.041	0.007
1068	M117	6in Dia. Duct	Sec 4 - min	-0.014	5	-0.055	1	-0.027	8	-0.644	7	0.092	6	-0.529	5	-0.346	8	274.123	6	0.229	6	0.002	0.046	0.038		0.644		0.028	0.007
1947	M205	3in Dia. Duct	Sec 4 - max	0.152	5	0.003	6	0.048	2	0.937	1	-0.538	2	0.321	2	0.498	1	-6.695	6	-0.090	6	0.034	0.037	0.015		0.937		0.005	0.003
2139	M224	3in Dia. Duct	Sec 5 - max	0.191	5	0.000	5	0.023	7	0.196	5	0.375	8	1.042	2	-0.027	1	-14.328	8	-0.061	6	0.022	0.017	0.046		1.042		0.005	0.002
2141	M225	3in Dia. Duct	Sec 1 - max	0.191	5	0.037	8	-0.004	6	0.196	5	0.375	8	1.042	2	-0.027	1	-14.328	8	-0.061	8	0.022	0.017	0.046		1.042		0.005	0.003
1620	M172	12in Dia. Duct	Sec 5 - min	-0.127	8	-0.217	7	-0.104	8	-1.372	4	0.955	3	-0.321	5	-0.321	8	-693.515	5	-0.227	5	0.009	0.061	0.014		1.372		0.017	0.017
2005	M211	3in Dia. Duct	Sec 3 - max	0.209	7	-0.002	6	0.040	8	0.330	7	-0.313	6	1.024	1	-0.641	2	-13.162	5	-0.056	5	0.024	0.015	0.046		1.024		0.004	0.003
1698	M180	4in Dia. Duct	Sec 4 - min	-0.036	8	-0.077	7	0.024	5	-0.896	7	0.362	6	0.604	8	-0.926	5	-1.169	5	-0.003	5	0.003	0.040	0.041		0.926		0.009	0.006
242	M25	4in Dia. Duct	Sec 1 - min	-0.029	8	0.024	5	-0.067	6	0.495	8	-0.905	5	0.302	6	-0.925	7	53.888	5	0.119	5	0.003	0.040	0.041		0.925		0.009	0.005
1642	M175	12in Dia. Duct	Sec 1 - min	0.348	6	0.496	1	-0.117	4	-0.333	7	-0.574	6	0.212	6	-0.741	7	-1491.663	5	-0.489	5	0.025	0.026	0.033		0.741		0.038	0.038
1692	M180	4in Dia. Duct	Sec 1 - min	-0.035	8	-0.076	7	0.025	5	-0.906	8	0.345	5	0.539	8	-0.898	5	-1.169	5	-0.003	5	0.003	0.040	0.040		0.906		0.000	0.006
1699	M180	4in Dia. Duct	Sec 5 - max	-0.009	5	0.053	6	0.058	8	-0.362	6	0.925	7	0.935	5	-0.626	8	96.077	8	0.213	8	0.001	0.041	0.042		0.935		0.016	0.004
1690	M178	4in Dia. Duct	Sec 5 - min	-0.043	8	-0.080	7	0.025	5	-0.906	8	0.345	5	0.580	7	-0.675	6	-103.048	5	-0.227	5	0.004	0.040	0.039		0.906		0.017	0.006
1694	M180	4in Dia. Duct	Sec 2 - min	-0.035	8	-0.077	7	0.025	5	-0.848	8	0.373	5	0.541	8	-0.908	5	-1.169	5	-0.003	5	0.003	0.039	0.040		0.908		0.000	0.006
241	M25	4in Dia. Duct	Sec 1 - max	-0.019	5	0.058	8	0.087	7	0.905	5	-0.495	8	0.925	7	-0.362	6	130.227	8	0.287	6	0.002	0.040	0.041		0.925		0.022	0.005
1698	M179	4in Dia. Duct	Sec 4 - min	-0.043	8	-0.080	7	0.025	5	-0.909	6	0.318	5	0.559	7	-0.865	6	-103.048	5	-0.227	5	0.004	0.040	0.038		0.909		0.017	0.006
1610	M171	12in Dia. Duct	Sec 5 - min	-0.107	6	-0.250	7	-0.103	6	-1.291	4	0.842	3	-0.399	5	-0.399	6	-498.755	5	-0.163	5	0.008	0.057	0.018		1.291		0.013	0.019
2165	M227	6in Dia. Duct	Sec 3 - max	0.074	8	0.064	7	0.159	7	-0.169	6	0.303	7	0.726	5	-0.508	6	353.378	6	0.298	6	0.009	0.022	0.052		0.720		0.037	0.020
1696	M180	4in Dia. Duct	Sec 3 - min	-0.036	8	-0.077	7	0.025	5	-0.869	8	0.400	5	0.583	8	-0.917	5	-1.169	5	-0.003	5	0.003	0.039	0.041		0.917		0.000	0.006
1618	M172	12in Dia. Duct	Sec 4 - min	-0.126	6	-0.216	7	-0.104	8	-1.352	4	0.927	3	-0.301	5	-0.301	8	-693.515	5	-0.227	5	0.009	0.060	0.013		1.352		0.017	0.017
1686	M179	4in Dia. Duct	Sec 3 - min	-0.042	8	-0.079	7	0.026	5	-0.912	8	0.292	5	0.539	7	-0.854	6	-103.048	5	-0.227	5	0.004	0.041	0.038		0.912		0.017	0.006
1987	M208	3in Dia. Duct	Sec 4 - max	0.159	7	-0.031	7	-0.115	8	0.256	6	-0.254	7	-0.588	6	1.174	7	-27.019	5	-0.115	5	0.018	0.012	0.052		1.174		0.009	0.009
1065	M117	6in Dia. Duct	Sec 3 - max	0.013	8	-0.051	5	0.026	5	-0.009	6	0.561	7	0.397	8	0.570	5	401.076	7	0.336	7	0.002	0.040	0.041		0.570		0.041	0.006
1066	M117	6in Dia. Duct	Sec 3 - min	-0.013	5	-0.051	1	-0.028	8	-0.561	7	0.009	8	-0.570	5	-0.397	8	274.123	6	0.229	6	0.002	0.040	0.041		0.570		0.028	0.006
1684	M179	4in Dia. Duct	Sec 2 - min	-0.042	8	-0.078	7	0.026	5	-0.915	8	0.265	5	0.518	7	-0.844	6	-103.048	5	-0.227	5	0.004	0.041	0.038		0.915		0.017	0.006
2213	M232	3in Dia. Duct	Sec 2 - max	0.143	5	0.043	5	0.028	7	0.089	8	0.522	5	-0.019	1	0.953	2	6.063	5	0.035	5	0.017	0.023	0.042		0.953		0.003	0.003
2058	M216	3in Dia. Duct	Sec 4 - min	0.008	8	-0.032	8	0.027	7	-0.114	8	0.112	7	0.067	5	-1.715	8	-7.691	5	-0.033	5	0.001	0.005	0.076		1.715		0.002	0.002
1682	M178	4in Dia. Duct	Sec 1 - min	-0.042	8	-0.076	7	0.026	5	-0.919	8	0.239	5	0.498	7	-0.833	6	-103.048	5	-0.227	5	0.004	0.041	0.037		0.919		0.017	0.006
1697	M180	4in Dia. Duct	Sec 4 - max	-0.009	5	0.053	8	0.058	8	-0.362	8	0.696	7	0.926	5	-0.604	8	98.677	8	0.213	8	0.001	0.040	0.041		0.926		0.016	0.004
1976	M208	3in Dia. Duct	Sec 3 - min	0.097	8	0.023	6	0.012	8	0.405	7	-0.498	6	0.395	8	-1.072	5	30.864	7	0.132	7	0.011	0.022	0.048		1.072		0.010	0.002
1691	M180	4in Dia. Duct	Sec 1 - max	-0.008	5	0.053	8	0.057	8	-0.345	5	0.908	8	0.898	5	-0.539	8	96.677	8	0.213	6	0.001	0.040	0.040		0.906		0.016	0.004
1616	M172	12in Dia. Duct	Sec 3 - min	-0.126	6	-0.216	7	-0.103	6	-1.331	4	0.898	3	-0.282	5	-0.282	8	-693.515	5	-0.227	5	0.009	0.059	0.013		1.331		0.017	0.017
1693	M180	4in Dia. Duct	Sec 2 - max	-0.009	5	0.053	6	0.058	6	-0.373	5	0.889	8	0.908	5	-0.561	8	96.677	8	0.213	8	0.001	0.039	0.040		0.908		0.016	0.004
1608	M171	12in Dia. Duct	Sec 4 - min	-0.107	6	-0.249	7	-0.102	6	-1.257	4	0.693	3	-0.379	5	-0.379	8	-498.755	5	-0.163	5	0.008	0.056	0.017		1.257		0.013	0.019
2335	M244	6in Dia. Duct	Sec 3 - max	0.051	7	0.048	5	0.091	8	0.058	7	0.148	6	0.886	7	-0.133	6	411.135	8	0.344	8	0.006	0.011	0.063		0.880		0.042	0.011
1619	M172	12in Dia. Duct	Sec 5 - max	-0.069	5	-0.044	6	0.104	8	-0.955	3	1.372	4	0.321	8	0.321	5	693.536	8	0.227	8	0.005	0.061	0.014		1.372		0.017	0.008
1595	M169	4in Dia. Duct	Sec 3 - max	-0.009	5	0.053	6	0.058	8	-0.400	5	0.669	8	0.917	5	-0.583	8	96.677	8	0.213	8	0.001	0.039	0.041		0.917		0.016	0.004
1689	M179	4in Dia. Duct	Sec 5 - max	0.011	5	0.017	6	0.057	8	-0.345	5	0.906	8	0.875	6	-0.580	7	22.461	8	0.049	8	0.001	0.040	0.039		0.905		0.004	0.004
368	M39	6in Dia. Duct	Sec 4 - min	-0.055	5	0.141	6	-0.034	6	0.128	7	-0.299	6	-0.019	5	-0.728	6	-678.810	7	-0.568	7	0.007	0.021	0.052		0.726		0.070	0.017
2147	M225	3in Dia. Duct	Sec 4 - max	0.197	5	0.008	8	-0.016	6	0.180	8	0.474	5	-0.193	6	0.814	7	-14.328	8	-0.061	8	0.023	0.021	0.038		0.814		0.005	0.001
2188	M227	6in Dia. Duct	Sec 3 - min	0.052	5	0.045	6	0.091	6	-0.303	7	0.169	6	0.508	8	-0.726	5	326.161	7	0.273	7	0.007	0.022	0.052		0.728		0.034	0.011
2016	M212	3in Dia. Duct	Sec 3 - min	0.045	6	0.013	5	-0.067	7	0.858	7	-0.865	6	-0.616	2	-0.096	1	-14.055	8	-0.060	8	0.005	0.038	0.038		0.865		0.005	0.005
1687	M179	4in Dia. Duct	Sec 4 - max	0.011	5	0.017	8	0.057	8	-0.318	5	0.909	8	0.865	6	-0.559	7	22.461	8	0.049	8	0.001	0.040	0.039		0.909		0.004	0.004
1630	M173	12in Dia. Duct	Sec 5 - min	-0.127	8	-0.150	7	-0.105	6	-1.386	4	1.011	3	-0.201	6	-0.201	7	-828.032	5	-0.271	5	0.009	0.062	0.009		1.386		0.021	0.012
1663	M117	6in Dia. Duct	Sec 2 - max	0.012	8	-0.048	5	0.024	5	0.068	8	0.484	7	0.428	8	0.609	5	401.076	7	0.336	7	0.002	0.035	0.044		0.609		0.041	0.005
1664	M117	6in Dia. Duct	Sec 2 - min	-0.012	5	-0.048	1	-0.024	8	-0.484	7	-0.068	6	-0.609	5	-0.428	8	274.123	6	0.229	6	0.002	0.035	0.044		0.609		0.025	0.005
1685	M179	4in Dia. Duct	Sec 3 - max	0.011	5	0.017	6	0.057	8	-0.292	5	0.912	8	0.854	6	-0.539	7	22.461	8	0.049	8	0.001	0.041	0.038		0.912		0.004	0.004
2076	M218	3in Dia. Duct	Sec 3 - min	-0.026	8	0.029	8	0.131	7	-0.227	8	0.146	5	-1.485	8	-0.577	5	-7.691	5	-0.033	5	0.003	0.010	0.066		1.485		0.003	0.010
1663	M179	4in Dia. Duct	Sec 2 - max	0.011	5	0.017	6	0.057	8	-0.285	5	0.915	8	0.644	6	-0.518	7	22.461	8	0.049	8	0.001	0.041	0.038		0.919		0.004	0.004
2212	M232	3in Dia. Duct	Sec 1 - min	0.079	8	0.017	8	0.013	6	-0.588	5	-0.064	8	-0.988	2	0.045	1	-0.009	8	0.000	8	0.009	0.026	0.044		0.598		0.000	0.001
1614	M172	12in Dia. Duct	Sec 2 - min	-0.125	8	-0.215	7	-0.103	8	-1.311	4	0.870	3	-0.262	5	-0.262	8	-693.515	5	-0.227	5	0.009	0.059	0.012		1.311		0.017	0.017
1681	M179	4in Dia. Duct	Sec 1 - max	0.011	5	0.017	6	0.056	8	-0.239	5	0.919	8	0.833	6	-0.498	7	22.461	8	0.049	8	0.001	0.041	0.037		0.919		0.004	0.004
1628	M173	12in Dia. Duct	Sec 4 - min	-0.127	8	-0.149	7	-0.105	6	-1.362	4	0.997	3	-0.182	6	-0.182	7	-828.032	5	-0.271	5	0.009	0.061	0.008		1.362		0.021	0.011
1617	M172	12in Dia. Duct	Sec 4 - max	-0.068	5	-0.044	8	0.104	8	-0.927	3	1.352	4	0.301	8	0.301	5	693.536	8	0.227	8	0.005	0.060	0.013		1.352		0.017	0.008
1629	M173	12in Dia. Duct	Sec 5 - max	-0.106	7	0.057	8	0.105	8	-1.011	3	1.366	4	0.201	7	0.201	0	828.054	8	0.271	8	0.008	0.062	0.009		1.366		0.021	0.008
1608	M171	12in Dia. Duct	Sec 3 - min	-0.106	8	-0.248	7	-0.102	6	-1.224	4	0.764	3	-0.360	5	-0.360	8	-498.755	5	-0.163	5	0.008	0.054	0.016		1.224		0.013	0.019
367	M39	6in Dia. Duct	Sec 4 - max	-0.038	8	0.244	7	0.034	5	0.299	6	-0.128	7	0.726	8	0.019	5	-119.100	6	-0.100	8	0.005	0.021	0.052		0.726		0.012	0.030
1620	M173	12in Dia. Duct	Sec 3 - min	-0.126	6	-0.149	7	-0.103	6	-1.379	4	0.963	3	-0.162	6	-0.162	7	-828.032	5	-0.271	5	0.009	0.061	0.007		1.379		0.021	0.011
1603	M191	16in Dia. Duct	Sec 2 - max	0.077	2	-0.459	2	0.049	4	0.175	1	0.150	2	-0.200	7	0.776	6	-653.734	7	-0.169	7	0.009	0.014	0.055		0.778		0.021	0.057
2215	M232	3in Dia. Duct	Sec 3 - max	0.143	5	0.041	5	0.028	7	0.111	8	0.456	5	0.006	1	0.915	2	6.063	5	0.035	5	0.017	0.020	0.041		0.915		0.003	0.003
690	M71	16in Dia. Duct	Sec 5 - min	-0.033	1	-0.478	2	-0.056	3	0.050	2	-0.421	1	-0.611	6	0.110	7	-2517.459	6	-0.499	6	0.004	0.030	0.044		0.611		0.062	0.059
1612	M173	12in Dia. Duct	Sec 1 - min	-0.125	6	-0.214	7	-0.103	6	-1.291	4	0.842	3	-0.243	5	-0.243	8	-693.515	5	-0.227	5	0.009	0.057	0.011		1.291		0.017	0.016
1627	M173	12in Dia. Duct	Sec 4 - max	-0.106	7	0.057	6	0.105	8	-0.997	3	1.382	4	0.182	7	0.182	6	828.054	8	0.271	8	0.008	0.061	0.008		1.382		0.021	0.008
669	M71	16in Dia. Duct	Sec 5 - max	0.030	2	-0.463	1	0.051	4	0.421	1	-0.050	2	-0.110	7	0.811	6	-825.473	7	-0.183	7	0.003	0.030	0.044		0.611		0.023	0.057
2336	M244	6in Dia. Duct	Sec 3 - min	-0.023	8	-0.051	6	0.015	5	-0.149	8	-0.008	7	0.133	6	-0.886	7	-347.386	5	-0.291	5	0.003	0.011	0.063		0.886		0.038	0.006
1661	M117	6in Dia. Duct	Sec 1 - max	0.011	6	-0.044	5	0.022	5	0.141	8	0.411	7	0.462	8	0.645	5	401.076	7	0.336	7	0.001	0.029	0.046		0.645		0.041	0.005
1662	M117	6in Dia. Duct	Sec 1 - min	-0.011	5	-0.044	1	-0.022	8	-0.411	7	-0.141	6	-0.645	5	-0.462	8	274.123	6	0.229	6	0.001	0.029	0.046		0.645		0.028	0.005
1609	M171	12in Dia. Duct	Sec 5 - max	-0.022	7	-0.135	6	0.103	8	-0.842	3	1.291	4	0.399	8	0.399	5	498.771	8	0.163	8	0.002	0.057	0.016		1.291		0.013	0.010
1624	M173	12in Dia. Duct	Sec 2 - min	-0.126	6	-0.148	7	-0.104	6	-1.376	4	0.969	3	-0.142	6	-0.142	7	-828.032	5	-0.271	5	0.009	0.061	0.006		1.376		0.021	0.011
1615	M172	12in Dia. Duct	Sec 3 - max	-0.068	5	-0.043	6	0.103	8	-0.896	3	1.331	4	0.282	8	0.282	5	693.536	8	0.227	8	0.005	0.059	0.013		1.331		0.017	0.008
2477	M269	6in Dia. Duct	Sec 4 - max	0.102	7	-0.033	7	-0.075	6	0.450	7	0.025	6	-0.272	1	0.442	2	-179.120	6	-0.100	6	0.013	0.032	0.032		0.450		0.019	0.009
366	M39	6in Dia. Duct	Sec 3 - min	-0.056	5	0.143	6	-0.036	6	-0.196	7	-0.111	6	-0.066	5	-0.773	8	-678.810	7	-0.568	7	0.007	0.014	0.055		0.773		0.070	0.018
1622	M173	12in Dia. Duct	Sec 1 - min	-0.125	6	-0.148	7	-0.104	6	-1.372	4	0.955	3	-0.138	2	-0.138	1	-828.032	5	-0.271	5	0.009	0.061	0.006		1.372		0.021	0.011
1625	M173	12in Dia. Duct	Sec 3 - max	-0.106	7	0.057	6	0.105	8	-0.963	3	1.379	4	0.162	7	0.162	6	828.054	8	0.271	8	0.008	0.061	0.007		1.379		0.021	0.008
1604	M171	12in Dia. Duct	Sec 2 - min	-0.106	6	-0.247	7	-0.102	6	-1.190	4	0.726	3	-0.341	5	-0.341	8	-498.755	5	-0.163	5	0.008	0.053	0.015		1.190		0.013	0.019
225	M23	4in Dia. Duct	Sec 3 - max	0.011	5	0.052	5	0.071	6	-0.348	5	0.417	8	-0.748	8	1.263	5	-74.673	8	-0.164	8	0.001	0.019	0.058		1.263		0.013	0.005
226	M23	4in Dia. Duct	Sec 3 - min	-0.011	6	0.032	8	0.012	7	-0.417	8	0.348	5	-1.263	5	0.748	8	-188.824	5	-0.415	5	0.001	0.019	0.056		1.263		0.032	0.002
1600	M170	12in Dia. Duct	Sec 5 - min	-0.072	8	-0.244	7	-0.102	6	-1.157	4	0.699	3	-0.422	5	-0.422	8	-498.190	1	-0.134	1	0.005	0.051	0.018		1.157		0.010	0.019
2140	M224	3in Dia. Duct	Sec 5 - min	0.195	6	-0.012	8	0.001	8	-0.375	8	-0.198	5	0.027	1	-1.042	2	-38.188	5	-0.155	5	0.012	0.017	0.046		1.042		0.012	0.001
2142	M225	3in Dia. Duct	Sec 1 - min	0.105	8	-0.013	5	-0.079	7	-0.375	8	-0.199	5	0.027	1	-1.042	2	-36.188	5	-0.155	5	0.012	0.017	0.046		1.042		0.012	0.006
1623	M173	12in Dia. Duct	Sec 2 - max	-0.105	7	0.056	8	0.104	8	-0.969	3	1.376	4	0.142	7	0.142	6	828.054	8	0.271	8	0.008	0.061	0.006		1.370		0.021	0.008
1613	M172	12in Dia. Duct	Sec 2 - max	-0.068	5	-0.043	6	0.103	8	-0.870	3	1.311	4	0.262	8	0.262	5	693.536	8	0.227	8	0.005	0.058	0.012		1.311		0.017	0.008
2135	M224	3in Dia. Duct	Sec 3 - max	0.185	5	0.033	5	0.022	1	-0.264	5	0.505	8	0.694	2	0.315	1	-14.328	8	-0.061	8	0.022	0.022	0.031		0.694		0.005	0.003
1621	M173	12in Dia. Duct	Sec 1 - max	-0.105	7	0.056	8	0.104	8	-0.955	3	1.372	4	0.138	1	0.138	2	828.054	8	0.271	8	0.008	0.061	0.006		1.372		0.021	0.008

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f/σ	fv/σ	fw/σ	D-2250	ft (ksi)		f/σt	f/σs	
2214	M232	3in Dia. Duct	Sec 2 - min	0.079	8	0.016	8	0.012	6	-0.522	5	-0.089	8	-0.953	2	0.018	1	-0.009	8	0.000	8	0.009	0.023	0.042	[illegible]	0.953	[illegible]	0.000	0.001	[illegible]
1948	M205	2in Dia. Duct	Sec 3 - min	0.083	8	-0.002	7	-0.014	1	0.522	8	-0.996	5	-0.522	2	-0.017	1	-24.608	5	-0.335	5	0.018	0.037	0.019	[illegible]	0.996	[illegible]	0.021	0.001	[illegible]
365	M39	6in Dia. Duct	Sec 3 - max	-0.040	8	0.243	7	0.036	6	0.111	6	0.196	7	0.773	8	0.066	5	-119.100	6	-0.100	8	0.005	0.014	0.055	[illegible]	0.773	[illegible]	0.012	0.030	[illegible]
1607	M171	12in Dia. Duct	Sec 4 - max	-0.021	7	-0.135	6	0.102	8	-0.803	3	1.257	4	0.379	8	0.379	5	498.771	8	0.163	8	0.002	0.056	0.017	[illegible]	1.257	[illegible]	0.013	0.010	[illegible]
1602	M171	12in Dia. Duct	Sec 1 - min	-0.106	6	-0.249	7	-0.102	6	-1.157	4	0.688	3	-0.322	5	-0.322	8	-498.755	5	-0.163	5	0.008	0.051	0.014	[illegible]	1.157	[illegible]	0.013	0.019	[illegible]
2333	M264	6in Dia. Duct	Sec 2 - max	0.046	7	0.065	5	0.080	8	0.298	8	0.469	5	0.476	5	0.387	8	411.135	8	0.344	8	0.006	0.034	0.034	[illegible]	0.476	[illegible]	0.042	0.010	[illegible]
2217	M232	3in Dia. Duct	Sec 4 - max	0.143	5	0.039	5	0.030	7	0.130	8	0.397	5	0.028	1	0.677	2	8.083	5	0.035	5	0.017	0.018	0.039	[illegible]	0.677	[illegible]	0.003	0.003	[illegible]
1611	M172	12in Dia. Duct	Sec 1 - max	-0.068	5	-0.043	6	0.103	8	-0.842	3	1.291	4	0.243	8	0.243	5	693.536	8	0.227	8	0.005	0.057	0.011	[illegible]	1.291	[illegible]	0.017	0.008	[illegible]
1987	M207	3in Dia. Duct	Sec 4 - max	0.188	7	-0.015	6	0.030	8	-0.280	7	0.332	6	-0.399	8	0.866	5	34.434	6	0.147	6	0.020	0.015	0.038	[illegible]	0.866	[illegible]	0.011	0.002	[illegible]
1598	M170	12in Dia. Duct	Sec 4 - min	-0.072	8	-0.243	7	-0.101	6	-1.116	4	0.645	3	-0.403	5	-0.403	8	-409.190	1	-0.134	1	0.005	0.050	0.018	[illegible]	1.116	[illegible]	0.010	0.019	[illegible]
2014	M212	3in Dia. Duct	Sec 2 - min	0.051	8	0.042	5	-0.085	2	0.183	7	-0.191	6	1.000	7	-1.304	6	-14.055	8	-0.060	8	0.006	0.008	0.058	[illegible]	1.304	[illegible]	0.005	0.007	[illegible]
1599	M170	12in Dia. Duct	Sec 5 - max	0.028	7	-0.204	6	0.102	8	-0.668	3	1.157	4	0.422	8	0.422	5	409.200	2	0.134	2	0.002	0.051	0.019	[illegible]	1.157	[illegible]	0.010	0.016	[illegible]
2127	M223	3in Dia. Duct	Sec 4 - max	0.189	5	-0.038	8	0.024	2	0.679	8	-0.620	5	0.383	1	0.502	2	-14.328	8	-0.061	8	0.020	0.030	0.022	[illegible]	0.679	[illegible]	0.005	0.003	[illegible]
1605	M171	12in Dia. Duct	Sec 3 - max	-0.021	7	-0.134	6	0.102	8	-0.764	3	1.224	4	0.360	8	0.360	5	498.771	8	0.163	8	0.002	0.054	0.016	[illegible]	1.224	[illegible]	0.013	0.010	[illegible]
2137	M224	3in Dia. Duct	Sec 4 - max	0.186	5	0.016	5	0.017	7	0.082	5	0.323	8	0.795	2	0.071	1	-14.328	8	-0.061	8	0.022	0.014	0.035	[illegible]	0.795	[illegible]	0.005	0.001	[illegible]
1988	M209	3in Dia. Duct	Sec 4 - min	0.062	6	-0.033	6	-0.227	5	0.254	7	-0.266	6	-1.174	7	0.588	6	-28.024	8	-0.120	8	0.007	0.012	0.052	[illegible]	1.174	[illegible]	0.009	0.017	[illegible]
1880	M178	4in Dia. Duct	Sec 5 - min	-0.038	6	-0.061	7	0.028	5	-0.919	8	0.239	5	0.376	7	-0.599	6	-172.913	5	-0.380	5	0.004	0.041	0.027	[illegible]	0.919	[illegible]	0.029	0.005	[illegible]
2053	M216	3in Dia. Duct	Sec 2 - max	0.046	1	0.014	5	0.081	6	0.244	2	-0.238	1	0.066	7	1.232	6	-6.980	8	-0.030	8	0.005	0.011	0.055	[illegible]	1.232	[illegible]	0.002	0.008	[illegible]
1804	M191	16in Dia. Duct	Sec 2 - min	0.015	1	-0.469	1	-0.054	3	-0.190	2	-0.175	1	-0.770	6	0.200	7	-2168.192	6	-0.430	6	0.002	0.014	0.055	[illegible]	0.776	[illegible]	0.053	0.058	[illegible]
1965	M207	3in Dia. Duct	Sec 3 - max	0.164	7	0.007	6	0.023	8	0.009	7	0.252	6	-0.847	1	0.098	2	34.434	6	0.147	6	0.019	0.011	0.040	[illegible]	0.898	[illegible]	0.011	0.002	[illegible]
1596	M170	12in Dia. Duct	Sec 3 - min	-0.072	8	-0.242	7	-0.101	8	-1.075	4	0.603	3	-0.384	5	-0.384	8	-409.190	1	-0.134	1	0.005	0.040	0.017	[illegible]	1.075	[illegible]	0.010	0.019	[illegible]
2216	M232	3in Dia. Duct	Sec 3 - min	0.078	8	0.014	8	0.011	8	-0.456	5	-0.111	8	-0.915	2	-0.006	1	-0.009	8	0.000	8	0.009	0.020	0.041	[illegible]	0.915	[illegible]	0.000	0.001	[illegible]
1679	M178	4in Dia. Duct	Sec 5 - max	0.027	5	-0.022	6	0.056	8	-0.239	5	0.919	8	0.599	6	-0.376	7	-48.062	8	-0.106	8	0.003	0.041	0.027	[illegible]	0.919	[illegible]	0.008	0.004	[illegible]
1678	M178	4in Dia. Duct	Sec 4 - min	-0.038	8	-0.060	7	0.027	5	-0.906	8	0.221	5	0.356	7	-0.588	6	-172.913	5	-0.380	5	0.004	0.040	0.026	[illegible]	0.906	[illegible]	0.029	0.005	[illegible]
2334	M244	6in Dia. Duct	Sec 2 - min	-0.017	6	-0.032	8	0.026	5	-0.469	5	-0.298	8	-0.367	8	-0.478	5	-347.386	5	-0.291	5	0.002	0.034	0.034	[illegible]	0.476	[illegible]	0.036	0.004	[illegible]
1603	M171	12in Dia. Duct	Sec 2 - max	-0.021	7	-0.134	6	0.102	8	-0.726	3	1.190	4	0.341	8	0.341	5	498.771	8	0.163	8	0.002	0.053	0.015	[illegible]	1.190	[illegible]	0.013	0.010	[illegible]
1597	M170	12in Dia. Duct	Sec 4 - max	0.027	7	-0.203	6	0.101	8	-0.645	3	1.116	4	0.403	8	0.403	5	409.200	2	0.134	2	0.002	0.050	0.018	[illegible]	1.116	[illegible]	0.010	0.016	[illegible]
1949	M205	2in Dia. Duct	Sec 4 - min	0.080	8	-0.019	7	-0.028	1	0.538	2	-0.987	1	-0.408	1	-0.321	2	-24.608	5	-0.335	5	0.018	0.037	0.015	[illegible]	0.987	[illegible]	0.021	0.002	[illegible]
1677	M178	4in Dia. Duct	Sec 4 - max	0.027	6	-0.022	6	0.056	8	-0.221	5	0.900	8	0.588	6	-0.356	7	-48.062	8	-0.106	6	0.003	0.040	0.026	[illegible]	0.908	[illegible]	0.008	0.004	[illegible]
1676	M178	4in Dia. Duct	Sec 3 - min	-0.038	8	-0.059	7	0.027	5	-0.893	8	0.203	5	0.336	7	-0.577	6	-172.913	5	-0.380	5	0.004	0.040	0.026	[illegible]	0.893	[illegible]	0.029	0.005	[illegible]
2219	M232	3in Dia. Duct	Sec 5 - max	0.144	5	0.038	5	0.031	7	0.147	8	0.339	5	0.050	1	0.838	2	8.083	5	0.035	5	0.017	0.015	0.037	[illegible]	0.838	[illegible]	0.003	0.003	[illegible]
2148	M225	3in Dia. Duct	Sec 4 - min	0.099	8	-0.041	5	-0.068	7	-0.474	5	-0.180	8	-0.814	7	0.193	6	-36.188	5	-0.155	5	0.012	0.021	0.038	[illegible]	0.814	[illegible]	0.012	0.005	[illegible]
2006	M211	3in Dia. Duct	Sec 3 - min	0.068	6	-0.003	7	0.034	5	0.313	6	-0.330	7	0.641	2	-1.024	1	-14.055	8	-0.060	8	0.008	0.015	0.046	[illegible]	1.024	[illegible]	0.005	0.003	[illegible]
1674	M178	4in Dia. Duct	Sec 2 - min	-0.038	8	-0.059	7	0.027	5	-0.881	8	0.188	5	0.316	7	-0.566	6	-172.913	5	-0.380	5	0.004	0.039	0.025	[illegible]	0.881	[illegible]	0.029	0.005	[illegible]
1675	M178	4in Dia. Duct	Sec 3 - max	0.027	5	-0.021	6	0.056	8	-0.203	5	0.093	8	0.577	6	-0.336	7	-48.062	8	-0.106	8	0.003	0.040	0.028	[illegible]	0.693	[illegible]	0.008	0.004	[illegible]
1594	M170	12in Dia. Duct	Sec 2 - min	-0.071	8	-0.241	7	-0.101	6	-1.034	4	0.560	3	-0.365	5	-0.385	8	-409.190	1	-0.134	1	0.005	0.048	0.016	[illegible]	1.034	[illegible]	0.010	0.019	[illegible]
2054	M216	3in Dia. Duct	Sec 2 - min	0.015	2	0.014	8	0.009	7	0.238	1	-0.244	2	-1.232	6	-0.088	7	-7.691	5	-0.033	5	0.002	0.011	0.055	[illegible]	1.232	[illegible]	0.003	0.001	[illegible]
1601	M171	12in Dia. Duct	Sec 1 - max	-0.021	7	-0.133	6	0.102	8	-0.688	3	1.157	4	0.322	8	0.322	5	498.771	8	0.163	8	0.002	0.051	0.014	[illegible]	1.157	[illegible]	0.013	0.010	[illegible]
2128	M223	3in Dia. Duct	Sec 4 - min	0.127	8	-0.038	5	-0.029	1	0.620	5	-0.679	8	-0.502	2	-0.383	1	-36.188	5	-0.155	5	0.015	0.030	0.022	[illegible]	0.679	[illegible]	0.012	0.003	[illegible]
1673	M178	4in Dia. Duct	Sec 2 - max	0.027	5	-0.021	6	0.055	8	-0.188	5	0.881	8	0.566	6	-0.316	7	-48.062	8	-0.106	8	0.003	0.039	0.025	[illegible]	0.881	[illegible]	0.008	0.004	[illegible]
581	M61	12in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	1.142	3	-0.687	4	0.362	6	0.362	7	384.330	2	0.126	2	0.000	0.051	0.016	[illegible]	1.142	[illegible]	0.010	0.000	[illegible]
582	M61	12in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.667	4	-1.142	3	-0.362	7	-0.362	6	-384.324	1	-0.126	1	0.000	0.051	0.016	[illegible]	1.142	[illegible]	0.010	0.000	[illegible]
1595	M170	12in Dia. Duct	Sec 3 - max	0.027	7	-0.202	6	0.101	8	-0.603	3	1.075	4	0.384	8	0.384	5	409.200	2	0.134	2	0.002	0.048	0.017	[illegible]	1.075	[illegible]	0.010	0.016	[illegible]
1872	M178	4in Dia. Duct	Sec 1 - min	-0.037	8	-0.058	7	0.027	5	-0.868	8	0.168	5	0.296	7	-0.555	6	-172.913	5	-0.380	5	0.004	0.039	0.025	[illegible]	0.868	[illegible]	0.029	0.004	[illegible]
583	M61	12in Dia. Duct	Sec 2 - max	0.000	5	-0.005	1	0.003	2	1.140	3	-0.064	4	0.360	6	0.360	7	384.330	2	0.126	2	0.000	0.051	0.018	[illegible]	1.140	[illegible]	0.010	0.000	[illegible]
584	M61	12in Dia. Duct	Sec 2 - min	0.000	6	-0.005	1	-0.003	1	0.664	4	-1.140	3	-0.360	7	-0.360	6	-384.324	1	-0.126	1	0.000	0.061	0.018	[illegible]	1.140	[illegible]	0.010	0.000	[illegible]
2478	M258	6in Dia. Duct	Sec 4 - min	0.023	6	-0.052	6	-0.177	7	-0.025	6	-0.450	7	-0.442	2	0.272	1	-325.274	7	-0.272	7	0.003	0.032	0.032	[illegible]	0.450	[illegible]	0.034	0.022	[illegible]
585	M61	12in Dia. Duct	Sec 3 - max	0.002	5	-0.010	1	0.007	2	1.132	3	-0.656	4	0.357	6	0.357	7	384.330	2	0.126	2	0.000	0.050	0.016	[illegible]	1.132	[illegible]	0.010	0.001	[illegible]
586	M61	12in Dia. Duct	Sec 3 - min	-0.002	6	-0.010	1	-0.007	1	0.656	4	-1.132	3	-0.357	7	-0.357	6	-384.324	1	-0.126	1	0.000	0.050	0.018	[illegible]	1.132	[illegible]	0.010	0.001	[illegible]
2136	M224	3in Dia. Duct	Sec 3 - min	0.112	8	0.021	8	0.002	2	-0.505	8	0.284	5	-0.315	1	-0.694	2	-36.188	5	-0.155	5	0.013	0.022	0.031	[illegible]	0.694	[illegible]	0.012	0.002	[illegible]
1968	M207	3in Dia. Duct	Sec 4 - min	0.109	6	-0.028	7	-0.005	5	-0.332	6	0.280	7	-0.868	5	0.399	8	30.864	7	0.132	7	0.013	0.015	0.038	[illegible]	0.866	[illegible]	0.010	0.002	[illegible]
1871	M178	4in Dia. Duct	Sec 1 - max	0.027	5	-0.020	6	0.055	8	-0.168	5	0.868	8	0.555	6	-0.298	7	-48.062	8	-0.106	8	0.003	0.039	0.025	[illegible]	0.868	[illegible]	0.008	0.004	[illegible]
2218	M232	3in Dia. Duct	Sec 4 - min	0.078	8	0.012	8	0.011	6	-0.397	5	-0.130	8	-0.877	2	-0.029	1	-0.009	8	0.000	8	0.009	0.018	0.039	[illegible]	0.877	[illegible]	0.000	0.001	[illegible]
587	M61	12in Dia. Duct	Sec 4 - max	0.003	5	-0.014	1	0.010	2	1.119	3	-0.643	4	0.352	6	0.352	7	384.330	2	0.126	2	0.000	0.050	0.016	[illegible]	1.119	[illegible]	0.010	0.001	[illegible]
588	M61	12in Dia. Duct	Sec 4 - min	-0.003	6	-0.014	1	-0.010	1	0.643	4	-1.119	3	-0.352	7	-0.352	6	-384.324	1	-0.128	1	0.000	0.050	0.016	[illegible]	1.119	[illegible]	0.010	0.001	[illegible]
1592	M170	12in Dia. Duct	Sec 1 - min	-0.071	8	-0.240	7	-0.100	6	-0.993	4	0.518	3	-0.347	5	-0.347	8	-409.190	1	-0.134	1	0.005	0.044	0.015	[illegible]	0.993	[illegible]	0.010	0.018	[illegible]
589	M61	12in Dia. Duct	Sec 5 - max	0.004	5	-0.019	1	0.014	2	1.101	3	-0.625	4	0.345	6	0.345	7	384.330	2	0.126	2	0.000	0.049	0.015	[illegible]	1.101	[illegible]	0.010	0.001	[illegible]
590	M61	12in Dia. Duct	Sec 5 - min	-0.004	6	-0.019	1	-0.014	1	0.625	4	-1.101	3	-0.345	7	-0.345	6	-384.324	1	-0.126	1	0.000	0.049	0.015	[illegible]	1.101	[illegible]	0.010	0.001	[illegible]
639	M66	12in Dia. Duct	Sec 5 - max	0.050	7	-0.225	1	0.100	8	-0.518	3	0.993	4	0.375	8	0.375	5	384.330	2	0.126	2	0.004	0.044	0.017	[illegible]	0.993	[illegible]	0.010	0.017	[illegible]
640	M66	12in Dia. Duct	Sec 5 - min	-0.050	6	-0.225	8	-0.100	6	-0.993	4	0.518	3	-0.375	5	-0.375	8	-384.324	1	-0.126	1	0.004	0.044	0.017	[illegible]	0.993	[illegible]	0.010	0.017	[illegible]
1966	M207	3in Dia. Duct	Sec 3 - min	0.113	6	-0.004	7	0.003	7	-0.252	6	-0.009	7	-0.898	2	0.847	1	30.864	7	0.132	7	0.013	0.011	0.040	[illegible]	0.898	[illegible]	0.010	0.000	[illegible]
1593	M170	12in Dia. Duct	Sec 2 - max	0.027	7	-0.202	6	0.101	6	-0.500	3	1.034	4	0.365	8	0.365	5	409.200	2	0.134	2	0.002	0.048	0.016	[illegible]	1.034	[illegible]	0.010	0.016	[illegible]
2138	M224	3in Dia. Duct	Sec 4 - min	0.108	6	0.005	8	0.008	6	-0.323	8	-0.082	5	-0.071	1	-0.795	2	-36.188	5	-0.155	5	0.013	0.014	0.035	[illegible]	0.795	[illegible]	0.012	0.001	[illegible]
1591	M170	12in Dia. Duct	Sec 1 - max	0.027	7	-0.201	6	0.100	8	-0.518	3	0.993	4	0.347	8	0.347	5	409.200	2	0.134	2	0.002	0.044	0.015	[illegible]	0.993	[illegible]	0.010	0.015	[illegible]
2220	M232	3in Dia. Duct	Sec 5 - min	0.078	8	0.010	8	0.010	8	-0.339	5	-0.147	8	-0.636	2	-0.050	1	-0.009	8	0.000	8	0.008	0.015	0.037	[illegible]	0.836	[illegible]	0.000	0.001	[illegible]
239	M24	4in Dia. Duct	Sec 5 - max	0.032	7	-0.031	5	0.055	6	-0.160	5	0.868	8	0.409	8	-0.161	5	-74.873	8	-0.164	6	0.003	0.039	0.018	[illegible]	0.868	[illegible]	0.013	0.004	[illegible]
240	M24	4in Dia. Duct	Sec 5 - min	-0.032	6	-0.051	8	0.027	5	-0.868	8	0.168	5	0.161	5	-0.409	8	-188.824	5	-0.415	5	0.003	0.039	0.018	[illegible]	0.868	[illegible]	0.032	0.004	[illegible]
637	M66	12in Dia. Duct	Sec 4 - max	0.050	7	-0.222	1	0.099	8	-0.392	3	0.868	4	0.319	8	0.319	5	384.330	2	0.126	2	0.004	0.039	0.014	[illegible]	0.868	[illegible]	0.010	0.017	[illegible]
638	M66	12in Dia. Duct	Sec 4 - min	-0.050	6	-0.222	8	-0.099	6	-0.868	4	0.392	3	-0.319	5	-0.319	8	-384.324	1	-0.126	1	0.004	0.039	0.014	[illegible]	0.868	[illegible]	0.010	0.017	[illegible]
1985	M209	3in Dia. Duct	Sec 3 - max	0.157	7	-0.025	7	-0.110	8	0.428	6	-0.406	7	0.352	5	0.288	8	-27.019	5	-0.115	5	0.018	0.019	0.016	[illegible]	0.428	[illegible]	0.009	0.009	[illegible]
227	M23	4in Dia. Duct	Sec 4 - max	0.013	5	0.044	5	0.067	6	-0.073	5	0.258	6	-0.657	8	0.881	5	-74.673	8	-0.164	8	0.001	0.011	0.039	[illegible]	0.881	[illegible]	0.013	0.005	[illegible]
228	M23	4in Dia. Duct	Sec 4 - min	-0.013	6	0.024	8	0.016	7	-0.258	8	0.073	5	-0.881	5	0.657	8	-188.824	5	-0.415	5	0.001	0.011	0.039	[illegible]	0.881	[illegible]	0.032	0.002	[illegible]
2123	M223	3in Dia. Duct	Sec 2 - max	0.165	6	0.050	8	0.026	1	0.201	2	-0.199	1	0.523	1	0.260	2	-14.328	8	-0.061	8	0.019	0.009	0.023	[illegible]	0.523	[illegible]	0.005	0.004	[illegible]
635	M66	12in Dia. Duct	Sec 3 - max	0.049	7	-0.220	1	0.098	8	-0.268	3	0.743	4	0.263	8	0.263	5	384.330	2	0.126	2	0.004	0.033	0.012	[illegible]	0.743	[illegible]	0.010	0.017	[illegible]
636	M66	12in Dia. Duct	Sec 3 - min	-0.049	6	-0.220	8	-0.098	6	-0.743	4	0.268	3	-0.263	5	-0.263	8	-384.324	1	-0.126	1	0.004	0.033	0.012	[illegible]	0.743	[illegible]	0.010	0.017	[illegible]
2124	M223	3in Dia. Duct	Sec 2 - min	0.131	7	0.049	5	-0.031	2	0.199	1	-0.201	2	-0.260	2	-0.523	1	-36.188	5	-0.155	5	0.015	0.009	0.023	[illegible]	0.523	[illegible]	0.012	0.004	[illegible]
2143	M225	3in Dia. Duct	Sec 2 - max	0.193	5	0.027	8	-0.008	6	0.069	1	0.127	2	0.427	2	0.050	1	-14.328	8	-0.061	8	0.022	0.006	0.019	[illegible]	0.427	[illegible]	0.005	0.002	[illegible]
2557	M268	3in Dia. Duct	Sec 4 - max	0.182	6	-0.050	5	0.032	8	0.210	5	-0.195	8	0.335	2	0.372	1	-14.328	8	-0.061	8	0.021	0.009	0.017	[illegible]	0.372	[illegible]	0.005	0.004	[illegible]
2145	M225	3in Dia. Duct	Sec 3 - max	0.195	5	0.018	8	-0.012	8	0.109	6	0.206	7	-0.042	8	0.273	5	-14.328	8	-0.061	8	0.023	0.009	0.012	[illegible]	0.273	[illegible]	0.005	0.001	[illegible]
1986	M209	3in Dia. Duct	Sec 3 - min	0.003	8	-0.027	6	-0.223	5	0.400	7	-0.428	8	-0.288	8	-0.352	5	-28.024	8	-0.120	8	0.007	0.019	0.016	[illegible]	0.428	[illegible]	0.009	0.017	[illegible]
2539	M284	2in Dia. Duct	Sec 5 - max	0.165	5	-0.058	8	-0.099	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.041	0.000	0.000	[illegible]	0.165	[illegible]	0.000	0.006	[illegible]
231	M24	4in Dia. Duct	Sec 1 - max	0.025	7	-0.002	5	0.044	6	0.155	5	0.145	8	-0.355	6	0.710	7	-74.673	8	-0.164	8	0.002	0.007	0.032	[illegible]	0.710	[illegible]	0.013	0.003	[illegible]
232	M24	4in Dia. Duct	Sec 1 - min	-0.025	6	-0.022	8	0.039	7	-0.145	8	-0.155	5	-0.710	7	0.355	6	-188.824	5	-0.415	5	0.002	0.007	0.032	[illegible]	0.710	[illegible]	0.032	0.003	[illegible]
237	M24	4in Dia. Duct	Sec 4 - max	0.030	7	-0.023	5	0.052	8	-0.034	5	0.635	8	0.218	6	0.056	7	-74.673	8	-0.164	8	0.003	0.028	0.010	[illegible]	0.635	[illegible]	0.013	0.004	[illegible]
238	M24	4in Dia. Duct	Sec 4 - min	-0.030	6	-0.044	8	0.031	5	-0.835	8	0.034	5	-0.056	7	-0.218	6	-188.824	5	-0.415	5	0.003	0.028	0.010	[illegible]	0.635	[illegible]	0.032	0.003	[illegible]

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_b	f_v/σ_v	[illegible]	f_t (ksi)	[illegible]	f/τ_t	f/σ_t	[illegible]
633	M66	12in Dia. Duct	Sec 2 - max	0.049	7	-0.218	1	0.097	8	-0.145	3	0.620	4	0.208	8	0.208	5	384.330	2	0.126	2	0.004	0.026	0.009	[illegible]	0.620	[illegible]	0.010	0.017	[illegible]
634	M66	12in Dia. Duct	Sec 2 - min	-0.049	8	-0.218	8	-0.097	8	-0.620	4	0.145	3	-0.208	5	-0.208	8	-384.324	1	-0.126	1	0.004	0.028	0.009	[illegible]	0.620	[illegible]	0.010	0.017	[illegible]
2055	M216	3in Dia. Duct	Sec 3 - max	0.050	5	-0.009	5	0.072	6	0.294	2	-0.291	1	0.474	4	-0.135	3	-0.950	8	-0.030	8	0.006	0.013	0.021	[illegible]	0.474	[illegible]	0.002	0.006	[illegible]
229	M23	4in Dia. Duct	Sec 5 - max	0.015	5	0.036	5	0.063	6	0.155	5	0.149	8	-0.355	6	0.710	7	-74.673	8	-0.164	8	0.001	0.007	0.032	[illegible]	0.710	[illegible]	0.013	0.005	[illegible]
230	M23	4in Dia. Duct	Sec 5 - min	-0.015	6	0.016	8	0.020	7	-0.145	8	-0.155	5	-0.710	7	0.355	6	-168.824	5	-0.415	5	0.001	0.007	0.032	[illegible]	0.710	[illegible]	0.032	0.002	[illegible]
2558	M286	3in Dia. Duct	Sec 4 - min	0.114	7	-0.050	8	-0.019	5	0.195	8	-0.210	5	-0.372	1	-0.335	2	-36.188	5	-0.155	5	0.013	0.009	0.017	[illegible]	0.272	[illegible]	0.012	0.004	[illegible]
1973	M208	3in Dia. Duct	Sec 2 - max	0.176	7	0.043	7	0.068	5	-0.014	8	0.140	7	0.264	8	-0.077	5	34.434	6	0.147	8	0.020	0.006	0.012	[illegible]	0.264	[illegible]	0.011	0.005	[illegible]
233	M24	4in Dia. Duct	Sec 2 - max	0.027	7	-0.009	5	0.044	8	0.127	5	0.273	8	-0.146	6	0.510	7	-74.673	8	-0.164	8	0.003	0.012	0.023	[illegible]	0.510	[illegible]	0.013	0.003	[illegible]
234	M24	4in Dia. Duct	Sec 2 - min	-0.027	6	-0.029	8	0.038	5	-0.273	8	-0.127	5	-0.510	7	0.146	6	-188.824	5	-0.415	5	0.003	0.012	0.023	[illegible]	0.510	[illegible]	0.032	0.003	[illegible]
2144	M225	3in Dia. Duct	Sec 2 - min	0.103	8	-0.022	5	-0.076	7	-0.127	2	-0.069	1	-0.050	1	-0.427	2	-36.188	5	-0.155	5	0.012	0.006	0.019	[illegible]	0.427	[illegible]	0.012	0.006	[illegible]
2549	M285	2in Dia. Duct	Sec 5 - max	0.163	5	-0.105	8	-0.121	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.036	0.000	0.000	[illegible]	0.163	[illegible]	0.000	0.008	[illegible]
2056	M216	3in Dia. Duct	Sec 3 - min	0.011	8	-0.009	8	0.016	7	0.291	1	-0.294	2	0.135	3	-0.474	4	-7.691	5	-0.033	5	0.001	0.013	0.021	[illegible]	0.474	[illegible]	0.003	0.001	[illegible]
235	M24	4in Dia. Duct	Sec 3 - max	0.028	7	-0.016	5	0.048	8	0.064	5	0.436	8	0.045	6	0.292	7	-74.673	8	-0.164	8	0.003	0.019	0.013	[illegible]	0.436	[illegible]	0.013	0.004	[illegible]
236	M24	4in Dia. Duct	Sec 3 - min	-0.028	6	-0.037	8	0.034	5	-0.436	8	-0.064	5	-0.292	7	-0.045	6	-188.624	5	-0.415	5	0.003	0.019	0.013	[illegible]	0.436	[illegible]	0.032	0.003	[illegible]
2003	M211	3in Dia. Duct	Sec 2 - max	0.203	7	0.026	6	0.054	1	0.049	7	-0.018	6	0.003	8	0.171	5	-13.162	5	-0.056	5	0.024	0.002	0.008	[illegible]	0.203	[illegible]	0.004	0.004	[illegible]
1490	M159	12in Dia. Duct	Sec 5 - min	-0.057	5	-0.063	6	-0.046	2	-0.325	4	-0.272	3	-0.330	2	-0.330	1	-70.689	1	-0.023	1	0.004	0.014	0.015	[illegible]	0.330	[illegible]	0.002	0.005	[illegible]
1491	M160	12in Dia. Duct	Sec 1 - max	0.028	5	0.008	2	0.030	8	0.512	1	-0.298	2	0.186	7	0.187	6	439.952	2	0.144	2	0.002	0.023	0.008	[illegible]	0.512	[illegible]	0.011	0.002	[illegible]
1492	M160	12in Dia. Duct	Sec 1 - min	-0.028	6	-0.008	1	-0.030	7	0.298	2	-0.512	1	-0.187	6	-0.186	7	176.816	1	0.058	1	0.002	0.023	0.008	[illegible]	0.512	[illegible]	0.004	0.002	[illegible]
1511	M162	12in Dia. Duct	Sec 1 - max	0.028	7	0.008	1	0.033	1	0.512	2	-0.288	1	0.186	8	0.187	5	-176.812	2	-0.058	2	0.002	0.023	0.008	[illegible]	0.512	[illegible]	0.004	0.003	[illegible]
1512	M162	12in Dia. Duct	Sec 1 - min	-0.028	8	-0.008	2	-0.033	2	0.298	1	-0.512	2	-0.107	5	-0.188	8	-439.950	1	-0.144	1	0.002	0.023	0.008	[illegible]	0.512	[illegible]	0.011	0.003	[illegible]
2146	M225	3in Dia. Duct	Sec 3 - min	0.101	8	-0.032	5	-0.072	7	-0.206	7	-0.109	8	-0.273	5	0.042	8	-36.188	5	-0.155	5	0.012	0.009	0.012	[illegible]	0.273	[illegible]	0.012	0.006	[illegible]
1489	M159	12in Dia. Duct	Sec 5 - max	-0.048	8	0.021	7	0.048	1	0.272	3	0.325	4	0.330	1	0.330	2	70.689	2	0.023	2	0.004	0.014	0.015	[illegible]	0.330	[illegible]	0.002	0.004	[illegible]
591	M62	12in Dia. Duct	Sec 1 - max	0.020	5	0.007	1	0.036	8	0.505	2	-0.235	1	0.195	5	0.195	8	-241.657	2	-0.079	2	0.001	0.022	0.009	[illegible]	0.505	[illegible]	0.006	0.003	[illegible]
592	M62	12in Dia. Duct	Sec 1 - min	-0.020	8	-0.026	2	-0.038	5	0.235	1	-0.505	2	-0.195	8	-0.195	5	-435.950	1	-0.143	1	0.001	0.022	0.009	[illegible]	0.505	[illegible]	0.011	0.003	[illegible]
611	M64	12in Dia. Duct	Sec 1 - max	0.020	7	0.007	2	0.038	7	0.505	1	-0.235	2	0.195	6	0.195	7	435.951	2	0.143	2	0.001	0.022	0.009	[illegible]	0.505	[illegible]	0.011	0.003	[illegible]
612	M64	12in Dia. Duct	Sec 1 - min	-0.020	6	-0.028	1	-0.038	6	0.235	2	-0.505	1	-0.195	7	-0.195	6	241.659	1	0.079	1	0.001	0.022	0.009	[illegible]	0.505	[illegible]	0.006	0.003	[illegible]
631	M66	12in Dia. Duct	Sec 1 - max	0.048	7	-0.215	1	0.096	8	-0.023	3	0.490	4	0.154	8	0.154	5	384.330	2	0.126	2	0.004	0.022	0.007	[illegible]	0.499	[illegible]	0.010	0.017	[illegible]
632	M66	12in Dia. Duct	Sec 1 - min	-0.048	6	-0.215	8	-0.098	6	-0.499	4	0.023	3	-0.154	5	-0.154	8	-384.324	1	-0.126	1	0.004	0.022	0.007	[illegible]	0.499	[illegible]	0.010	0.017	[illegible]
1488	M159	12in Dia. Duct	Sec 4 - min	-0.056	5	-0.063	6	-0.045	2	-0.315	4	-0.269	3	-0.322	2	-0.322	1	-70.689	1	-0.023	1	0.004	0.014	0.014	[illegible]	0.322	[illegible]	0.002	0.005	[illegible]
1487	M159	12in Dia. Duct	Sec 4 - max	-0.048	8	0.021	7	0.045	1	0.269	3	0.315	4	0.322	1	0.322	2	70.689	2	0.023	2	0.004	0.014	0.014	[illegible]	0.323	[illegible]	0.002	0.003	[illegible]
549	M57	12in Dia. Duct	Sec 5 - max	0.033	8	0.046	2	0.044	4	0.333	2	0.333	1	0.325	4	0.272	3	29.034	1	0.010	1	0.002	0.015	0.014	[illegible]	0.333	[illegible]	0.001	0.004	[illegible]
550	M57	12in Dia. Duct	Sec 5 - min	0.033	7	-0.046	1	-0.044	3	-0.333	1	-0.333	2	-0.272	3	-0.325	4	-29.034	2	-0.010	2	0.002	0.015	0.014	[illegible]	0.333	[illegible]	0.001	0.004	[illegible]
2529	M263	2in Dia. Duct	Sec 6 - max	0.142	5	-0.051	8	-0.049	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.032	0.000	0.000	[illegible]	0.142	[illegible]	0.000	0.003	[illegible]
1486	M159	12in Dia. Duct	Sec 3 - min	-0.056	5	-0.082	6	-0.044	2	-0.305	4	-0.267	3	-0.313	2	-0.313	1	-70.689	1	-0.023	1	0.004	0.014	0.014	[illegible]	0.313	[illegible]	0.002	0.005	[illegible]
559	M58	12in Dia. Duct	Sec 5 - max	0.017	8	0.087	6	0.035	6	0.555	3	-0.079	4	0.127	6	0.127	7	384.329	2	0.126	2	0.001	0.025	0.006	[illegible]	0.555	[illegible]	0.010	0.007	[illegible]
560	M58	12in Dia. Duct	Sec 5 - min	-0.017	5	0.087	7	-0.035	7	0.079	4	-0.555	3	-0.127	7	-0.127	6	-384.325	1	-0.126	1	0.001	0.025	0.006	[illegible]	0.555	[illegible]	0.010	0.007	[illegible]
1493	M160	12in Dia. Duct	Sec 2 - max	0.028	8	0.003	2	0.033	6	0.508	3	-0.297	4	0.154	7	0.154	6	439.952	2	0.144	2	0.002	0.023	0.007	[illegible]	0.508	[illegible]	0.011	0.003	[illegible]
1494	M160	12in Dia. Duct	Sec 2 - min	-0.028	7	-0.013	1	-0.033	7	0.297	4	-0.508	3	-0.154	6	-0.154	7	176.816	1	0.058	1	0.002	0.023	0.007	[illegible]	0.508	[illegible]	0.004	0.003	[illegible]
1513	M162	12in Dia. Duct	Sec 2 - max	0.028	8	0.003	1	0.033	1	0.508	3	-0.297	4	0.154	8	0.154	5	-176.812	2	-0.058	2	0.002	0.023	0.007	[illegible]	0.508	[illegible]	0.004	0.003	[illegible]
1514	M162	12in Dia. Duct	Sec 2 - min	-0.028	5	-0.013	2	-0.033	2	0.297	4	-0.500	3	-0.154	5	-0.154	8	-439.950	1	-0.144	1	0.002	0.023	0.007	[illegible]	0.508	[illegible]	0.011	0.003	[illegible]
1485	M159	12in Dia. Duct	Sec 3 - max	-0.048	8	0.021	7	0.044	1	0.267	3	0.305	4	0.313	1	0.313	2	70.689	2	0.023	2	0.004	0.014	0.014	[illegible]	0.313	[illegible]	0.002	0.003	[illegible]
1484	M159	12in Dia. Duct	Sec 2 - min	-0.056	5	-0.062	6	-0.044	2	-0.295	4	-0.285	3	-0.305	2	-0.305	1	-70.889	1	-0.023	1	0.004	0.013	0.014	[illegible]	0.305	[illegible]	0.002	0.005	[illegible]
1483	M159	12in Dia. Duct	Sec 2 - max	-0.047	8	0.021	7	0.044	1	0.265	3	0.285	4	0.305	1	0.305	2	70.689	2	0.023	2	0.003	0.013	0.014	[illegible]	0.305	[illegible]	0.002	0.003	[illegible]
593	M62	12in Dia. Duct	Sec 2 - max	0.020	6	0.003	1	0.038	8	0.480	2	-0.240	1	0.162	5	0.162	8	-241.657	2	-0.079	2	0.001	0.021	0.007	[illegible]	0.480	[illegible]	0.008	0.003	[illegible]
594	M62	12in Dia. Duct	Sec 2 - min	-0.020	8	-0.030	2	-0.038	5	0.240	1	-0.480	2	-0.162	8	-0.162	5	-435.950	1	-0.143	1	0.001	0.021	0.007	[illegible]	0.480	[illegible]	0.011	0.003	[illegible]
613	M64	12in Dia. Duct	Sec 2 - max	0.020	7	0.003	2	0.038	7	0.480	1	-0.240	2	0.162	6	0.162	7	435.951	2	0.143	2	0.001	0.021	0.007	[illegible]	0.480	[illegible]	0.011	0.003	[illegible]
614	M64	12in Dia. Duct	Sec 2 - min	-0.020	6	-0.030	1	-0.038	6	0.240	2	-0.480	1	-0.162	7	-0.162	6	241.659	1	0.079	1	0.001	0.021	0.007	[illegible]	0.480	[illegible]	0.006	0.003	[illegible]
1482	M159	12in Dia. Duct	Sec 1 - min	-0.055	5	-0.061	6	-0.043	2	-0.265	4	-0.263	3	-0.297	2	-0.297	1	-70.689	1	-0.023	1	0.004	0.013	0.013	[illegible]	0.297	[illegible]	0.002	0.005	[illegible]
1974	M208	3in Dia. Duct	Sec 2 - min	0.100	6	0.041	6	0.004	8	-0.140	7	0.014	6	0.077	5	-0.264	8	30.864	7	0.132	7	0.012	0.006	0.012	[illegible]	0.264	[illegible]	0.010	0.003	[illegible]
1495	M160	12in Dia. Duct	Sec 3 - max	0.029	6	-0.001	2	0.035	6	0.500	3	-0.290	4	0.118	7	0.118	6	439.952	2	0.144	2	0.002	0.022	0.005	[illegible]	0.500	[illegible]	0.011	0.003	[illegible]
1496	M160	12in Dia. Duct	Sec 3 - min	-0.029	7	-0.017	1	-0.035	7	0.290	4	-0.500	3	-0.118	6	-0.118	7	178.816	1	0.058	1	0.002	0.022	0.005	[illegible]	0.500	[illegible]	0.004	0.003	[illegible]
1515	M182	12in Dia. Duct	Sec 3 - max	0.029	8	-0.001	1	0.035	5	0.500	3	-0.290	4	0.118	8	0.118	5	-178.812	2	-0.058	2	0.002	0.022	0.005	[illegible]	0.500	[illegible]	0.004	0.003	[illegible]
1516	M182	12in Dia. Duct	Sec 3 - min	-0.029	5	-0.017	2	-0.035	8	0.290	4	-0.500	3	-0.118	5	-0.118	8	-439.950	1	-0.144	1	0.002	0.022	0.005	[illegible]	0.500	[illegible]	0.011	0.003	[illegible]
557	M58	12in Dia. Duct	Sec 4 - max	0.018	8	0.089	6	0.035	6	0.518	3	-0.042	4	0.112	6	0.112	7	384.329	2	0.126	2	0.001	0.023	0.005	[illegible]	0.518	[illegible]	0.010	0.007	[illegible]
558	M58	12in Dia. Duct	Sec 4 - min	-0.018	5	0.089	7	-0.035	7	0.042	4	-0.518	3	-0.112	7	-0.112	6	-384.325	1	-0.126	1	0.001	0.023	0.005	[illegible]	0.518	[illegible]	0.010	0.007	[illegible]
1481	M159	12in Dia. Duct	Sec 1 - max	-0.047	8	0.020	7	0.043	1	0.283	3	0.285	4	0.297	1	0.297	2	70.889	2	0.023	2	0.003	0.013	0.013	[illegible]	0.297	[illegible]	0.002	0.003	[illegible]
1501	M161	12in Dia. Duct	Sec 1 - max	0.035	8	-0.010	2	0.008	6	0.537	3	-0.300	4	0.049	8	0.049	5	183.236	2	0.060	2	0.003	0.024	0.002	[illegible]	0.537	[illegible]	0.005	0.001	[illegible]
1502	M161	12in Dia. Duct	Sec 1 - min	-0.035	7	-0.026	1	-0.008	7	0.300	4	-0.537	3	-0.049	5	-0.049	8	-153.910	1	-0.050	1	0.003	0.024	0.002	[illegible]	0.537	[illegible]	0.004	0.002	[illegible]
1521	M163	12in Dia. Duct	Sec 1 - max	0.035	8	-0.010	1	0.008	5	0.537	3	-0.300	4	0.049	7	0.049	6	153.913	2	0.050	2	0.003	0.024	0.002	[illegible]	0.537	[illegible]	0.004	0.001	[illegible]
1522	M163	12in Dia. Duct	Sec 1 - min	-0.035	5	-0.026	2	-0.008	8	0.300	4	-0.537	3	-0.049	6	-0.049	7	-183.235	1	-0.060	1	0.003	0.024	0.002	[illegible]	0.537	[illegible]	0.005	0.002	[illegible]
1503	M161	12in Dia. Duct	Sec 2 - max	0.036	6	-0.011	2	0.008	8	0.534	3	-0.297	4	0.048	8	0.048	5	183.236	2	0.060	2	0.003	0.024	0.002	[illegible]	0.534	[illegible]	0.005	0.001	[illegible]
1504	M161	12in Dia. Duct	Sec 2 - min	-0.036	7	-0.027	1	-0.008	7	0.297	4	-0.534	3	-0.048	5	-0.048	8	-153.910	1	-0.050	1	0.003	0.024	0.002	[illegible]	0.534	[illegible]	0.004	0.002	[illegible]
1523	M163	12in Dia. Duct	Sec 2 - max	0.036	8	-0.011	1	0.008	5	0.534	3	-0.297	4	0.048	7	0.048	6	153.913	2	0.050	2	0.003	0.024	0.002	[illegible]	0.534	[illegible]	0.004	0.001	[illegible]
1524	M163	12in Dia. Duct	Sec 2 - min	-0.036	5	-0.027	2	-0.008	8	0.297	4	-0.534	3	-0.048	6	-0.048	7	-183.235	1	-0.060	1	0.003	0.024	0.002	[illegible]	0.534	[illegible]	0.005	0.002	[illegible]
1505	M161	12in Dia. Duct	Sec 3 - max	0.036	6	-0.012	2	0.009	6	0.531	3	-0.294	4	0.047	8	0.047	5	183.236	2	0.060	2	0.003	0.024	0.002	[illegible]	0.531	[illegible]	0.005	0.001	[illegible]
1506	M161	12in Dia. Duct	Sec 3 - min	-0.036	7	-0.028	1	-0.009	7	0.294	4	-0.531	3	-0.047	5	-0.047	8	-153.910	1	-0.050	1	0.003	0.024	0.002	[illegible]	0.531	[illegible]	0.004	0.002	[illegible]
1525	M163	12in Dia. Duct	Sec 3 - max	0.036	8	-0.012	1	0.009	5	0.531	3	-0.294	4	0.047	7	0.047	6	153.913	2	0.050	2	0.003	0.024	0.002	[illegible]	0.531	[illegible]	0.004	0.001	[illegible]
1526	M163	12in Dia. Duct	Sec 3 - min	-0.036	5	-0.028	2	-0.009	8	0.294	4	-0.531	3	-0.047	6	-0.047	7	-183.235	1	-0.060	1	0.003	0.024	0.002	[illegible]	0.531	[illegible]	0.005	0.002	[illegible]
1507	M161	12in Dia. Duct	Sec 4 - max	0.036	6	-0.012	2	0.009	6	0.528	3	-0.290	4	0.046	8	0.046	5	183.236	2	0.060	2	0.003	0.023	0.002	[illegible]	0.528	[illegible]	0.005	0.001	[illegible]
1508	M161	12in Dia. Duct	Sec 4 - min	-0.036	7	-0.028	1	-0.009	7	0.290	4	-0.520	3	-0.046	5	-0.046	8	-153.910	1	-0.050	1	0.003	0.023	0.002	[illegible]	0.528	[illegible]	0.004	0.002	[illegible]
1527	M163	12in Dia. Duct	Sec 4 - max	0.036	8	-0.012	1	0.009	5	0.528	3	-0.290	4	0.046	7	0.046	6	153.913	2	0.050	2	0.003	0.023	0.002	[illegible]	0.528	[illegible]	0.004	0.001	[illegible]
1528	M163	12in Dia. Duct	Sec 4 - min	-0.036	5	-0.028	2	-0.009	8	0.290	4	-0.528	3	-0.046	6	-0.046	7	-183.235	1	-0.060	1	0.003	0.023	0.002	[illegible]	0.528	[illegible]	0.005	0.002	[illegible]
1480	M158	12in Dia. Duct	Sec 5 - min	-0.055	5	-0.092	6	-0.043	2	-0.265	4	-0.263	3	-0.257	2	-0.257	1	-238.593	1	-0.078	1	0.004	0.013	0.011	[illegible]	0.265	[illegible]	0.006	0.007	[illegible]
2083	M217	3in Dia. Duct	Sec 2 - max	0.066	5	0.030	8	-0.050	5	0.236	1	-0.235	2	0.222	6	0.200	7	-6.980	8	-0.030	8	0.008	0.010	0.010	[illegible]	0.236	[illegible]	0.002	0.004	[illegible]
1509	M161	12in Dia. Duct	Sec 5 - max	0.036	6	-0.013	2	0.009	6	0.525	3	-0.287	4	0.045	8	0.045	5	183.236	2	0.060	2	0.003	0.023	0.002	[illegible]	0.525	[illegible]	0.005	0.001	[illegible]
1510	M161	12in Dia. Duct	Sec 5 - min	-0.036	7	-0.029	1	-0.009	7	0.287	4	-0.525	3	-0.045	5	-0.045	8	-153.910	1	-0.050	1	0.003	0.023	0.002	[illegible]	0.525	[illegible]	0.004	0.002	[illegible]
1529	M163	12in Dia. Duct	Sec 5 - max	0.036	8	-0.013	1	0.009	5	0.525	3	-0.287	4	0.045	7	0.045	8	153.913	2	0.050	2	0.003	0.023	0.002	[illegible]	0.525	[illegible]	0.004	0.001	[illegible]
1530	M163	12in Dia. Duct	Sec 5 - min	-0.036	5	-0.029	2	-0.009	8	0.287	4	-0.525	3	-0.045	6	-0.045	7	-183.235	1	-0.060	1	0.003	0.023	0.002	[illegible]	0.525	[illegible]	0.005	0.002	[illegible]
1497	M160	12in Dia. Duct	Sec 4 - max	0.029	5	-0.008	2	0.038	6	0.489	3	-0.278	4	0.082	8	0.082	5	439.952	2	0.144	2	0.002	0.022	0.004	[illegible]	0.489	[illegible]	0.011	0.003	[illegible]
1498	M160	12in Dia. Duct	Sec 4 - min	-0.029	7	-0.022	1	-0.038	7	0.278	4	-0.489	3	-0.082	5	-0.082	8	178.816	1	0.058	1	0.002	0.022	0.004	[illegible]	0.489	[illegible]	0.004	0.003	[illegible]
1517	M162	12in Dia. Duct	Sec 4 - max	0.029	8	-0.006	1	0.038	5	0.469	3	-0.278	4	0.082	7	0.082	6	-176.812	2	-0.058	2	0.002	0.022	0.004	[illegible]	0.489	[illegible]	0.004	0.003	[illegible]
1518	M162	12in Dia. Duct	Sec 4 - min	-0.029	5	-0.022	2	-0.038	8	0.278	4	-0.489	3	-0.082	6	-0.082	7	-439.950	1	-0.144	1	0.002	0.022	0.004	[illegible]	0.489	[illegible]	0.011	0.003	[illegible]
1579	M168	12in Dia. Duct	Sec 5 - max	0.030	5	0.042	2	0.016	8	0.497	3	-0.259	4	0.064	7	0.064	6	106.722	2	0.035	2	0.002	0.022	0.003	[illegible]	0.497	[illegible]	0.003	0.003	[illegible]
1580	M168	12in Dia. Duct	Sec 5 - min	-0.030	8	0.008	1	-0.016	5	0.259	4	-0.497	3	-0.064	6	-0.064	7	-178.962	1	-0.059	1	0.002	0.022	0.003	[illegible]	0.497	[illegible]	0.005	0.001	[illegible]
1589	M169	12in Dia. Duct	Sec 5 - max	0.030	7	0.042	1	0.016	7	0.497	3	-0.259	4	0.064	8	0.064	5	178.965	2	0.059	2	0.002	0.022	0.003	[illegible]	0.497	[illegible]	0.005	0.003	[illegible]

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	Member	Duct Size	Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{sy}/σ_a	f_{sz}/σ_a	f_t (ksi)	f_t/σ_t	f_t/σ_t
1590	M168	12in Dia. Duct	Sec 5 - min	8	0.008	2	-0.016	6	0.259	4	-0.497	3	-0.064	5	-0.064	8	-106.720	1	-0.035	1	0.002	0.022	0.003	0.497	0.003	0.001
595	M62	12in Dia. Duct	Sec 3 - max	0.020	5	0.000	1	0.040	8	0.451	2	-0.241	1	0.126	5	0.126	8	-241.657	2	-0.079	2	0.001	0.020	0.005	0.451	0.005	0.003
596	M62	12in Dia. Duct	Sec 3 - min	-0.020	8	-0.034	2	-0.040	5	0.241	1	-0.451	2	-0.126	8	-0.126	5	-435.950	1	-0.143	1	0.001	0.020	0.006	0.451	0.011	0.003
615	M64	12in Dia. Duct	Sec 3 - max	0.020	7	0.000	2	0.040	7	0.451	1	-0.241	2	0.126	6	0.126	7	435.951	2	0.143	2	0.001	0.020	0.006	0.451	0.011	0.003
616	M64	12in Dia. Duct	Sec 3 - min	-0.020	6	-0.034	1	-0.040	8	0.241	2	-0.451	1	-0.126	7	-0.126	6	241.659	1	0.079	1	0.001	0.020	0.006	0.451	0.005	0.003
1476	M158	12in Dia. Duct	Sec 4 - min	-0.054	5	-0.092	6	-0.043	2	-0.268	4	-0.268	3	-0.249	2	-0.249	1	-238.593	1	-0.078	1	0.004	0.012	0.011	0.268	0.006	0.007
555	M58	12in Dia. Duct	Sec 3 - max	0.018	8	0.091	8	0.036	8	0.490	3	-0.004	4	0.097	6	0.097	7	384.329	2	0.126	2	0.001	0.021	0.004	0.490	0.010	0.007
556	M58	12in Dia. Duct	Sec 3 - min	-0.018	5	0.091	7	-0.036	7	0.004	4	-0.490	3	-0.097	7	-0.097	6	-384.325	1	-0.126	1	0.001	0.021	0.004	0.490	0.010	0.007
691	M80	6in Dia. Duct	Sec 1 - max	0.223	8	0.060	7	0.065	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.027	0.000	0.000	0.223	0.000	0.010
1478	M158	12in Dia. Duct	Sec 3 - min	-0.054	5	-0.091	8	-0.042	2	-0.253	4	-0.274	3	-0.241	2	-0.241	1	-238.593	1	-0.078	1	0.004	0.012	0.011	0.274	0.006	0.007
1474	M158	12in Dia. Duct	Sec 2 - min	-0.054	5	-0.090	6	-0.041	2	-0.238	4	-0.260	3	-0.233	2	-0.233	1	-238.593	1	-0.078	1	0.004	0.012	0.010	0.260	0.006	0.007
1472	M158	12in Dia. Duct	Sec 1 - min	-0.053	5	-0.089	6	-0.041	2	-0.222	4	-0.286	3	-0.225	2	-0.225	1	-238.593	1	-0.078	1	0.004	0.013	0.010	0.286	0.006	0.007
1479	M158	12in Dia. Duct	Sec 5 - max	-0.032	8	-0.023	7	0.043	1	0.260	3	0.265	4	0.257	1	0.257	2	238.594	2	0.078	2	0.002	0.013	0.011	0.265	0.006	0.003
1577	M168	12in Dia. Duct	Sec 4 - max	0.030	5	0.046	2	0.017	8	0.474	3	-0.236	4	0.060	7	0.060	6	106.722	2	0.035	2	0.002	0.021	0.003	0.474	0.003	0.004
1578	M168	12in Dia. Duct	Sec 4 - min	-0.030	8	0.012	1	-0.017	5	0.236	4	-0.474	3	-0.060	6	-0.060	7	-176.962	1	-0.059	1	0.002	0.021	0.003	0.474	0.005	0.001
1587	M169	12in Dia. Duct	Sec 4 - max	0.030	7	0.046	1	0.017	7	0.474	3	-0.236	4	0.060	8	0.060	5	176.965	2	0.059	2	0.002	0.021	0.003	0.474	0.005	0.004
1588	M169	12in Dia. Duct	Sec 4 - min	-0.030	6	0.012	2	-0.017	8	0.236	4	-0.474	3	-0.060	5	-0.060	8	-106.720	1	-0.035	1	0.002	0.021	0.003	0.474	0.003	0.001
692	M80	6in Dia. Duct	Sec 1 - min	-0.214	5	-0.009	6	-0.095	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.026	0.000	0.000	0.214	0.000	0.012
1575	M168	12in Dia. Duct	Sec 3 - max	0.044	5	0.101	2	0.044	8	0.448	3	-0.210	4	0.054	7	0.054	6	106.722	2	0.035	2	0.003	0.020	0.002	0.448	0.003	0.008
1576	M168	12in Dia. Duct	Sec 3 - min	-0.044	8	0.067	1	-0.044	5	0.210	4	-0.448	3	-0.054	6	-0.054	7	-176.962	1	-0.059	1	0.003	0.020	0.002	0.448	0.005	0.005
1585	M169	12in Dia. Duct	Sec 3 - max	0.044	7	0.101	1	0.044	7	0.448	3	-0.210	4	0.054	8	0.054	5	176.965	2	0.059	2	0.003	0.020	0.002	0.448	0.005	0.008
1586	M169	12in Dia. Duct	Sec 3 - min	-0.044	6	0.067	2	-0.044	6	0.210	4	-0.448	3	-0.054	5	-0.054	8	-106.720	1	-0.035	1	0.003	0.020	0.002	0.448	0.003	0.005
1499	M160	12in Dia. Duct	Sec 5 - max	0.030	6	-0.010	2	0.040	6	0.472	3	-0.261	4	0.049	8	0.049	5	439.952	2	0.144	2	0.002	0.021	0.002	0.472	0.011	0.003
1500	M160	12in Dia. Duct	Sec 5 - min	-0.030	7	-0.026	1	-0.040	7	0.261	4	-0.472	3	-0.049	5	-0.049	8	176.816	1	0.058	1	0.002	0.021	0.002	0.472	0.004	0.003
1519	M162	12in Dia. Duct	Sec 5 - max	0.030	8	-0.010	1	0.040	5	0.472	3	-0.261	4	0.049	7	0.049	6	-176.812	2	-0.058	2	0.002	0.021	0.002	0.472	0.004	0.003
1520	M162	12in Dia. Duct	Sec 5 - min	-0.030	5	-0.026	2	-0.040	8	0.261	4	-0.472	3	-0.049	6	-0.049	7	-439.950	1	-0.144	1	0.002	0.021	0.002	0.472	0.011	0.003
1477	M158	12in Dia. Duct	Sec 4 - max	-0.031	8	-0.023	7	0.043	1	0.266	3	0.269	4	0.249	1	0.249	2	238.594	2	0.078	2	0.002	0.012	0.011	0.269	0.006	0.003
1475	M158	12in Dia. Duct	Sec 3 - max	-0.031	8	-0.023	7	0.042	1	0.274	3	0.253	4	0.241	1	0.241	2	238.594	2	0.078	2	0.002	0.012	0.011	0.274	0.006	0.003
1473	M158	12in Dia. Duct	Sec 2 - max	-0.031	8	-0.023	7	0.041	1	0.280	3	0.238	4	0.233	1	0.233	2	238.594	2	0.078	2	0.002	0.012	0.010	0.280	0.006	0.003
1471	M158	12in Dia. Duct	Sec 1 - max	-0.031	8	-0.022	7	0.041	1	0.286	3	0.222	4	0.225	1	0.225	2	238.594	2	0.078	2	0.002	0.013	0.010	0.286	0.006	0.003
597	M62	12in Dia. Duct	Sec 4 - max	0.021	5	-0.005	1	0.043	8	0.429	3	-0.228	4	0.089	5	0.089	8	-241.657	2	-0.079	2	0.002	0.019	0.004	0.429	0.008	0.003
598	M62	12in Dia. Duct	Sec 4 - min	-0.021	8	-0.038	2	-0.043	5	0.228	4	-0.429	3	-0.089	8	-0.089	5	-435.950	1	-0.143	1	0.002	0.019	0.004	0.429	0.011	0.003
617	M64	12in Dia. Duct	Sec 4 - max	0.021	7	-0.005	2	0.043	7	0.429	3	-0.228	4	0.089	6	0.089	7	435.951	2	0.143	2	0.002	0.019	0.004	0.429	0.011	0.003
618	M64	12in Dia. Duct	Sec 4 - min	-0.021	6	-0.038	1	-0.043	6	0.228	4	-0.429	3	-0.089	7	-0.089	6	241.659	1	0.079	1	0.002	0.019	0.004	0.429	0.006	0.003
553	M58	12in Dia. Duct	Sec 2 - max	0.018	6	0.092	6	0.037	6	0.441	3	0.034	4	0.081	6	0.081	7	384.329	2	0.126	2	0.001	0.020	0.004	0.441	0.010	0.007
554	M58	12in Dia. Duct	Sec 2 - min	-0.018	5	0.092	7	-0.037	7	-0.034	4	-0.441	3	-0.081	7	-0.081	6	-384.325	1	-0.126	1	0.001	0.020	0.004	0.441	0.010	0.007
609	M63	12in Dia. Duct	Sec 5 - max	0.055	5	-0.091	1	0.036	7	-0.065	1	0.334	2	0.120	7	0.120	6	211.607	2	0.069	2	0.004	0.015	0.005	0.334	0.005	0.007
610	M63	12in Dia. Duct	Sec 5 - min	-0.055	8	-0.124	2	-0.036	6	-0.334	2	0.065	1	-0.120	6	-0.120	7	14.416	1	0.005	1	0.004	0.015	0.005	0.334	0.000	0.010
629	M65	12in Dia. Duct	Sec 5 - max	0.055	7	-0.091	2	0.036	8	-0.065	2	0.334	1	0.120	8	0.120	5	-14.416	2	-0.005	2	0.004	0.015	0.005	0.334	0.000	0.007
630	M65	12in Dia. Duct	Sec 5 - min	-0.055	6	-0.124	1	-0.036	5	-0.334	1	0.065	2	-0.120	5	-0.120	8	-211.906	1	-0.069	1	0.004	0.015	0.005	0.334	0.005	0.010
1462	M157	12in Dia. Duct	Sec 1 - min	-0.043	5	-0.103	6	-0.039	7	-0.148	4	-0.335	3	-0.118	2	-0.118	1	-351.816	1	-0.116	1	0.003	0.015	0.005	0.335	0.009	0.008
1464	M157	12in Dia. Duct	Sec 2 - min	-0.044	5	-0.104	6	-0.039	7	-0.167	4	-0.323	3	-0.125	2	-0.125	1	-351.816	1	-0.115	1	0.003	0.014	0.006	0.323	0.009	0.008
1466	M157	12in Dia. Duct	Sec 3 - min	-0.044	5	-0.104	6	-0.040	2	-0.185	4	-0.311	3	-0.133	2	-0.133	1	-351.816	1	-0.115	1	0.003	0.014	0.008	0.311	0.009	0.008
1468	M157	12in Dia. Duct	Sec 4 - min	-0.044	6	-0.105	6	-0.040	2	-0.204	4	-0.298	3	-0.140	2	-0.140	1	-351.816	1	-0.115	1	0.003	0.013	0.008	0.298	0.009	0.008
1470	M157	12in Dia. Duct	Sec 5 - min	-0.045	5	-0.105	6	-0.041	2	-0.222	4	-0.286	3	-0.148	2	-0.148	1	-351.816	1	-0.115	1	0.003	0.013	0.007	0.286	0.009	0.008
599	M62	12in Dia. Duct	Sec 5 - max	0.021	5	-0.008	1	0.045	8	0.408	3	-0.207	4	0.064	6	0.064	7	241.657	2	-0.079	2	0.002	0.018	0.003	0.408	0.008	0.003
600	M62	12in Dia. Duct	Sec 5 - min	-0.021	8	-0.042	2	-0.045	5	0.207	4	-0.408	3	-0.064	7	-0.064	6	435.950	1	-0.143	1	0.002	0.018	0.003	0.408	0.011	0.003
619	M64	12in Dia. Duct	Sec 5 - max	0.021	7	-0.008	2	0.045	7	0.408	3	-0.207	4	0.064	5	0.064	8	435.951	2	0.143	2	0.002	0.018	0.003	0.408	0.011	0.003
620	M64	12in Dia. Duct	Sec 5 - min	-0.021	6	-0.042	1	-0.045	6	0.207	4	-0.408	3	-0.064	8	-0.064	5	241.659	1	0.079	1	0.002	0.018	0.003	0.408	0.006	0.003
551	M58	12in Dia. Duct	Sec 1 - max	0.018	8	0.094	6	0.038	6	0.402	3	0.074	4	0.066	6	0.066	7	384.329	2	0.126	2	0.001	0.018	0.003	0.402	0.010	0.007
552	M58	12in Dia. Duct	Sec 1 - min	-0.018	5	0.094	7	-0.038	7	-0.074	4	-0.402	3	-0.066	7	-0.066	6	-384.325	1	-0.126	1	0.001	0.018	0.003	0.402	0.010	0.007
1531	M164	12in Dia. Duct	Sec 1 - max	0.036	6	-0.013	2	0.009	6	0.428	3	-0.190	4	0.010	8	0.010	5	183.236	2	0.060	2	0.003	0.019	0.000	0.428	0.005	0.001
1532	M164	12in Dia. Duct	Sec 1 - min	-0.036	7	-0.029	1	-0.009	7	0.190	4	-0.428	3	-0.010	5	-0.010	8	-153.910	1	-0.050	1	0.003	0.019	0.000	0.428	0.004	0.002
1541	M165	12in Dia. Duct	Sec 1 - max	0.036	8	-0.013	1	0.009	5	0.428	3	-0.190	4	0.010	7	0.010	6	153.913	2	0.050	2	0.003	0.019	0.000	0.428	0.004	0.001
1542	M165	12in Dia. Duct	Sec 1 - min	-0.036	5	-0.029	2	-0.009	8	0.190	4	-0.428	3	-0.010	8	-0.010	7	-183.235	1	-0.060	1	0.003	0.019	0.000	0.428	0.005	0.002
1533	M164	12in Dia. Duct	Sec 2 - max	0.036	8	-0.014	2	0.010	8	0.425	3	-0.187	4	0.010	6	0.010	7	183.236	2	0.060	2	0.003	0.019	0.000	0.425	0.005	0.001
1534	M164	12in Dia. Duct	Sec 2 - min	-0.036	7	-0.030	1	-0.010	7	0.187	4	-0.425	3	-0.010	7	-0.010	6	-153.910	1	-0.050	1	0.003	0.019	0.000	0.425	0.004	0.002
1543	M165	12in Dia. Duct	Sec 2 - max	0.036	8	-0.014	1	0.010	5	0.425	3	-0.187	4	0.010	5	0.010	8	153.913	2	0.050	2	0.003	0.019	0.000	0.425	0.004	0.001
1544	M165	12in Dia. Duct	Sec 2 - min	-0.036	8	-0.030	2	-0.010	8	0.187	4	-0.425	3	-0.010	8	-0.010	5	-183.235	1	-0.060	1	0.003	0.019	0.000	0.425	0.005	0.002
1535	M164	12in Dia. Duct	Sec 3 - max	0.036	6	-0.014	2	0.010	6	0.421	3	-0.183	4	0.011	6	0.011	7	183.236	2	0.060	2	0.003	0.019	0.000	0.421	0.005	0.001
1536	M164	12in Dia. Duct	Sec 3 - min	-0.036	7	-0.030	1	-0.010	7	0.183	4	-0.421	3	-0.011	7	-0.011	6	-153.910	1	-0.050	1	0.003	0.019	0.000	0.421	0.004	0.002
1545	M165	12in Dia. Duct	Sec 3 - max	0.036	8	-0.014	1	0.010	5	0.421	3	-0.183	4	0.011	5	0.011	8	153.913	2	0.050	2	0.003	0.019	0.000	0.421	0.004	0.001
1546	M165	12in Dia. Duct	Sec 3 - min	-0.036	6	-0.030	2	-0.010	8	0.183	4	-0.421	3	-0.011	8	-0.011	5	-183.235	1	-0.060	1	0.003	0.019	0.000	0.421	0.005	0.002
1452	M156	12in Dia. Duct	Sec 1 - min	-0.026	5	-0.100	6	-0.038	7	-0.074	4	-0.402	3	-0.043	6	-0.043	7	394.024	1	-0.129	1	0.002	0.010	0.002	0.402	0.010	0.008
547	M57	12in Dia. Duct	Sec 4 - max	0.027	6	0.038	2	0.035	4	0.223	2	0.223	1	0.223	4	0.169	3	28.034	1	0.010	1	0.002	0.010	0.010	0.223	0.001	0.003
548	M57	12in Dia. Duct	Sec 4 - min	0.027	7	-0.038	1	-0.035	3	-0.223	1	-0.223	2	-0.169	3	-0.223	4	-28.034	2	-0.010	2	0.002	0.010	0.010	0.223	0.001	0.003
1539	M164	12in Dia. Duct	Sec 5 - max	0.037	6	-0.016	2	0.010	6	0.414	3	-0.176	4	0.015	6	0.015	7	183.236	2	0.060	2	0.003	0.018	0.001	0.414	0.005	0.001
1540	M164	12in Dia. Duct	Sec 5 - min	-0.037	7	-0.032	1	-0.010	7	0.176	4	-0.414	3	-0.015	7	-0.015	6	-153.910	1	-0.050	1	0.003	0.018	0.001	0.414	0.004	0.002
1549	M165	12in Dia. Duct	Sec 5 - max	0.037	8	-0.016	1	0.010	5	0.414	3	-0.176	4	0.015	5	0.015	8	153.913	2	0.050	2	0.003	0.018	0.001	0.414	0.004	0.001
1550	M165	12in Dia. Duct	Sec 5 - min	-0.037	5	-0.032	2	-0.010	8	0.176	4	-0.414	3	-0.015	8	-0.015	5	-183.235	1	-0.060	1	0.003	0.018	0.001	0.414	0.005	0.002
1537	M164	12in Dia. Duct	Sec 4 - max	0.036	6	-0.015	2	0.010	6	0.417	3	-0.160	4	0.013	6	0.013	7	183.236	2	0.060	2	0.003	0.019	0.001	0.417	0.005	0.001
1538	M164	12in Dia. Duct	Sec 4 - min	-0.036	7	-0.031	1	-0.010	7	0.160	4	-0.417	3	-0.013	7	-0.013	6	-153.910	1	-0.050	1	0.003	0.019	0.001	0.417	0.004	0.002
1547	M165	12in Dia. Duct	Sec 4 - max	0.036	8	-0.015	1	0.010	5	0.417	3	-0.160	4	0.013	5	0.013	8	153.913	2	0.050	2	0.003	0.019	0.001	0.417	0.004	0.001
1548	M165	12in Dia. Duct	Sec 4 - min	-0.036	5	-0.031	2	-0.010	8	0.160	4	-0.417	3	-0.013	8	-0.013	5	-183.235	1	-0.060	1	0.003	0.019	0.001	0.417	0.005	0.002
1573	M168	12in Dia. Duct	Sec 2 - max	0.045	8	0.105	2	0.046	8	0.374	3	-0.137	4	0.025	7	0.025	6	106.722	2	0.035	2	0.003	0.017	0.001	0.374	0.003	0.008
1574	M168	12in Dia. Duct	Sec 2 - min	-0.045	8	0.071	1	-0.046	5	0.137	4	-0.374	3	-0.025	6	-0.025	7	-176.962	1	-0.059	1	0.003	0.017	0.001	0.374	0.005	0.005
1583	M169	12in Dia. Duct	Sec 2 - max	0.045	7	0.105	1	0.046	7	0.374	3	-0.137	4	0.025	8	0.025	5	176.965	2	0.059	2	0.003	0.017	0.001	0.374	0.005	0.008
1584	M169	12in Dia. Duct	Sec 2 - min	-0.045	6	0.071	2	-0.046	6	0.137	4	-0.374	3	-0.025	5	-0.025	8	-106.720	1	-0.035	1	0.003	0.017	0.001	0.374	0.003	0.005
2064	M217	3in Dia. Duct	Sec 2 - min	-0.005	8	0.030	5	-0.106	8	0.235	2	-0.236	1	-0.200	7	-0.222	6	-7.691	5	-0.003	5	0.001	0.010	0.010	0.236	0.003	0.006
1461	M157	12in Dia. Duct	Sec 1 - max	-0.011	8	-0.059	7	0.039	8	0.335	3	0.148	4	0.118	1	0.118	2	351.818	2	0.115	2	0.001	0.015	0.005	0.335	0.009	0.005
1464	M156	12in Dia. Duct	Sec 2 - min	-0.028	5	-0.101	6	-0.038	7	-0.092	4	-0.386	3	-0.036	6	-0.036	7	-394.024	1	-0.129	1	0.002	0.017	0.002	0.386	0.010	0.008
1463	M157	12in Dia. Duct	Sec 2 - max	-0.011	8	-0.060	7	0.039	8	0.323	3	0.167	4	0.125	1	0.125	2	351.818	2	0.115	2	0.001	0.014	0.006	0.323	0.009	0.005
1465	M157	12in Dia. Duct	Sec 3 - max	-0.011	8	-0.060	7	0.040	1	0.311	3	0.185	4	0.133	1	0.133	2	351.818	2	0.115	2	0.001	0.014	0.006	0.311	0.009	0.005
1451	M156	12in Dia. Duct	Sec 1 - max	0.009	8	-0.085	7	0.038	8	0.402	3	0.074	4	0.043	7	0.043	6	394.027	2	0.129	2	0.001	0.010	0.002	0.402	0.010	0.007
1467	M157	12in Dia. Duct	Sec 4 - max	-0.011	8	-0.061	7	0.040	1	0.298	3	0.204	4	0.140	1	0.140	2	351.818	2	0.115	2	0.001	0.013	0.005	0.298	0.009	0.005

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a	D-2250	f_t (ksi)		f_v/v_t	f_t/σ_a	
1469	M157	12in Dia. Duct	Sec 5 - max	-0.011	8	-0.061	7	0.041	1	0.266	3	0.222	4	0.148	1	0.148	2	351.818	2	0.115	2	0.001	0.013	0.007	[illegible]	0.266	[illegible]	0.009	0.005	[illegible]
569	M59	12in Dia. Duct	Sec 5 - max	0.035	6	0.032	1	0.022	7	0.378	3	-0.163	4	0.015	7	0.015	6	-41.869	2	-0.014	2	0.003	0.017	0.001	[illegible]	0.378	[illegible]	0.001	0.002	[illegible]
570	M59	12in Dia. Duct	Sec 5 - min	-0.035	7	0.016	2	-0.022	6	0.163	4	-0.378	3	-0.015	6	-0.015	7	-317.552	1	-0.104	1	0.003	0.017	0.001	[illegible]	0.378	[illegible]	0.008	0.002	[illegible]
579	M60	12in Dia. Duct	Sec 5 - max	0.035	8	0.032	2	0.022	8	0.378	3	-0.163	4	0.015	8	0.015	5	317.554	2	0.104	2	0.003	0.017	0.001	[illegible]	0.378	[illegible]	0.008	0.002	[illegible]
580	M60	12in Dia. Duct	Sec 5 - min	-0.035	5	0.016	1	-0.022	5	0.163	4	-0.378	3	-0.015	5	-0.015	8	41.871	1	0.014	1	0.003	0.017	0.001	[illegible]	0.378	[illegible]	0.001	0.002	[illegible]
1456	M158	12in Dia. Duct	Sec 3 - min	-0.028	5	-0.101	6	-0.038	7	-0.111	4	-0.369	3	-0.028	6	-0.029	7	-394.024	1	-0.129	1	0.002	0.016	0.001	[illegible]	0.369	[illegible]	0.010	0.008	[illegible]
1453	M158	12in Dia. Duct	Sec 2 - max	0.009	8	-0.086	7	0.038	8	0.366	3	0.092	4	0.036	7	0.036	6	394.027	2	0.129	2	0.001	0.017	0.002	[illegible]	0.366	[illegible]	0.010	0.007	[illegible]
1571	M168	12in Dia. Duct	Sec 1 - max	0.045	5	0.108	2	0.047	8	0.298	3	-0.060	4	0.058	5	0.058	8	106.722	2	0.035	2	0.003	0.013	0.003	[illegible]	0.298	[illegible]	0.003	0.008	[illegible]
1572	M168	12in Dia. Duct	Sec 1 - min	-0.045	8	0.075	1	-0.047	5	0.060	4	-0.298	3	-0.058	8	-0.058	5	-178.982	1	-0.059	1	0.003	0.013	0.003	[illegible]	0.298	[illegible]	0.005	0.006	[illegible]
1581	M169	12in Dia. Duct	Sec 1 - max	0.045	7	0.108	1	0.047	7	0.298	3	-0.060	4	0.058	6	0.058	7	178.965	2	0.059	2	0.003	0.013	0.003	[illegible]	0.298	[illegible]	0.005	0.008	[illegible]
1582	M169	12in Dia. Duct	Sec 1 - min	-0.045	6	0.075	2	-0.047	6	0.060	4	-0.298	3	-0.058	7	-0.058	8	-106.720	1	-0.035	1	0.003	0.013	0.003	[illegible]	0.298	[illegible]	0.003	0.008	[illegible]
567	M59	12in Dia. Duct	Sec 4 - max	0.037	6	0.037	1	0.021	7	0.348	3	-0.133	4	0.021	5	0.021	8	-41.869	2	-0.014	2	0.003	0.015	0.001	[illegible]	0.348	[illegible]	0.001	0.003	[illegible]
568	M59	12in Dia. Duct	Sec 4 - min	-0.037	7	0.021	2	-0.021	6	0.133	4	-0.348	3	-0.021	8	-0.021	5	-317.552	1	-0.104	1	0.003	0.015	0.001	[illegible]	0.348	[illegible]	0.008	0.002	[illegible]
577	M60	12in Dia. Duct	Sec 4 - max	0.037	8	0.037	2	0.021	8	0.348	3	-0.133	4	0.021	6	0.021	7	317.554	2	0.104	2	0.003	0.015	0.001	[illegible]	0.348	[illegible]	0.008	0.003	[illegible]
578	M60	12in Dia. Duct	Sec 4 - min	-0.037	5	0.021	1	-0.021	5	0.133	4	-0.348	3	-0.021	7	-0.021	6	41.871	1	0.014	1	0.003	0.015	0.001	[illegible]	0.348	[illegible]	0.001	0.002	[illegible]
1458	M158	12in Dia. Duct	Sec 4 - min	-0.028	5	-0.102	6	-0.039	7	-0.128	4	-0.352	3	-0.022	6	-0.022	7	-394.024	1	-0.129	1	0.002	0.016	0.001	[illegible]	0.352	[illegible]	0.010	0.008	[illegible]
2540	M264	2in Dia. Duct	Sec 5 - min	0.083	8	-0.188	5	-0.398	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.018	0.000	0.000	[illegible]	0.083	[illegible]	0.000	0.026	[illegible]
1455	M156	12in Dia. Duct	Sec 3 - max	0.009	8	-0.087	7	0.038	8	0.369	3	0.111	4	0.029	7	0.029	6	394.027	2	0.129	2	0.001	0.016	0.001	[illegible]	0.369	[illegible]	0.010	0.007	[illegible]
2004	M211	3in Dia. Duct	Sec 2 - min	0.073	8	0.026	7	0.020	2	0.018	6	-0.049	7	-0.171	5	-0.003	8	-14.055	8	-0.060	8	0.008	0.002	0.008	[illegible]	0.171	[illegible]	0.005	0.002	[illegible]
565	M59	12in Dia. Duct	Sec 3 - max	0.038	6	0.042	1	0.020	7	0.313	3	-0.098	4	0.033	5	0.033	8	-41.669	2	-0.014	2	0.003	0.014	0.001	[illegible]	0.313	[illegible]	0.001	0.003	[illegible]
566	M59	12in Dia. Duct	Sec 3 - min	-0.038	7	0.026	2	-0.020	8	0.098	4	-0.313	3	-0.033	8	-0.033	5	-317.552	1	-0.104	1	0.003	0.014	0.001	[illegible]	0.313	[illegible]	0.008	0.002	[illegible]
575	M60	12in Dia. Duct	Sec 3 - max	0.038	8	0.042	2	0.020	8	0.313	3	-0.098	4	0.033	6	0.033	7	317.554	2	0.104	2	0.003	0.014	0.001	[illegible]	0.313	[illegible]	0.008	0.003	[illegible]
578	M60	12in Dia. Duct	Sec 3 - min	-0.038	5	0.026	1	-0.020	5	0.099	4	-0.313	3	-0.033	7	-0.033	6	41.871	1	0.014	1	0.003	0.014	0.001	[illegible]	0.313	[illegible]	0.001	0.002	[illegible]
601	M63	12in Dia. Duct	Sec 1 - max	0.051	5	-0.075	1	0.027	7	0.266	3	-0.064	4	0.058	8	0.058	5	211.907	2	0.069	2	0.004	0.012	0.003	[illegible]	0.266	[illegible]	0.003	0.006	[illegible]
602	M63	12in Dia. Duct	Sec 1 - min	-0.051	8	-0.108	2	-0.027	8	0.004	4	-0.266	3	-0.058	5	-0.058	8	14.418	1	0.005	1	0.004	0.012	0.003	[illegible]	0.266	[illegible]	0.000	0.008	[illegible]
621	M65	12in Dia. Duct	Sec 1 - max	0.051	7	-0.075	2	0.027	8	0.260	3	-0.064	4	0.058	7	0.058	6	-14.418	2	-0.005	2	0.004	0.012	0.003	[illegible]	0.268	[illegible]	0.000	0.006	[illegible]
622	M65	12in Dia. Duct	Sec 1 - min	-0.051	6	-0.108	1	-0.027	5	0.064	4	-0.268	3	-0.058	6	-0.058	7	-211.906	1	-0.069	1	0.004	0.012	0.003	[illegible]	0.268	[illegible]	0.005	0.006	[illegible]
2550	M265	2in Dia. Duct	Sec 5 - min	0.061	8	-0.280	5	-0.343	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.018	0.000	0.000	[illegible]	0.081	[illegible]	0.000	0.022	[illegible]
1460	M158	12in Dia. Duct	Sec 5 - min	-0.029	5	-0.103	6	-0.039	7	-0.148	4	-0.335	3	-0.021	2	-0.021	1	-394.024	1	-0.129	1	0.002	0.016	0.001	[illegible]	0.335	[illegible]	0.010	0.008	[illegible]
607	M63	12in Dia. Duct	Sec 4 - max	0.054	5	-0.087	1	0.034	7	0.016	1	0.222	2	0.088	7	0.088	6	211.907	2	0.069	2	0.004	0.010	0.004	[illegible]	0.222	[illegible]	0.005	0.007	[illegible]
608	M63	12in Dia. Duct	Sec 4 - min	-0.054	8	-0.120	2	-0.034	8	-0.222	2	-0.018	1	-0.088	6	-0.088	7	14.418	1	0.005	1	0.004	0.010	0.004	[illegible]	0.222	[illegible]	0.000	0.009	[illegible]
627	M65	12in Dia. Duct	Sec 4 - max	0.054	7	-0.087	2	0.034	8	0.016	2	0.222	1	0.088	8	0.088	5	-14.416	2	-0.005	2	0.004	0.010	0.004	[illegible]	0.222	[illegible]	0.000	0.007	[illegible]
628	M65	12in Dia. Duct	Sec 4 - min	-0.054	6	-0.120	1	-0.034	5	-0.222	1	-0.016	2	-0.088	5	-0.088	8	-211.906	1	-0.069	1	0.004	0.010	0.004	[illegible]	0.222	[illegible]	0.005	0.009	[illegible]
563	M59	12in Dia. Duct	Sec 2 - max	0.039	6	0.047	1	0.019	7	0.273	3	-0.058	4	0.055	6	0.055	7	-41.869	2	-0.014	2	0.003	0.012	0.002	[illegible]	0.273	[illegible]	0.001	0.004	[illegible]
564	M58	12in Dia. Duct	Sec 2 - min	-0.039	7	0.030	2	-0.019	6	0.050	4	-0.273	3	-0.055	7	-0.055	6	-317.552	1	-0.104	1	0.003	0.012	0.002	[illegible]	0.273	[illegible]	0.008	0.002	[illegible]
573	M80	12in Dia. Duct	Sec 2 - max	0.039	8	0.047	2	0.019	8	0.273	3	-0.058	4	0.055	5	0.055	8	317.554	2	0.104	2	0.003	0.012	0.002	[illegible]	0.273	[illegible]	0.005	0.004	[illegible]
574	M60	12in Dia. Duct	Sec 2 - min	-0.039	5	0.030	1	-0.019	5	0.050	4	-0.273	3	-0.055	8	-0.055	5	41.871	1	0.014	1	0.003	0.012	0.002	[illegible]	0.273	[illegible]	0.001	0.002	[illegible]
1457	M156	12in Dia. Duct	Sec 4 - max	0.010	8	-0.087	7	0.039	8	0.352	3	0.129	4	0.022	7	0.022	6	394.027	2	0.129	2	0.001	0.016	0.001	[illegible]	0.352	[illegible]	0.010	0.007	[illegible]
1459	M156	12in Dia. Duct	Sec 5 - max	0.010	8	-0.088	7	0.039	6	0.335	3	0.148	4	0.021	1	0.021	2	394.027	2	0.128	2	0.001	0.015	0.001	[illegible]	0.335	[illegible]	0.010	0.007	[illegible]
561	M59	12in Dia. Duct	Sec 1 - max	0.041	8	0.051	1	0.018	7	0.227	3	-0.012	4	0.076	6	0.076	7	-41.669	2	-0.014	2	0.003	0.010	0.003	[illegible]	0.227	[illegible]	0.001	0.004	[illegible]
562	M59	12in Dia. Duct	Sec 1 - min	-0.041	7	0.035	2	-0.018	8	0.012	4	-0.227	3	-0.076	7	-0.076	6	-317.552	1	-0.104	1	0.003	0.010	0.003	[illegible]	0.227	[illegible]	0.008	0.003	[illegible]
571	M60	12in Dia. Duct	Sec 1 - max	0.041	8	0.051	2	0.018	8	0.227	3	-0.012	4	0.078	5	0.076	8	317.554	2	0.104	2	0.003	0.010	0.003	[illegible]	0.227	[illegible]	0.008	0.004	[illegible]
572	M60	12in Dia. Duct	Sec 1 - min	-0.041	5	0.035	1	-0.018	5	0.012	4	-0.227	3	-0.076	8	-0.076	5	41.871	1	0.014	1	0.003	0.010	0.003	[illegible]	0.227	[illegible]	0.001	0.003	[illegible]
603	M63	12in Dia. Duct	Sec 2 - max	0.052	5	-0.079	1	0.029	7	0.180	3	0.022	4	0.051	8	0.051	5	211.907	2	0.069	2	0.004	0.008	0.002	[illegible]	0.180	[illegible]	0.005	0.006	[illegible]
604	M63	12in Dia. Duct	Sec 2 - min	-0.052	8	-0.112	2	-0.029	6	-0.022	4	-0.180	3	-0.051	5	-0.051	8	14.418	1	0.005	1	0.004	0.006	0.002	[illegible]	0.180	[illegible]	0.000	0.009	[illegible]
623	M65	12in Dia. Duct	Sec 2 - max	0.052	7	-0.079	2	0.029	8	0.180	3	0.022	4	0.051	7	0.051	6	-14.416	2	-0.005	2	0.004	0.008	0.002	[illegible]	0.180	[illegible]	0.000	0.006	[illegible]
624	M65	12in Dia. Duct	Sec 2 - min	-0.052	6	-0.112	1	-0.029	5	-0.022	4	-0.180	3	-0.051	6	-0.051	7	-211.906	1	-0.069	1	0.004	0.008	0.002	[illegible]	0.180	[illegible]	0.005	0.009	[illegible]
545	M57	12in Dia. Duct	Sec 3 - max	0.021	6	0.030	2	0.027	4	0.134	2	0.134	1	0.141	4	0.088	3	29.034	1	0.010	1	0.002	0.006	0.006	[illegible]	0.141	[illegible]	0.001	0.002	[illegible]
546	M57	12in Dia. Duct	Sec 3 - min	0.021	7	-0.030	1	-0.027	3	-0.134	1	-0.134	2	-0.088	3	-0.141	4	-29.034	2	-0.010	2	0.002	0.006	0.006	[illegible]	0.141	[illegible]	0.001	0.002	[illegible]
2530	M263	2in Dia. Duct	Sec 6 - min	0.058	8	-0.219	5	-0.276	5	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.013	0.000	0.000	[illegible]	0.058	[illegible]	0.000	0.018	[illegible]
605	M63	12in Dia. Duct	Sec 3 - max	0.053	5	-0.083	1	0.031	7	0.094	1	0.114	2	0.058	7	0.058	6	211.907	2	0.069	2	0.004	0.005	0.003	[illegible]	0.114	[illegible]	0.005	0.006	[illegible]
606	M63	12in Dia. Duct	Sec 3 - min	-0.053	6	-0.116	2	-0.031	6	-0.114	2	-0.094	1	-0.058	6	-0.058	7	14.418	1	0.005	1	0.004	0.005	0.003	[illegible]	0.114	[illegible]	0.000	0.009	[illegible]
625	M65	12in Dia. Duct	Sec 3 - max	0.053	7	-0.083	2	0.031	8	0.094	2	0.114	1	0.058	8	0.058	5	-14.416	2	-0.005	2	0.004	0.005	0.003	[illegible]	0.114	[illegible]	0.000	0.006	[illegible]
626	M65	12in Dia. Duct	Sec 3 - min	-0.053	8	-0.116	1	-0.031	5	-0.114	1	-0.094	2	-0.058	5	-0.058	8	-211.906	1	-0.069	1	0.004	0.005	0.003	[illegible]	0.114	[illegible]	0.005	0.009	[illegible]
543	M57	12in Dia. Duct	Sec 2 - max	0.016	8	0.022	2	0.019	4	0.066	2	0.066	1	0.080	4	0.027	3	29.034	1	0.010	1	0.001	0.003	0.004	[illegible]	0.080	[illegible]	0.001	0.002	[illegible]
544	M57	12in Dia. Duct	Sec 2 - min	0.016	7	-0.022	1	-0.019	3	-0.066	1	-0.066	2	-0.027	3	-0.080	4	-29.034	2	-0.010	2	0.001	0.003	0.004	[illegible]	0.080	[illegible]	0.001	0.002	[illegible]
1401	M151	12in Dia. Duct	Sec 1 - max	0.011	3	0.015	4	0.014	2	-0.013	3	0.041	4	0.023	1	0.023	2	21.400	1	0.007	1	0.001	0.002	0.001	[illegible]	0.041	[illegible]	0.001	0.001	[illegible]
1402	M151	12in Dia. Duct	Sec 1 - min	0.008	4	-0.008	3	-0.014	1	-0.041	4	0.013	3	-0.023	2	-0.023	1	-21.400	2	-0.007	2	0.001	0.002	0.001	[illegible]	0.041	[illegible]	0.001	0.001	[illegible]
541	M57	12in Dia. Duct	Sec 1 - max	0.010	6	0.014	2	0.011	4	0.019	2	0.019	1	0.041	4	-0.013	3	29.034	1	0.010	1	0.001	0.001	0.002	[illegible]	0.041	[illegible]	0.001	0.001	[illegible]
542	M57	12in Dia. Duct	Sec 1 - min	0.010	7	-0.014	1	-0.011	3	-0.019	1	-0.019	2	0.013	3	-0.041	4	-29.034	2	-0.010	2	0.001	0.001	0.002	[illegible]	0.041	[illegible]	0.001	0.001	[illegible]
1403	M151	12in Dia. Duct	Sec 2 - max	0.010	3	0.015	4	0.013	2	-0.014	3	0.037	4	0.020	1	0.020	2	21.400	1	0.007	1	0.001	0.002	0.001	[illegible]	0.037	[illegible]	0.001	0.001	[illegible]
1404	M151	12in Dia. Duct	Sec 2 - min	0.008	4	-0.006	3	-0.013	1	-0.037	4	0.014	3	-0.020	2	-0.020	1	-21.400	2	-0.007	2	0.001	0.002	0.001	[illegible]	0.037	[illegible]	0.001	0.001	[illegible]
1405	M151	12in Dia. Duct	Sec 3 - max	0.010	3	0.014	4	0.013	2	-0.015	3	0.034	4	0.017	1	0.017	2	21.400	1	0.007	1	0.001	0.002	0.001	[illegible]	0.034	[illegible]	0.001	0.001	[illegible]
1406	M151	12in Dia. Duct	Sec 3 - min	0.007	4	-0.005	3	-0.013	1	-0.034	4	0.015	3	-0.017	2	-0.017	1	-21.400	2	-0.007	2	0.001	0.002	0.001	[illegible]	0.034	[illegible]	0.001	0.001	[illegible]
1411	M152	12in Dia. Duct	Sec 1 - max	0.009	3	0.017	4	0.011	2	-0.016	3	0.028	4	0.017	1	0.017	2	10.922	1	0.004	1	0.001	0.001	0.001	[illegible]	0.028	[illegible]	0.000	0.001	[illegible]
1407	M151	12in Dia. Duct	Sec 4 - max	0.009	3	0.013	4	0.012	2	-0.017	3	0.031	4	0.014	1	0.014	2	21.400	1	0.007	1	0.001	0.001	0.001	[illegible]	0.031	[illegible]	0.001	0.001	[illegible]
1408	M151	12in Dia. Duct	Sec 4 - min	0.007	4	-0.005	3	-0.012	1	-0.031	4	0.017	3	-0.014	2	-0.014	1	-21.400	2	-0.007	2	0.001	0.001	0.001	[illegible]	0.031	[illegible]	0.001	0.001	[illegible]
1409	M151	12in Dia. Duct	Sec 5 - max	0.009	3	0.012	4	0.011	2	-0.018	3	0.028	4	0.012	1	0.012	2	21.400	1	0.007	1	0.001	0.001	0.001	[illegible]	0.028	[illegible]	0.001	0.001	[illegible]
1413	M152	12in Dia. Duct	Sec 2 - max	0.008	3	0.015	4	0.011	2	-0.017	3	0.025	4	0.014	1	0.014	2	10.922	1	0.004	1	0.001	0.001	0.001	[illegible]	0.025	[illegible]	0.000	0.001	[illegible]
1410	M151	12in Dia. Duct	Sec 5 - min	0.007	4	-0.004	3	-0.011	1	-0.028	4	0.018	3	-0.012	2	-0.012	1	-21.400	2	-0.007	2	0.001	0.001	0.001	[illegible]	0.028	[illegible]	0.001	0.001	[illegible]
1412	M152	12in Dia. Duct	Sec 1 - min	0.003	4	0.004	3	-0.011	1	-0.020	4	0.018	3	-0.017	2	-0.017	1	-10.922	2	-0.004	2	0.000	0.001	0.001	[illegible]	0.028	[illegible]	0.000	0.001	[illegible]
1415	M152	12in Dia. Duct	Sec 3 - max	0.008	3	0.014	4	0.010	2	-0.016	3	0.021	4	0.012	1	0.012	2	10.922	1	0.004	1	0.001	0.001	0.001	[illegible]	0.021	[illegible]	0.000	0.001	[illegible]
1414	M152	12in Dia. Duct	Sec 2 - min	0.003	4	0.004	3	-0.011	1	-0.025	4	0.017	3	-0.014	2	-0.014	1	-10.922	2	-0.004	2	0.000	0.001	0.001	[illegible]	0.025	[illegible]	0.000	0.001	[illegible]
1417	M152	12in Dia. Duct	Sec 4 - max	0.007	3	0.013	4	0.009	2	-0.015	5	0.018	6	0.010	1	0.010	2	10.922	1	0.004	1	0.001	0.001	0.000	[illegible]	0.018	[illegible]	0.000	0.001	[illegible]
1416	M152	12in Dia. Duct	Sec 3 - min	0.003	4	0.004	3	-0.010	1	-0.021	4	0.016	3	-0.012	2	-0.012	1	-10.922	2	-0.004	2	0.000	0.001	0.001	[illegible]	0.021	[illegible]	0.000	0.001	[illegible]
1421	M153	12in Dia. Duct	Sec 1 - max	0.005	3	0.013	4	0.008	2	-0.014	5	0.016	8	0.010	1	0.010	2	4.171	1	0.001	1	0.000	0.001	0.000	[illegible]	0.016	[illegible]	0.000	0.001	[illegible]
1419	M152	12in Dia. Duct	Sec 5 - max	0.006	3	0.012	4	0.008	2	-0.014	5	0.016	8	0.008	1	0.008	2	10.922	1	0.004	1	0.000	0.001	0.000	[illegible]	0.016	[illegible]	0.000	0.001	[illegible]
1418	M152	12in Dia. Duct	Sec 4 - min	0.003	4	0.004	3	-0.009	1	-0.018	8	0.015	5	-0.010	2	-0.010	1	-10.922	2	-0.004	2	0.000	0.001	0.000	[illegible]	0.018	[illegible]	0.000	0.001	[illegible]
1420	M152	12in Dia. Duct	Sec 5 - min	0.003	4	0.003	3	-0.008	1	-0.016	8	0.014	5	-0.008	2	-0.008	1	-10.922	2	-0.004	2	0.000	0.001	0.000	[illegible]	0.016	[illegible]	0.000	0.001	[illegible]
1423	M153	12in Dia. Duct	Sec 2 - max	0.004	3	0.012	4	0.008	2	-0.012	5	0.013	8	0.009	1	0.009	2	4.171	1	0.001	1	0.000	0.001	0.000	[illegible]	0.013	[illegible]	0.000	0.001	[illegible]
1422	M153	12in Dia. Duct	Sec 1 - min	0.000	4	0.009	3	-0.008	1	-0.016	8	0.014	5	-0.010	2	-0.010	1	-4.171	2	-0.001	2	0.000	0.001	0.000	[illegible]	0.016	[illegible]	0.000	0.001	[illegible]
1425	M153	12in Dia. Duct	Sec 3 - max	0.004	3	0.011	4	0.007	2	-0.010	4	0.011	3	0.007	1	0.007	2	4.171	1	0.001	1	0.000	0.000	0.000	[illegible]	0.011	[illegible]	0.000	0.001	[illegible]
1424	M153	12in Dia. Duct	Sec 2 - min	0.000	4	0.008	3	-0.008	1	-0.013	8	0.012	5	-0.009	2	-0.009	1	-4.171	2	-0.001	2	0.000	0.001	0.000	[illegible]	0.013	[illegible]	0.000	0.001	[illegible]
1427	M153	12in Dia. Duct	Sec 4 - max	0.003	5	0.010	6	0.006	2	-0.008	4	0.009	3	0.005	1	0.005	2	4.171	1	0.001	1	0.000	0.000	0.000	[illegible]	0.009	[illegible]	0.000	0.001	[illegible]
1428	M153	12in Dia. Duct	Sec 3 - min	0.000	4	0.007	3	-0.007	1	-0.011	3	0.010	4	-0.007	2	-0.007	1	-4.171	2	-0.001	2	0.000	0.000	0.000	[illegible]	0.011	[illegible]	0.000	0.001	[illegible]

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_a	f_s/σ_a		f_t (ksi)		f_t/σ_t	f_t/σ_c	
1429	M153	12in Dia. Duct	Sec 5 - max	0.003	5	0.008	6	0.006	2	-0.008	4	0.008	3	0.004	1	0.004	2	4.171	1	0.001	1	0.000	0.000	0.000		0.008		0.000	0.001	
1432	M154	12in Dia. Duct	Sec 1 - min	-0.002	6	0.008	6	-0.006	1	-0.008	3	0.008	4	-0.005	2	-0.005	1	-0.873	2	0.000	2	0.000	0.000	0.000		0.008		0.000	0.001	
1431	M154	12in Dia. Duct	Sec 1 - max	0.001	5	0.008	7	0.006	2	-0.008	4	0.008	3	0.005	1	0.005	2	0.873	1	0.000	1	0.000	0.000	0.000		0.008		0.000	0.001	
1428	M153	12in Dia. Duct	Sec 4 - min	0.000	6	0.007	7	-0.005	1	-0.009	3	0.008	4	-0.005	2	-0.005	1	-4.171	2	-0.001	2	0.000	0.000	0.000		0.009		0.000	0.001	
1434	M154	12in Dia. Duct	Sec 2 - min	-0.002	4	0.007	4	-0.005	1	-0.006	3	0.004	4	-0.004	2	-0.004	1	-0.873	2	0.000	2	0.000	0.000	0.000		0.006		0.000	0.001	
1430	M153	12in Dia. Duct	Sec 5 - min	0.000	6	0.006	7	-0.006	1	-0.008	3	0.006	4	-0.004	2	-0.004	1	-4.171	2	-0.001	2	0.000	0.000	0.000		0.008		0.000	0.000	
1433	M154	12in Dia. Duct	Sec 2 - max	0.001	3	0.007	3	0.005	2	-0.004	4	0.006	3	0.004	1	0.004	2	0.873	1	0.000	1	0.000	0.000	0.000		0.006		0.000	0.001	
1436	M154	12in Dia. Duct	Sec 3 - min	-0.002	4	0.006	4	-0.004	1	-0.004	3	0.003	4	-0.003	2	-0.003	1	-0.873	2	0.000	2	0.000	0.000	0.000		0.004		0.000	0.000	
1435	M154	12in Dia. Duct	Sec 3 - max	0.001	3	0.006	3	0.004	2	-0.003	4	0.004	3	0.003	1	0.003	2	0.873	1	0.000	1	0.000	0.000	0.000		0.004		0.000	0.000	
1438	M154	12in Dia. Duct	Sec 4 - min	-0.002	4	0.005	4	-0.004	1	-0.003	3	0.002	4	-0.002	2	-0.002	1	-0.873	2	0.000	2	0.000	0.000	0.000		0.003		0.000	0.000	
1437	M154	12in Dia. Duct	Sec 4 - max	0.001	3	0.005	3	0.004	2	-0.002	4	0.003	3	0.002	1	0.002	2	0.873	1	0.000	1	0.000	0.000	0.000		0.003		0.000	0.000	
1440	M154	12in Dia. Duct	Sec 5 - min	-0.002	4	0.004	4	-0.003	1	-0.002	3	0.003	4	-0.001	2	-0.001	1	-0.873	2	0.000	2	0.000	0.000	0.000		0.002		0.000	0.000	
1442	M155	12in Dia. Duct	Sec 1 - min	-0.002	4	0.002	4	-0.003	1	-0.002	3	0.000	4	-0.001	2	-0.001	1	0.000	1	0.000	1	0.000	0.000	0.000		0.002		0.000	0.000	
1439	M154	12in Dia. Duct	Sec 5 - max	0.001	3	0.004	3	0.003	2	0.000	4	0.002	3	0.001	1	0.001	2	0.873	1	0.000	1	0.000	0.000	0.000		0.002		0.000	0.000	
1444	M155	12in Dia. Duct	Sec 2 - min	-0.002	4	0.001	4	-0.002	1	-0.001	3	0.000	4	0.000	2	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000		0.002		0.000	0.000	
1441	M155	12in Dia. Duct	Sec 1 - max	0.000	3	0.005	3	0.003	2	0.000	4	0.002	3	0.001	1	0.001	2	0.000	1	0.000	1	0.000	0.000	0.000		0.002		0.000	0.000	
1446	M155	12in Dia. Duct	Sec 3 - min	-0.001	4	0.000	4	-0.001	1	0.000	3	0.000	4	-0.000	2	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000		0.001		0.000	0.000	
1443	M155	12in Dia. Duct	Sec 2 - max	0.000	3	0.004	3	0.002	2	0.000	4	0.001	3	0.000	1	0.000	2	0.000	1	0.000	1	0.000	0.000	0.000		0.001		0.000	0.000	
1445	M155	12in Dia. Duct	Sec 3 - max	0.000	3	0.002	3	0.001	2	0.000	4	0.000	3	-0.000	1	0.000	2	0.000	1	0.000	1	0.000	0.000	0.000		0.000		0.000	0.000	
1447	M155	12in Dia. Duct	Sec 4 - max	0.000	3	0.001	3	0.000	2	0.000	4	0.000	3	0.000	1	0.000	2	0.000	1	0.000	1	0.000	0.000	0.000		0.000		0.000	0.000	
1448	M155	12in Dia. Duct	Sec 4 - min	0.000	4	0.000	4	0.000	1	0.000	3	0.000	4	0.000	2	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000		0.000		0.000	0.000	
1449	M155	12in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000		0.000		0.000	0.000	
1450	M155	12in Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000		0.000		0.000	0.000	

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CALCULATION SHEET

CALC. NO.:	145579-V-CA-005	REV:	1	DATE:	March 26, 2006
CALC. TITLE:	Off-Gas Treatment System Pipe Stress Analysis				
PROJECT NO.:	145579	PROJECT TITLE:	Final DBVS Design		

Attachment 10: Excel Spreadsheet – Model 2 AG-1 Analysis and Unity Checks

NOTE: This cover sheet represents the approval signatures of the originator and checker for all pages of this attachment

ORIGINATOR:	DATE:	CHECKER:	DATE:
Kevin M. Jones KMJ	3/26/06	J. Van Corbach JVC	3/26/06

Duct Size	σ_x (ksi) Eq. 1b	σ_y (ksi) Eq. 8 or 7	ϵ_x (ksi) Eq. 5	ϵ_x (ksi) Eq. 8	τ_t (ksi) Eq. 9	σ_z (ksi) Eq. 10	Temp
2in Dia. Duct Sch 40S	3.9	14.0	11.7	26.4	8.1	8.1	572
2in Dia Duct Sch 80S	3.7	14.0	11.7	43.8	8.1	8.1	572
2.5in Dia Duct Sch 80S	5.1	14.0	11.7	51.0	8.1	8.1	572
2.5in Dia Duct Sch 160S	4.9	14.0	11.7	74.8	8.1	8.1	572
6in Dia. Duct	7.9	14.0	11.7	27.8	8.1	8.1	572
6in Dia. Duct	6.3	14.0	11.7	10.3	8.1	8.1	572
12in Dia. Duct	8.7	14.0	11.7	9.8	8.1	8.1	572

Model 2

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_x	f_{sy}/σ_y	f_{sz}/σ_z		f_c (ksi)	
																								D-2250			
231	M24	RIGID	Sec 1 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	77.526	8	0.000	1	0.000	0.000	0.000		0.000	
232	M24	RIGID	Sec 1 - min	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	50.057	1	0.000	1	0.000	0.000	0.000		0.000	
233	M24	RIGID	Sec 2 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	77.526	8	0.000	1	0.000	0.000	0.000		0.000	
234	M24	RIGID	Sec 2 - min	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	50.057	1	0.000	1	0.000	0.000	0.000		0.000	
235	M24	RIGID	Sec 3 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	77.526	8	0.000	1	0.000	0.000	0.000		0.000	
236	M24	RIGID	Sec 3 - min	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	50.057	1	0.000	1	0.000	0.000	0.000		0.000	
237	M24	RIGID	Sec 4 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	77.526	8	0.000	1	0.000	0.000	0.000		0.000	
238	M24	RIGID	Sec 4 - min	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	50.057	1	0.000	1	0.000	0.000	0.000		0.000	
239	M24	RIGID	Sec 5 - max	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	77.526	8	0.000	1	0.000	0.000	0.000		0.000	
240	M24	RIGID	Sec 6 - min	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	50.057	1	0.000	1	0.000	0.000	0.000		0.000	
321	M33	2.5in Dia. Duct Sch 80S	Sec 1 - max	0.139	8	0.149	8	0.033	7	2.455	9	8.796	6	1.158	8	1.172	7	22.002	7	0.114	7	0.027	0.628	0.084		8.796	
221	M23	6in Dia. Duct	Sec 1 - max	0.029	8	0.022	8	-0.010	1	-0.072	1	0.085	8	10.164	9	-0.050	1	77.528	8	0.065	8	0.004	0.006	0.726		10.164	
222	M23	6in Dia. Duct	Sec 1 - min	-0.015	7	0.021	1	-0.797	9	-0.085	8	0.072	1	0.050	1	-10.164	9	50.057	1	0.042	1	0.002	0.006	0.726		10.164	
322	M33	2.5in Dia. Duct Sch 80S	Sec 1 - min	0.044	1	-0.149	8	-0.033	8	-8.796	6	-2.455	9	-1.172	7	-1.158	8	-21.324	8	-0.110	8	0.009	0.628	0.084		8.796	
223	M23	6in Dia. Duct	Sec 2 - max	0.031	8	0.017	8	-0.010	1	-0.026	1	0.038	8	8.245	9	-0.025	1	77.526	8	0.065	8	0.004	0.003	0.589		8.245	
224	M23	6in Dia. Duct	Sec 2 - min	-0.016	7	0.016	1	-0.794	9	-0.038	8	0.026	1	0.025	1	-8.245	9	50.057	1	0.042	1	0.002	0.003	0.589		8.245	
323	M33	2.5in Dia. Duct Sch 80S	Sec 2 - max	0.132	8	0.142	8	0.026	7	0.100	9	6.441	6	0.861	8	0.899	7	22.002	7	0.114	7	0.026	0.480	0.050		6.441	
324	M33	2.5in Dia. Duct Sch 80S	Sec 2 - min	0.037	1	-0.142	8	-0.028	8	-6.441	6	-0.100	9	-0.899	7	-0.861	8	-21.324	8	-0.110	8	0.007	0.460	0.050		6.441	
531	M54	2.5in Dia. Duct Sch 80S	Sec 1 - max	0.122	8	0.148	8	0.005	7	0.183	7	6.396	8	0.209	7	0.224	8	11.167	9	0.058	9	0.024	0.457	0.016		6.396	
533	M54	2.5in Dia. Duct Sch 80S	Sec 2 - max	0.121	8	0.148	8	0.005	7	0.242	7	6.368	8	0.211	7	0.228	8	11.167	9	0.058	9	0.024	0.455	0.016		6.368	
535	M54	2.5in Dia. Duct Sch 80S	Sec 3 - max	0.121	8	0.146	6	0.004	7	0.300	7	6.339	8	0.213	7	0.228	8	11.167	9	0.058	9	0.024	0.453	0.016		6.339	
529	M53	2.5in Dia. Duct Sch 80S	Sec 5 - max	0.123	6	0.140	6	0.005	7	0.163	7	6.396	8	0.123	7	0.149	8	19.788	7	0.102	7	0.024	0.457	0.011		6.396	
537	M54	2.5in Dia. Duct Sch 80S	Sec 4 - max	0.121	8	0.147	6	0.004	7	0.358	7	6.311	8	0.214	7	0.229	8	11.167	9	0.058	9	0.024	0.451	0.016		6.311	
527	M53	2.5in Dia. Duct Sch 80S	Sec 4 - max	0.123	8	0.140	8	0.005	7	0.127	7	6.372	8	0.121	7	0.147	8	19.786	7	0.102	7	0.024	0.455	0.011		6.372	
539	M54	2.5in Dia. Duct Sch 80S	Sec 5 - max	0.121	8	0.147	6	0.004	7	0.417	7	6.283	8	0.216	7	0.231	8	11.167	9	0.058	9	0.024	0.449	0.017		6.283	
525	M53	2.5in Dia. Duct Sch 80S	Sec 3 - max	0.124	8	0.141	6	0.005	7	0.072	7	6.349	8	0.119	7	0.145	8	19.786	7	0.102	7	0.024	0.454	0.010		6.349	
523	M53	2.5in Dia. Duct Sch 80S	Sec 2 - max	0.124	8	0.141	8	0.005	7	0.016	7	6.325	8	0.117	7	0.142	8	19.786	7	0.102	7	0.024	0.452	0.010		6.325	
521	M53	2.5in Dia. Duct Sch 80S	Sec 1 - max	0.124	8	0.141	6	0.005	7	-0.039	7	6.301	6	0.115	7	0.140	8	19.786	7	0.102	7	0.024	0.450	0.010		6.301	
541	M55	2.5in Dia. Duct Sch 80S	Sec 1 - max	0.087	8	0.182	8	0.004	7	0.417	7	6.283	8	0.245	7	0.245	8	3.807	8	0.019	8	0.017	0.449	0.018		6.283	
543	M55	2.5in Dia. Duct Sch 80S	Sec 2 - max	0.087	8	0.182	8	0.004	7	0.462	7	6.211	8	0.248	7	0.247	8	3.807	8	0.019	8	0.017	0.444	0.018		6.211	
329	M33	2.5in Dia. Duct Sch 80S	Sec 6 - max	0.112	8	0.122	6	0.005	7	-0.039	7	6.301	8	0.089	7	0.088	6	22.002	7	0.114	7	0.022	0.450	0.006		6.301	
542	M55	2.5in Dia. Duct Sch 80S	Sec 1 - min	-0.047	7	0.029	1	-0.004	8	-6.283	8	-0.417	7	-0.245	8	-0.245	7	-0.799	7	-0.004	7	0.009	0.449	0.018		6.283	
532	M54	2.5in Dia. Duct Sch 80S	Sec 1 - min	-0.012	7	0.022	1	-0.005	8	-0.386	8	-0.183	7	-0.224	8	-0.209	7	-8.776	6	-0.045	6	0.002	0.457	0.016		6.396	
534	M54	2.5in Dia. Duct Sch 80S	Sec 2 - min	-0.012	7	0.022	1	-0.005	8	-6.388	8	-0.242	7	-0.226	8	-0.211	7	-8.776	6	-0.045	6	0.002	0.455	0.016		6.368	
545	M55	2.5in Dia. Duct Sch 80S	Sec 3 - max	0.087	8	0.182	8	0.004	7	0.508	7	6.139	8	0.248	7	0.249	8	3.807	8	0.019	8	0.017	0.439	0.018		6.139	
536	M54	2.5in Dia. Duct Sch 80S	Sec 3 - min	-0.012	7	0.022	1	-0.005	8	-0.339	8	-0.300	7	-0.228	8	-0.213	7	-8.776	6	-0.045	6	0.002	0.453	0.016		6.339	
544	M55	2.5in Dia. Duct Sch 80S	Sec 2 - min	-0.047	7	0.029	1	-0.004	8	-6.211	8	-0.462	7	-0.247	8	-0.248	7	-0.799	7	-0.004	7	0.009	0.444	0.018		6.211	
530	M53	2.5in Dia. Duct Sch 80S	Sec 6 - min	0.015	1	-0.060	9	-0.005	8	-6.396	8	-0.183	7	-0.149	8	-0.123	7	-18.438	8	-0.095	8	0.003	0.457	0.011		6.396	
538	M54	2.5in Dia. Duct Sch 80S	Sec 4 - min	-0.012	7	0.021	1	-0.004	8	-0.311	8	-0.358	7	-0.229	8	-0.214	7	-8.776	6	-0.045	6	0.002	0.451	0.016		6.311	
528	M53	2.5in Dia. Duct Sch 80S	Sec 4 - min	0.015	1	-0.060	9	-0.005	8	-0.372	8	-0.127	7	-0.147	8	-0.121	7	-18.438	8	-0.095	8	0.003	0.455	0.011		6.372	
547	M55	2.5in Dia. Duct Sch 80S	Sec 4 - max	0.087	8	0.182	8	0.004	7	0.553	7	6.067	8	0.249	7	0.250	8	3.807	8	0.019	8	0.017	0.433	0.018		6.067	
540	M54	2.5in Dia. Duct Sch 80S	Sec 5 - min	-0.012	7	0.021	1	-0.004	8	-6.283	8	-0.417	7	-0.231	8	-0.216	7	-8.776	6	-0.045	6	0.002	0.449	0.017		6.283	
526	M53	2.5in Dia. Duct Sch 80S	Sec 3 - min	0.015	1	-0.060	9	-0.005	8	-6.349	8	-0.072	7	-0.145	8	-0.119	7	-18.438	8	-0.095	8	0.003	0.454	0.010		6.349	
546	M55	2.5in Dia. Duct Sch 80S	Sec 3 - min	-0.047	7	0.028	1	-0.004	8	-6.139	8	-0.508	7	-0.249	8	-0.248	7	-0.799	7	-0.004	7	0.009	0.439	0.018		6.139	
524	M53	2.5in Dia. Duct Sch 80S	Sec 2 - min	0.016	1	-0.060	9	-0.005	8	-6.325	8	-0.016	7	-0.142	8	-0.117	7	-18.438	8	-0.095	8	0.003	0.452	0.010		6.325	
522	M53	2.5in Dia. Duct Sch 80S	Sec 1 - min	0.016	1	-0.060	9	-0.005	8	-6.301	8	0.039	7	-0.140	8	-0.115	7	-18.438	8	-0.095	8	0.003	0.450	0.010		6.301	
549	M55	2.5in Dia. Duct Sch 80S	Sec 5 - max	0.086	8	0.181	8	0.003	7	0.598	7	5.996	8	0.250	7	0.252	8	3.807	8	0.019	8	0.017	0.428	0.018		5.996	
548	M55	2.5in Dia. Duct Sch 80S	Sec 4 - min	-0.047	7	0.028	1	-0.004	8	-0.067	8	-0.553	7	-0.250	8	-0.249	7	-0.799	7	-0.004	7	0.009	0.433	0.018		6.067	
330	M33	2.5in Dia. Duct Sch 80S	Sec 6 - min	0.016	1	-0.122	8	-0.005	8	-8.301	8	0.039	7	-0.088	8	-0.059	7	-21.324	8	-0.110	8	0.003	0.450	0.006		8.301	
225	M23	6in Dia. Duct	Sec 3 - max	0.032	8	0.012	8	-0.010	1	0.007	1	0.003	8	6.349	6	0.000	1	77.526	8	0.065	8	0.004	0.001	0.454		6.349	
1	M1	2.5in Dia. Duct Sch 80S	Sec 1 - max	0.060	8	0.220	8	0.003	7	0.598	7	5.996	8	0.240	7	0.233	8	9.788	8	0.051	8	0.012	0.428	0.017		5.996	
2	M1	2.5in Dia. Duct Sch 80S	Sec 1 - min	-0.060	7	0.029	1	-0.004	8	-5.996	8	-0.598	7	-0.233	8	-0.240	7	-7.047	7	-0.036	7	0.012	0.428	0.017		5.996	
228	M23	6in Dia. Duct	Sec 3 - min	-0.017	7	0.011	1	-0.781	9	-0.003	8	-0.007	1	0.000	1	-6.349	6	50.057	1	0.042	1	0.002	0.001	0.454		6.349	
550	M55	2.5in Dia. Duct Sch 80S	Sec 5 - min	-0.047	7	0.028	1	-0.004	8	-5.996	8	-0.598	7	-0.252	8	-0.250	7	-0.799	7	-0.004	7	0.009	0.428	0.018		5.996	
161	M17	2in Dia. Duct Sch 80S	Sec 1 - max	0.030	8	0.142	1	0.150	1	-1.544	1	2.404	6	-1.518	1	3.173	7	77.526	8	0.734	8	0.008	0.172	0.227		3.173	
181	M19	2in Dia. Duct Sch 80S	Sec 1 - max	0.030	8	0.176	6	-0.046	8	-1.544	1	2.404	6	3.173	7	-1.518	1	77.526	8	0.734	8	0.008	0.172	0.227		3.173	
162	M17	2in Dia. Duct Sch 80S	Sec 1 - min	0.009	1	0.090	6	0.017	8	-2.404	8	1.544	1	-3.173	7	1.518	1	50.057	1	0.474	1	0.002	0.172	0.227		3.173	
182	M19	2in Dia. Duct Sch 80S	Sec 1 - min	0.009	1	0.136	1	-0.180	7	-2.404	8	1.544	1	1.518	1	-3.173	7	50.057	1	0.474	1	0.002	0.172	0.227		3.173	
227	M23	6in Dia. Duct	Sec 4 - max	0.033	8	0.007	8	-0.010	1	0.027	1	-0.020	8	5.233	8	0.028	1	77.526	8	0.065	8	0.004	0.002	0.374		5.233	
79	M8	2in Dia. Duct Sch 80S	Sec 5 - max	0.018	7	0.095	8	0.012	6	4.775	8	-2.687	1	0.460	1	0.231	7	0.207	1	0.002	1	0.005	0.341	0.033		4.775	
80	M8	2in Dia. Duct Sch 80S	Sec 5 - min	-0.018	8	0.044	1	-0.014	7	2.687	1	-4.775	8	-0.231	7	-0.460	1	0.041	7	0.000	7	0.005	0.341	0.033		4.775	
228	M23	6in Dia. Duct	Sec 4 - min	-0.018	7	0.006	1	-0.769	9	0.020	8	-0.027	1	-0.026	1	-5.233	6	50.057	1	0.042	1	0.002	0.002	0.374		5.233	
163	M17	2in Dia. Duct Sch 80S	Sec 2 - max	0.030	8	0.140	1	0.150	1	-1.234	1	2.181	6	-1.188	1	2.972	7	77.526	8	0.734	8	0.008	0.156	0.212		2.972	
164	M17	2in Dia. Duct Sch 80S	Sec 2 - min	0.009	1	0.089	6	0.017	8	-2.181	6	1.234	1	-2.972	7	1.188	1	50.057	1	0.474	1	0.002	0.156	0.212		2.972	
152	M16	2in Dia. Duct Sch 80S	Sec 1 - min	-0.046	6	-0.057	1	-0.150	1	-0.527	8	-1.513	1	-0.715	7	-3.488	1	31.057	1	0.294	1	0.013	0.108	0.249		3.488	
9	M1	2.5in Dia. Duct Sch 80S	Sec 5 - max	0.035	8	0.120	8	0.046	8	4.007	8	1.201	1	1.028	6	1.033	9	9.788	8	0.051	8	0.007	0.288	0.074		4.007	
10	M1	2.5in Dia. Duct Sch 80S	Sec 5 - min	-0.035	7	-0.071	1	-0.047	9	-1.201	1	-4.007	8	-1.033	9	-1.028	8	-7.047	7	-0.036	7	0.007	0.288	0.074		4.007	
381	M39	2.5in Dia. Duct Sch 80S	Sec 1 - max	0.035	8	0.057	1	0.033	9	4.007	8	1.201	1	1.028	6	1.033	9	9.788	8	0.051	8	0.007	0.288	0.074		4.007	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_a	f_s/σ_a	f_t (ksi)
382	M39	2.5in Dia. Duct Sch 80S	Sec 1- min	-0.035	8	0.003	8	-0.033	6	-1.201	1	-4.007	8	-1.033	9	-1.028	6	-7.047	7	-0.036	7	0.007	0.288	0.074	4.007
383	M39	2.5in Dia. Duct Sch 80S	Sec 2 - max	0.034	8	0.054	1	0.032	9	4.013	8	1.042	1	0.938	6	0.942	9	9.788	8	0.051	8	0.007	0.287	0.067	4.013
384	M39	2.5in Dia. Duct Sch 80S	Sec 2 - min	-0.034	8	0.001	8	-0.032	6	-1.042	1	-4.013	8	-0.942	9	-0.938	6	-7.047	7	-0.036	7	0.007	0.287	0.067	4.013
181	M16	2in Dia. Duct Sch 80S	Sec 1 - max	-0.007	9	-0.008	8	-0.023	8	1.513	1	0.927	6	3.488	1	0.715	7	53.440	8	0.508	8	0.002	0.108	0.249	3.488
385	M39	2.5in Dia. Duct Sch 80S	Sec 3 - max	0.034	8	0.052	1	0.030	9	4.013	8	0.891	1	0.847	6	0.853	9	9.788	8	0.051	8	0.007	0.287	0.061	4.013
386	M39	2.5in Dia. Duct Sch 80S	Sec 3 - min	-0.034	8	-0.001	8	-0.030	6	-0.891	1	-4.013	8	-0.853	9	-0.847	6	-7.047	7	-0.036	7	0.007	0.287	0.061	4.013
326	M33	2.5in Dia. Duct Sch 80S	Sec 3 - max	0.126	8	0.136	6	0.019	7	-0.050	1	4.197	6	0.315	8	0.338	7	22.002	7	0.114	7	0.025	0.300	0.024	4.197
387	M39	2.5in Dia. Duct Sch 80S	Sec 4 - max	0.033	8	0.050	1	0.029	9	4.005	8	0.746	1	0.762	6	0.769	9	9.788	8	0.051	8	0.006	0.286	0.055	4.005
388	M39	2.5in Dia. Duct Sch 80S	Sec 4 - min	-0.033	8	-0.004	8	-0.029	6	-0.746	1	-4.005	8	-0.769	9	-0.762	6	-7.047	7	-0.036	7	0.006	0.286	0.055	4.005
165	M17	2in Dia. Duct Sch 80S	Sec 3 - max	0.030	8	0.139	1	0.150	1	-0.927	1	1.961	6	-0.857	1	2.773	7	77.528	8	0.734	8	0.008	0.140	0.198	2.773
371	M38	2.5in Dia. Duct Sch 80S	Sec 1 - max	0.033	9	0.047	1	0.028	9	3.991	8	0.608	1	0.660	6	0.687	9	9.788	8	0.051	8	0.006	0.285	0.049	3.991
372	M38	2.5in Dia. Duct Sch 80S	Sec 1- min	-0.033	6	-0.006	8	-0.028	6	-0.608	1	-3.991	8	-0.687	0	-0.660	6	-7.047	7	-0.036	7	0.006	0.285	0.049	3.991
389	M39	2.5in Dia. Duct Sch 80S	Sec 5 - max	0.033	8	0.047	1	0.028	9	3.991	8	0.608	1	0.660	6	0.687	9	9.788	8	0.051	8	0.006	0.285	0.049	3.991
390	M39	2.5in Dia. Duct Sch 80S	Sec 5 - min	-0.033	8	-0.006	8	-0.028	6	-0.608	1	-3.991	8	-0.687	9	-0.660	6	-7.047	7	-0.036	7	0.006	0.285	0.049	3.991
166	M17	2in Dia. Duct Sch 80S	Sec 3 - min	0.009	1	0.087	8	0.018	8	-1.961	6	0.927	1	-2.773	7	0.857	1	50.057	1	0.474	1	0.002	0.140	0.198	2.773
327	M33	2.5in Dia. Duct Sch 80S	Sec 4 - max	0.119	8	0.129	6	0.012	7	-0.050	1	4.278	8	0.059	6	0.084	7	22.002	7	0.114	7	0.023	0.306	0.006	4.278
373	M38	2.5in Dia. Duct Sch 80S	Sec 2 - max	0.032	9	0.045	1	0.027	9	3.975	8	0.504	1	0.618	6	0.625	9	9.788	8	0.051	8	0.006	0.284	0.045	3.975
374	M38	2.5in Dia. Duct Sch 80S	Sec 2 - min	-0.032	6	-0.008	8	-0.027	6	-0.504	1	-3.975	8	-0.625	9	-0.618	6	-7.047	7	-0.036	7	0.006	0.284	0.045	3.975
328	M33	2.5in Dia. Duct Sch 80S	Sec 3 - min	0.030	1	-0.136	8	-0.019	8	-4.197	6	0.050	1	-0.336	7	-0.315	8	-21.324	8	-0.110	8	0.008	0.300	0.024	4.197
375	M38	2.5in Dia. Duct Sch 80S	Sec 3 - max	0.032	9	0.043	1	0.026	9	3.955	8	0.404	1	0.558	6	0.566	9	9.788	8	0.051	8	0.006	0.283	0.040	3.955
376	M38	2.5in Dia. Duct Sch 80S	Sec 3 - min	-0.032	6	-0.010	8	-0.026	6	-0.404	1	-3.955	8	-0.566	9	-0.558	8	-7.047	7	-0.036	7	0.006	0.283	0.040	3.955
451	M46	2in Dia. Duct Sch 80S	Sec 1 - max	0.082	8	0.068	1	0.100	8	-0.439	9	0.511	1	3.805	7	0.004	1	-13.576	1	-0.129	1	0.017	0.037	0.272	3.805
377	M38	2.5in Dia. Duct Sch 80S	Sec 4 - max	0.031	8	0.042	1	0.025	9	3.931	8	0.309	1	0.501	6	0.508	9	9.788	8	0.051	8	0.006	0.281	0.036	3.931
378	M38	2.5in Dia. Duct Sch 80S	Sec 4 - min	-0.031	6	-0.012	8	-0.025	6	-0.309	1	-3.931	8	-0.508	9	-0.501	6	-7.047	7	-0.036	7	0.006	0.281	0.036	3.931
453	M46	2in Dia. Duct Sch 80S	Sec 2 - max	0.082	6	0.067	1	0.099	8	-0.407	9	0.479	1	3.743	7	0.004	1	-13.576	1	-0.129	1	0.017	0.034	0.267	3.743
361	M37	2.5in Dia. Duct Sch 80S	Sec 1 - max	0.031	9	0.040	1	0.024	9	3.902	8	0.218	1	0.445	6	0.453	9	9.788	8	0.051	8	0.006	0.279	0.032	3.902
362	M37	2.5in Dia. Duct Sch 80S	Sec 1- min	-0.031	6	-0.014	8	-0.024	6	-0.218	1	-3.902	8	-0.453	9	-0.445	6	-7.047	7	-0.036	7	0.006	0.279	0.032	3.902
379	M38	2.5in Dia. Duct Sch 80S	Sec 5 - max	0.031	9	0.040	1	0.024	9	3.902	8	0.218	1	0.445	6	0.453	9	9.788	8	0.051	8	0.006	0.279	0.032	3.902
380	M38	2.5in Dia. Duct Sch 80S	Sec 5 - min	-0.031	6	-0.014	8	-0.024	6	-0.218	1	-3.902	8	-0.453	9	-0.445	6	-7.047	7	-0.036	7	0.006	0.279	0.032	3.902
167	M17	2in Dia. Duct Sch 80S	Sec 4 - max	0.029	8	0.137	1	0.150	1	-0.623	1	1.745	6	-0.527	1	2.576	7	77.528	8	0.734	8	0.008	0.125	0.184	2.576
328	M33	2.5in Dia. Duct Sch 80S	Sec 4 - min	0.023	1	-0.129	8	-0.012	6	-4.278	8	0.050	1	-0.084	7	-0.059	8	-21.324	8	-0.110	8	0.005	0.306	0.006	4.278
81	M7	2in Dia. Duct Sch 80S	Sec 1 - max	0.048	8	0.045	8	0.101	7	-0.355	9	0.427	1	0.004	1	3.805	7	-19.661	7	-0.186	7	0.013	0.031	0.272	3.805
455	M46	2in Dia. Duct Sch 80S	Sec 3 - max	0.082	6	0.067	1	0.099	8	-0.375	9	0.447	1	3.661	7	0.004	1	-13.576	1	-0.129	1	0.017	0.032	0.263	3.661
168	M17	2in Dia. Duct Sch 80S	Sec 4 - min	0.009	1	0.086	8	0.019	8	-1.745	6	0.623	1	-2.576	7	0.527	1	50.057	1	0.474	1	0.002	0.125	0.184	2.576
169	M19	2in Dia. Duct Sch 80S	Sec 2 - max	0.031	8	0.174	6	-0.047	8	-1.029	1	1.735	6	2.465	7	-1.246	1	77.528	8	0.734	8	0.008	0.124	0.176	2.465
452	M46	2in Dia. Duct Sch 80S	Sec 1 - min	-0.003	9	0.067	8	-0.131	7	-0.511	1	0.439	9	-0.004	1	-3.805	7	-14.513	8	-0.137	8	0.001	0.037	0.272	3.805
481	M47	2in Dia. Duct Sch 80S	Sec 1 - max	0.073	6	0.066	1	0.058	8	-0.404	9	0.461	1	3.557	7	0.004	1	-1.625	1	-0.015	1	0.020	0.033	0.254	3.557
457	M46	2in Dia. Duct Sch 80S	Sec 4 - max	0.082	6	0.067	1	0.099	8	-0.343	9	0.415	1	3.619	7	0.004	1	-13.576	1	-0.129	1	0.017	0.030	0.259	3.619
184	M19	2in Dia. Duct Sch 80S	Sec 2 - min	0.009	1	0.133	1	-0.179	7	-1.735	6	1.029	1	1.246	1	-2.465	7	50.057	1	0.474	1	0.002	0.124	0.176	2.465
570	M57	2in Dia. Duct Sch 80S	Sec 6 - min	-0.062	1	-0.098	1	0.052	8	-1.925	6	0.699	1	-0.240	1	-2.088	7	30.609	1	0.290	1	0.017	0.138	0.149	2.088
454	M46	2in Dia. Duct Sch 80S	Sec 2 - min	-0.003	9	0.067	8	-0.131	7	-0.479	1	0.407	9	-0.004	1	-3.743	7	-14.513	8	-0.137	8	0.001	0.034	0.267	3.743
62	M7	2in Dia. Duct Sch 80S	Sec 1- min	0.000	1	0.043	1	0.000	1	-0.427	1	0.355	9	-3.805	7	-0.004	1	-20.094	1	-0.190	1	0.000	0.031	0.272	3.805
101	M11	6in Dia. Duct	Sec 1 - max	0.035	8	0.002	8	-0.010	1	0.035	1	-0.030	8	4.110	6	0.051	1	77.526	8	0.065	8	0.004	0.003	0.294	4.110
229	M23	6in Dia. Duct	Sec 5 - max	0.035	8	0.002	8	-0.010	1	0.035	1	-0.030	6	4.110	6	0.051	1	77.526	8	0.065	8	0.004	0.003	0.294	4.110
660	M56	2in Dia. Duct Sch 80S	Sec 5 - min	-0.092	1	-0.071	8	0.060	8	-1.597	6	0.834	1	-0.320	1	-2.251	6	8.566	1	0.081	1	0.025	0.114	0.161	2.251
483	M47	2in Dia. Duct Sch 80S	Sec 2 - max	0.073	6	0.066	1	0.058	8	-0.373	9	0.429	1	3.488	7	0.004	1	-1.625	1	-0.015	1	0.020	0.031	0.249	3.488
102	M11	6in Dia. Duct	Sec 1 - min	-0.020	7	0.000	1	-0.788	8	0.030	8	-0.035	1	-0.051	1	-4.110	6	50.057	1	0.042	1	0.003	0.003	0.294	4.110
230	M23	6in Dia. Duct	Sec 5 - min	-0.020	7	0.000	1	-0.788	8	0.030	8	-0.035	1	-0.051	1	-4.110	6	50.057	1	0.042	1	0.003	0.003	0.294	4.110
459	M46	2in Dia. Duct Sch 80S	Sec 6 - max	0.082	6	0.066	1	0.099	8	-0.312	9	0.384	1	3.557	7	0.004	1	-13.576	1	-0.129	1	0.017	0.027	0.254	3.557
568	M57	2in Dia. Duct Sch 80S	Sec 4 - min	-0.062	1	-0.098	1	0.052	8	-1.889	6	0.652	1	-0.288	1	-2.047	7	30.609	1	0.290	1	0.017	0.135	0.146	2.047
180	M16	2in Dia. Duct Sch 80S	Sec 5 - min	-0.085	1	-0.003	1	0.018	1	0.598	1	-1.006	8	1.462	9	-2.828	6	-3.051	1	-0.029	1	0.023	0.072	0.202	2.828
558	M56	2in Dia. Duct Sch 80S	Sec 4 - min	-0.092	1	-0.071	8	0.060	8	-1.571	6	0.815	1	-0.343	1	-2.225	6	8.566	1	0.081	1	0.025	0.112	0.159	2.225
458	M46	2in Dia. Duct Sch 80S	Sec 3 - min	-0.003	9	0.067	8	-0.131	7	-0.447	1	0.375	9	-0.004	1	-3.681	7	-14.513	8	-0.137	8	0.001	0.032	0.263	3.681
383	M37	2.5in Dia. Duct Sch 80S	Sec 2 - max	0.030	9	0.035	1	0.022	9	3.780	8	-0.073	1	0.266	8	0.275	7	9.788	8	0.051	8	0.006	0.270	0.020	3.780
384	M37	2.5in Dia. Duct Sch 80S	Sec 2 - min	-0.030	6	-0.016	8	-0.022	6	0.073	1	-3.780	8	-0.275	7	-0.266	8	-7.047	7	-0.036	7	0.006	0.270	0.020	3.780
579	M58	2in Dia. Duct Sch 80S	Sec 5 - max	0.020	8	-0.090	8	0.150	1	-0.528	1	1.600	6	2.260	7	-0.090	1	72.103	8	0.683	8	0.005	0.129	0.161	2.260
462	M47	2in Dia. Duct Sch 80S	Sec 1- min	-0.030	9	0.066	8	-0.145	7	-0.481	1	0.404	9	-0.004	1	-3.557	7	-4.210	8	-0.040	8	0.008	0.033	0.254	3.557
580	M58	2in Dia. Duct Sch 80S	Sec 5 - min	-0.017	1	-0.132	1	0.032	8	-1.800	6	0.526	1	0.090	1	-2.260	7	45.895	1	0.435	1	0.005	0.129	0.161	2.260
485	M47	2in Dia. Duct Sch 80S	Sec 3 - max	0.073	6	0.088	1	0.058	8	-0.342	9	0.398	1	3.425	6	0.004	1	-1.625	1	-0.015	1	0.020	0.028	0.245	3.425
566	M57	2in Dia. Duct Sch 80S	Sec 3 - min	-0.062	1	-0.097	1	0.052	8	-1.854	6	0.625	1	-0.335	1	-2.009	7	30.609	1	0.290	1	0.017	0.132	0.144	2.009
556	M56	2in Dia. Duct Sch 80S	Sec 3 - min	-0.092	1	-0.071	8	0.060	8	-1.545	6	0.795	1	-0.366	1	-2.199	6	8.566	1	0.081	1	0.025	0.110	0.157	2.199
103	M11	6in Dia. Duct	Sec 2 - max	0.035	8	0.000	8	-0.010	1	0.035	1	-0.030	8	3.992	6	0.053	1	77.526	8	0.065	8	0.004	0.003	0.285	3.992
467	M47	2in Dia. Duct Sch 80S	Sec 4 - max	0.073	6	0.065	1	0.058	8	-0.311	9	0.367	1	3.429	6	0.004	1	-1.625	1	-0.015	1	0.020	0.029	0.245	3.429
802	M61	2in Dia. Duct Sch 80S	Sec 1- min	-0.084	1	-0.011	9	-0.028	1	0.358	1	-0.730	8	-3.015	6	1.591	1	5.789	1	0.055	1	0.023	0.052	0.215	3.015
104	M11	6in Dia. Duct	Sec 2 - min	-0.020	7	0.000	1	-0.788	8	0.030	8	-0.035	1	-0.053	1	-3.992	6	50.057	1	0.042	1	0.003	0.003	0.285	3.992
577	M58	2in Dia. Duct Sch 80S	Sec 4 - max	0.020	8	-0.090	8	0.150	1	-0.477	1	1.762	6	2.223	7	-0.033	1	72.103	8	0.683	8	0.005	0.126	0.159	2.223
578	M58	2in Dia. Duct Sch 80S	Sec 4 - min	-0.017	1	-0.132	1	0.032	8	-1.762	6	0.477	1	0.033	1	-2.223	7	45.895	1	0.435	1	0.005	0.126	0.159	2.223
590	M59	2in Dia. Duct Sch 80S	Sec 5 - min	-0.052	6	-0.072	1	-0.142	1	-1.162	6	0.472	1	-2.687	6	1.288	1	29.524	1	0.260	1	0.014	0.083	0.192	2.687
458	M46	2in Dia. Duct Sch 80S	Sec 4 - min	-0.003	9	0.066	8	-0.131	7	-0.415	1	0.343	9	-0.004	1	-3.619	7	-14.513	8	-0.137	8	0.001	0.030	0.259	3.619
489	M47	2in Dia. Duct Sch 80S	Sec 5 - max	0.073	6	0.065	1	0.058	8	-0.280	9	0.336	1	3.433	6	0.004	1	-1.625	1	-0.015	1	0.020	0.024	0.245	3.433
804	M61	2in Dia. Duct Sch 80S	Sec 2 - min	-0.084	1	-0.011	9	-0.028	1	0.358	1	-0.730	8	-2.993	6	1.595	9	5.789	1	0.055	1	0.023	0.052	0.214	2.993
554	M56	2in Dia. Duct Sch 80S	Sec 2 - min	-0.092	1	-0.070	8	0.060	8	-1.519	6	0.775	1	-0.369	1	-2.173	6	8.566	1	0.081	1	0.025	0.109	0.155	2.173
464	M47	2in Dia. Duct Sch 80S	Sec 2 - min	-0.030	9	0.066	8	-0.145	7	-0.429	1	0.373	9	-0.004	1	-3.488	7	-4.210	8	-0.040	8	0.008	0.031	0.249	3.488
564	M57	2in Dia. Duct Sch 80S	Sec 2 - min	-0.062	1	-0.097	1	0.052	8	-1.819	6	0.589	1	-0.382	1	-1.971	7	30.609	1	0.290	1	0.017	0.130	0.141	1.971
189	M17	2in Dia. Duct Sch 80S	Sec 5 - max	0.029	8	0.135	1	0.150	1	-0.323	1	1.532	6	-0.197	1	2.380	7	77.528	8	0.734	8	0.008	0.109	0.170	2.380
806	M61	2in Dia. Duct Sch 80S	Sec 3 - min	-0.084	1	-0.011	9	-0.028	1	0.357	1	-0.729	8	-2.971	6	1.590	9	5.789	1	0.055	1	0.023	0.052	0.212	2.971
588	M59	2in Dia. Duct Sch 80S	Sec 4 - min	-0.052	6	-0.072	1	-0.142	1	-1.151	6	0.444	1	-2.667	6	1.234	1	29.524	1	0.260	1	0.014	0.082	0.191	2.667
569	M57	2in Dia. Duct Sch 80S	Sec 5 - max	0.000	8	-0.083	9	0.125	1	-0.699	1	1.925	6	2.096	7	0.240	1	49.979	8	0.473	8	0.000	0.138	0.149	2.088
160	M16	2in Dia. Duct Sch 80S	Sec 5 - min	-0.043	6	-0.078	1	-0.150	1	-1.381	6	0.507	1	-2.479	6	0.995	1	31.057	1	0.294	1	0.012	0.097	0.177	2.479

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a	f_t (ksi)
172	M18	2in Dia. Duct Sch 80S	Sec 1-min	-0.098	1	0.042	1	0.018	1	-1.290	8	0.821	1	-2.340	6	-0.298	1	-3.051	1	-0.029	1	0.026	0.092	0.167	2.340
608	M61	2in Dia. Duct Sch 80S	Sec 4-min	-0.084	1	-0.011	9	-0.028	1	0.356	1	-0.729	8	-2.949	6	1.584	9	5.789	1	0.055	1	0.023	0.052	0.211	2.949
552	M58	2in Dia. Duct Sch 80S	Sec 1-min	-0.092	1	-0.070	8	0.060	8	-1.493	6	0.756	1	-0.412	1	-2.146	6	8.566	1	0.081	1	0.025	0.107	0.153	2.146
575	M58	2in Dia. Duct Sch 80S	Sec 3-max	0.020	8	-0.089	8	0.150	1	-0.427	1	1.724	6	2.188	7	0.024	1	72.103	8	0.683	8	0.005	0.123	0.156	2.188
471	M46	2in Dia. Duct Sch 80S	Sec 1-max	0.065	8	0.065	1	0.002	8	-0.281	9	0.306	1	3.433	6	0.004	1	7.459	1	0.071	1	0.018	0.022	0.245	3.433
588	M59	2in Dia. Duct Sch 80S	Sec 3-min	-0.052	8	-0.072	1	-0.142	1	-1.141	6	0.417	1	-2.647	6	1.180	1	29.524	1	0.280	1	0.014	0.082	0.189	2.647
610	M61	2in Dia. Duct Sch 80S	Sec 5-min	-0.085	1	-0.011	9	-0.028	1	0.355	1	-0.728	8	-2.927	6	1.578	9	5.789	1	0.055	1	0.023	0.052	0.209	2.927
576	M58	2in Dia. Duct Sch 80S	Sec 3-min	-0.017	1	-0.132	1	0.032	8	-1.724	6	0.427	1	-0.024	1	-2.186	7	45.895	1	0.435	1	0.005	0.123	0.156	2.186
105	M11	6in Dia. Duct	Sec 3-max	0.035	8	0.000	8	-0.010	1	0.035	1	-0.030	8	3.874	6	0.056	1	77.526	8	0.065	8	0.004	0.003	0.277	3.874
562	M57	2in Dia. Duct Sch 80S	Sec 1-min	-0.082	1	-0.097	1	0.052	8	-1.784	6	0.552	1	-0.429	1	-1.938	6	30.609	1	0.290	1	0.017	0.127	0.138	1.938
584	M59	2in Dia. Duct Sch 80S	Sec 2-min	-0.052	6	-0.072	1	-0.142	1	-1.131	8	0.390	1	-2.627	6	1.127	1	29.524	1	0.280	1	0.014	0.081	0.188	2.627
480	M46	2in Dia. Duct Sch 80S	Sec 5-min	-0.003	9	0.066	8	-0.130	7	-0.384	1	0.312	9	-0.004	1	-3.557	7	-14.513	8	-0.137	8	0.001	0.027	0.254	3.557
170	M17	2in Dia. Duct Sch 80S	Sec 6-min	0.009	1	0.084	8	0.020	8	-1.532	6	0.323	1	-2.380	7	0.197	1	50.057	1	0.474	1	0.002	0.109	0.170	2.380
106	M11	6in Dia. Duct	Sec 3-min	-0.020	7	0.000	1	-0.788	8	0.030	8	-0.035	1	-0.056	1	-3.874	6	50.057	1	0.042	1	0.003	0.003	0.277	3.874
460	M47	2in Dia. Duct Sch 80S	Sec 3-min	-0.030	9	0.085	8	-0.144	7	-0.398	1	0.342	9	-0.004	1	-3.425	6	-4.210	8	-0.040	8	0.008	0.028	0.245	3.425
567	M57	2in Dia. Duct Sch 80S	Sec 4-max	0.000	8	-0.083	9	0.125	1	-0.662	1	1.689	6	2.047	7	0.268	1	49.979	8	0.473	8	0.000	0.135	0.145	2.047
559	M58	2in Dia. Duct Sch 80S	Sec 5-max	-0.021	8	-0.053	1	0.078	7	-0.834	1	1.597	6	2.251	6	0.320	1	17.438	9	0.165	9	0.006	0.114	0.161	2.251
179	M18	2in Dia. Duct Sch 80S	Sec 6-max	-0.024	9	0.013	9	0.084	6	1.006	8	-0.586	1	2.828	8	-1.462	9	1.880	9	0.018	9	0.006	0.072	0.202	2.828
582	M59	2in Dia. Duct Sch 80S	Sec 1-min	-0.052	6	-0.071	1	-0.142	1	-1.121	6	0.363	1	-2.607	6	1.073	1	29.524	1	0.280	1	0.014	0.080	0.188	2.607
472	M46	2in Dia. Duct Sch 80S	Sec 1-min	-0.049	9	0.065	8	-0.120	7	-0.308	1	0.281	9	-0.004	1	-3.433	6	3.863	9	0.037	9	0.013	0.022	0.245	3.433
473	M46	2in Dia. Duct Sch 80S	Sec 2-max	0.065	6	0.065	1	0.001	8	-0.250	9	0.275	1	3.401	6	0.004	1	7.459	1	0.071	1	0.018	0.020	0.243	3.401
569	M59	2in Dia. Duct Sch 80S	Sec 5-max	-0.018	9	-0.023	8	-0.028	9	-0.472	1	1.162	6	-1.288	1	2.687	6	51.499	8	0.488	8	0.005	0.083	0.192	2.687
573	M58	2in Dia. Duct Sch 80S	Sec 2-max	0.020	8	-0.089	8	0.150	1	-0.377	1	1.685	6	2.148	7	0.081	1	72.103	8	0.683	8	0.005	0.120	0.153	2.148
468	M47	2in Dia. Duct Sch 80S	Sec 4-min	-0.030	9	0.065	8	-0.144	7	-0.367	1	0.311	9	-0.004	1	-3.429	6	-4.210	8	-0.040	8	0.008	0.026	0.245	3.429
574	M56	2in Dia. Duct Sch 80S	Sec 2-min	-0.016	1	-0.132	1	0.032	8	-1.686	6	0.377	1	-0.081	1	-2.148	7	45.895	1	0.435	1	0.004	0.129	0.153	2.148
567	M59	2in Dia. Duct Sch 80S	Sec 4-max	-0.018	9	-0.023	8	-0.028	9	-0.444	1	1.151	6	-1.234	1	2.667	6	51.499	8	0.488	8	0.005	0.082	0.191	2.667
470	M47	2in Dia. Duct Sch 80S	Sec 5-min	-0.030	9	0.065	8	-0.144	7	-0.336	1	0.280	9	-0.004	1	-3.433	6	-4.210	8	-0.040	8	0.008	0.024	0.245	3.433
557	M56	2in Dia. Duct Sch 80S	Sec 4-max	-0.021	8	-0.053	1	0.078	7	-0.815	1	1.571	6	2.225	6	0.343	1	17.438	9	0.165	9	0.006	0.112	0.159	2.225
169	M18	2in Dia. Duct Sch 80S	Sec 5-max	-0.009	1	-0.027	8	-0.034	9	-0.507	1	1.361	6	-0.995	1	2.479	6	53.440	8	0.506	8	0.002	0.087	0.177	2.479
565	M57	2in Dia. Duct Sch 80S	Sec 3-max	0.000	8	-0.083	9	0.125	1	-0.825	1	1.654	6	2.009	7	0.335	1	49.979	8	0.473	8	0.000	0.132	0.144	2.009
474	M46	2in Dia. Duct Sch 80S	Sec 2-min	-0.049	9	0.064	8	-0.119	7	-0.275	1	0.250	9	-0.004	1	-3.401	6	3.863	9	0.037	9	0.013	0.020	0.243	3.401
475	M46	2in Dia. Duct Sch 80S	Sec 3-max	0.065	8	0.064	1	0.001	8	-0.219	9	0.245	1	3.370	8	0.003	1	7.459	1	0.071	1	0.018	0.018	0.241	3.370
555	M59	2in Dia. Duct Sch 80S	Sec 3-max	-0.018	9	-0.023	8	-0.028	9	-0.417	1	1.141	6	-1.180	1	2.647	6	51.499	8	0.488	8	0.005	0.082	0.189	2.647
107	M11	6in Dia. Duct	Sec 4-max	0.035	8	0.000	8	-0.010	1	0.035	1	-0.030	8	3.756	6	0.059	1	77.526	8	0.065	8	0.004	0.003	0.268	3.756
119	M12	2.5in Dia. Duct Sch 160S	Sec 5-max	0.005	6	-0.054	1	0.000	1	-1.023	1	1.041	8	0.002	1	2.795	8	9.713	1	0.040	1	0.001	0.074	0.200	2.795
120	M12	2.5in Dia. Duct Sch 160S	Sec 5-min	-0.005	7	-0.054	8	-0.057	8	-1.041	8	1.023	1	-2.795	8	-0.002	1	5.892	9	0.024	9	0.001	0.074	0.200	2.795
619	M62	2.5in Dia. Duct Sch 160S	Sec 5-max	0.005	6	-0.040	7	0.085	8	-1.023	1	1.041	8	2.795	8	0.002	1	9.713	1	0.040	1	0.001	0.074	0.200	2.795
620	M62	2.5in Dia. Duct Sch 160S	Sec 5-min	-0.005	7	-0.044	8	0.000	1	-1.041	8	1.023	1	-0.002	1	-2.795	8	5.892	9	0.024	9	0.001	0.074	0.200	2.795
601	M61	2in Dia. Duct Sch 80S	Sec 1-max	-0.028	9	0.009	6	0.060	7	0.730	8	-0.358	1	-1.591	1	3.015	6	15.572	9	0.147	9	0.007	0.052	0.215	3.015
571	M58	2in Dia. Duct Sch 80S	Sec 1-max	0.020	8	-0.089	8	0.150	1	-0.327	1	1.648	6	2.111	7	0.137	1	72.103	8	0.683	8	0.005	0.118	0.151	2.111
108	M11	6in Dia. Duct	Sec 4-min	-0.020	7	-0.001	1	-0.789	8	0.030	8	-0.035	1	-0.059	1	-3.756	6	50.057	1	0.042	1	0.003	0.003	0.268	3.756
583	M59	2in Dia. Duct Sch 80S	Sec 2-max	-0.016	9	-0.022	8	-0.027	9	-0.390	1	1.131	6	-1.127	1	2.627	6	51.499	8	0.468	8	0.005	0.081	0.188	2.627
555	M56	2in Dia. Duct Sch 80S	Sec 3-max	-0.021	8	-0.053	1	0.079	7	-0.795	1	1.545	6	2.199	6	0.366	1	17.438	9	0.165	9	0.006	0.110	0.157	2.199
603	M61	2in Dia. Duct Sch 80S	Sec 2-max	-0.028	9	0.008	6	0.060	7	0.730	8	-0.358	1	-1.595	9	2.993	6	15.572	9	0.147	9	0.007	0.052	0.214	2.993
572	M58	2in Dia. Duct Sch 80S	Sec 1-min	-0.016	1	-0.131	1	0.032	8	-1.648	6	0.327	1	-0.137	1	-2.111	7	45.895	1	0.435	1	0.004	0.116	0.151	2.111
385	M37	2.5in Dia. Duct Sch 80S	Sec 3-max	0.029	9	0.031	1	0.020	9	3.624	9	-0.330	1	0.104	8	0.114	7	9.788	8	0.051	8	0.006	0.259	0.008	3.624
386	M37	2.5in Dia. Duct Sch 80S	Sec 3-min	-0.029	8	-0.022	8	-0.020	6	0.330	1	-3.624	9	-0.114	7	-0.104	8	-7.047	7	-0.036	7	0.006	0.259	0.008	3.624
605	M61	2in Dia. Duct Sch 80S	Sec 3-max	-0.027	9	0.008	6	0.059	7	0.729	8	-0.357	1	-1.590	9	2.971	6	15.572	9	0.147	9	0.007	0.052	0.212	2.971
476	M46	2in Dia. Duct Sch 80S	Sec 3-min	-0.049	9	0.064	8	-0.119	7	-0.245	1	0.219	9	-0.003	1	-3.370	6	3.863	9	0.037	9	0.013	0.018	0.241	3.370
477	M46	2in Dia. Duct Sch 80S	Sec 4-max	0.065	6	0.064	1	0.001	8	-0.188	9	0.214	1	3.339	6	0.003	1	7.459	1	0.071	1	0.018	0.015	0.239	3.339
581	M59	2in Dia. Duct Sch 80S	Sec 1-max	-0.016	9	-0.022	8	-0.027	9	-0.383	1	1.121	8	-1.073	1	2.607	6	51.499	8	0.488	8	0.005	0.080	0.186	2.607
583	M57	2in Dia. Duct Sch 80S	Sec 2-max	0.000	8	-0.082	9	0.125	1	-0.589	1	1.819	6	1.971	7	0.362	1	49.979	8	0.473	8	0.000	0.130	0.141	1.971
607	M61	2in Dia. Duct Sch 80S	Sec 4-max	-0.027	9	0.008	6	0.059	7	0.729	8	-0.356	1	-1.584	9	2.949	6	15.572	9	0.147	9	0.007	0.052	0.211	2.949
553	M56	2in Dia. Duct Sch 80S	Sec 2-max	-0.021	8	-0.053	1	0.079	7	-0.775	1	1.519	6	2.173	6	0.389	1	17.438	9	0.165	9	0.006	0.109	0.155	2.173
609	M61	2in Dia. Duct Sch 80S	Sec 5-max	-0.027	9	0.007	6	0.059	7	0.726	8	-0.355	1	-1.578	9	2.927	6	15.572	9	0.147	9	0.007	0.052	0.209	2.927
77	M8	2in Dia. Duct Sch 80S	Sec 4-max	0.016	7	0.105	8	0.009	1	3.349	8	-1.988	1	0.337	1	0.066	7	0.207	1	0.002	1	0.004	0.239	0.024	3.348
78	M8	2in Dia. Duct Sch 80S	Sec 4-min	-0.016	6	0.054	1	-0.009	7	1.988	1	-3.348	8	-0.066	7	-0.337	1	0.041	7	0.000	7	0.004	0.239	0.024	3.348
171	M18	2in Dia. Duct Sch 80S	Sec 1-max	-0.028	8	0.060	8	0.059	6	-0.821	1	1.290	8	0.298	1	2.340	6	1.880	9	0.018	9	0.006	0.092	0.187	2.340
478	M46	2in Dia. Duct Sch 80S	Sec 4-min	-0.049	9	0.064	8	-0.119	7	-0.214	1	0.189	9	-0.003	1	-3.339	6	3.863	9	0.037	9	0.013	0.015	0.239	3.339
479	M46	2in Dia. Duct Sch 80S	Sec 6-max	0.065	6	0.064	1	0.000	8	-0.156	9	0.184	1	3.307	6	0.003	1	7.459	1	0.071	1	0.018	0.013	0.236	3.307
109	M11	6in Dia. Duct	Sec 5-max	0.035	8	0.000	8	-0.010	1	0.034	1	-0.030	8	3.638	6	0.061	1	77.526	8	0.065	8	0.004	0.002	0.260	3.638
241	M25	6in Dia. Duct	Sec 1-max	0.035	8	0.000	8	-0.010	1	0.034	1	-0.030	8	3.638	6	0.061	1	77.526	8	0.065	8	0.004	0.002	0.260	3.638
561	M57	2in Dia. Duct Sch 80S	Sec 1-max	0.000	8	-0.082	9	0.125	1	-0.552	1	1.784	6	1.938	6	0.429	1	49.979	8	0.473	8	0.000	0.127	0.138	1.938
551	M56	2in Dia. Duct Sch 80S	Sec 1-max	-0.021	8	-0.052	1	0.079	7	-0.750	1	1.493	6	2.146	6	0.412	1	17.438	9	0.165	9	0.006	0.107	0.153	2.146
110	M11	6in Dia. Duct	Sec 5-min	-0.020	7	-0.002	1	-0.789	8	0.030	8	-0.034	1	-0.061	1	-3.638	6	50.057	1	0.042	1	0.003	0.002	0.260	3.638
242	M25	6in Dia. Duct	Sec 1-min	-0.020	7	-0.002	1	-0.789	8	0.030	8	-0.034	1	-0.061	1	-3.638	6	50.057	1	0.042	1	0.003	0.002	0.260	3.638
480	M46	2in Dia. Duct Sch 80S	Sec 5-min	-0.049	9	0.063	8	-0.119	7	-0.184	1	0.158	9	-0.003	1	-3.307	6	3.863	9	0.037	9	0.013	0.013	0.236	3.307
692	M60	2in Dia. Duct Sch 80S	Sec 1-min	-0.066	1	-0.037	1	-0.102	1	-0.468	6	-0.092	9	-2.952	6	1.427	1	20.588	1	0.195	1	0.016	0.033	0.211	2.952
598	M60	2in Dia. Duct Sch 80S	Sec 4-min	-0.066	1	-0.036	1	-0.102	1	-0.467	6	-0.073	9	-2.953	6	1.542	1	20.588	1	0.195	1	0.016	0.033	0.211	2.953
600	M60	2in Dia. Duct Sch 80S	Sec 5-min	-0.066	1	-0.036	1	-0.102	1	-0.467	6	-0.066	9	-2.953	6	1.581	1	20.588	1	0.195	1	0.016	0.033	0.211	2.953
594	M60	2in Dia. Duct Sch 80S	Sec 2-min	-0.066	1	-0.037	1	-0.102	1	-0.467	6	-0.086	9	-2.952	6	1.465	1	20.588	1	0.195	1	0.016	0.033	0.211	2.952
596	M60	2in Dia. Duct Sch 80S	Sec 3-min	-0.066	1	-0.037	1	-0.102	1	-0.467	6	-0.079	9	-2.952	6	1.504	1	20.588	1	0.195	1	0.016	0.033	0.211	2.952
481	M46	2in Dia. Duct Sch 80S	Sec 1-max	0.054	6	0.064	1	0.000	1	-0.133	7	0.142	8	3.307	6	0.003	1	9.713	1	0.092	1	0.015	0.010	0.236	3.307
482	M46	2in Dia. Duct Sch 80S	Sec 1-min	-0.054	7	0.063	8	-0.097	6	-0.142	8	0.133	7	-0.003	1	-3.307	6	5.892	9	0.056	9	0.015	0.010	0.236	3.307
154	M16	2in Dia. Duct Sch 80S	Sec 2-min	-0.047	6	-0.062	1	-0.150	1	-0.676	6	-1.067	1	-1.092	7	-2.367	1	31.057	1	0.294	1	0.013	0.076	0.169	2.367
367	M37	2.5in Dia. Duct Sch 80S	Sec 4-max	0.028	9	0.027	1	0.018	9	3.435	9	-0.555	1	0.035	9	0.045	6	9.788	8	0.051	8	0.005	0.245	0.003	3.435
388	M37	2.5in Dia. Duct Sch 80S	Sec 4-min	-0.028	8	-0.027	8	-0.018	0	0.555	1	-3.435	9	-0.045	6	-0.035	9	-7.047	7	-0.036	7	0.005	0.245	0.003	3.435
311	M32	2in Dia. Duct Sch 80S	Sec 1-max	0.008	7	0.143	8	0.011	9	-1.958	1	3.359	8	0.158	6	0.129	1	0.207	1	0.002	1	0.002	0.240	0.011	3.359
312	M32	2in Dia. Duct Sch 80S	Sec 1-min	-0.008	9	0.092	1	-0.013	6	-3.359	8	1.958	1	-0.129	1	-0.158	6	0.041	7	0.000	7	0.002	0.240	0.011	3.359

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_a	f_s/σ_a		f_c (ksi)	
339	M34	2in Dia. Duct Sch 80S	Sec 5 - min	0.006	6	-0.035	1	0.013	6	-1.958	1	3.359	8	0.158	6	0.129	1	0.207	1	0.002	1	0.002	0.240	0.011		3.359	
340	M34	2in Dia. Duct Sch 80S	Sec 5 - min	-0.006	9	-0.003	8	-0.010	9	-3.359	8	1.958	1	-0.129	1	-0.158	6	0.041	7	0.000	7	0.002	0.240	0.011		3.359	
597	M60	2in Dia. Duct Sch 80S	Sec 4 - max	-0.026	9	0.000	6	0.007	7	0.073	9	0.467	6	-1.542	1	2.953	6	38.325	9	0.363	9	0.007	0.033	0.211		2.953	
599	M60	2in Dia. Duct Sch 80S	Sec 5 - max	-0.026	0	0.000	6	0.007	7	0.066	9	0.467	6	-1.581	1	2.953	6	38.325	9	0.363	9	0.007	0.033	0.211		2.953	
593	M60	2in Dia. Duct Sch 80S	Sec 2 - max	-0.026	9	0.000	6	0.008	7	0.086	9	0.467	6	-1.465	1	2.952	6	38.325	9	0.363	9	0.007	0.033	0.211		2.952	
595	M60	2in Dia. Duct Sch 80S	Sec 3 - max	-0.026	9	0.000	6	0.007	7	0.079	9	0.467	6	-1.504	1	2.952	6	38.325	9	0.363	9	0.007	0.033	0.211		2.952	
591	M60	2in Dia. Duct Sch 80S	Sec 1 - max	-0.025	9	0.001	6	0.008	7	0.092	9	0.468	6	-1.427	1	2.952	6	38.325	9	0.363	9	0.007	0.033	0.211		2.952	
243	M25	6in Dia. Duct	Sec 2 - max	0.035	8	-0.002	8	-0.010	1	0.033	1	-0.029	8	3.411	6	0.066	1	77.526	8	0.065	8	0.004	0.002	0.244		3.411	
244	M25	6in Dia. Duct	Sec 2 - min	-0.021	7	-0.003	1	-0.789	8	0.029	8	-0.033	1	-0.066	1	-3.411	6	50.057	1	0.042	1	0.003	0.002	0.244		3.411	
153	M16	2in Dia. Duct Sch 80S	Sec 2 - max	-0.009	1	-0.011	8	-0.026	9	1.067	1	0.676	6	2.307	1	1.092	7	53.440	8	0.508	8	0.002	0.078	0.169		2.387	
369	M37	2.5in Dia. Duct Sch 80S	Sec 5 - max	0.026	9	0.023	1	0.016	9	3.213	9	-0.748	1	0.164	9	0.175	6	9.788	8	0.051	8	0.005	0.230	0.013		3.213	
370	M37	2.5in Dia. Duct Sch 80S	Sec 5 - min	-0.026	6	-0.031	8	-0.016	8	0.746	1	-3.213	9	-0.175	6	-0.164	9	-7.047	7	-0.036	7	0.005	0.230	0.013		3.213	
7	M1	2.5in Dia. Duct Sch 80S	Sec 4 - max	0.041	8	0.145	8	0.034	6	2.743	6	0.340	1	0.438	6	0.440	9	9.788	8	0.051	8	0.008	0.198	0.031		2.743	
8	M1	2.5in Dia. Duct Sch 80S	Sec 4 - min	-0.041	7	-0.046	1	-0.034	9	-0.340	1	-2.743	6	-0.440	9	-0.438	6	-7.047	7	-0.036	7	0.008	0.198	0.031		2.743	
3	M1	2.5in Dia. Duct Sch 80S	Sec 2 - max	0.054	8	0.195	8	0.009	6	1.680	6	2.945	9	0.198	7	0.195	8	9.788	8	0.051	8	0.011	0.210	0.014		2.945	
4	M1	2.5in Dia. Duct Sch 80S	Sec 2 - min	-0.054	7	0.004	1	-0.009	9	-2.945	9	-1.680	6	-0.195	8	-0.198	7	-7.047	7	-0.038	7	0.011	0.210	0.014		2.945	
817	M62	2.5in Dia. Duct Sch 160S	Sec 4 - max	0.005	8	-0.037	7	0.083	8	-0.645	1	0.853	9	2.423	8	0.002	1	9.713	1	0.040	1	0.001	0.061	0.173		2.423	
818	M62	2.5in Dia. Duct Sch 160S	Sec 4 - min	-0.005	7	-0.041	8	0.000	1	-0.853	9	0.645	1	-0.002	1	-2.423	8	5.892	9	0.024	9	0.001	0.061	0.173		2.423	
246	M25	6in Dia. Duct	Sec 3 - max	0.036	8	-0.003	8	-0.010	1	0.032	1	-0.028	8	3.183	6	0.072	1	77.526	8	0.065	8	0.005	0.002	0.227		3.183	
248	M25	6in Dia. Duct	Sec 3 - min	-0.021	7	-0.004	1	-0.790	8	0.028	8	-0.032	1	-0.072	1	-3.183	6	50.057	1	0.042	1	0.003	0.002	0.227		3.183	
489	M49	2in Dia. Duct Sch 80S	Sec 5 - max	0.051	6	0.050	1	0.000	1	0.992	7	-0.978	8	2.027	6	0.002	1	9.713	1	0.092	1	0.014	0.071	0.145		2.027	
490	M49	2in Dia. Duct Sch 80S	Sec 5 - min	-0.051	7	0.049	8	-0.050	6	0.978	8	-0.992	7	-0.002	1	-2.027	8	5.892	9	0.050	9	0.014	0.071	0.145		2.027	
483	M49	2in Dia. Duct Sch 80S	Sec 2 - max	0.053	6	0.060	1	0.000	1	0.174	7	-0.164	8	2.831	6	0.003	1	9.713	1	0.092	1	0.014	0.012	0.202		2.831	
484	M49	2in Dia. Duct Sch 80S	Sec 2 - min	-0.053	7	0.060	8	-0.095	6	0.164	8	-0.174	7	-0.003	1	-2.831	6	5.892	9	0.056	9	0.014	0.012	0.202		2.831	
158	M16	2in Dia. Duct Sch 80S	Sec 4 - min	-0.044	6	-0.073	1	-0.150	1	-1.094	6	-0.057	1	-1.915	6	-0.125	1	31.057	1	0.294	1	0.012	0.078	0.137		1.915	
165	M19	2in Dia. Duct Sch 80S	Sec 3 - max	0.032	8	0.171	8	-0.048	8	-0.524	1	1.076	6	1.962	6	-0.974	1	77.526	8	0.734	8	0.009	0.077	0.140		1.962	
487	M49	2in Dia. Duct Sch 80S	Sec 4 - max	0.051	8	0.053	1	0.000	1	0.738	7	-0.724	8	2.196	6	0.003	1	9.713	1	0.092	1	0.014	0.053	0.157		2.196	
488	M49	2in Dia. Duct Sch 80S	Sec 4 - min	-0.051	7	0.053	8	-0.092	6	0.724	8	-0.736	7	-0.003	1	-2.196	8	5.892	9	0.056	9	0.014	0.053	0.157		2.196	
337	M34	2in Dia. Duct Sch 80S	Sec 4 - max	0.005	6	-0.031	1	0.011	6	-1.750	1	2.980	8	0.082	6	0.111	1	0.207	1	0.002	1	0.001	0.213	0.008		2.980	
338	M34	2in Dia. Duct Sch 80S	Sec 4 - min	-0.005	9	-0.058	8	-0.008	9	-2.980	8	1.750	1	-0.111	1	-0.082	6	0.041	7	0.000	7	0.001	0.213	0.008		2.980	
313	M32	2in Dia. Duct Sch 80S	Sec 2 - max	0.007	7	0.141	8	0.010	9	-1.701	1	2.958	8	0.123	8	0.105	1	0.207	1	0.002	1	0.002	0.211	0.009		2.958	
314	M32	2in Dia. Duct Sch 80S	Sec 2 - min	-0.007	9	0.090	1	-0.012	6	-2.958	8	1.701	1	-0.105	1	-0.123	6	0.041	7	0.000	7	0.002	0.211	0.009		2.958	
19	M2	2.5in Dia. Duct Sch 160S	Sec 5 - max	0.002	8	-0.054	1	0.024	8	-1.034	1	2.669	8	0.394	8	0.411	7	9.788	8	0.041	8	0.000	0.191	0.029		2.669	
20	M2	2.5in Dia. Duct Sch 160S	Sec 5 - min	-0.002	8	-0.094	8	-0.024	7	-2.669	8	1.034	1	-0.411	7	-0.394	8	-7.047	7	-0.029	7	0.000	0.191	0.029		2.669	
411	M42	2.5in Dia. Duct Sch 160S	Sec 1 - max	0.002	8	0.071	8	0.018	7	-1.034	1	2.669	8	0.394	8	0.411	7	9.788	8	0.041	8	0.000	0.191	0.029		2.669	
412	M42	2.5in Dia. Duct Sch 160S	Sec 1 - min	-0.002	6	0.039	1	-0.023	8	-2.669	8	1.034	1	-0.411	7	-0.394	8	-7.047	7	-0.029	7	0.000	0.191	0.029		2.669	
166	M19	2in Dia. Duct Sch 80S	Sec 3 - min	0.009	1	0.131	1	-0.178	7	-1.076	6	0.524	1	0.974	1	-1.962	8	50.057	1	0.474	1	0.002	0.077	0.140		1.962	
247	M25	6in Dia. Duct	Sec 4 - max	0.036	8	-0.004	8	-0.010	1	0.030	1	-0.027	8	2.955	6	0.077	1	77.526	8	0.065	8	0.005	0.002	0.211		2.955	
157	M16	2in Dia. Duct Sch 80S	Sec 4 - max	-0.009	1	-0.022	8	-0.031	9	0.057	1	1.094	6	0.125	1	1.916	6	53.440	8	0.508	8	0.002	0.078	0.137		1.916	
485	M49	2in Dia. Duct Sch 80S	Sec 3 - max	0.052	8	0.057	1	0.000	1	0.464	7	-0.453	8	2.363	6	0.003	1	9.713	1	0.092	1	0.014	0.033	0.169		2.363	
486	M49	2in Dia. Duct Sch 80S	Sec 3 - min	-0.052	7	0.056	8	-0.093	6	0.453	8	-0.464	7	-0.003	1	-2.363	6	5.892	9	0.056	9	0.014	0.033	0.169		2.363	
248	M25	6in Dia. Duct	Sec 4 - min	-0.021	7	-0.005	1	-0.790	8	0.027	8	-0.030	1	-0.077	1	-2.955	6	50.057	1	0.042	1	0.003	0.002	0.211		2.955	
251	M26	6in Dia. Duct	Sec 1 - max	0.098	8	-0.005	8	-0.010	1	0.014	1	-0.004	8	2.727	6	0.082	1	78.875	8	0.086	8	0.012	0.001	0.195		2.727	
413	M42	2.5in Dia. Duct Sch 160S	Sec 2 - max	0.002	8	0.089	8	0.017	7	-0.919	1	2.458	8	0.326	6	0.359	7	9.788	8	0.041	8	0.000	0.176	0.026		2.458	
414	M42	2.5in Dia. Duct Sch 160S	Sec 2 - min	-0.002	6	0.037	1	-0.021	8	-2.458	8	0.919	1	-0.359	7	-0.326	8	-7.047	7	-0.029	7	0.000	0.176	0.026		2.458	
249	M25	6in Dia. Duct	Sec 5 - max	0.036	8	-0.005	8	-0.010	1	0.027	1	-0.025	8	2.727	6	0.082	1	77.526	8	0.065	8	0.005	0.002	0.195		2.727	
253	M26	6in Dia. Duct	Sec 2 - max	0.098	8	-0.005	8	-0.010	1	0.012	1	-0.003	8	2.620	6	0.084	1	78.875	8	0.086	8	0.012	0.001	0.187		2.620	
250	M25	6in Dia. Duct	Sec 5 - min	-0.021	7	-0.006	1	-0.791	8	0.025	8	-0.027	1	-0.082	1	-2.727	6	50.057	1	0.042	1	0.003	0.002	0.195		2.727	
11	M2	2.5in Dia. Duct Sch 160S	Sec 1 - max	0.020	8	0.017	1	0.012	9	2.579	9	-0.599	1	0.132	9	0.141	6	9.788	8	0.041	8	0.004	0.184	0.010		2.579	
12	M2	2.5in Dia. Duct Sch 160S	Sec 1 - min	-0.020	8	-0.023	8	-0.012	6	0.599	1	-2.579	9	-0.141	6	-0.132	9	-7.047	7	-0.029	7	0.004	0.184	0.010		2.579	
815	M62	2.5in Dia. Duct Sch 160S	Sec 3 - max	0.004	8	-0.033	7	0.061	8	-0.677	6	0.697	9	2.059	6	0.001	1	9.713	1	0.040	1	0.001	0.050	0.147		2.059	
816	M62	2.5in Dia. Duct Sch 160S	Sec 3 - min	-0.004	7	-0.037	8	0.000	1	-0.697	9	0.677	6	-0.001	1	-2.059	6	5.892	9	0.024	9	0.001	0.050	0.147		2.059	
252	M26	6in Dia. Duct	Sec 1 - min	0.003	1	-0.008	1	-0.770	8	0.004	8	-0.014	1	-0.082	1	-2.727	6	51.989	1	0.044	1	0.000	0.001	0.195		2.727	
335	M34	2in Dia. Duct Sch 80S	Sec 3 - max	0.004	6	-0.027	1	0.009	6	-1.570	1	2.628	8	0.021	6	0.093	1	0.207	1	0.002	1	0.001	0.188	0.007		2.628	
336	M34	2in Dia. Duct Sch 80S	Sec 3 - min	-0.004	9	-0.054	8	-0.008	9	-2.628	8	1.570	1	-0.093	1	-0.021	6	0.041	7	0.000	7	0.001	0.188	0.007		2.628	
301	M31	8in Dia. Duct	Sec 1 - max	0.398	8	0.030	6	0.077	8	-0.119	1	0.162	8	1.241	7	1.867	8	0.000	1	0.000	1	0.050	0.012	0.133		1.867	
299	M30	8in Dia. Duct	Sec 5 - max	0.399	8	-0.015	8	0.003	1	-0.117	1	0.160	8	1.241	7	1.867	8	15.118	8	0.013	8	0.051	0.011	0.133		1.867	
297	M30	8in Dia. Duct	Sec 4 - max	0.399	8	-0.014	8	0.003	1	-0.114	1	0.157	8	1.268	7	1.856	8	15.118	8	0.013	8	0.051	0.011	0.133		1.856	
281	M27	6in Dia. Duct	Sec 1 - max	0.213	8	-0.007	8	-0.007	1	-0.020	1	0.042	8	2.298	6	0.485	9	74.780	8	0.063	8	0.027	0.003	0.164		2.298	
295	M30	8in Dia. Duct	Sec 3 - max	0.399	8	-0.014	8	0.003	1	-0.110	1	0.154	8	1.295	7	1.845	8	15.118	8	0.013	8	0.051	0.011	0.132		1.845	
255	M26	6in Dia. Duct	Sec 3 - max	0.098	8	-0.006	8	-0.010	1	0.011	1	-0.002	8	2.513	6	0.138	9	78.875	8	0.066	8	0.012	0.001	0.160		2.513	
293	M30	8in Dia. Duct	Sec 2 - max	0.399	8	-0.013	8	0.003	1	-0.107	1	0.150	8	1.322	7	1.834	8	15.118	8	0.013	8	0.051	0.011	0.131		1.834	
315	M32	2in Dia. Duct Sch 80S	Sec 3 - max	0.007	7	0.139	8	0.009	9	-1.450	1	2.563	8	0.090	6	0.080	1	0.207	1	0.002	1	0.002	0.183	0.006		2.563	
316	M32	2in Dia. Duct Sch 80S	Sec 3 - min	-0.007	9	0.088	1	-0.011	6	-2.563	8	1.450	1	-0.080	1	-0.090	6	0.041	7	0.000	7	0.002	0.183	0.006		2.563	
291	M30	8in Dia. Duct	Sec 1 - max	0.399	8	-0.013	8	0.003	1	-0.104	1	0.147	8	1.349	7	1.823	8	15.118	8	0.013	8	0.051	0.011	0.130		1.823	
254	M26	6in Dia. Duct	Sec 2 - min	0.003	1	-0.008	1	-0.770	8	0.003	8	-0.012	1	-0.084	1	-2.620	6	51.989	1	0.044	1	0.000	0.001	0.187		2.620	
263	M27	6in Dia. Duct	Sec 2 - max	0.213	8	-0.007	8	-0.007	1	-0.021	1	0.044	8	2.198	6	0.636	9	74.780	8	0.063	8	0.027	0.003	0.157		2.198	
269	M29	6in Dia. Duct	Sec 5 - max	0.271	8	-0.013	8	0.000	1	-0.093	1	0.132	8	1.349	7	1.823	8	41.631	8	0.035	8	0.047	0.009	0.130		1.823	
267	M26	6in Dia. Duct	Sec 4 - max	0.098	8	-0.006	8	-0.010	1	0.009	1	0.000	8	2.405	6	0.311	9	78.875	8	0.066	8	0.012	0.001	0.172		2.405	
415	M42	2.5in Dia. Duct Sch 160S	Sec 3 - max	0.001	8	0.066	8	0.015	7	-0.811	1	2.255	9	0.265	8	0.311	7	9.788	8	0.041	8	0.000	0.161	0.022		2.255	
416	M42	2.5in Dia. Duct Sch 160S	Sec 3 - min	-0.001	6	0.035	1	-0.020	8	-2.255	9	0.811	1	-0.311	7	-0.265	8	-7.047	7	-0.029	7	0.000	0.161	0.022		2.255	
5	M1	2.5in Dia. Duct Sch 80S	Sec 3 - max	0.048	8	0.170	8	0.021	6	2.395	6	0.261	9	0.031	6	0.031	9	9.788	8	0.051	8	0.009	0.171	0.002		2.395	
6	M1	2.5in Dia. Duct Sch 80S	Sec 3 - min	-0.048	7	-0.021	1	-0.022	9	-0.261	9	-2.395	6	-0.031	9	-0.031	6	-7.047	7	-0.036	7	0.009	0.171	0.002		2.395	
287	M29	6in Dia. Duct	Sec 4 - max	0.271	8	-0.012	8	0.000	1	-0.090	1	0.130	8	1.405	7	1.756	8	41.631	8	0.035	8	0.047	0.009	0.125		1.756	
271	M28	6in Dia. Duct	Sec 1 - max	0.307	8	-0.009	8	-0.004	1	-0.052	1	0.085	8	1.901	7	1.083	8	62.057	8	0.052	8	0.038	0.006	0.136		1.901	
256	M26	6in Dia. Duct	Sec 3 - min	0.003	1	-0.007	1	-0.770	8	0.002	8	-0.011	1	-0.136	9	-2.513	6	51.989	1	0.044	1	0.000	0.001	0.160		2.513	
156	M16	2in Dia. Duct Sch 80S	Sec 3 - min	-0.046	6	-0.068	1	-0.150	1	-0.865	6	-0.582	1	-1.489	7	-1.240	1	31.057	1	0.294	1	0.012	0.052	0.108		1.489	
265	M27	6in Dia. Duct	Sec 3 - max	0.213	8	-0.008	8	-0.007	1	-0.023	1	0.045	8	2.098	6	0.787	9	74.780	8	0.063	8	0.027	0.003	0.150		2.098	
178	M18	2in Dia. Duct Sch 80S	Sec 4 - min	-0.088	1	0.009	1	0.018	1	0.543	1	-0.817	3	0.914	9	-1.364	6	-3.051	1	-0.029	1	0.024	0.058	0.097		1.364	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_a	f_s/σ_a		f_t (ksi)	
259	M28	6in Dia. Duct	Sec 5 - max	0.088	8	-0.007	8	-0.010	1	0.008	1	0.001	8	2.298	6	0.485	9	78.675	8	0.066	8	0.012	0.001	0.164		2.298	
285	M29	6in Dia. Duct	Sec 3 - max	0.371	8	-0.012	8	0.000	1	-0.087	1	0.127	8	1.462	7	1.690	8	41.631	8	0.035	8	0.047	0.009	0.121		1.690	
273	M28	6in Dia. Duct	Sec 2 - max	0.307	8	-0.009	8	-0.004	1	-0.055	1	0.087	8	1.820	7	1.209	8	62.057	8	0.052	8	0.039	0.006	0.130		1.820	
267	M27	6in Dia. Duct	Sec 4 - max	0.213	8	-0.008	8	-0.007	1	-0.025	1	0.047	8	1.999	7	0.940	8	74.780	8	0.063	8	0.027	0.003	0.143		1.999	
258	M26	6in Dia. Duct	Sec 4 - min	0.003	1	-0.007	1	-0.770	8	0.000	8	-0.009	1	-0.311	9	-2.405	6	51.569	1	0.044	1	0.000	0.001	0.172		2.405	
283	M29	6in Dia. Duct	Sec 2 - max	0.371	8	-0.011	8	0.000	1	-0.084	1	0.124	8	1.519	7	1.623	8	41.631	8	0.035	8	0.047	0.009	0.116		1.623	
333	M34	2in Dia. Duct Sch 80S	Sec 2 - max	0.003	6	-0.022	1	0.006	6	-1.417	1	2.305	8	0.034	7	0.075	1	0.207	1	0.002	1	0.001	0.165	0.005		2.305	
334	M34	2in Dia. Duct Sch 80S	Sec 2 - min	-0.003	9	-0.049	8	-0.004	9	-2.305	8	1.417	1	-0.075	1	-0.034	7	0.041	7	0.000	7	0.001	0.165	0.005		2.305	
155	M16	2in Dia. Duct Sch 80S	Sec 3 - max	-0.009	1	-0.016	8	-0.029	9	0.582	1	0.865	6	1.246	1	1.489	7	53.440	8	0.506	8	0.002	0.082	0.108		1.489	
276	M28	6in Dia. Duct	Sec 3 - max	0.307	8	-0.010	8	-0.004	1	-0.057	1	0.090	8	1.738	7	1.325	8	62.057	8	0.052	8	0.039	0.006	0.124		1.738	
281	M29	6in Dia. Duct	Sec 1 - max	0.371	8	-0.011	8	0.000	1	-0.082	1	0.122	8	1.576	7	1.556	8	41.631	8	0.035	8	0.047	0.009	0.113		1.576	
282	M27	6in Dia. Duct	Sec 1 - min	0.004	1	-0.008	1	-0.672	8	-0.042	8	0.020	1	-0.485	9	-2.298	6	50.861	1	0.043	1	0.001	0.003	0.164		2.298	
417	M42	2.5in Dia. Duct Sch 160S	Sec 4 - max	0.000	6	0.084	8	0.014	7	-0.710	1	2.059	9	0.214	6	0.274	9	9.788	8	0.041	8	0.000	0.147	0.020		2.059	
416	M42	2.5in Dia. Duct Sch 160S	Sec 4 - min	0.000	6	0.032	1	-0.019	8	-2.059	9	0.710	1	-0.274	9	-0.214	6	-7.047	7	-0.029	7	0.000	0.147	0.020		2.059	
269	M27	6in Dia. Duct	Sec 5 - max	0.213	8	-0.009	8	-0.007	1	-0.028	1	0.049	8	1.901	7	1.093	8	74.780	8	0.063	8	0.027	0.004	0.138		1.901	
260	M26	6in Dia. Duct	Sec 5 - min	0.003	1	-0.008	1	-0.771	8	-0.001	8	-0.006	1	-0.485	9	-2.298	6	51.969	1	0.044	1	0.000	0.001	0.164		2.298	
277	M28	6in Dia. Duct	Sec 4 - max	0.307	8	-0.010	8	-0.004	1	-0.050	1	0.092	8	1.657	7	1.440	8	62.057	8	0.052	8	0.039	0.007	0.118		1.657	
177	M16	2in Dia. Duct Sch 80S	Sec 4 - max	-0.028	8	0.021	9	0.078	6	0.817	8	-0.543	1	1.364	6	-0.914	9	1.880	9	0.018	9	0.008	0.058	0.097		1.364	
613	M62	2.5in Dia. Duct Sch 160S	Sec 2 - max	0.003	6	-0.030	7	0.079	8	-0.519	8	0.559	9	1.702	8	0.001	1	9.713	1	0.040	1	0.001	0.040	0.122		1.702	
614	M62	2.5in Dia. Duct Sch 160S	Sec 2 - min	-0.003	7	-0.034	8	0.000	1	-0.556	9	0.519	6	-0.001	1	-1.702	8	5.892	9	0.024	9	0.001	0.040	0.122		1.702	
317	M32	2in Dia. Duct Sch 80S	Sec 4 - max	0.008	7	0.137	8	0.009	1	-1.204	1	2.173	8	0.061	6	0.056	1	0.207	1	0.002	1	0.002	0.155	0.004		2.173	
318	M32	2in Dia. Duct Sch 80S	Sec 4 - min	-0.008	9	0.086	1	-0.010	6	-2.173	8	1.204	1	-0.056	1	-0.061	6	0.041	7	0.000	7	0.002	0.155	0.004		2.173	
264	M27	6in Dia. Duct	Sec 2 - min	0.004	1	-0.008	1	-0.672	8	-0.044	8	0.021	1	-0.636	9	-2.198	6	50.861	1	0.043	1	0.001	0.003	0.157		2.198	
83	M7	2in Dia. Duct Sch 80S	Sec 2 - max	0.054	6	0.028	8	0.092	7	0.500	8	-0.404	1	0.000	1	1.518	7	-19.661	7	-0.168	7	0.015	0.036	0.108		1.518	
279	M28	6in Dia. Duct	Sec 5 - max	0.307	8	-0.011	8	-0.004	1	-0.062	1	0.094	8	1.576	7	1.556	8	62.057	8	0.052	8	0.039	0.007	0.113		1.576	
13	M2	2.5in Dia. Duct Sch 160S	Sec 2 - max	0.016	8	0.000	1	0.003	9	1.860	9	-0.783	1	0.297	9	0.308	6	9.788	8	0.041	8	0.003	0.133	0.022		1.860	
14	M2	2.5in Dia. Duct Sch 160S	Sec 2 - min	-0.016	8	-0.041	8	-0.003	6	0.783	1	-1.860	9	-0.308	6	-0.297	9	-7.047	7	-0.029	7	0.003	0.133	0.022		1.860	
303	M31	6in Dia. Duct	Sec 2 - max	0.401	8	0.019	8	0.083	8	0.000	1	0.032	8	0.975	7	1.445	8	0.000	1	0.000	1	0.051	0.002	0.103		1.445	
266	M27	6in Dia. Duct	Sec 3 - min	0.004	1	-0.009	1	-0.672	8	-0.045	6	0.023	1	-0.787	9	-2.098	6	50.861	1	0.043	1	0.001	0.003	0.150		2.098	
187	M19	2in Dia. Duct Sch 80S	Sec 4 - max	0.032	8	0.168	8	-0.050	8	-0.030	1	0.428	6	1.589	6	-0.648	9	77.526	8	0.734	8	0.009	0.031	0.114		1.589	
67	M7	2in Dia. Duct Sch 80S	Sec 4 - max	0.009	8	-0.107	6	0.002	1	1.875	8	-1.647	1	0.206	7	0.000	1	0.207	1	0.002	1	0.002	0.134	0.015		1.875	
68	M7	2in Dia. Duct Sch 80S	Sec 4 - min	-0.009	6	-0.108	1	-0.012	6	1.647	1	-1.875	8	0.000	1	-0.206	7	0.041	7	0.000	7	0.002	0.134	0.015		1.875	
401	M41	2.5in Dia. Duct Sch 160S	Sec 1 - max	0.000	1	0.082	8	0.013	7	-0.617	1	1.870	9	0.168	6	0.242	9	9.788	8	0.041	8	0.000	0.134	0.017		1.870	
402	M41	2.5in Dia. Duct Sch 160S	Sec 1 - min	0.000	1	0.030	1	-0.018	8	-1.870	9	0.617	1	-0.242	9	-0.168	6	-7.047	7	-0.029	7	0.000	0.134	0.017		1.870	
419	M42	2.5in Dia. Duct Sch 160S	Sec 5 - max	0.000	1	0.082	8	0.013	7	-0.617	1	1.870	9	0.168	6	0.242	9	9.788	8	0.041	8	0.000	0.134	0.017		1.870	
420	M42	2.5in Dia. Duct Sch 160S	Sec 5 - min	0.000	1	0.030	1	-0.018	8	-1.870	9	0.617	1	-0.242	9	-0.168	6	-7.047	7	-0.029	7	0.000	0.134	0.017		1.870	
331	M34	2in Dia. Duct Sch 80S	Sec 1 - max	0.002	6	-0.018	1	0.004	8	-1.293	1	2.009	8	0.047	7	0.063	8	0.207	1	0.002	1	0.001	0.144	0.005		2.009	
332	M34	2in Dia. Duct Sch 80S	Sec 1 - min	-0.002	9	-0.045	8	-0.003	1	-2.009	8	1.293	1	-0.063	8	-0.047	7	0.041	7	0.000	7	0.001	0.144	0.005		2.009	
349	M35	2in Dia. Duct Sch 80S	Sec 5 - max	0.002	6	-0.018	1	0.004	8	-1.293	1	2.009	8	0.047	7	0.063	8	0.207	1	0.002	1	0.001	0.144	0.005		2.009	
350	M35	2in Dia. Duct Sch 80S	Sec 5 - min	-0.002	8	-0.045	8	-0.003	1	-2.009	8	1.293	1	-0.063	8	-0.047	7	0.041	7	0.000	7	0.001	0.144	0.005		2.009	
268	M27	6in Dia. Duct	Sec 4 - min	0.004	1	-0.009	1	-0.673	8	-0.047	8	0.025	1	-0.940	8	-1.999	7	50.861	1	0.043	1	0.001	0.003	0.143		1.999	
188	M19	2in Dia. Duct Sch 80S	Sec 4 - min	0.009	1	0.128	1	-0.178	7	-0.428	6	0.030	1	0.646	9	-1.589	6	50.057	1	0.474	1	0.002	0.031	0.114		1.589	
75	M8	2in Dia. Duct Sch 80S	Sec 3 - max	0.013	7	0.115	8	0.009	1	1.778	8	-1.146	1	0.214	1	0.077	6	0.207	1	0.002	1	0.004	0.127	0.015		1.778	
76	M8	2in Dia. Duct Sch 80S	Sec 3 - min	-0.013	8	0.064	1	-0.004	7	1.148	1	-1.778	8	-0.077	6	-0.214	1	0.041	7	0.000	7	0.004	0.127	0.015		1.778	
302	M31	6in Dia. Duct	Sec 1 - min	0.005	1	0.028	1	-0.048	7	-0.162	8	0.119	1	-1.867	8	-1.241	7	0.000	1	0.000	1	0.001	0.012	0.133		1.867	
300	M30	6in Dia. Duct	Sec 5 - min	0.006	1	-0.016	1	-0.120	6	-0.160	8	0.117	1	-1.867	8	-1.241	7	11.068	1	0.009	1	0.001	0.011	0.133		1.867	
298	M30	6in Dia. Duct	Sec 4 - min	0.006	1	-0.015	1	-0.120	6	-0.157	8	0.114	1	-1.856	8	-1.268	7	11.068	1	0.009	1	0.001	0.011	0.133		1.856	
64	M7	2in Dia. Duct Sch 80S	Sec 2 - min	0.000	1	0.027	1	0.000	1	0.404	1	-0.500	8	-1.518	7	0.000	1	-20.094	1	-0.190	1	0.000	0.036	0.108		1.518	
296	M30	6in Dia. Duct	Sec 3 - min	0.006	1	-0.015	1	-0.120	6	-0.154	6	0.110	1	-1.845	8	-1.295	7	11.068	1	0.009	1	0.001	0.011	0.132		1.845	
272	M28	6in Dia. Duct	Sec 1 - min	0.005	1	-0.010	1	-0.508	8	-0.085	8	0.052	1	-1.093	8	-1.901	7	43.297	1	0.036	1	0.001	0.006	0.136		1.901	
294	M30	6in Dia. Duct	Sec 2 - min	0.006	1	-0.014	1	-0.120	6	-0.150	8	0.107	1	-1.834	8	-1.322	7	11.068	1	0.009	1	0.001	0.011	0.131		1.834	
174	M18	2in Dia. Duct Sch 80S	Sec 2 - min	-0.095	1	0.031	1	0.018	1	-0.408	9	0.168	1	-1.221	6	-0.814	1	-3.051	1	-0.029	1	0.026	0.029	0.087		1.221	
292	M30	6in Dia. Duct	Sec 1 - min	0.006	1	-0.014	1	-0.119	6	-0.147	8	0.104	1	-1.823	8	-1.349	7	11.068	1	0.009	1	0.001	0.011	0.130		1.823	
347	M35	2in Dia. Duct Sch 80S	Sec 4 - max	0.001	8	-0.016	1	0.003	6	-1.249	1	1.894	8	0.048	7	0.071	8	0.207	1	0.002	1	0.000	0.135	0.005		1.894	
348	M35	2in Dia. Duct Sch 80S	Sec 4 - min	-0.001	8	-0.043	8	-0.003	1	-1.894	8	1.249	1	-0.071	8	-0.048	7	0.041	7	0.000	7	0.000	0.135	0.005		1.894	
290	M29	6in Dia. Duct	Sec 5 - min	0.008	1	-0.014	1	-0.293	8	-0.132	8	0.093	1	-1.823	8	-1.349	7	29.712	1	0.025	1	0.001	0.009	0.130		1.823	
270	M27	6in Dia. Duct	Sec 5 - min	0.004	1	-0.010	1	-0.673	8	-0.049	8	0.028	1	-1.093	8	-1.901	7	50.861	1	0.043	1	0.001	0.004	0.136		1.901	
403	M41	2.5in Dia. Duct Sch 160S	Sec 2 - max	0.000	6	0.060	8	0.012	7	-0.549	1	1.727	9	0.135	6	0.220	9	9.788	8	0.041	8	0.000	0.123	0.016		1.727	
404	M41	2.5in Dia. Duct Sch 160S	Sec 2 - min	0.000	8	0.028	1	-0.017	8	-1.727	9	0.549	1	-0.220	9	-0.135	6	-7.047	7	-0.029	7	0.000	0.123	0.016		1.727	
274	M28	6in Dia. Duct	Sec 2 - min	0.005	1	-0.010	1	-0.508	8	-0.087	8	0.055	1	-1.208	8	-1.820	7	43.297	1	0.036	1	0.001	0.006	0.130		1.820	
289	M29	6in Dia. Duct	Sec 4 - min	0.008	1	-0.013	1	-0.293	8	-0.130	8	0.090	1	-1.756	8	-1.405	7	29.712	1	0.025	1	0.001	0.009	0.125		1.756	
345	M35	2in Dia. Duct Sch 80S	Sec 3 - max	0.000	6	-0.014	1	0.002	6	-1.210	1	1.784	8	0.048	9	0.078	6	0.207	1	0.002	1	0.000	0.127	0.006		1.784	
346	M35	2in Dia. Duct Sch 80S	Sec 3 - min	0.000	8	-0.041	8	-0.003	1	-1.784	8	1.210	1	-0.078	6	-0.048	9	0.041	7	0.000	7	0.000	0.127	0.006		1.784	
71	M8	2in Dia. Duct Sch 80S	Sec 1 - max	0.006	7	0.135	8	0.009	1	-0.964	1	1.789	8	0.035	6	0.032	1	0.207	1	0.002	1	0.002	0.128	0.003		1.789	
72	M8	2in Dia. Duct Sch 80S	Sec 1 - min	-0.006	8	0.084	1	-0.009	6	-1.789	8	0.964	1	-0.032	1	-0.035	6	0.041	7	0.000	7	0.002	0.128	0.003		1.789	
319	M32	2in Dia. Duct Sch 80S	Sec 5 - max	0.008	7	0.135	8	0.009	1	-0.964	1	1.789	8	0.035	6	0.032	1	0.207	1	0.002	1	0.002	0.128	0.003		1.789	
320	M32	2in Dia. Duct Sch 80S	Sec 5 - min	-0.008	9	0.084	1	-0.009	6	-1.789	8	0.964	1	-0.032	1	-0.035	6	0.041	7	0.000	7	0.002	0.128	0.003		1.789	
278	M28	6in Dia. Duct	Sec 3 - min	0.005	1	-0.011	1	-0.508	8	-0.090	8	0.057	1	-1.325	8	-1.738	7	43.297	1	0.038	1	0.001	0.008	0.124		1.738	
115	M12	2.5in Dia. Duct Sch 160S	Sec 3 - max	0.015	6	-0.015	1	0.000	1	0.662	7	-0.671	6	0.000	1	1.107	7	9.713	1	0.040	1	0.003	0.049	0.079		1.107	
116	M12	2.5in Dia. Duct Sch 160S	Sec 3 - min	-0.015	7	-0.015	8	-0.037	8	0.671	6	-0.662	7	-1.107	7	0.000	1	5.892	9	0.024	9	0.003	0.049	0.079		1.107	
288	M29	6in Dia. Duct	Sec 3 - min	0.008	1	-0.013	1	-0.293	8	-0.127	8	0.087	1	-1.690	8	-1.462	7	29.712	1	0.025	1	0.001	0.009	0.121		1.690	
39	M4	2.5in Dia. Duct Sch 160S	Sec 5 - max	0.002	6	-0.026	7	0.078	8	-0.377	8	0.432	7	1.359	9	0.001	1	9.713	1	0.040	1	0.000	0.031	0.097		1.359	
40	M4	2.5in Dia. Duct Sch 160S	Sec 5 - min	-0.002	7	-0.030	8	0.000	1	-0.432	7	0.377	8	-0.001	1	-1.359	9	5.892	9	0.024	9	0.000	0.031	0.097		1.359	
611	M62	2.5in Dia. Duct Sch 160S	Sec 1 - max	0.002	6	-0.026	7	0.078	8	-0.377	8	0.432	7	1.359	9	0.001	1	9.713	1	0.040	1	0.000	0.031	0.097		1.359	
612	M62	2.5in Dia. Duct Sch 160S	Sec 1 - min	-0.002	7	-0.030	8	0.000	1	-0.432	7	0.377	8	-0.001	1	-1.359	9	5.892	9	0.024	9	0.000	0.031	0.097		1.359	
189	M19	2in Dia. Duct Sch 80S	Sec 5 - max	0.033	8	0.165	6	-0.051	8	0.454	1	-0.210	6	1.210	6	-0.160	9	77.526	8	0.734	8	0.009	0.032	0.086		1.210	
405	M41	2.5in Dia. Duct Sch 160S	Sec 3 - max	0.000	6	0.058	8	0.011	7	-0.485	1	1.588	9	0.103	6	0.200	9	9.788	8	0.041	8	0.000	0.113	0.014		1.588	
406	M41	2.5in Dia. Duct Sch 160S	Sec 3 - min	0.000	8	0.026	1	-0.016	8	-1.588	9	0.485	1	-0.200	9	-0.103	6	-7.047	7	-0.029	7	0.000	0.113	0.014		1.588	
305	M31	6in Dia. Duct	Sec 3 - max	0.404	8	0.008	8	0.089	8	0.060	1	-0.030	8	0.680	7	0.993	8	0.000	1	0.000	1	0.051	0.004	0.071		0.993	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a		f_c (ksi)	
343	M35	2in Dia. Duct Sch 80S	Sec 2 - max	0.000	6	-0.012	1	0.002	7	-1.176	1	1.679	8	0.046	9	0.083	6	0.207	1	0.002	1	0.000	0.120	0.008		1.679	
344	M35	2in Dia. Duct Sch 80S	Sec 2 - min	0.000	8	-0.040	8	-0.003	1	-1.679	8	1.176	1	-0.083	6	-0.046	9	0.041	7	0.000	7	0.000	0.120	0.008		1.679	
278	M28	6in Dia. Duct	Sec 4 - min	0.005	1	-0.011	1	-0.508	8	-0.092	8	0.060	1	-1.440	8	-1.657	7	43.297	1	0.038	1	0.001	0.007	0.116		1.657	
284	M29	6in Dia. Duct	Sec 2 - min	0.006	1	-0.012	1	-0.293	8	-0.124	6	0.064	1	-1.623	8	-1.519	7	29.712	1	0.025	1	0.001	0.009	0.116		1.623	
65	M7	2in Dia. Duct Sch 80S	Sec 3 - max	0.058	8	0.011	8	0.088	6	0.960	8	-0.638	1	0.571	7	0.004	1	-19.561	7	-0.166	7	0.010	0.069	0.041		0.960	
173	M18	2in Dia. Duct Sch 80S	Sec 2 - max	-0.028	8	0.046	8	0.065	6	-0.166	1	0.408	9	0.614	1	1.221	6	1.880	9	0.018	9	0.008	0.029	0.087		1.221	
282	M29	6in Dia. Duct	Sec 1 - min	0.000	1	-0.012	1	-0.293	8	-0.122	8	0.082	1	-1.556	8	-1.576	7	29.712	1	0.025	1	0.001	0.009	0.113		1.576	
190	M10	2in Dia. Duct Sch 80S	Sec 5 - min	0.009	1	0.125	1	-0.175	7	0.210	8	-0.454	1	0.160	9	-1.210	6	50.057	1	0.474	1	0.002	0.032	0.086		1.210	
117	M12	2.5in Dia. Duct Sch 160S	Sec 4 - max	0.010	6	-0.034	1	0.000	1	0.074	7	-0.059	8	0.001	1	1.593	6	9.713	1	0.040	1	0.002	0.005	0.114		1.593	
116	M12	2.5in Dia. Duct Sch 160S	Sec 4 - min	-0.010	7	-0.035	6	-0.047	8	0.059	8	-0.074	7	-1.593	6	-0.001	1	5.892	9	0.024	9	0.002	0.005	0.114		1.593	
280	M28	6in Dia. Duct	Sec 5 - min	0.005	1	-0.012	1	-0.508	8	-0.094	8	0.062	1	-1.556	8	-1.576	7	43.297	1	0.036	1	0.001	0.007	0.113		1.576	
341	M35	2in Dia. Duct Sch 80S	Sec 1 - max	0.000	1	-0.010	1	0.003	7	-1.147	1	1.578	8	0.042	9	0.086	6	0.207	1	0.002	1	0.000	0.113	0.008		1.578	
342	M35	2in Dia. Duct Sch 80S	Sec 1 - min	0.000	1	-0.038	8	-0.003	1	-1.578	8	1.147	1	-0.086	6	-0.042	9	0.041	7	0.000	7	0.000	0.113	0.008		1.578	
359	M36	2in Dia. Duct Sch 80S	Sec 5 - max	0.000	1	-0.010	1	0.003	7	-1.147	1	1.578	8	0.042	9	0.086	6	0.207	1	0.002	1	0.000	0.113	0.008		1.578	
360	M36	2in Dia. Duct Sch 80S	Sec 5 - min	0.000	1	-0.038	8	-0.003	1	-1.578	8	1.147	1	-0.086	6	-0.042	9	0.041	7	0.000	7	0.000	0.113	0.008		1.578	
176	M18	2in Dia. Duct Sch 80S	Sec 3 - min	-0.091	1	0.020	1	0.018	1	0.192	9	-0.373	6	-0.027	7	-0.931	1	-3.051	1	-0.029	1	0.025	0.027	0.067		0.931	
407	M41	2.5in Dia. Duct Sch 160S	Sec 4 - max	0.001	6	0.056	8	0.010	7	-0.425	1	1.454	9	0.074	6	0.183	9	9.788	8	0.041	8	0.000	0.104	0.013		1.454	
408	M41	2.5in Dia. Duct Sch 160S	Sec 4 - min	-0.001	8	0.024	1	-0.015	8	-1.454	9	0.425	1	-0.183	9	-0.074	6	-7.047	7	-0.029	7	0.000	0.104	0.013		1.454	
37	M4	2.5in Dia. Duct Sch 160S	Sec 4 - max	0.001	6	-0.024	7	0.077	8	-0.307	8	0.372	7	1.185	9	0.000	1	9.713	1	0.040	1	0.000	0.027	0.085		1.185	
36	M4	2.5in Dia. Duct Sch 160S	Sec 4 - min	-0.001	7	-0.028	8	0.000	1	-0.372	7	0.307	8	0.000	1	-1.185	9	5.892	9	0.024	9	0.000	0.027	0.085		1.185	
66	M7	2in Dia. Duct Sch 80S	Sec 3 - min	0.000	1	0.010	1	0.000	1	0.838	1	-0.960	8	-0.004	1	-0.571	7	-20.094	1	-0.190	1	0.000	0.069	0.041		0.960	
391	M40	2.5in Dia. Duct Sch 160S	Sec 1 - max	0.002	7	0.054	8	0.009	7	-0.370	1	1.324	9	0.047	6	0.167	9	9.788	8	0.041	8	0.000	0.095	0.012		1.324	
392	M40	2.5in Dia. Duct Sch 160S	Sec 1 - min	-0.002	8	0.022	1	-0.014	8	-1.324	9	0.370	1	-0.167	9	-0.047	8	-7.047	7	-0.029	7	0.000	0.095	0.012		1.324	
409	M41	2.5in Dia. Duct Sch 160S	Sec 5 - max	0.002	6	0.054	8	0.009	7	-0.370	1	1.324	9	0.047	6	0.167	9	9.788	8	0.041	8	0.000	0.095	0.012		1.324	
410	M41	2.5in Dia. Duct Sch 160S	Sec 5 - min	-0.002	8	0.022	1	-0.014	8	-1.324	9	0.370	1	-0.167	9	-0.047	6	-7.047	7	-0.029	7	0.000	0.095	0.012		1.324	
304	M31	6in Dia. Duct	Sec 2 - min	0.005	1	0.017	1	-0.053	7	-0.032	8	0.000	1	-1.445	8	-0.975	7	0.000	1	0.000	1	0.001	0.002	0.103		1.445	
357	M36	2in Dia. Duct Sch 80S	Sec 4 - max	0.001	8	-0.006	1	0.005	7	-1.096	1	1.356	8	0.022	9	0.083	6	0.207	1	0.002	1	0.000	0.097	0.006		1.356	
358	M36	2in Dia. Duct Sch 80S	Sec 4 - min	-0.001	6	-0.030	8	-0.003	1	-1.356	8	1.096	1	-0.083	6	-0.022	9	0.041	7	0.000	7	0.000	0.097	0.006		1.356	
175	M18	2in Dia. Duct Sch 80S	Sec 3 - max	-0.028	8	0.032	8	0.072	6	0.373	6	-0.192	9	0.931	1	0.027	7	1.880	9	0.018	9	0.008	0.027	0.067		0.931	
111	M12	2.5in Dia. Duct Sch 160S	Sec 1 - max	0.025	8	0.025	1	0.000	1	0.434	7	-0.428	8	0.887	8	0.000	1	9.713	1	0.040	1	0.005	0.031	0.083		0.887	
112	M12	2.5in Dia. Duct Sch 160S	Sec 1 - min	-0.025	7	0.025	8	-0.045	6	0.428	8	-0.434	7	0.000	1	-0.887	8	5.892	9	0.024	9	0.005	0.031	0.083		0.887	
35	M4	2.5in Dia. Duct Sch 160S	Sec 3 - max	0.000	6	-0.022	7	0.076	8	-0.242	8	0.316	7	1.013	9	0.000	1	9.713	1	0.040	1	0.000	0.023	0.072		1.013	
36	M4	2.5in Dia. Duct Sch 160S	Sec 3 - min	0.000	7	-0.027	8	0.000	1	-0.316	7	0.242	8	0.000	1	-1.013	9	5.892	9	0.024	9	0.000	0.023	0.072		1.013	
307	M31	6in Dia. Duct	Sec 4 - max	0.408	8	-0.004	8	0.094	8	0.069	1	-0.049	8	0.355	7	0.512	8	0.000	1	0.000	1	0.051	0.004	0.037		0.512	
69	M7	2in Dia. Duct Sch 80S	Sec 5 - max	0.004	8	-0.124	8	0.002	1	-0.855	8	1.109	1	0.046	1	0.143	7	0.207	1	0.002	1	0.001	0.079	0.010		1.109	
70	M7	2in Dia. Duct Sch 80S	Sec 5 - min	-0.004	6	-0.125	1	-0.019	7	-1.109	1	0.855	8	-0.143	7	-0.046	1	0.041	7	0.000	7	0.001	0.079	0.010		1.109	
351	M36	2in Dia. Duct Sch 80S	Sec 1 - max	0.004	8	0.007	1	0.012	7	-0.855	8	1.109	1	0.046	1	0.143	7	0.207	1	0.002	1	0.001	0.079	0.010		1.109	
352	M36	2in Dia. Duct Sch 80S	Sec 1 - min	-0.004	8	-0.020	8	-0.009	8	-1.109	1	0.855	8	-0.143	7	-0.046	1	0.041	7	0.000	7	0.001	0.079	0.010		1.109	
113	M12	2.5in Dia. Duct Sch 160S	Sec 2 - max	0.020	6	0.005	1	0.000	1	0.802	7	-0.794	8	0.332	8	0.400	7	9.713	1	0.040	1	0.004	0.057	0.029		0.802	
114	M12	2.5in Dia. Duct Sch 160S	Sec 2 - min	-0.020	7	0.005	8	-0.035	8	0.794	8	-0.802	7	-0.400	7	-0.332	8	5.892	9	0.024	9	0.004	0.057	0.029		0.802	
355	M36	2in Dia. Duct Sch 80S	Sec 3 - max	0.002	8	0.002	1	0.007	7	-1.073	1	1.161	8	0.010	1	0.066	6	0.207	1	0.002	1	0.001	0.083	0.005		1.161	
356	M36	2in Dia. Duct Sch 80S	Sec 3 - min	-0.002	6	-0.029	8	-0.004	8	-1.161	8	1.073	1	-0.066	6	-0.010	1	0.041	7	0.000	7	0.001	0.083	0.005		1.161	
353	M36	2in Dia. Duct Sch 80S	Sec 2 - max	0.003	8	0.003	1	0.009	7	-0.994	8	1.077	1	0.028	1	0.077	7	0.207	1	0.002	1	0.001	0.077	0.006		1.077	
354	M36	2in Dia. Duct Sch 80S	Sec 2 - min	-0.003	6	-0.024	8	-0.007	8	-1.077	1	0.994	8	-0.077	7	-0.028	1	0.041	7	0.000	7	0.001	0.077	0.006		1.077	
33	M4	2.5in Dia. Duct Sch 160S	Sec 2 - max	0.000	6	-0.021	7	0.075	8	-0.182	8	0.265	7	0.843	9	0.000	1	9.713	1	0.040	1	0.000	0.019	0.060		0.843	
34	M4	2.5in Dia. Duct Sch 160S	Sec 2 - min	0.000	7	-0.025	8	0.000	1	-0.265	7	0.182	8	0.000	1	-0.843	9	5.892	9	0.024	9	0.000	0.019	0.060		0.843	
393	M40	2.5in Dia. Duct Sch 160S	Sec 2 - max	0.003	7	0.048	8	0.000	7	-0.228	1	0.949	9	0.000	1	0.133	9	9.788	8	0.041	8	0.001	0.068	0.010		0.949	
394	M40	2.5in Dia. Duct Sch 160S	Sec 2 - min	-0.003	8	0.016	1	-0.011	8	-0.949	9	0.228	1	-0.133	9	0.000	1	-7.047	7	-0.029	7	0.001	0.068	0.010		0.949	
306	M31	6in Dia. Duct	Sec 3 - min	0.005	1	0.006	1	-0.059	7	0.036	8	-0.060	1	-0.993	8	-0.680	7	0.000	1	0.000	1	0.001	0.004	0.071		0.993	
15	M2	2.5in Dia. Duct Sch 160S	Sec 3 - max	0.011	8	-0.018	1	0.006	8	0.745	9	-0.572	1	0.266	9	0.279	8	9.788	8	0.041	8	0.002	0.053	0.020		0.745	
16	M2	2.5in Dia. Duct Sch 160S	Sec 3 - min	-0.011	6	-0.059	8	-0.006	7	0.572	1	-0.745	9	-0.279	8	-0.266	9	-7.047	7	-0.029	7	0.002	0.053	0.020		0.745	
29	M3	2.5in Dia. Duct Sch 160S	Sec 5 - max	0.000	1	-0.019	7	0.074	8	-0.125	8	0.218	7	0.675	9	0.000	1	9.713	1	0.040	1	0.000	0.016	0.048		0.675	
30	M3	2.5in Dia. Duct Sch 160S	Sec 5 - min	0.000	1	-0.023	8	0.000	1	-0.218	7	0.125	8	0.000	1	-0.675	9	5.892	9	0.024	9	0.000	0.016	0.048		0.675	
31	M4	2.5in Dia. Duct Sch 160S	Sec 1 - max	0.000	1	-0.019	7	0.074	8	-0.125	8	0.218	7	0.675	9	0.000	1	9.713	1	0.040	1	0.000	0.016	0.048		0.675	
32	M4	2.5in Dia. Duct Sch 160S	Sec 1 - min	0.000	1	-0.023	8	0.000	1	-0.218	7	0.125	8	0.000	1	-0.675	9	5.892	9	0.024	9	0.000	0.016	0.048		0.675	
17	M2	2.5in Dia. Duct Sch 160S	Sec 4 - max	0.007	8	-0.038	1	0.015	8	-0.034	1	0.765	8	0.037	9	0.052	6	9.788	8	0.041	8	0.001	0.055	0.004		0.765	
18	M2	2.5in Dia. Duct Sch 160S	Sec 4 - min	-0.007	6	-0.077	8	-0.015	7	-0.765	8	0.034	1	-0.052	6	-0.037	9	-7.047	7	-0.029	7	0.001	0.055	0.004		0.765	
395	M40	2.5in Dia. Duct Sch 160S	Sec 3 - max	0.005	7	0.042	8	0.003	7	-0.129	1	0.618	9	0.000	1	0.161	8	9.788	8	0.041	8	0.001	0.044	0.012		0.618	
396	M40	2.5in Dia. Duct Sch 160S	Sec 3 - min	-0.005	8	0.011	1	-0.008	8	-0.616	9	0.129	1	-0.161	8	0.000	1	-7.047	7	-0.029	7	0.001	0.044	0.012		0.618	
99	M10	6in Dia. Duct	Sec 5 - max	-0.075	2	0.045	9	0.066	8	0.007	9	0.389	8	0.151	6	0.265	7	25.554	7	0.022	7	0.009	0.028	0.019		0.389	
100	M10	6in Dia. Duct	Sec 5 - min	-0.075	1	-0.102	6	-0.084	7	-0.389	6	-0.007	9	-0.265	7	-0.151	8	-159.847	1	-0.140	1	0.009	0.028	0.019		0.389	
219	M22	6in Dia. Duct	Sec 5 - max	0.025	8	-0.022	6	0.000	9	0.038	6	0.105	1	-0.175	9	0.630	6	77.526	8	0.085	8	0.003	0.008	0.045		0.630	
220	M22	6in Dia. Duct	Sec 5 - min	-0.010	7	-0.032	1	-0.060	8	-0.105	1	-0.038	8	-0.630	6	0.175	9	50.057	1	0.042	1	0.001	0.008	0.045		0.630	
97	M10	6in Dia. Duct	Sec 4 - max	-0.075	2	0.044	9	0.066	8	-0.004	9	0.364	6	0.135	8	0.245	7	25.554	7	0.022	7	0.009	0.026	0.018		0.364	
98	M10	6in Dia. Duct	Sec 4 - min	-0.075	1	-0.102	6	-0.083	7	-0.364	6	0.004	9	-0.245	7	-0.135	8	-159.847	1	-0.140	1	0.009	0.026	0.018		0.364	
309	M31	6in Dia. Duct	Sec 5 - max	0.409	8	-0.015	8	0.100	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.052	0.000	0.000		0.409	
95	M10	6in Dia. Duct	Sec 3 - max	-0.075	2	0.044	9	0.066	8	-0.014	9	0.339	6	0.110	8	0.225	7	25.554	7	0.022	7	0.009	0.024	0.016		0.339	
96	M10	6in Dia. Duct	Sec 3 - min	-0.075	1	-0.102	6	-0.083	7	-0.339	6	0.014	9	-0.225	7	-0.119	8	-159.847	1	-0.140	1	0.009	0.024	0.016		0.339	
27	M3	2.5in Dia. Duct Sch 160S	Sec 4 - max	0.000	7	-0.017	7	0.073	8	-0.074	8	0.176	7	0.510	9	0.000	1	9.713	1	0.040	1	0.000	0.013	0.036		0.510	
28	M3	2.5in Dia. Duct Sch 160S	Sec 4 - min	0.000	8	-0.021	8	0.000	1	-0.176	7	0.074	8	0.000	1	-0.510	9	5.892	9	0.024	9	0.000	0.013	0.036		0.510	
59	M6	6in Dia. Duct	Sec 5 - max	-0.075	2	0.089	8	0.070	8	0.301	6	0.085	7	0.175	8	0.257	7	65.102	7	0.057	7	0.009	0.022	0.018		0.301	
60	M6	6in Dia. Duct	Sec 5 - min	-0.075	1	-0.056	7	-0.083	7	-0.085	7	-0.301	8	-0.257	7	-0.175	8	0.863	1	0.000	1	0.009	0.022	0.018		0.301	
139	M14	6in Dia. Duct	Sec 5 - max	0.017	1	0.011	9	0.060	1	0.479	6	-0.098	1	0.151	1	-0.097	9	25.554	7	0.022	7	0.002	0.034	0.011		0.479	
140	M14	6in Dia. Duct	Sec 5 - min	0.017	2	-0.053	8	0.002	9	0.098	1	-0.479	8	0.097	9	-0.151	1	-159.847	1	-0.140	1	0.002	0.034	0.011		0.479	
141	M15	6in Dia. Duct	Sec 1 - max	0.017	1	-0.007	1	0.009	9	0.479	8	-0.098	1	0.151	1	-0.097	9	25.554	7	0.022	7	0.002	0.034	0.011		0.479	
142	M15	6in Dia. Duct	Sec 1 - min	0.017	2	-0.050	8	-0.028	6	0.098	1	-0.479	8	0.097	9	-0.151	1	-159.847	1	-0.140	1	0.002	0.034	0.011		0.479	
93	M10	6in Dia. Duct	Sec 2 - max	-0.074	2	0.044	9	0.065	8	-0.025	9	0.315	6	0.103	8	0.205	7	25.554	7	0.022	7	0.009	0.023	0.015		0.315	
94	M10	6in Dia. Duct	Sec 2 - min	-0.074	1	-0.101	6	-0.083	7	-0.315	6	0.025	9	-0.205	7	-0.103	8	-159.847	1	-0.140	1	0.009	0.023	0.015		0.315	
57	M6	6in Dia. Duct	Sec 4 - max	-0.075	2	0.089	8	0.070	8	0.280	8	0.071	7	0.158	8	0.237	7	65.102	7	0.057	7	0.009	0.020	0.017		0.280	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a		f_s (ksi)	
58	M6	8in Dia. Duct	Sec 4 - min	-0.075	1	-0.056	7	-0.082	7	-0.071	7	-0.280	8	-0.237	7	-0.158	8	0.863	1	0.000	1	0.009	0.020	0.017		0.260	
137	M14	8in Dia. Duct	Sec 4 - max	0.017	1	0.010	9	0.060	1	0.475	8	-0.101	1	0.130	6	-0.096	9	25.554	7	0.022	7	0.002	0.034	0.009		0.475	
138	M14	8in Dia. Duct	Sec 4 - min	0.017	2	-0.052	8	0.002	9	0.101	1	-0.475	8	0.096	9	-0.130	6	-159.847	1	-0.140	1	0.002	0.034	0.009		0.475	
135	M14	8in Dia. Duct	Sec 3 - max	0.018	1	0.009	9	0.060	1	0.471	8	-0.103	1	0.116	8	-0.094	7	25.554	7	0.022	7	0.002	0.034	0.008		0.471	
136	M14	8in Dia. Duct	Sec 3 - min	0.018	2	-0.052	8	0.003	9	0.103	1	-0.471	8	0.094	7	-0.116	8	-159.847	1	-0.140	1	0.002	0.034	0.008		0.471	
217	M22	8in Dia. Duct	Sec 4 - max	0.024	6	-0.016	6	-0.004	9	0.084	6	0.033	1	-0.189	9	0.469	6	77.526	8	0.065	8	0.003	0.006	0.035		0.469	
133	M14	8in Dia. Duct	Sec 2 - max	0.019	1	0.009	9	0.060	1	0.468	8	-0.106	1	0.105	8	-0.078	1	25.554	7	0.022	7	0.002	0.033	0.008		0.468	
134	M14	8in Dia. Duct	Sec 2 - min	0.019	2	-0.051	6	0.003	9	0.106	1	-0.468	8	0.078	1	-0.105	8	-159.847	1	-0.140	1	0.002	0.033	0.008		0.468	
55	M6	8in Dia. Duct	Sec 3 - max	-0.075	2	0.089	8	0.089	8	0.258	6	0.058	7	0.141	8	0.217	7	65.102	7	0.057	7	0.009	0.018	0.016		0.258	
56	M6	8in Dia. Duct	Sec 3 - min	-0.075	1	-0.056	7	-0.082	7	-0.058	7	-0.256	8	-0.217	7	-0.141	6	0.863	1	0.000	1	0.009	0.018	0.016		0.258	
91	M10	8in Dia. Duct	Sec 1 - max	-0.074	2	0.043	9	0.065	8	-0.035	9	0.290	8	0.087	8	0.185	7	25.554	7	0.022	7	0.009	0.021	0.013		0.290	
92	M10	8in Dia. Duct	Sec 1 - min	-0.074	1	-0.101	6	-0.082	7	-0.290	8	0.035	9	-0.185	7	-0.087	8	-159.847	1	-0.140	1	0.009	0.021	0.013		0.290	
131	M14	8in Dia. Duct	Sec 1 - max	0.019	1	0.008	9	0.060	1	0.465	8	-0.109	1	0.094	8	-0.054	1	25.554	7	0.022	7	0.002	0.033	0.007		0.465	
132	M14	8in Dia. Duct	Sec 1 - min	0.019	2	-0.051	6	0.004	9	0.109	1	-0.465	8	0.054	1	-0.094	8	-159.847	1	-0.140	1	0.002	0.033	0.007		0.465	
218	M22	8in Dia. Duct	Sec 4 - min	-0.009	7	-0.027	1	-0.057	8	-0.033	1	-0.084	6	-0.489	6	0.169	9	50.057	1	0.042	1	0.001	0.006	0.035		0.489	
309	M31	8in Dia. Duct	Sec 4 - min	0.005	1	-0.006	1	-0.065	7	0.049	6	-0.060	1	-0.512	8	-0.355	7	0.000	1	0.000	1	0.001	0.004	0.037		0.512	
53	M6	8in Dia. Duct	Sec 2 - max	-0.074	2	0.088	8	0.069	8	0.237	6	0.044	7	0.124	8	0.198	7	65.102	7	0.057	7	0.009	0.017	0.014		0.237	
54	M6	8in Dia. Duct	Sec 2 - min	-0.074	1	-0.055	7	-0.081	7	-0.044	7	-0.237	8	-0.198	7	-0.124	8	0.863	1	0.000	1	0.009	0.017	0.014		0.237	
397	M40	2.5in Dia. Duct Sch 160S	Sec 4 - max	0.006	7	0.038	6	0.000	7	-0.072	1	0.327	9	0.000	1	0.210	8	9.788	8	0.041	8	0.001	0.023	0.015		0.327	
398	M40	2.5in Dia. Duct Sch 160S	Sec 4 - min	-0.006	8	0.005	1	-0.005	8	-0.327	9	0.072	1	-0.210	8	0.000	1	-7.047	7	-0.029	7	0.001	0.023	0.015		0.327	
89	M9	8in Dia. Duct	Sec 5 - max	-0.043	2	0.012	9	0.034	6	-0.035	9	0.290	6	0.087	6	0.165	7	25.554	7	0.022	7	0.005	0.021	0.013		0.290	
90	M9	8in Dia. Duct	Sec 5 - min	-0.043	1	-0.070	6	-0.051	7	-0.290	6	0.035	9	-0.185	7	-0.087	8	-159.847	1	-0.140	1	0.005	0.021	0.013		0.290	
51	M6	8in Dia. Duct	Sec 1 - max	-0.074	2	0.088	6	0.069	8	0.215	8	0.031	7	0.108	6	0.178	7	65.102	7	0.057	7	0.009	0.015	0.013		0.215	
52	M6	8in Dia. Duct	Sec 1 - min	-0.074	1	-0.055	7	-0.081	7	-0.031	7	-0.215	8	-0.178	7	-0.108	6	0.863	1	0.000	1	0.009	0.015	0.013		0.215	
215	M22	8in Dia. Duct	Sec 3 - max	0.023	8	-0.011	6	-0.006	9	0.117	6	-0.026	1	-0.158	9	0.355	8	77.526	8	0.065	8	0.003	0.006	0.025		0.355	
25	M3	2.5in Dia. Duct Sch 160S	Sec 3 - max	0.000	7	-0.015	7	0.072	8	-0.028	8	0.139	7	0.367	7	0.000	1	9.713	1	0.040	1	0.000	0.010	0.026		0.367	
26	M3	2.5in Dia. Duct Sch 160S	Sec 3 - min	0.000	6	-0.019	8	0.000	1	-0.139	7	0.028	8	0.000	1	-0.367	7	5.892	9	0.024	9	0.000	0.010	0.026		0.367	
216	M22	8in Dia. Duct	Sec 3 - min	-0.008	7	-0.022	1	-0.054	6	0.026	1	-0.117	6	-0.355	6	0.158	9	50.057	1	0.042	1	0.001	0.008	0.025		0.355	
143	M15	8in Dia. Duct	Sec 2 - max	0.013	1	-0.007	1	0.005	9	0.341	8	-0.076	1	0.121	7	-0.071	6	25.554	7	0.022	7	0.002	0.024	0.009		0.341	
144	M15	8in Dia. Duct	Sec 2 - min	0.013	2	-0.046	8	-0.022	8	0.078	1	-0.341	6	0.071	8	-0.121	7	-159.847	1	-0.140	1	0.002	0.024	0.009		0.341	
49	M5	8in Dia. Duct	Sec 5 - max	-0.043	2	0.057	6	0.038	8	0.215	8	0.031	7	0.108	6	0.178	7	65.102	7	0.057	7	0.005	0.015	0.013		0.215	
50	M5	8in Dia. Duct	Sec 5 - min	-0.043	1	-0.024	7	-0.050	7	-0.031	7	-0.215	8	-0.178	7	-0.108	8	0.863	1	0.000	1	0.005	0.015	0.013		0.215	
145	M15	8in Dia. Duct	Sec 3 - max	0.008	1	-0.007	1	0.000	9	0.279	6	-0.058	1	0.126	7	-0.016	8	25.554	7	0.022	7	0.001	0.020	0.009		0.279	
146	M15	8in Dia. Duct	Sec 3 - min	0.008	2	-0.042	6	-0.016	6	0.056	1	-0.279	6	0.016	8	-0.126	7	-159.847	1	-0.140	1	0.001	0.020	0.009		0.279	
129	M13	8in Dia. Duct	Sec 5 - max	0.017	1	0.010	9	0.044	6	-0.178	9	0.280	6	0.104	6	-0.034	1	65.102	7	0.057	7	0.002	0.020	0.007		0.280	
130	M13	8in Dia. Duct	Sec 5 - min	0.017	2	0.056	6	0.000	1	-0.280	6	0.178	9	0.034	1	-0.104	6	0.863	1	0.000	1	0.002	0.020	0.007		0.280	
441	M45	8in Dia. Duct	Sec 1 - max	0.017	1	0.006	6	0.011	9	-0.176	9	0.280	6	0.104	6	-0.034	1	65.102	7	0.057	7	0.002	0.020	0.007		0.280	
442	M45	8in Dia. Duct	Sec 1 - min	0.017	2	-0.003	9	-0.023	6	-0.280	6	0.176	9	0.034	1	-0.104	6	0.863	1	0.000	1	0.002	0.020	0.007		0.280	
213	M22	8in Dia. Duct	Sec 2 - max	0.021	8	-0.006	6	-0.009	9	0.138	6	-0.072	1	-0.115	1	0.227	8	77.526	8	0.065	8	0.003	0.010	0.016		0.227	
87	M9	8in Dia. Duct	Sec 4 - max	-0.041	2	0.010	9	0.032	6	-0.030	1	0.196	6	0.042	8	0.116	7	25.554	7	0.022	7	0.005	0.014	0.006		0.196	
88	M9	8in Dia. Duct	Sec 4 - min	-0.041	1	-0.068	6	-0.049	7	-0.196	6	0.030	1	-0.116	7	-0.042	8	-159.847	1	-0.140	1	0.005	0.014	0.008		0.196	
214	M22	8in Dia. Duct	Sec 2 - min	-0.006	7	-0.017	1	-0.052	8	0.072	1	-0.138	6	-0.227	6	0.115	1	50.057	1	0.042	1	0.001	0.010	0.016		0.227	
127	M13	8in Dia. Duct	Sec 4 - max	0.017	1	0.009	9	0.043	6	-0.180	9	0.258	8	0.086	6	-0.035	1	65.102	7	0.057	7	0.002	0.018	0.008		0.258	
128	M13	8in Dia. Duct	Sec 4 - min	0.017	2	-0.056	8	0.000	1	-0.258	6	0.180	9	0.035	1	-0.086	6	0.863	1	0.000	1	0.002	0.018	0.008		0.258	
510	M51	2.5in Dia. Duct Sch 160S	Sec 5 - min	-0.026	6	0.009	7	0.000	1	-0.083	7	-0.046	8	0.000	1	-0.234	6	-1.000	9	-0.004	9	0.005	0.005	0.017		0.234	
508	M51	2.5in Dia. Duct Sch 160S	Sec 4 - min	-0.026	8	0.009	7	0.000	1	-0.067	7	-0.041	8	0.000	1	-0.215	8	-1.000	9	-0.004	9	0.005	0.005	0.015		0.215	
23	M3	2.5in Dia. Duct Sch 160S	Sec 2 - max	0.001	7	-0.013	7	0.071	8	0.016	8	0.105	7	0.246	7	0.000	1	9.713	1	0.040	1	0.000	0.008	0.018		0.246	
24	M3	2.5in Dia. Duct Sch 160S	Sec 2 - min	-0.001	6	-0.017	8	0.000	1	-0.105	7	-0.016	8	0.000	1	-0.246	7	5.892	9	0.024	9	0.000	0.008	0.018		0.246	
519	M52	2.5in Dia. Duct Sch 160S	Sec 5 - max	0.008	6	0.001	1	0.002	8	-0.048	6	0.093	9	0.238	8	0.000	1	11.845	8	0.049	8	0.002	0.007	0.017		0.238	
520	M52	2.5in Dia. Duct Sch 160S	Sec 6 - min	-0.008	9	-0.031	8	-0.008	7	-0.093	9	0.048	6	0.000	1	-0.238	8	-4.445	7	-0.018	7	0.002	0.007	0.017		0.238	
147	M15	8in Dia. Duct	Sec 4 - max	0.004	1	-0.007	1	-0.004	9	0.219	8	-0.037	1	0.120	7	0.027	6	25.554	7	0.022	7	0.000	0.016	0.009		0.219	
148	M15	8in Dia. Duct	Sec 4 - min	0.004	2	-0.037	8	-0.013	6	0.037	1	-0.219	6	-0.027	8	-0.120	7	-159.847	1	-0.140	1	0.000	0.016	0.009		0.219	
209	M21	8in Dia. Duct	Sec 5 - max	0.020	8	0.000	6	-0.011	9	0.146	6	-0.106	1	-0.058	8	0.163	7	77.526	8	0.065	8	0.003	0.010	0.012		0.163	
211	M22	8in Dia. Duct	Sec 1 - max	0.020	6	0.000	6	-0.011	9	0.146	6	-0.106	1	-0.058	8	0.163	7	77.526	8	0.065	8	0.003	0.010	0.012		0.163	
399	M40	2.5in Dia. Duct Sch 160S	Sec 5 - max	0.008	7	0.031	8	0.000	6	-0.060	1	0.081	9	0.000	1	0.238	8	9.788	8	0.041	8	0.002	0.008	0.017		0.238	
400	M40	2.5in Dia. Duct Sch 160S	Sec 5 - min	-0.008	8	-0.001	1	-0.006	9	-0.081	9	0.060	1	-0.238	8	0.000	1	-7.047	7	-0.029	7	0.002	0.008	0.017		0.238	
517	M52	2.5in Dia. Duct Sch 160S	Sec 4 - max	0.008	6	0.002	1	0.002	8	-0.038	6	0.081	9	0.237	8	0.000	1	11.845	8	0.049	8	0.002	0.006	0.017		0.237	
518	M52	2.5in Dia. Duct Sch 160S	Sec 4 - min	-0.008	9	-0.030	8	-0.007	7	-0.081	8	0.038	6	0.000	1	-0.237	8	-4.445	7	-0.018	7	0.002	0.006	0.017		0.237	
506	M51	2.5in Dia. Duct Sch 160S	Sec 3 - min	-0.026	6	0.009	7	0.000	1	-0.070	7	-0.038	8	0.000	7	-0.196	8	-1.000	9	-0.004	9	0.005	0.005	0.014		0.196	
125	M13	8in Dia. Duct	Sec 3 - max	0.018	1	0.008	9	0.042	6	-0.183	1	0.236	6	0.069	8	-0.035	1	65.102	7	0.057	7	0.002	0.017	0.005		0.236	
126	M13	8in Dia. Duct	Sec 3 - min	0.018	2	-0.050	8	0.000	1	-0.236	8	0.183	1	0.035	1	-0.069	6	0.863	1	0.000	1	0.002	0.017	0.005		0.236	
515	M52	2.5in Dia. Duct Sch 160S	Sec 3 - max	0.008	6	0.002	1	0.002	8	-0.028	8	0.070	7	0.236	8	0.000	1	11.845	8	0.049	8	0.002	0.005	0.017		0.236	
516	M52	2.5in Dia. Duct Sch 160S	Sec 3 - min	-0.008	9	-0.030	8	-0.007	7	-0.070	7	0.028	8	0.000	1	-0.236	8	-4.445	7	-0.018	7	0.002	0.005	0.017		0.236	
207	M21	8in Dia. Duct	Sec 4 - max	0.020	8	0.000	6	-0.012	9	0.146	6	-0.114	1	-0.034	6	0.148	7	77.526	8	0.065	8	0.003	0.010	0.010		0.148	
604	M51	2.5in Dia. Duct Sch 160S	Sec 2 - min	-0.026	6	0.010	7	0.000	1	-0.074	7	-0.030	8	-0.018	7	-0.177	6	-1.000	9	-0.004	9	0.005	0.005	0.013		0.177	
514	M52	2.5in Dia. Duct Sch 160S	Sec 2 - min	-0.009	9	-0.030	8	-0.007	7	-0.080	7	0.015	8	0.000	1	-0.235	8	-4.445	7	-0.018	7	0.002	0.004	0.017		0.235	
47	M5	8in Dia. Duct	Sec 4 - max	-0.041	2	0.055	8	0.038	8	0.139	8	0.000	7	0.058	8	0.111	7	65.102	7	0.057	7	0.005	0.010	0.008		0.139	
48	M5	8in Dia. Duct	Sec 4 - min	-0.041	1	-0.022	7	-0.048	7	0.000	7	-0.139	8	-0.111	7	-0.058	8	0.863	1	0.000	1	0.005	0.010	0.008		0.139	
210	M21	8in Dia. Duct	Sec 5 - min	-0.005	7	-0.011	1	-0.049	6	0.106	1	-0.146	6	-0.163	7	0.058	8	50.057	1	0.042	1	0.001	0.010	0.012		0.163	
212	M22	8in Dia. Duct	Sec 1 - min	-0.005	7	-0.011	1	-0.049	6	0.106	1	-0.146	6	-0.163	7	0.058	8	50.057	1	0.042	1	0.001	0.010	0.012		0.163	
513	M52	2.5in Dia. Duct Sch 160S	Sec 2 - max	0.008	6	0.002	1	0.002	8	-0.016	8	0.060	7	0.235	8	0.000	1	11.845	8	0.049	8	0.002	0.004	0.017		0.235	
512	M52	2.5in Dia. Duct Sch 160S	Sec 1 - min	-0.008	9	-0.029	8	-0.007	7	-0.058	1	0.003	8	0.000	1	-0.234	8	-4.445	7	-0.018	7	0.002	0.004	0.017		0.234	
511	M52	2.5in Dia. Duct Sch 160S	Sec 1 - max	0.008	6	0.003	1	0.003	8	-0.003	8	0.058	1	0.234	8	0.000	1	11.845	8	0.049	8	0.002	0.004	0.017		0.234	
443	M45	8in Dia. Duct	Sec 2 - max	0.013	1	0.032	6	0.008	9	-0.145	1	0.164	6	0.107	7	-0.027	1	65.102	7	0.057	7	0.002	0.013	0.008		0.164	
444	M45	8in Dia. Duct	Sec 2 - min	0.013	2	0.001	9	-0.019	6	-0.164	6	0.145	1	0.027	1	-0.107	7	0.863	1	0.000	1	0.002	0.013	0.008		0.164	
502	M51	2.5in Dia. Duct Sch 160S	Sec 1 - min	-0.026	8	0.010	7	0.000	1	-0.076	7	-0.024	8	-0.035	7	-0.158	8	-1.000	9	-0.004	9	0.005	0.008	0.011		0.158	
205	M21	8in Dia. Duct	Sec 3 - max	0.019	8	0.002	6	-0.013	9	0.145	6	-0.120	1	-0.010	8	0.129	7	77.526	8	0.065	8	0.002	0.010	0.009		0.145	
206	M21	8in Dia. Duct	Sec 4 - min	-0.005	7	-0.010	1	-0.048	6	0.114	1	-0.146	6	-0.146	7	0.024	8	50.057	1	0.042	1	0.001	0.010	0.010		0.146	
445	M45	8in Dia. Duct	Sec 3 - max	0.008	1	0.027	6	0.002	9	-0.098	7	0.171	8	0.118	7	0.014	8	65.102	7	0.057	7	0.001	0.012	0.008		0.171	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_a	f_w/σ_a		f_t (ksi)	
448	M46	8in Dia. Duct	Sec 3 - min	0.008	2	0.005	9	-0.015	6	-0.171	8	-0.098	7	-0.014	8	-0.116	7	0.863	1	0.000	1	0.001	0.012	0.008		0.171	
123	M13	8in Dia. Duct	Sec 2 - max	0.019	1	0.006	9	0.042	6	-0.183	1	0.214	6	0.052	6	-0.035	1	65.102	7	0.057	7	0.002	0.015	0.004		0.214	
124	M13	8in Dia. Duct	Sec 2 - min	0.019	2	-0.054	6	0.000	1	-0.214	6	0.183	1	0.035	1	-0.052	8	0.863	1	0.000	1	0.002	0.015	0.004		0.214	
509	M51	2.5in Dia. Duct Sch 160S	Sec 5 - max	0.000	1	0.013	8	0.050	9	0.046	8	0.053	7	0.234	8	0.000	1	10.699	6	0.044	6	0.000	0.005	0.017		0.234	
73	M8	2in Dia. Duct Sch 80S	Sec 2 - max	0.011	7	0.125	8	0.009	1	0.162	1	-0.066	8	0.091	1	0.057	6	0.207	1	0.002	1	0.003	0.012	0.007		0.162	
74	M8	2in Dia. Duct Sch 80S	Sec 2 - min	-0.011	8	0.074	1	-0.004	6	0.066	8	-0.162	1	-0.057	6	-0.091	1	0.041	7	0.000	7	0.003	0.012	0.007		0.162	
203	M21	6in Dia. Duct	Sec 2 - max	0.019	8	0.004	6	-0.014	9	0.143	6	-0.125	1	0.013	8	0.112	7	77.526	8	0.065	8	0.002	0.010	0.008		0.143	
507	M51	2.5in Dia. Duct Sch 160S	Sec 4 - max	0.000	1	0.013	8	0.050	9	0.041	8	0.067	7	0.215	8	0.000	1	10.699	6	0.044	6	0.000	0.005	0.015		0.215	
206	M21	6in Dia. Duct	Sec 3 - min	-0.004	7	-0.009	1	-0.048	6	0.120	1	-0.145	6	-0.120	7	0.010	8	50.057	1	0.042	1	0.001	0.010	0.008		0.145	
447	M45	8in Dia. Duct	Sec 4 - max	0.004	1	0.023	8	-0.002	9	-0.026	7	0.149	8	0.113	7	0.047	8	65.102	7	0.057	7	0.000	0.011	0.008		0.149	
448	M45	8in Dia. Duct	Sec 4 - min	0.004	2	0.010	9	-0.010	6	-0.149	8	0.026	7	-0.047	8	-0.113	7	0.863	1	0.000	1	0.000	0.011	0.008		0.149	
201	M21	6in Dia. Duct	Sec 1 - max	0.019	8	0.005	8	-0.014	9	0.140	6	-0.130	1	0.038	8	0.093	7	77.526	8	0.065	8	0.002	0.010	0.007		0.140	
505	M51	2.5in Dia. Duct Sch 160S	Sec 3 - max	0.000	1	0.013	8	0.050	9	0.036	6	0.070	7	0.196	8	0.000	7	10.699	6	0.044	6	0.000	0.005	0.014		0.196	
204	M21	6in Dia. Duct	Sec 2 - min	-0.004	7	-0.007	1	-0.047	6	0.125	1	-0.143	6	-0.112	7	-0.013	8	50.057	1	0.042	1	0.001	0.010	0.008		0.143	
500	M50	2.5in Dia. Duct Sch 160S	Sec 5 - min	-0.011	8	0.010	7	0.000	1	-0.071	7	-0.064	8	-0.035	7	-0.158	8	3.408	9	0.014	9	0.002	0.005	0.011		0.158	
121	M13	8in Dia. Duct	Sec 1 - max	0.019	1	0.007	9	0.041	6	-0.183	1	0.192	6	0.036	1	-0.035	7	65.102	7	0.057	7	0.002	0.014	0.003		0.192	
122	M13	8in Dia. Duct	Sec 1 - min	0.019	2	-0.054	6	0.000	1	-0.192	6	0.183	1	0.035	7	-0.036	1	0.863	1	0.000	1	0.002	0.014	0.003		0.192	
503	M51	2.5in Dia. Duct Sch 160S	Sec 2 - max	0.000	1	0.014	8	0.050	9	0.030	8	0.074	7	0.177	8	0.018	7	10.699	6	0.044	6	0.000	0.005	0.013		0.177	
199	M20	6in Dia. Duct	Sec 5 - max	0.010	8	0.038	6	-0.017	8	0.140	6	-0.130	1	0.036	8	0.093	7	77.526	8	0.065	8	0.001	0.010	0.007		0.140	
149	M15	8in Dia. Duct	Sec 5 - max	0.000	1	-0.007	1	-0.008	9	0.147	6	0.005	9	0.101	7	0.059	8	25.554	7	0.022	7	0.000	0.011	0.007		0.147	
150	M15	8in Dia. Duct	Sec 5 - min	0.000	1	-0.033	8	-0.011	1	-0.005	9	-0.147	6	-0.059	8	-0.101	7	-159.847	1	-0.140	1	0.000	0.011	0.007		0.147	
421	M43	8in Dia. Duct	Sec 1 - max	0.000	1	-0.007	1	-0.008	9	0.147	6	0.005	9	0.101	7	0.059	8	25.554	7	0.022	7	0.000	0.011	0.007		0.147	
422	M43	8in Dia. Duct	Sec 1 - min	0.000	1	-0.033	8	-0.011	1	-0.005	9	-0.147	6	-0.059	8	-0.101	7	-159.847	1	-0.140	1	0.000	0.011	0.007		0.147	
492	M50	2.5in Dia. Duct Sch 160S	Sec 1 - min	-0.011	8	0.011	7	0.000	1	-0.089	7	-0.040	8	-0.122	7	-0.047	8	3.408	9	0.014	9	0.002	0.006	0.009		0.122	
202	M21	6in Dia. Duct	Sec 1 - min	-0.004	7	-0.006	1	-0.046	6	0.130	1	-0.140	6	-0.093	7	-0.036	8	50.057	1	0.042	1	0.001	0.010	0.007		0.140	
200	M20	6in Dia. Duct	Sec 5 - min	0.002	1	0.027	1	-0.044	7	0.130	1	-0.140	6	-0.093	7	-0.036	8	50.057	1	0.042	1	0.000	0.010	0.007		0.140	
498	M50	2.5in Dia. Duct Sch 160S	Sec 4 - min	-0.011	8	0.010	7	0.000	1	-0.075	7	-0.058	8	-0.057	7	-0.130	8	3.408	9	0.014	9	0.002	0.005	0.009		0.130	
501	M51	2.5in Dia. Duct Sch 160S	Sec 1 - max	0.000	1	0.014	8	0.050	9	0.024	8	0.078	7	0.158	8	0.035	7	10.699	6	0.044	6	0.000	0.005	0.011		0.158	
499	M50	2.5in Dia. Duct Sch 160S	Sec 5 - max	0.000	1	0.014	8	0.066	8	0.064	8	0.071	7	0.158	8	0.035	7	8.693	1	0.036	1	0.000	0.005	0.011		0.158	
423	M43	8in Dia. Duct	Sec 2 - max	0.000	1	-0.007	1	-0.008	8	0.129	6	0.025	9	0.095	7	0.064	8	25.554	7	0.022	7	0.000	0.009	0.007		0.129	
424	M43	8in Dia. Duct	Sec 2 - min	0.000	1	-0.032	8	-0.011	1	-0.025	9	-0.129	6	-0.064	8	-0.095	7	-159.847	1	-0.140	1	0.000	0.009	0.007		0.129	
85	M9	8in Dia. Duct	Sec 3 - max	-0.039	2	0.008	9	0.030	8	-0.020	1	0.104	8	0.000	8	0.050	7	25.554	7	0.022	7	0.005	0.007	0.004		0.104	
86	M9	8in Dia. Duct	Sec 3 - min	-0.039	1	-0.056	6	-0.047	7	-0.104	6	0.020	1	-0.050	7	0.000	8	-159.847	1	-0.140	1	0.005	0.007	0.004		0.104	
61	M9	8in Dia. Duct	Sec 1 - max	-0.035	2	0.004	9	0.026	8	0.071	7	0.081	8	0.074	9	0.077	6	25.554	7	0.022	7	0.004	0.006	0.008		0.081	
62	M9	8in Dia. Duct	Sec 1 - min	-0.035	1	-0.062	6	-0.043	7	-0.081	8	-0.071	7	-0.077	6	-0.074	9	-159.847	1	-0.140	1	0.004	0.006	0.006		0.081	
494	M50	2.5in Dia. Duct Sch 160S	Sec 2 - min	-0.011	8	0.011	7	0.000	1	-0.084	7	-0.046	8	-0.101	7	-0.075	8	3.408	9	0.014	9	0.002	0.006	0.007		0.101	
41	M5	8in Dia. Duct	Sec 1 - max	-0.035	2	0.049	8	0.030	8	0.078	6	0.073	9	0.074	9	0.076	6	65.102	7	0.057	7	0.004	0.008	0.005		0.078	
42	M5	8in Dia. Duct	Sec 1 - min	-0.035	1	-0.016	7	-0.042	7	-0.073	9	-0.078	6	-0.076	6	-0.074	9	0.863	1	0.000	1	0.004	0.008	0.005		0.078	
431	M44	8in Dia. Duct	Sec 1 - max	0.000	1	0.018	8	-0.002	1	0.034	7	0.115	8	0.098	7	0.068	8	65.102	7	0.057	7	0.000	0.008	0.007		0.115	
432	M44	8in Dia. Duct	Sec 1 - min	0.000	1	0.013	1	-0.007	7	-0.115	8	-0.034	7	-0.068	8	-0.098	7	0.863	1	0.000	1	0.000	0.008	0.007		0.115	
449	M45	8in Dia. Duct	Sec 5 - max	0.000	1	0.019	8	-0.002	1	0.034	7	0.115	8	0.098	7	0.068	8	65.102	7	0.057	7	0.000	0.008	0.007		0.115	
450	M45	8in Dia. Duct	Sec 5 - min	0.000	1	0.013	1	-0.007	7	-0.115	8	-0.034	7	-0.068	8	-0.098	7	0.863	1	0.000	1	0.000	0.008	0.007		0.115	
496	M50	2.5in Dia. Duct Sch 160S	Sec 3 - min	-0.011	8	0.011	7	0.000	1	-0.079	7	-0.052	8	-0.079	7	-0.102	8	3.408	9	0.014	9	0.002	0.006	0.007		0.102	
491	M50	2.5in Dia. Duct Sch 160S	Sec 1 - max	0.000	1	0.015	8	0.067	8	0.040	8	0.089	7	0.047	8	0.122	7	8.693	1	0.036	1	0.000	0.006	0.009		0.122	
497	M50	2.5in Dia. Duct Sch 160S	Sec 4 - max	0.000	1	0.014	8	0.066	8	0.058	8	0.075	7	0.130	8	0.057	7	8.693	1	0.036	1	0.000	0.005	0.009		0.130	
21	M3	2.5in Dia. Duct Sch 160S	Sec 1 - max	0.002	7	-0.011	7	0.070	8	0.055	8	0.077	7	0.122	7	0.047	8	9.713	1	0.040	1	0.000	0.008	0.009		0.122	
22	M3	2.5in Dia. Duct Sch 160S	Sec 1 - min	-0.002	6	-0.015	8	0.000	1	-0.077	7	-0.055	8	-0.047	8	-0.122	7	5.892	9	0.024	9	0.000	0.008	0.009		0.122	
425	M43	8in Dia. Duct	Sec 3 - max	-0.002	1	-0.007	1	-0.007	8	0.110	6	0.044	9	0.089	7	0.069	8	25.554	7	0.022	7	0.000	0.008	0.006		0.110	
426	M43	8in Dia. Duct	Sec 3 - min	-0.002	1	-0.031	8	-0.011	1	-0.044	9	-0.110	6	-0.069	8	-0.089	7	-159.847	1	-0.140	1	0.000	0.008	0.006		0.110	
433	M44	8in Dia. Duct	Sec 2 - max	0.000	1	0.018	6	-0.002	1	0.046	7	0.105	6	0.093	7	0.071	8	65.102	7	0.057	7	0.000	0.008	0.007		0.105	
434	M44	8in Dia. Duct	Sec 2 - min	0.000	1	0.013	1	-0.008	7	-0.105	8	-0.046	7	-0.071	8	-0.093	7	0.863	1	0.000	1	0.000	0.008	0.007		0.105	
197	M20	6in Dia. Duct	Sec 4 - max	0.010	8	0.039	6	-0.016	8	0.111	6	-0.109	1	0.046	8	0.061	7	77.526	8	0.065	8	0.001	0.008	0.004		0.111	
435	M44	8in Dia. Duct	Sec 3 - max	-0.002	1	0.017	6	-0.002	1	0.058	7	0.095	8	0.087	7	0.073	8	65.102	7	0.057	7	0.000	0.007	0.006		0.095	
438	M44	8in Dia. Duct	Sec 3 - min	-0.002	1	0.013	1	-0.009	7	-0.095	8	-0.058	7	-0.073	8	-0.087	7	0.863	1	0.000	1	0.000	0.007	0.006		0.095	
493	M50	2.5in Dia. Duct Sch 160S	Sec 2 - max	0.000	1	0.015	8	0.067	8	0.046	8	0.084	7	0.075	8	0.101	7	8.693	1	0.036	1	0.000	0.006	0.007		0.101	
495	M50	2.5in Dia. Duct Sch 160S	Sec 3 - max	0.000	1	0.015	8	0.066	8	0.052	8	0.079	7	0.102	8	0.079	7	8.693	1	0.036	1	0.000	0.008	0.007		0.102	
83	M9	8in Dia. Duct	Sec 2 - max	+0.037	2	0.066	9	0.028	8	-0.011	1	0.077	8	0.014	9	0.041	6	25.554	7	0.022	7	0.004	0.006	0.003		0.077	
84	M9	8in Dia. Duct	Sec 2 - min	-0.037	1	-0.064	6	-0.045	7	-0.077	8	0.011	1	-0.041	8	-0.014	9	-159.847	1	-0.140	1	0.004	0.006	0.003		0.077	
45	M5	8in Dia. Duct	Sec 3 - max	-0.039	2	0.053	8	0.034	8	0.066	8	-0.029	7	0.010	8	0.047	7	65.102	7	0.057	7	0.005	0.005	0.003		0.066	
46	M5	8in Dia. Duct	Sec 3 - min	-0.039	1	-0.020	7	-0.048	7	0.029	7	-0.066	8	-0.047	7	-0.010	8	0.863	1	0.000	1	0.005	0.005	0.003		0.066	
427	M43	8in Dia. Duct	Sec 4 - max	-0.003	1	-0.007	1	-0.008	8	0.091	6	0.003	9	0.082	7	0.073	8	25.554	7	0.022	7	0.000	0.007	0.006		0.091	
428	M43	8in Dia. Duct	Sec 4 - min	-0.003	1	-0.030	8	-0.011	7	-0.063	0	-0.091	6	-0.073	8	-0.082	7	-159.847	1	-0.140	1	0.000	0.007	0.006		0.091	
198	M20	6in Dia. Duct	Sec 4 - min	0.002	1	0.029	1	-0.044	7	0.109	1	-0.111	8	-0.061	7	-0.048	8	50.057	1	0.042	1	0.000	0.008	0.004		0.111	
195	M20	6in Dia. Duct	Sec 3 - max	0.010	8	0.041	6	-0.015	8	0.087	1	-0.092	6	0.088	6	0.035	9	77.526	8	0.065	8	0.001	0.006	0.005		0.087	
437	M44	8in Dia. Duct	Sec 4 - max	-0.003	1	0.017	8	-0.002	8	0.066	7	0.084	8	0.081	7	0.075	8	65.102	7	0.057	7	0.000	0.008	0.006		0.084	
438	M44	8in Dia. Duct	Sec 4 - min	-0.003	1	0.013	1	-0.010	7	-0.084	8	-0.066	7	-0.075	8	-0.081	7	0.863	1	0.000	1	0.000	0.008	0.006		0.084	
193	M20	6in Dia. Duct	Sec 2 - max	0.009	8	0.043	8	-0.014	8	0.084	1	-0.051	6	0.087	6	0.011	9	77.526	8	0.065	8	0.001	0.005	0.006		0.087	
429	M43	8in Dia. Duct	Sec 5 - max	-0.004	1	-0.007	1	-0.005	8	0.071	7	0.081	8	0.074	9	0.077	6	25.554	7	0.022	7	0.000	0.006	0.006		0.081	
430	M43	8in Dia. Duct	Sec 5 - min	-0.004	1	-0.031	6	-0.012	7	-0.081	8	-0.071	7	-0.077	6	-0.074	9	-159.847	1	-0.140	1	0.000	0.006	0.006		0.081	
191	M20	6in Dia. Duct	Sec 1 - max	0.009	8	0.044	6	-0.014	8	0.040	1	-0.019	6	0.107	6	-0.014	9	77.526	8	0.065	8	0.001	0.003	0.008		0.107	
439	M44	8in Dia. Duct	Sec 5 - max	-0.004	1	0.018	8	-0.001	8	0.078	6	0.073	9	0.074	9	0.076	6	65.102	7	0.057	7	0.000	0.008	0.005		0.078	
440	M44	8in Dia. Duct	Sec 5 - min	-0.004	1	0.013	1	-0.011	7	-0.073	9	-0.078	6	-0.076	6	-0.074	9	0.863	1	0.000	1	0.000	0.006	0.005		0.078	
196	M20	6in Dia. Duct	Sec 3 - min	0.002	1	0.030	1	-0.045	7	0.082	6	-0.087	1	-0.035	9	-0.066	6	50.057	1	0.042	1	0.000	0.008	0.005		0.087	
194	M20	6in Dia. Duct	Sec 2 - min	0.002	1	0.032	1	-0.046	7	0.051	6	-0.064	1	-0.011	9	-0.087	6	50.057	1	0.042	1	0.000	0.005	0.008		0.087	
43	M5	8in Dia. Duct	Sec 2 - max	-0.037	2	0.051	8	0.032	8	0.055	6	0.005	9	0.017	9	0.036	6	65.102	7	0.057	7	0.004	0.004	0.003		0.055	
44	M5	8in Dia. Duct	Sec 2 - min	-0.037	1	-0.018	7	-0.044	7	-0.005	9	-0.055	6	-0.036	6	-0.017	9	0.863	1	0.000	1	0.004	0.004	0.003		0.055	
192	M20	6in Dia. Duct	Sec 1 - min	0.002	1	0.033	1	-0.047	7	0.019	6	-0.040	1	0.014	9	-0.107	6	50.057	1	0.042	1	0.000	0.003	0.008		0.107	
310	M31	6in Dia. Duct	Sec 5 - min	0.005	1	-0.017	1	-0.070	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.001	0.000	0.000		0.005	

amec

CALCULATION SHEET

CALC. NO.:	145579-V-CA-005	REV:	1	DATE:	March 26, 2006
CALC. TITLE:	Off-Gas Treatment System Pipe Stress Analysis				
PROJECT NO.:	145579	PROJECT TITLE:	Final DBVS Design		

Attachment 11: Excel Spreadsheet – Model 3 AG-1 Analysis and Unity Checks

NOTE: This cover sheet represents the approval signatures of the originator and checker for all pages of this attachment

ORIGINATOR:	DATE:	CHECKER:	DATE:
Kevin M. Jones KMJ	3/26/06	J. Van Corbach JVC	3/26/06

Duct Size	σ_c (ksi) Eq. 1b	σ_a (ksi) Eq. 8 or 7	ϵ_0 (ksi) Eq. 5	ϵ_v (ksi) Eq. 9	ν_i (ksi) Eq. 9	σ_r (ksi) Eq. 10	Temp
3in Dia. Duct	8.8	22.5	18.8	35.7	13.0	13.0	100
4in Dia. Duct	10.4	22.6	18.8	33.2	13.0	13.0	100
5in Dia. Duct	11.5	22.5	18.8	31.5	13.0	13.0	100
6in Dia. Duct	12.2	22.5	18.8	30.6	13.0	13.0	100
8in Dia. Duct	13.0	22.5	18.8	11.3	13.0	13.0	100
12in Dia. Duct	13.7	22.5	18.8	10.8	13.0	13.0	100

Model 3

D-2250

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_b/σ_a	f_s/σ_a		f_c (ksi)	
131	M14	RIGID	Sec 1 - max	0.000	9	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.044	8	0.000	1	0.000	0.000	0.000		0.000	
132	M14	RIGID	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.112	1	0.000	1	0.000	0.000	0.000		0.000	
133	M14	RIGID	Sec 2 - max	0.000	9	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.044	8	0.000	1	0.000	0.000	0.000		0.000	
134	M14	RIGID	Sec 2 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.112	1	0.000	1	0.000	0.000	0.000		0.000	
135	M14	RIGID	Sec 3 - max	0.000	9	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.044	8	0.000	1	0.000	0.000	0.000		0.000	
136	M14	RIGID	Sec 3 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.112	1	0.000	1	0.000	0.000	0.000		0.000	
137	M14	RIGID	Sec 4 - max	0.000	9	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.044	8	0.000	1	0.000	0.000	0.000		0.000	
138	M14	RIGID	Sec 4 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.112	1	0.000	1	0.000	0.000	0.000		0.000	
139	M14	RIGID	Sec 5 - max	0.000	9	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.044	8	0.000	1	0.000	0.000	0.000		0.000	
140	M14	RIGID	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.112	1	0.000	1	0.000	0.000	0.000		0.000	
291	M30	RIGID	Sec 1 - max	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.009	1	0.000	1	0.000	0.000	0.000		0.000	
292	M30	RIGID	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.924	6	0.000	1	0.000	0.000	0.000		0.000	
293	M30	RIGID	Sec 2 - max	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.009	1	0.000	1	0.000	0.000	0.000		0.000	
294	M30	RIGID	Sec 2 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.924	6	0.000	1	0.000	0.000	0.000		0.000	
295	M30	RIGID	Sec 3 - max	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.009	1	0.000	1	0.000	0.000	0.000		0.000	
296	M30	RIGID	Sec 3 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.924	6	0.000	1	0.000	0.000	0.000		0.000	
297	M30	RIGID	Sec 4 - max	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.009	1	0.000	1	0.000	0.000	0.000		0.000	
298	M30	RIGID	Sec 4 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.924	6	0.000	1	0.000	0.000	0.000		0.000	
299	M30	RIGID	Sec 5 - max	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.009	1	0.000	1	0.000	0.000	0.000		0.000	
300	M30	RIGID	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-0.924	6	0.000	1	0.000	0.000	0.000		0.000	
179	M16	4in Dia. Duct	Sec 5 - max	0.358	6	0.000	1	0.000	1	-0.012	1	2.551	8	-0.044	1	6.985	6	0.126	6	0.282	6	0.034	0.113	0.310		6.985	
180	M16	4in Dia. Duct	Sec 5 - min	0.024	1	-0.110	8	-0.216	6	-2.551	8	0.012	1	-6.985	6	0.044	1	0.000	1	-0.002	1	0.002	0.113	0.310		6.985	
1	M1	4in Dia. Duct	Sec 1 - max	0.000	1	-0.099	1	0.174	9	5.675	8	-0.257	1	0.000	8	3.387	9	-0.037	1	-0.081	1	0.000	0.252	0.151		5.675	
2	M1	4in Dia. Duct	Sec 1 - min	0.000	1	-0.558	8	-0.041	6	0.257	1	-5.675	6	-3.387	9	0.000	6	-0.114	8	-0.251	8	0.000	0.252	0.151		5.675	
151	M16	4in Dia. Duct	Sec 1 - max	0.000	1	0.219	8	0.103	6	-0.457	1	5.173	8	1.629	9	3.476	6	0.126	8	0.277	8	0.000	0.230	0.154		5.173	
152	M16	4in Dia. Duct	Sec 1 - min	0.000	1	0.004	7	-0.055	9	-5.173	8	0.457	1	-3.476	6	-1.629	9	-0.021	7	-0.045	7	0.000	0.230	0.154		5.173	
154	M16	4in Dia. Duct	Sec 2 - min	-0.001	9	0.000	7	-0.053	9	-4.470	8	0.291	1	-3.146	6	-1.455	9	-0.021	7	-0.045	7	0.000	0.199	0.140		4.470	
153	M16	4in Dia. Duct	Sec 2 - max	0.000	8	0.214	8	0.100	6	-0.291	1	4.470	8	1.455	9	3.146	6	0.126	8	0.277	8	0.000	0.199	0.140		4.470	
4	M1	4in Dia. Duct	Sec 2 - min	-0.001	6	-0.563	8	-0.039	6	-0.074	1	-3.853	8	-2.825	9	0.054	1	-0.114	8	-0.251	8	0.000	0.171	0.126		3.853	
3	M1	4in Dia. Duct	Sec 2 - max	0.000	7	-0.104	1	0.172	9	3.853	8	0.074	1	-0.054	1	2.825	9	-0.037	1	-0.081	1	0.000	0.171	0.126		3.853	
156	M16	4in Dia. Duct	Sec 3 - min	-0.003	9	-0.005	7	-0.050	9	-3.782	8	0.140	1	-2.824	6	-1.287	9	-0.021	7	-0.045	7	0.000	0.168	0.126		3.782	
155	M16	4in Dia. Duct	Sec 3 - max	0.002	8	0.209	8	0.098	6	-0.140	1	3.782	8	1.287	9	2.824	6	0.126	8	0.277	8	0.000	0.168	0.126		3.782	
177	M16	4in Dia. Duct	Sec 4 - max	0.394	8	0.000	1	0.000	1	1.085	8	0.184	7	-0.071	1	3.988	7	0.128	6	0.282	6	0.038	0.048	0.177		3.988	
158	M16	4in Dia. Duct	Sec 4 - min	-0.004	9	-0.009	7	-0.048	9	-3.110	8	0.004	1	-2.509	6	-1.128	9	-0.021	7	-0.045	7	0.000	0.138	0.112		3.110	
157	M16	4in Dia. Duct	Sec 4 - max	0.003	8	0.204	8	0.096	6	-0.004	1	3.110	8	1.128	9	2.509	6	0.126	8	0.277	8	0.000	0.138	0.112		3.110	
178	M16	4in Dia. Duct	Sec 4 - min	0.060	1	-0.146	6	-0.252	6	-0.184	7	-1.085	8	-3.988	7	0.071	1	0.000	1	-0.002	1	0.008	0.048	0.177		3.988	
129	M13	4in Dia. Duct	Sec 5 - max	0.063	9	-0.075	8	0.184	7	-1.854	8	1.700	1	3.352	7	-0.105	1	0.055	8	0.120	8	0.006	0.076	0.149		3.352	
130	M13	4in Dia. Duct	Sec 5 - min	-0.031	6	-0.084	1	-0.031	8	-1.700	1	1.654	6	0.105	1	-3.352	7	0.002	1	0.005	1	0.003	0.076	0.149		3.352	
127	M13	4in Dia. Duct	Sec 4 - max	0.083	9	-0.074	8	0.163	7	-1.570	8	1.608	1	3.169	7	-0.097	1	0.055	8	0.120	8	0.008	0.071	0.141		3.169	
128	M13	4in Dia. Duct	Sec 4 - min	-0.031	6	-0.083	1	-0.030	8	-1.608	1	1.570	8	0.097	1	-3.169	7	0.002	1	0.005	1	0.003	0.071	0.141		3.169	
160	M16	4in Dia. Duct	Sec 5 - min	-0.005	9	-0.014	7	-0.046	9	-2.454	8	-0.117	1	-2.202	6	-0.975	9	-0.021	7	-0.045	7	0.000	0.109	0.098		2.454	
162	M17	4in Dia. Duct	Sec 1 - min	-0.005	9	-0.015	7	-0.046	9	-2.454	8	-0.117	1	-2.201	6	-1.013	9	0.000	1	0.000	1	0.000	0.109	0.098		2.454	
159	M16	4in Dia. Duct	Sec 5 - max	0.004	8	0.199	8	0.093	6	0.117	1	2.454	8	0.975	9	2.202	6	0.126	8	0.277	8	0.000	0.109	0.098		2.454	
161	M17	4in Dia. Duct	Sec 1 - max	-0.002	1	0.199	8	0.093	6	0.117	1	2.454	8	1.013	9	2.201	6	0.110	8	0.241	8	0.000	0.109	0.098		2.454	
125	M13	4in Dia. Duct	Sec 3 - max	0.082	9	-0.072	8	0.163	7	-1.489	8	1.514	1	2.986	7	-0.088	1	0.055	8	0.120	8	0.006	0.067	0.133		2.986	
126	M13	4in Dia. Duct	Sec 3 - min	-0.030	6	-0.081	1	-0.030	8	-1.514	1	1.489	8	0.088	1	-2.986	7	0.002	1	0.005	1	0.003	0.067	0.133		2.986	
123	M13	4in Dia. Duct	Sec 2 - max	0.062	9	-0.071	8	0.162	7	-1.408	8	1.424	1	2.804	7	-0.080	1	0.055	8	0.120	8	0.006	0.063	0.125		2.804	
6	M1	4in Dia. Duct	Sec 3 - min	-0.003	8	-0.567	8	-0.038	8	-0.420	1	-2.017	8	-2.270	9	0.030	1	-0.114	8	-0.251	8	0.000	0.090	0.101		2.270	
124	M13	4in Dia. Duct	Sec 2 - min	-0.030	8	-0.080	1	-0.029	8	-1.424	1	1.408	8	0.080	1	-2.804	7	0.002	1	0.005	1	0.003	0.063	0.125		2.804	
5	M1	4in Dia. Duct	Sec 3 - max	0.002	7	-0.109	1	0.169	9	2.017	8	0.420	1	-0.030	1	2.270	9	-0.037	1	-0.081	1	0.000	0.090	0.101		2.270	
172	M18	4in Dia. Duct	Sec 1 - min	-0.057	7	0.000	1	-0.060	9	-0.517	6	-0.465	7	-3.229	8	-3.629	7	0.000	1	-0.002	1	0.005	0.023	0.161		3.629	
171	M18	4in Dia. Duct	Sec 1 - max	0.051	8	0.043	6	0.044	6	0.465	7	0.517	8	3.629	7	3.229	8	0.128	6	0.282	6	0.005	0.023	0.161		3.629	
184	M17	4in Dia. Duct	Sec 2 - min	-0.006	8	-0.017	7	-0.044	9	-2.130	8	-0.171	1	-2.049	8	-0.939	9	0.000	1	0.000	1	0.001	0.095	0.091		2.130	
163	M17	4in Dia. Duct	Sec 2 - max	-0.002	1	0.197	8	0.092	6	0.171	1	2.130	8	0.939	9	2.049	8	0.110	8	0.241	8	0.000	0.095	0.091		2.130	
119	M12	4in Dia. Duct	Sec 5 - max	0.061	9	-0.069	8	0.161	7	-1.328	9	1.338	1	2.624	7	-0.071	1	0.055	8	0.120	8	0.006	0.059	0.117		2.624	
121	M13	4in Dia. Duct	Sec 1 - max	0.061	9	-0.069	8	0.161	7	-1.328	9	1.338	1	2.624	7	-0.071	1	0.055	8	0.120	8	0.006	0.059	0.117		2.624	
176	M18	4in Dia. Duct	Sec 3 - min	-0.128	7	-0.031	7	-0.132	9	-0.002	1	-1.895	8	-1.907	9	-1.363	6	0.000	1	-0.002	1	0.012	0.084	0.085		1.907	
120	M12	4in Dia. Duct	Sec 5 - min	-0.029	6	-0.078	1	-0.028	8	-1.336	1	1.328	9	0.071	1	-2.624	7	0.002	1	0.005	1	0.003	0.059	0.117		2.624	
122	M13	4in Dia. Duct	Sec 1 - min	-0.029	6	-0.076	1	-0.028	8	-1.338	1	1.328	9	0.071	1	-2.624	7	0.002	1	0.005	1	0.003	0.059	0.117		2.624	
166	M17	4in Dia. Duct	Sec 3 - min	-0.006	9	-0.019	7	-0.043	9	-1.966	9	-0.222	1	-1.899	6	-0.867	9	0.000	1	0.000	1	0.001	0.087	0.084		1.966	
165	M17	4in Dia. Duct	Sec 3 - max	-0.002	1	0.195	8	0.091	6	0.222	1	1.966	9	0.867	9	1.899	6	0.110	8	0.241	8	0.000	0.087	0.084		1.966	
175	M18	4in Dia. Duct	Sec 3 - max	-0.021	8	0.078	8	0.115	6	1.895	8	0.002	1	1.363	8	1.907	9	0.128	6	0.282	6	0.002	0.084	0.085		1.907	
191	M20	8in Dia. Duct	Sec 1 - max	0.191	6	0.182	8	0.062	8	-0.016	1	2.657	6	0.753	6	-0.002	1	-0.003	1	-0.002	1	0.016	0.118	0.033		2.657	
168	M17	4in Dia. Duct	Sec 4 - min	-0.007	9	-0.022	7	-0.042	9	-1.995	9	-0.269	1	-1.751	6	-0.797	9	0.000	1	0.000	1	0.001	0.089	0.078		1.995	
167	M17	4in Dia. Duct	Sec 4 - max	-0.002	6	0.192	8	0.090	6	0.269	1	1.995	9	0.797	9	1.751	6	0.110	8	0.241	8	0.000	0.089	0.078		1.995	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_c/σ_c	f_{by}/σ_b	f_{bz}/σ_b		f_c (ksi)	
170	M17	4in Dia. Duct	Sec 6 - min	-0.007	9	-0.024	7	-0.041	9	-2.030	7	-0.312	1	-1.605	6	-0.729	9	0.000	1	0.000	1	0.001	0.090	0.071		2.030	
169	M17	4in Dia. Duct	Sec 5 - max	-0.001	6	0.190	8	0.089	6	0.312	1	2.030	7	0.729	9	1.605	6	0.110	8	0.241	8	0.000	0.090	0.071		2.030	
199	M20	6in Dia. Duct	Sec 5 - max	0.166	6	0.166	6	0.070	6	1.266	9	-0.017	1	1.976	6	-0.005	1	-0.003	1	-0.002	1	0.014	0.056	0.088		1.976	
192	M20	6in Dia. Duct	Sec 1 - min	0.009	1	0.017	1	0.000	1	-2.657	6	0.016	1	0.002	1	-0.753	8	-0.367	8	-0.308	8	0.001	0.118	0.033		2.657	
209	M21	6in Dia. Duct	Sec 5 - max	0.154	6	0.178	8	0.049	7	0.895	7	-0.003	1	2.160	6	-0.008	1	-0.005	1	-0.004	1	0.013	0.040	0.098		2.160	
207	M21	6in Dia. Duct	Sec 4 - max	0.165	6	0.179	6	0.048	7	0.872	7	-0.006	1	2.153	6	-0.008	1	-0.005	1	-0.004	1	0.014	0.039	0.096		2.153	
205	M21	6in Dia. Duct	Sec 3 - max	0.165	6	0.179	8	0.048	7	0.850	7	-0.009	1	2.145	6	-0.008	1	-0.005	1	-0.004	1	0.014	0.038	0.095		2.145	
203	M21	6in Dia. Duct	Sec 2 - max	0.165	6	0.179	8	0.048	7	0.827	7	-0.012	1	2.137	6	-0.008	1	-0.005	1	-0.004	1	0.014	0.037	0.095		2.137	
200	M20	6in Dia. Duct	Sec 5 - min	-0.008	1	-0.014	1	0.000	1	0.017	1	-1.266	9	0.005	1	-1.976	6	-0.367	8	-0.308	8	0.001	0.056	0.088		1.976	
309	M31	6in Dia. Duct	Sec 5 - max	0.060	6	0.008	1	0.000	1	0.035	1	0.052	9	0.029	1	3.086	9	0.009	1	0.008	1	0.005	0.002	0.137		3.086	
201	M21	6in Dia. Duct	Sec 1 - max	0.165	6	0.179	8	0.048	7	0.804	7	-0.015	1	2.129	6	-0.008	1	-0.005	1	-0.004	1	0.014	0.036	0.095		2.129	
310	M31	6in Dia. Duct	Sec 5 - min	-0.008	9	-0.023	9	-0.103	7	-0.052	9	-0.035	1	-3.088	9	-0.029	1	-0.924	6	-0.773	6	0.001	0.002	0.137		3.086	
193	M20	6in Dia. Duct	Sec 2 - max	0.165	6	0.179	6	0.056	8	0.058	1	1.666	8	1.078	8	-0.003	1	-0.003	1	-0.002	1	0.015	0.074	0.048		1.666	
210	M21	6in Dia. Duct	Sec 5 - min	-0.008	1	-0.017	1	0.000	1	0.003	1	-0.895	7	0.008	1	-2.160	6	-0.552	8	-0.462	8	0.001	0.040	0.098		2.160	
208	M21	6in Dia. Duct	Sec 4 - min	-0.008	1	-0.016	1	0.000	1	0.006	1	-0.872	7	0.008	1	-2.153	6	-0.552	8	-0.462	8	0.001	0.039	0.096		2.153	
206	M21	6in Dia. Duct	Sec 3 - min	-0.008	1	-0.016	1	0.000	1	0.009	1	-0.850	7	0.008	1	-2.145	6	-0.552	8	-0.462	8	0.001	0.038	0.095		2.145	
204	M21	6in Dia. Duct	Sec 2 - min	-0.008	1	-0.016	1	0.000	1	0.012	1	-0.827	7	0.008	1	-2.137	6	-0.552	8	-0.462	8	0.001	0.037	0.095		2.137	
307	M31	6in Dia. Duct	Sec 4 - max	0.058	6	0.013	1	0.000	1	0.008	1	0.002	9	0.028	1	2.846	9	0.009	1	0.008	1	0.005	0.000	0.126		2.846	
202	M21	6in Dia. Duct	Sec 1 - min	-0.008	1	-0.016	1	0.000	1	0.015	1	-0.804	7	0.008	1	-2.129	6	-0.552	8	-0.462	8	0.001	0.036	0.095		2.129	
11	M2	4in Dia. Duct	Sec 1 - max	0.016	8	0.112	8	0.165	9	-1.159	1	1.699	8	0.008	1	1.213	8	-0.037	1	-0.082	1	0.002	0.076	0.054		1.699	
51	M6	4in Dia. Duct	Sec 1 - max	0.070	9	0.036	8	0.012	8	0.008	1	0.299	8	2.473	9	0.797	6	-0.060	6	-0.132	6	0.007	0.013	0.110		2.473	
12	M2	4in Dia. Duct	Sec 1 - min	0.004	1	0.103	1	-0.032	6	-1.699	8	1.158	1	-1.213	8	-0.008	1	-0.094	8	-0.206	8	0.000	0.076	0.054		1.699	
39	M4	4in Dia. Duct	Sec 5 - max	0.050	9	0.038	8	0.105	9	0.399	1	-0.031	8	2.411	9	0.809	6	-0.060	1	-0.132	1	0.005	0.018	0.107		2.411	
53	M6	4in Dia. Duct	Sec 2 - max	0.070	9	0.036	8	0.012	8	0.019	1	0.286	8	2.459	9	0.794	6	-0.060	6	-0.132	6	0.007	0.013	0.109		2.459	
10	M1	4in Dia. Duct	Sec 5 - min	-0.005	8	-0.576	8	-0.032	6	-1.699	8	1.158	1	-1.184	9	-0.020	1	-0.114	8	-0.251	8	0.000	0.076	0.053		1.699	
9	M1	4in Dia. Duct	Sec 5 - max	0.004	7	-0.118	1	0.165	9	-1.158	1	1.699	8	0.020	1	1.184	9	-0.037	1	-0.081	1	0.000	0.076	0.053		1.699	
49	M5	4in Dia. Duct	Sec 5 - max	0.070	9	0.036	8	0.040	9	0.257	1	0.127	6	2.473	9	0.797	6	-0.085	6	-0.187	6	0.007	0.011	0.110		2.473	
55	M6	4in Dia. Duct	Sec 3 - max	0.070	9	0.035	8	0.012	8	0.029	1	0.273	8	2.446	9	0.791	6	-0.060	6	-0.132	6	0.007	0.012	0.109		2.446	
37	M4	4in Dia. Duct	Sec 4 - max	0.050	9	0.039	8	0.106	9	0.388	1	-0.016	8	2.372	9	0.811	6	-0.060	1	-0.132	1	0.005	0.017	0.105		2.372	
308	M31	6in Dia. Duct	Sec 4 - min	-0.007	8	-0.018	9	-0.103	7	-0.002	9	-0.008	1	-2.846	9	-0.028	1	-0.924	6	-0.773	6	0.001	0.000	0.126		2.846	
61	M7	4in Dia. Duct	Sec 1 - max	0.083	9	0.034	8	0.007	6	-0.083	1	0.306	8	2.419	9	0.784	6	-0.044	8	-0.096	8	0.006	0.014	0.108		2.419	
174	M16	4in Dia. Duct	Sec 2 - min	-0.092	7	0.000	1	-0.096	9	0.000	1	-1.171	8	-1.487	8	-1.415	7	0.000	1	-0.002	1	0.009	0.052	0.066		1.487	
47	M5	4in Dia. Duct	Sec 4 - max	0.070	9	0.037	8	0.040	9	0.246	1	0.141	8	2.457	9	0.800	6	-0.085	6	-0.187	6	0.007	0.011	0.109		2.457	
221	M23	6in Dia. Duct	Sec 1 - max	0.119	6	0.285	8	0.000	1	-0.021	1	0.653	8	1.777	8	-0.003	1	-0.002	1	-0.002	1	0.010	0.036	0.079		1.777	
57	M6	4in Dia. Duct	Sec 4 - max	0.070	9	0.035	8	0.013	8	0.038	1	0.259	8	2.433	9	0.788	6	-0.060	6	-0.132	6	0.007	0.012	0.108		2.433	
91	M10	4in Dia. Dia. Duct	Sec 1 - max	0.083	7	-0.020	8	0.048	6	0.390	1	-0.322	8	0.810	8	2.275	7	0.014	8	0.031	8	0.008	0.017	0.101		2.275	
45	M5	4in Dia. Duct	Sec 3 - max	0.070	9	0.037	8	0.041	9	0.236	1	0.155	8	2.442	9	0.803	6	-0.085	6	-0.187	6	0.007	0.010	0.109		2.442	
101	M11	4in Dia. Duct	Sec 1 - max	0.066	7	-0.022	8	0.107	7	0.442	1	-0.221	8	0.842	8	2.235	7	0.045	8	0.099	8	0.008	0.020	0.099		2.235	
35	M4	4in Dia. Duct	Sec 3 - max	0.050	9	0.040	8	0.106	9	0.377	1	-0.001	8	2.332	9	0.813	6	-0.060	1	-0.132	1	0.005	0.017	0.104		2.332	
59	M6	4in Dia. Duct	Sec 5 - max	0.070	9	0.034	8	0.013	8	0.048	1	0.246	8	2.419	9	0.784	6	-0.060	6	-0.132	6	0.007	0.011	0.108		2.419	
40	M4	4in Dia. Duct	Sec 6 - min	-0.002	6	0.029	1	0.005	1	0.031	8	-0.399	1	-0.809	6	-2.411	9	-0.095	8	-0.210	8	0.000	0.018	0.107		2.411	
93	M10	4in Dia. Duct	Sec 2 - max	0.083	7	-0.020	8	0.049	8	0.369	1	-0.315	8	0.818	8	2.265	7	0.014	8	0.031	8	0.008	0.016	0.101		2.265	
43	M5	4in Dia. Duct	Sec 2 - max	0.070	9	0.038	8	0.041	9	0.225	1	0.169	8	2.427	9	0.806	6	-0.085	6	-0.187	6	0.007	0.010	0.108		2.427	
95	M10	4in Dia. Duct	Sec 3 - max	0.083	7	-0.021	8	0.049	8	0.358	1	-0.307	8	0.828	8	2.255	7	0.014	8	0.031	8	0.008	0.016	0.100		2.255	
223	M23	6in Dia. Duct	Sec 2 - max	0.119	6	0.285	8	0.000	1	-0.025	1	0.799	8	1.767	8	-0.003	1	-0.002	1	-0.002	1	0.010	0.036	0.079		1.767	
52	M6	4in Dia. Duct	Sec 1 - min	0.002	6	0.027	1	-0.040	7	-0.269	8	-0.008	1	-0.797	6	-2.473	9	-0.113	1	-0.249	1	0.000	0.013	0.110		2.473	
41	M5	4in Dia. Duct	Sec 1 - max	0.070	9	0.036	8	0.041	9	0.214	1	0.183	8	2.411	9	0.809	6	-0.085	6	-0.187	6	0.007	0.010	0.107		2.411	
87	M10	4in Dia. Duct	Sec 4 - max	0.083	7	-0.021	8	0.049	6	0.347	1	-0.299	8	0.834	8	2.245	7	0.014	8	0.031	8	0.008	0.015	0.100		2.245	
103	M11	4in Dia. Duct	Sec 2 - max	0.066	7	-0.022	8	0.107	7	0.430	1	-0.213	8	0.844	8	2.194	7	0.045	8	0.099	8	0.008	0.019	0.098		2.194	
38	M4	4in Dia. Duct	Sec 4 - min	-0.002	6	0.030	1	0.005	1	0.016	8	-0.388	1	-0.811	6	-2.372	9	-0.095	8	-0.210	8	0.000	0.017	0.105		2.372	
33	M4	4in Dia. Duct	Sec 2 - max	0.050	9	0.040	8	0.106	9	0.365	1	0.014	8	2.292	9	0.815	6	-0.060	1	-0.132	1	0.005	0.016	0.102		2.292	
305	M31	6in Dia. Duct	Sec 3 - max	0.057	8	0.019	1	0.000	1	0.038	9	0.032	1	0.027	1	2.613	9	0.009	1	0.008	1	0.005	0.002	0.116		2.613	
89	M8	4in Dia. Duct	Sec 5 - max	0.078	7	-0.020	8	0.042	8	0.310	8	-0.177	1	0.810	8	2.275	7	-0.024	8	-0.054	8	0.008	0.014	0.101		2.275	
194	M20	6in Dia. Duct	Sec 2 - min	0.005	1	0.009	1	0.000	1	-1.666	6	-0.058	1	0.003	1	-1.076	8	-0.367	8	-0.308	8	0.000	0.074	0.048		1.666	
99	M10	4in Dia. Duct	Sec 5 - max	0.084	7	-0.022	8	0.050	6	0.335	1	-0.291	8	0.842	8	2.235	7	0.014	8	0.031	8	0.008	0.015	0.099		2.235	
54	M6	4in Dia. Duct	Sec 2 - min	0.002	6	0.027	1	-0.040	7	-0.266	8	-0.019	1	-0.794	6	-2.459	9	-0.113	1	-0.249	1	0.000	0.013	0.109		2.459	
87	M9	4in Dia. Duct	Sec 4 - max	0.076	7	-0.019	8	0.041	6	0.317	6	-0.188	1	0.798	8	2.253	7	-0.024	8	-0.054	8	0.008	0.014	0.100		2.253	
29	M3	4in Dia. Duct	Sec 5 - max	0.034	9	0.041	8	0.129	9	0.409	1	-0.081	8	2.252	9	0.817	6	-0.037	1	-0.082	1	0.003	0.018	0.100		2.252	
62	M7	4in Dia. Duct	Sec 1 - min	0.004	6	0.025	1	-0.071	9	-0.306	8	0.083	1	-0.784	6	-2.419	9	-0.112	1	-0.247	1	0.000	0.014	0.108		2.419	
50	M5	4in Dia. Duct	Sec 5 - min	0.000	6	0.027	1	0.000	1	-0.127	8	-0.257	1	-0.797	6	-2.473	9	-0.097	1	-0.214	1	0.000	0.011	0.110		2.473	
56	M6	4in Dia. Duct	Sec 3 - min	0.002	6	0.028	1	-0.040	7	-0.273	8	-0.029	1	-0.791	6	-2.446	9	-0.113	1	-0.249	1	0.000	0.012	0.109		2.446	
65	M8	4in Dia. Duct	Sec 3 - max	0.076	7	-0.019	8	0.041	6	0.324	8	-0.198	1	0.786	8	2.231	7	-0.024	8	-0.054	8	0.008	0.014	0.099		2.231	
225	M23	6in Dia. Duct	Sec 3 - max	0.119	6	0.285	8	0.000	1	-0.030	1	0.745	8	1.756	8	-0.003	1	-0.002	1	-0.002	1	0.010	0.033	0.078		1.756	
105	M11	4in Dia. Duct	Sec 3 - max	0.066	7	-0.023	8	0.107	7	0.419	1	-0.205	8	0.846	8	2.154	7	0.045	8	0.099	8	0.006	0.019	0.096		2.154	
102	M11	4in Dia. Duct	Sec 1 - min	-0.017	8	-0.031	1	0.005	8	0.221	8	-0.442	1	-2.235	7	-0.842	8	-0.022	1	-0.048	1	0.002	0.020	0.099		2.235	
36	M4	4in Dia. Duct	Sec 3 - min	-0.002	6	0.031	1	0.005	1	0.001	8	-0.377	1	-0.813	6	-2.332	9	-0.095	8	-0.210	8	0.000	0.017	0.104		2.332	
31	M4	4in Dia. Duct	Sec 1 - max	0.050	9	0.041	8	0.107	9	0.353	1	0.029	8	2.252	9	0.817	6	-0.060	1	-0.132	1	0.005	0.016	0.100		2.252	
83	M7	4in Dia. Duct	Sec 2 - max	0.062	9	0.032	8	0.006	6	-0.049	1	0.259	8	2.317	9	0.774	6	-0.044	8	-0.096	8	0.006	0.012	0.103		2.317	
83	M9	4in Dia. Duct	Sec 2 - max	0.078	7	-0.018	8	0.041	6	0.331	6	-0.208	1	0.774	8	2.209	7	-0.024	8	-0.054	8	0.008	0.015	0.098		2.209	
48	M5	4in Dia. Duct	Sec 4 - min	0.000	6	0.028	1	0.000	1	-0.141	8	-0.246	1	-0.800	6	-2.457	9	-0.097	1	-0.214	1	0.000	0.011	0.109		2.457	
58	M6	4in Dia. Duct	Sec 4 - min	0.003	6	0.026	1	-0.040	7	-0.259	8	-0.038	1	-0.788	6	-2.433	9	-0.113	1	-0.249	1	0.000	0.012	0.108		2.433	
81	M9	4in Dia. Duct	Sec 1 - max	0.078	7	-0.017	8	0.040	8	0.338	6	-0.216	1	0.763	8	2.187	7	-0.024	8	-0.054	8	0.008	0.015	0.097		2.187	
173	M18	4in Dia. Duct	Sec 2 - max	0.015	8	0.042	8	0.079	8	1.171	6	0.000	1	1.415	7	1.487	8	0.128	6	0.282	6	0.001	0.052	0.066		1.487	
92	M10	4in Dia. Duct	Sec 1 - min	-0.013	8	-0.029	1	0.000	1	0.322	8	-0.360	1	-2.275	7	-0.810	8	-0.089	1	-0.152	1	0.001	0.017	0.101		2.275	
46	M5	4in Dia. Duct	Sec 3 - min	0.000	6	0.028	1	0.000	1	-0.155	8	-0.236	1	-0.803	6	-2.442	9	-0.097	1	-0.214	1	0.000	0.010	0.109		2.442	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_a	f_s/σ_a		f_e (ksi)	
60	M6	4in Dia. Duct	Sec 5 - min	0.003	6	0.025	1	-0.040	7	-0.246	8	-0.048	1	-0.754	6	-2.419	9	-0.113	1	-0.249	1	0.000	0.011	0.108		2.419	
30	M3	4in Dia. Duct	Sec 5 - min	-0.002	8	0.032	1	0.004	6	0.081	6	-0.409	1	-0.817	6	-2.252	9	-0.094	8	-0.208	8	0.000	0.018	0.100		2.252	
104	M11	4in Dia. Duct	Sec 2 - min	-0.016	8	-0.031	1	0.005	8	0.213	8	-0.430	1	-2.194	7	-0.844	8	-0.022	1	-0.048	1	0.002	0.019	0.098		2.194	
107	M11	4in Dia. Duct	Sec 4 - max	0.086	7	-0.023	8	0.108	7	0.407	1	-0.196	8	0.847	8	2.114	7	0.045	8	0.099	8	0.006	0.018	0.094		2.114	
94	M10	4in Dia. Duct	Sec 2 - min	-0.013	8	-0.029	1	0.000	9	0.315	8	-0.369	1	-2.265	7	-0.818	8	-0.069	1	-0.152	1	0.001	0.016	0.101		2.265	
211	M22	6in Dia. Duct	Sec 1 - max	0.153	6	0.223	8	0.010	7	-0.003	1	0.236	8	2.142	6	-0.007	1	-0.005	1	-0.004	1	0.013	0.010	0.095		2.142	
306	M31	6in Dia. Duct	Sec 3 - min	-0.006	8	-0.012	9	-0.098	7	-0.032	1	-0.036	9	-2.613	9	-0.027	1	-0.924	6	-0.773	6	0.000	0.002	0.116		2.613	
34	M4	4in Dia. Duct	Sec 2 - min	-0.001	6	0.031	1	0.005	6	-0.014	8	-0.365	1	-0.815	6	-2.292	9	-0.095	8	-0.210	8	0.000	0.016	0.102		2.292	
227	M23	6in Dia. Duct	Sec 4 - max	0.118	6	0.284	8	0.000	1	-0.034	1	0.691	8	1.745	6	-0.003	1	-0.002	1	-0.002	1	0.010	0.031	0.076		1.745	
44	M5	4in Dia. Duct	Sec 2 - min	0.000	6	0.029	1	0.000	1	-0.169	8	-0.225	1	-0.806	6	-2.427	9	-0.097	1	-0.214	1	0.000	0.010	0.108		2.427	
98	M10	4in Dia. Duct	Sec 3 - min	-0.013	8	-0.030	1	0.000	9	0.307	8	-0.356	1	-2.255	7	-0.826	8	-0.069	1	-0.152	1	0.001	0.016	0.100		2.255	
222	M23	6in Dia. Duct	Sec 1 - min	-0.005	1	-0.023	1	-0.087	8	-0.853	6	0.021	1	0.003	1	-1.777	6	-0.916	8	-0.767	8	0.000	0.038	0.079		1.777	
79	M8	4in Dia. Duct	Sec 5 - max	0.068	7	-0.017	8	0.033	6	0.298	8	-0.094	1	0.763	8	2.187	7	-0.044	8	-0.096	8	0.007	0.013	0.097		2.187	
42	M5	4in Dia. Duct	Sec 1 - min	0.000	6	0.029	1	0.000	1	-0.183	8	-0.214	1	-0.809	6	-2.411	9	-0.097	1	-0.214	1	0.000	0.010	0.107		2.411	
98	M10	4in Dia. Duct	Sec 4 - min	-0.014	8	-0.030	1	0.000	9	0.299	8	-0.347	1	-2.245	7	-0.834	8	-0.069	1	-0.152	1	0.001	0.015	0.100		2.245	
213	M22	6in Dia. Duct	Sec 2 - max	0.153	6	0.223	8	0.010	7	-0.007	1	0.194	8	2.139	6	-0.007	1	-0.005	1	-0.004	1	0.013	0.009	0.095		2.139	
106	M11	4in Dia. Duct	Sec 3 - min	-0.016	8	-0.032	1	0.004	8	0.205	8	-0.419	1	-2.154	7	-0.846	8	-0.022	1	-0.048	1	0.002	0.019	0.098		2.154	
109	M11	4in Dia. Duct	Sec 5 - max	0.066	7	-0.024	8	0.108	7	0.394	1	-0.187	8	0.849	8	2.073	7	0.046	8	0.099	8	0.006	0.018	0.092		2.073	
32	M4	4in Dia. Duct	Sec 1 - min	-0.001	6	0.032	1	0.005	6	-0.029	8	-0.353	1	-0.817	6	-2.252	9	-0.095	8	-0.210	8	0.000	0.016	0.100		2.252	
100	M10	4in Dia. Duct	Sec 5 - min	-0.014	8	-0.031	1	-0.001	9	0.291	8	-0.335	1	-2.235	7	-0.842	8	-0.069	1	-0.152	1	0.001	0.015	0.099		2.235	
90	M9	4in Dia. Duct	Sec 5 - min	-0.006	8	-0.029	1	-0.059	9	0.177	1	-0.310	8	-2.275	7	-0.810	8	-0.103	1	-0.227	1	0.001	0.014	0.101		2.275	
231	M24	6in Dia. Duct	Sec 1 - max	0.087	6	0.336	6	0.000	1	-0.039	1	1.197	6	1.275	8	0.000	1	0.004	1	0.004	1	0.005	0.053	0.057		1.275	
229	M23	6in Dia. Duct	Sec 5 - max	0.118	6	0.284	8	0.000	1	-0.039	1	0.838	6	1.735	6	-0.003	1	-0.002	1	-0.002	1	0.010	0.028	0.077		1.735	
111	M12	4in Dia. Duct	Sec 1 - max	0.050	9	-0.024	6	0.138	7	0.406	1	-0.129	6	0.849	8	2.073	7	0.055	8	0.120	8	0.005	0.018	0.092		2.073	
64	M7	4in Dia. Duct	Sec 2 - min	0.004	1	0.023	1	-0.072	9	-0.259	8	0.049	1	-0.774	6	-2.317	9	-0.112	1	-0.247	1	0.000	0.012	0.103		2.317	
88	M9	4in Dia. Duct	Sec 4 - min	-0.006	8	-0.028	1	-0.069	9	0.188	1	-0.317	8	-2.253	7	-0.798	8	-0.103	1	-0.227	1	0.001	0.014	0.100		2.253	
303	M31	6in Dia. Duct	Sec 2 - max	0.056	6	0.024	1	0.000	1	0.060	9	0.086	1	0.025	1	2.388	9	0.009	1	0.008	1	0.005	0.004	0.106		2.388	
224	M23	6in Dia. Duct	Sec 2 - min	-0.005	1	-0.024	1	-0.087	8	-0.799	8	0.025	1	0.003	1	-1.767	6	-0.916	8	-0.767	8	0.000	0.038	0.079		1.767	
215	M22	6in Dia. Duct	Sec 3 - max	0.153	6	0.222	8	0.010	7	0.004	7	0.152	8	2.138	6	-0.007	1	-0.005	1	-0.004	1	0.013	0.007	0.095		2.138	
88	M9	4in Dia. Duct	Sec 3 - min	-0.006	8	-0.028	1	-0.069	9	0.198	1	-0.324	8	-2.231	7	-0.786	8	-0.103	1	-0.227	1	0.001	0.014	0.099		2.231	
65	M7	4in Dia. Duct	Sec 3 - max	0.062	9	0.030	8	0.009	6	-0.017	1	0.215	8	2.213	9	0.761	6	-0.044	8	-0.096	8	0.006	0.010	0.098		2.213	
108	M11	4in Dia. Duct	Sec 4 - min	-0.016	8	-0.032	1	0.004	8	0.196	8	-0.407	1	-2.114	7	-0.847	8	-0.022	1	-0.048	1	0.002	0.018	0.094		2.114	
197	M20	6in Dia. Duct	Sec 4 - max	0.172	6	0.172	6	0.064	8	0.814	9	-0.075	1	1.625	8	-0.005	1	-0.003	1	-0.002	1	0.014	0.027	0.072		1.625	
84	M9	4in Dia. Duct	Sec 2 - min	-0.005	8	-0.027	1	-0.068	9	0.208	1	-0.331	6	-2.209	7	-0.774	8	-0.103	1	-0.227	1	0.000	0.015	0.098		2.209	
82	M9	4in Dia. Duct	Sec 1 - min	-0.005	8	-0.026	1	-0.068	9	0.218	1	-0.338	6	-2.187	7	-0.763	8	-0.103	1	-0.227	1	0.000	0.015	0.097		2.187	
217	M22	6in Dia. Duct	Sec 4 - max	0.153	6	0.222	8	0.010	7	0.030	7	0.110	8	2.134	6	-0.008	1	-0.005	1	-0.004	1	0.013	0.005	0.095		2.134	
112	M12	4in Dia. Duct	Sec 1 - min	-0.016	6	-0.033	1	-0.005	8	0.129	8	-0.408	1	-2.073	7	-0.849	8	0.002	1	0.005	1	0.002	0.018	0.092		2.073	
233	M24	6in Dia. Duct	Sec 2 - max	0.067	6	0.336	6	0.000	1	-0.044	1	1.134	8	1.259	6	0.000	1	0.004	1	0.004	1	0.005	0.050	0.056		1.259	
8	M1	4in Dia. Duct	Sec 4 - min	-0.004	8	-0.572	8	-0.034	6	-0.781	1	-0.166	8	-1.723	9	0.005	1	-0.114	8	-0.251	8	0.000	0.035	0.077		1.723	
7	M1	4in Dia. Duct	Sec 4 - max	0.003	7	-0.113	1	0.167	9	0.168	8	0.781	1	-0.005	1	1.723	9	-0.037	1	-0.081	1	0.000	0.035	0.077		1.723	
226	M23	6in Dia. Duct	Sec 3 - min	-0.005	1	-0.024	1	-0.087	8	-0.745	8	0.030	1	0.003	1	-1.756	6	-0.916	8	-0.767	8	0.000	0.033	0.078		1.756	
110	M11	4in Dia. Duct	Sec 5 - min	-0.016	8	-0.033	1	0.004	8	0.187	8	-0.394	1	-2.073	7	-0.849	8	-0.022	1	-0.048	1	0.002	0.018	0.092		2.073	
80	M8	4in Dia. Duct	Sec 5 - min	-0.001	8	-0.028	1	-0.097	9	0.094	1	-0.298	8	-2.167	7	-0.763	8	-0.112	1	-0.247	1	0.000	0.013	0.097		2.167	
269	M27	6in Dia. Duct	Sec 5 - max	0.054	6	-0.010	9	0.000	1	0.070	9	0.153	1	0.024	1	2.231	8	0.009	1	0.008	1	0.004	0.007	0.099		2.231	
301	M31	6in Dia. Duct	Sec 1 - max	0.054	6	0.030	1	0.000	1	0.070	9	0.153	1	0.024	1	2.231	8	0.009	1	0.008	1	0.004	0.007	0.099		2.231	
219	M22	6in Dia. Duct	Sec 5 - max	0.153	6	0.222	8	0.010	7	0.055	7	0.068	8	2.131	6	-0.008	1	-0.005	1	-0.004	1	0.013	0.003	0.095		2.131	
304	M31	6in Dia. Duct	Sec 2 - min	-0.004	8	-0.007	9	-0.095	7	-0.088	1	-0.060	9	-2.388	9	-0.025	1	-0.924	8	-0.773	6	0.000	0.004	0.106		2.388	
232	M24	6in Dia. Duct	Sec 1 - min	-0.002	1	-0.027	1	-0.085	6	-1.197	8	0.039	1	0.000	1	-1.275	6	-0.946	8	-0.792	8	0.000	0.053	0.057		1.275	
13	M2	4in Dia. Duct	Sec 2 - max	0.017	9	0.108	8	0.163	9	-0.879	1	1.396	8	0.028	1	1.043	8	-0.037	1	-0.082	1	0.002	0.062	0.046		1.396	
14	M2	4in Dia. Duct	Sec 2 - min	0.004	1	0.100	1	-0.030	6	-1.396	8	0.879	1	-1.043	8	-0.028	1	-0.094	8	-0.206	8	0.000	0.062	0.046		1.396	
228	M23	6in Dia. Duct	Sec 4 - min	-0.005	1	-0.024	1	-0.087	8	-0.691	8	0.034	1	0.003	1	-1.745	6	-0.916	8	-0.767	8	0.000	0.031	0.078		1.745	
235	M24	6in Dia. Duct	Sec 3 - max	0.067	6	0.337	6	0.000	1	-0.049	1	1.076	9	1.243	6	0.000	1	0.004	1	0.004	1	0.005	0.048	0.055		1.243	
66	M7	4in Dia. Duct	Sec 3 - min	0.004	1	0.021	1	-0.073	9	-0.215	8	0.017	1	-0.761	6	-2.213	9	-0.112	1	-0.247	1	0.000	0.010	0.098		2.213	
67	M7	4in Dia. Duct	Sec 4 - max	0.061	9	0.028	8	0.010	6	0.011	1	0.174	8	2.108	9	0.748	6	-0.044	8	-0.096	8	0.006	0.008	0.094		2.108	
234	M24	6in Dia. Duct	Sec 2 - min	-0.002	1	-0.027	1	-0.085	6	-1.134	8	0.044	1	0.000	1	-1.259	6	-0.946	8	-0.792	8	0.000	0.050	0.058		1.259	
212	M22	6in Dia. Duct	Sec 1 - min	-0.007	1	-0.019	1	-0.038	8	-0.236	8	0.003	1	0.007	1	-2.142	6	-0.778	8	-0.651	8	0.001	0.010	0.095		2.142	
270	M27	6in Dia. Duct	Sec 5 - min	-0.003	9	-0.034	1	-0.092	7	-0.153	1	-0.070	9	-2.231	8	-0.024	1	-0.924	6	-0.773	6	0.000	0.007	0.099		2.231	
302	M31	6in Dia. Duct	Sec 1 - min	-0.003	8	-0.002	9	-0.092	7	-0.153	1	-0.070	9	-2.231	8	-0.024	1	-0.924	8	-0.773	6	0.000	0.007	0.099		2.231	
195	M20	6in Dia. Duct	Sec 3 - max	0.176	6	0.175	6	0.058	6	0.088	1	0.694	6	1.367	8	-0.004	1	-0.003	1	-0.002	1	0.015	0.031	0.061		1.367	
237	M24	6in Dia. Duct	Sec 4 - max	0.067	6	0.337	6	0.000	1	-0.054	1	1.037	9	1.227	6	0.000	1	0.004	1	0.004	1	0.005	0.046	0.055		1.227	
230	M23	6in Dia. Duct	Sec 6 - min	-0.005	1	-0.025	1	-0.066	8	-0.638	8	0.039	1	0.003	1	-1.735	6	-0.916	8	-0.767	8	0.000	0.028	0.077		1.735	
214	M22	6in Dia. Duct	Sec 2 - min	-0.007	1	-0.019	1	-0.038	8	-0.194	8	0.007	1	0.007	1	-2.139	6	-0.778	8	-0.651	8	0.001	0.009	0.095		2.139	
117	M12	4in Dia. Duct	Sec 4 - max	0.059	9	-0.058	8	0.155	7	-0.708	1	0.835	6	1.383	7	-0.012	1	0.055	8	0.120	8	0.006	0.037	0.061		1.383	
239	M24	6in Dia. Duct	Sec 5 - max	0.067	6	0.337	6	0.000	1	-0.059	1	0.998	9	1.211	6	0.000	1	0.004	1	0.004	1	0.005	0.044	0.054		1.211	
238	M24	6in Dia. Duct	Sec 3 - min	-0.002	1	-0.027	1	-0.084	6	-1.076	9	0.049	1	0.000	1	-1.243	6	-0.946	8	-0.792	8	0.000	0.048	0.055		1.243	
216	M22	6in Dia. Duct	Sec 3 - min	-0.007	1	-0.020	1	-0.036	8	-0.152	8	-0.004	7	0.007	1	-2.136	6	-0.778	8	-0.651	8	0.001	0.007	0.095		2.136	
68	M7	4in Dia. Duct	Sec 4 - min	0.004	1	0.019	1	-0.074	9	-0.174	8	-0.011	1	-0.748	6	-2.108	9	-0.112	1	-0.247	1	0.000	0.008	0.094		2.108	
118	M12	4in Dia. Duct	Sec 4 - min	-0.027	6	-0.067	1	-0.022	6	-0.635	6	0.768	1	0.012	1	-1.383	7	0.002	1	0.005	1	0.003	0.037	0.061		1.383	
241	M25	6in Dia. Duct	Sec 1 - max	0.037	6	0.352	6	0.000	1	-0.056	1	1.218	9	0.988	6	-0.002	1	0.009	1	0.008	1	0.003	0.054	0.044		1.218	
89	M7	4in Dia. Duct	Sec 5 - max	0.061	8	0.028	8	0.011	6	0.037	1	0.136	8	2.002	9	0.732	6	-0.044	8	-0.096	8	0.006	0.006	0.089		2.002	
238	M24	6in Dia. Duct	Sec 4 - min	-0.002	1	-0.028	1	-0.084	6	-1.037	9	0.054	1	0.000	1	-1.227	6	-0.946	8	-0.792	8	0.000	0.048	0.055		1.227	
218	M22	6in Dia. Duct	Sec 4 - min	-0.007	1	-0.020	1	-0.038	8	-0.110	8	-0.030	7	0.008	1	-2.134	6	-0.778	8	-0.651	8	0.001	0.005	0.095		2.134	
198	M20	6in Dia. Duct	Sec 4 - min	-0.004	1	-0.008	1	0.000	1	0.075	1	-0.614	9	0.005	1	-1.625	8	-0.367	8	-0.308	8	0.000	0.027	0.072		1.625	
287	M27	6in Dia. Duct	Sec 4 - max	0.052	6	-0.002	9	0.000	1	0.093	9	0.043	1	0.022	1	2.026	8	0.009	1	0.008	1	0.004	0.004	0.090		2.026	
220	M22	6in Dia. Duct	Sec 5 - min	-0.008	1	-0.020	1	-0.038	8	-0.068	8	-0.055	7	0.008	1	-2.131	6	-0.778	8	-0.651	8	0.001	0.003	0.095		2.131	

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	D-2250 f_{by}/σ_s	f_{bz}/σ_s	[redacted]	f_c (ksi)	[redacted]
240	M24	6in Dia. Duct	Sec 5 - min	-0.002	1	-0.028	1	-0.084	6	-0.998	9	0.059	1	0.000	1	-1.211	6	-0.946	8	-0.792	8	0.000	0.044	0.054	[redacted]	1.211	[redacted]
27	M3	4in Dia. Duct	Sec 4 - max	0.033	9	0.045	8	0.131	9	0.302	1	0.056	8	1.838	9	0.828	6	-0.037	1	-0.082	1	0.003	0.013	0.082	[redacted]	1.838	[redacted]
242	M25	8in Dia. Duct	Sec 1- min	0.000	1	-0.029	1	-0.095	6	-1.218	9	0.058	1	0.002	1	-0.988	6	-0.924	8	-0.773	8	0.000	0.054	0.044	[redacted]	1.218	[redacted]
70	M7	4in Dia. Duct	Sec 5 - min	0.004	1	0.017	1	-0.075	9	-0.136	8	-0.037	1	-0.732	8	-2.002	9	-0.112	1	-0.247	1	0.000	0.008	0.089	[redacted]	2.002	[redacted]
28	M3	4in Dia. Duct	Sec 4 - min	0.000	8	0.036	1	0.002	6	-0.056	8	-0.302	1	-0.826	6	-1.838	9	-0.094	8	-0.206	8	0.000	0.013	0.082	[redacted]	1.838	[redacted]
243	M25	6in Dia. Duct	Sec 2 - max	0.037	6	0.351	6	0.000	1	-0.072	1	1.115	9	0.942	6	-0.002	1	0.009	1	0.008	1	0.003	0.050	0.042	[redacted]	1.115	[redacted]
268	M27	6in Dia. Duct	Sec 4 - min	0.000	9	-0.028	1	-0.088	7	-0.043	1	-0.093	9	-2.026	8	-0.022	1	-0.924	6	-0.773	8	0.000	0.004	0.090	[redacted]	2.028	[redacted]
198	M20	6in Dia. Duct	Sec 3 - min	0.000	1	0.002	1	0.000	1	-0.694	8	-0.088	1	0.004	1	-1.367	8	-0.367	8	-0.308	8	0.000	0.031	0.061	[redacted]	1.367	[redacted]
244	M25	6in Dia. Duct	Sec 2 - min	0.000	1	-0.030	1	-0.095	6	-1.115	9	0.072	1	0.002	1	-0.942	6	-0.924	6	-0.773	6	0.000	0.050	0.042	[redacted]	1.115	[redacted]
15	M2	4in Dia. Duct	Sec 3 - max	0.018	9	0.105	8	0.161	9	-0.612	1	1.104	8	0.049	1	0.879	6	-0.037	1	-0.082	1	0.002	0.049	0.039	[redacted]	1.104	[redacted]
77	M8	4in Dia. Duct	Sec 4 - max	0.065	7	-0.007	8	0.027	6	0.390	6	-0.252	1	0.537	8	1.477	7	-0.044	8	-0.096	8	0.006	0.017	0.066	[redacted]	1.477	[redacted]
16	M2	4in Dia. Duct	Sec 3 - min	0.004	1	0.098	1	-0.028	6	-1.104	8	0.612	1	-0.879	8	-0.049	1	-0.094	8	-0.206	8	0.000	0.049	0.039	[redacted]	1.104	[redacted]
245	M25	6in Dia. Duct	Sec 3 - max	0.037	6	0.350	6	0.000	1	-0.087	1	1.012	9	0.911	7	-0.002	1	0.009	1	0.008	1	0.003	0.045	0.040	[redacted]	1.012	[redacted]
265	M27	6in Dia. Duct	Sec 3 - max	0.051	8	0.008	9	0.000	1	0.087	9	-0.037	1	0.020	1	1.806	8	0.009	1	0.008	1	0.004	0.004	0.080	[redacted]	1.806	[redacted]
246	M25	6in Dia. Duct	Sec 3 - min	0.000	1	-0.031	1	-0.094	6	-1.012	9	0.087	1	0.002	1	-0.911	7	-0.924	6	-0.773	6	0.000	0.045	0.040	[redacted]	1.012	[redacted]
266	M27	6in Dia. Duct	Sec 3 - min	0.000	1	-0.018	1	-0.084	7	0.037	1	-0.087	9	-1.806	8	-0.020	1	-0.924	6	-0.773	6	0.000	0.004	0.080	[redacted]	1.806	[redacted]
78	M6	4in Dia. Duct	Sec 4 - min	0.002	8	-0.016	1	-0.092	9	0.252	1	-0.390	6	-1.477	7	-0.537	8	-0.112	1	-0.247	1	0.000	0.017	0.066	[redacted]	1.477	[redacted]
247	M25	6in Dia. Duct	Sec 4 - max	0.038	6	0.349	6	0.000	1	-0.102	1	0.909	9	0.883	7	-0.003	1	0.009	1	0.008	1	0.003	0.040	0.039	[redacted]	0.909	[redacted]
248	M25	6in Dia. Duct	Sec 4 - min	0.000	1	-0.032	1	-0.094	6	-0.909	9	0.102	1	0.003	1	-0.883	7	-0.924	6	-0.773	6	0.000	0.040	0.039	[redacted]	0.909	[redacted]
263	M27	6in Dia. Duct	Sec 2 - max	0.049	8	0.014	9	0.000	1	0.089	1	-0.052	9	0.016	1	1.571	8	0.009	1	0.008	1	0.004	0.004	0.070	[redacted]	1.571	[redacted]
249	M25	6in Dia. Duct	Sec 5 - max	0.038	6	0.348	6	0.000	1	-0.117	1	0.807	9	0.854	7	-0.003	1	0.009	1	0.008	1	0.003	0.036	0.038	[redacted]	0.854	[redacted]
251	M26	6in Dia. Duct	Sec 1 - max,	0.038	6	0.058	9	0.000	1	-0.117	1	0.807	9	0.854	7	-0.003	1	0.009	1	0.008	1	0.003	0.036	0.038	[redacted]	0.854	[redacted]
290	M29	6in Dia. Duct	Sec 5 - min	-0.034	7	-0.027	1	0.000	1	-1.381	7	-1.229	8	-0.104	9	-0.277	6	0.000	1	0.000	1	0.003	0.061	0.012	[redacted]	1.381	[redacted]
289	M29	6in Dia. Duct	Sec 5 - max	0.028	8	0.026	8	0.024	6	1.229	8	1.381	7	0.277	6	0.104	9	0.107	8	0.090	8	0.002	0.061	0.012	[redacted]	1.381	[redacted]
25	M3	4in Dia. Duct	Sec 3 - max	0.032	9	0.050	8	0.133	9	0.179	1	0.207	8	1.418	9	0.829	6	-0.037	1	-0.082	1	0.003	0.009	0.063	[redacted]	1.418	[redacted]
250	M25	6in Dia. Duct	Sec 5 - min	0.000	1	-0.033	1	-0.093	6	-0.807	9	0.117	1	0.003	1	-0.854	7	-0.924	6	-0.773	6	0.000	0.036	0.038	[redacted]	0.854	[redacted]
252	M26	6in Dia. Duct	Sec 1- min	0.000	1	0.033	1	-0.093	8	-0.807	9	0.117	1	0.003	1	-0.854	7	-0.924	6	-0.773	6	0.000	0.036	0.038	[redacted]	0.854	[redacted]
284	M27	6in Dia. Duct	Sec 2 - min	0.000	1	-0.010	1	-0.081	7	0.052	9	-0.089	1	-1.571	8	-0.018	1	-0.924	6	-0.773	6	0.000	0.004	0.070	[redacted]	1.571	[redacted]
288	M29	6in Dia. Duct	Sec 4 - min	-0.033	7	-0.024	1	0.000	1	-1.349	7	-1.192	8	-0.108	9	-0.244	6	0.000	1	0.000	1	0.003	0.060	0.011	[redacted]	1.349	[redacted]
287	M29	6in Dia. Duct	Sec 4 - max	0.029	8	0.029	8	0.028	6	1.192	8	1.349	7	0.244	6	0.108	9	0.107	8	0.090	8	0.002	0.060	0.011	[redacted]	1.349	[redacted]
26	M3	4in Dia. Duct	Sec 3 - min	0.000	6	0.041	1	0.000	6	-0.207	8	-0.179	1	-0.829	6	-1.418	9	-0.094	8	-0.206	8	0.000	0.009	0.063	[redacted]	1.418	[redacted]
17	M2	4in Dia. Duct	Sec 4 - max	0.019	9	0.101	8	0.159	9	-0.355	1	0.823	8	0.122	9	0.743	6	-0.037	1	-0.082	1	0.002	0.037	0.033	[redacted]	0.823	[redacted]
286	M29	6in Dia. Duct	Sec 3 - min	-0.031	7	-0.023	7	0.000	9	-1.318	7	-1.152	8	-0.107	9	-0.209	6	0.000	1	0.000	1	0.003	0.059	0.009	[redacted]	1.318	[redacted]
285	M29	6in Dia. Duct	Sec 3 - max	0.028	8	0.032	8	0.027	8	1.152	8	1.318	7	0.209	6	0.107	9	0.107	8	0.090	8	0.002	0.059	0.009	[redacted]	1.318	[redacted]
18	M2	4in Dia. Duct	Sec 4 - min	0.004	1	0.092	1	-0.028	6	-0.823	8	0.355	1	-0.743	6	-0.122	9	-0.094	8	-0.206	8	0.000	0.037	0.033	[redacted]	0.823	[redacted]
261	M27	6in Dia. Duct	Sec 1 - max	0.047	6	0.021	9	0.000	1	0.112	1	0.012	9	0.016	1	1.322	8	0.009	1	0.008	1	0.004	0.005	0.059	[redacted]	1.322	[redacted]
283	M29	6in Dia. Duct	Sec 2 - max	0.030	8	0.035	8	0.029	6	1.108	8	1.289	7	0.172	6	0.106	9	0.107	8	0.090	8	0.002	0.057	0.008	[redacted]	1.289	[redacted]
284	M29	6in Dia. Duct	Sec 2 - min	-0.030	7	-0.021	7	-0.002	9	-1.289	7	-1.108	8	-0.106	9	-0.172	6	0.000	1	0.000	1	0.002	0.057	0.008	[redacted]	1.289	[redacted]
71	M6	4in Dia. Duct	Sec 1 - max	0.061	9	0.026	8	0.011	8	0.237	1	-0.171	8	1.111	9	0.600	6	-0.044	8	-0.098	8	0.006	0.011	0.049	[redacted]	1.111	[redacted]
115	M12	4in Dia. Duct	Sec 3 - max	0.056	9	-0.048	8	0.150	7	-0.288	1	0.426	6	0.926	6	0.064	9	0.055	8	0.120	8	0.005	0.019	0.041	[redacted]	0.926	[redacted]
279	M28	6in Dia. Duct	Sec 5 - max	0.030	8	0.037	8	0.030	6	1.059	8	1.262	7	0.134	6	0.103	9	0.107	8	0.090	8	0.002	0.056	0.006	[redacted]	1.262	[redacted]
281	M29	6in Dia. Duct	Sec 1 - max	0.030	8	0.038	8	0.030	6	1.059	8	1.262	7	0.134	6	0.103	9	0.107	8	0.090	8	0.002	0.056	0.006	[redacted]	1.262	[redacted]
280	M28	6in Dia. Duct	Sec 5 - min	-0.029	7	-0.021	7	-0.003	9	-1.282	7	-1.059	8	-0.103	9	-0.134	6	0.000	1	0.000	1	0.002	0.056	0.006	[redacted]	1.262	[redacted]
282	M29	6in Dia. Duct	Sec 1- min	-0.028	7	-0.020	7	-0.003	9	-1.282	7	-1.059	8	-0.103	9	-0.134	6	0.000	1	0.000	1	0.002	0.056	0.006	[redacted]	1.262	[redacted]
262	M27	6in Dia. Duct	Sec 1- min	0.000	1	-0.002	1	-0.077	7	-0.012	9	-0.112	1	-1.322	8	-0.016	1	-0.924	6	-0.773	6	0.000	0.005	0.059	[redacted]	1.322	[redacted]
23	M3	4in Dia. Duct	Sec 2 - max	0.031	9	0.054	8	0.136	9	0.042	1	0.372	8	0.990	9	0.824	6	-0.037	1	-0.082	1	0.003	0.017	0.044	[redacted]	0.990	[redacted]
21	M3	4in Dia. Duct	Sec 1 - max	0.029	9	0.059	8	0.138	9	-0.109	1	0.552	8	0.555	9	0.811	6	-0.037	1	-0.082	1	0.003	0.025	0.036	[redacted]	0.811	[redacted]
19	M2	4in Dia. Duct	Sec 5 - max	0.020	9	0.097	8	0.157	9	-0.109	1	0.552	8	0.555	9	0.811	6	-0.037	1	-0.082	1	0.002	0.025	0.036	[redacted]	0.811	[redacted]
116	M12	4in Dia. Duct	Sec 3 - min	-0.024	8	-0.055	1	-0.017	8	-0.425	6	0.288	1	-0.004	9	-0.926	6	0.002	1	0.005	1	0.002	0.019	0.041	[redacted]	0.926	[redacted]
142	M15	6in Dia. Duct	Sec 1- min	-0.004	9	-0.014	7	-0.023	9	-0.772	7	-0.119	1	-0.611	6	-0.277	9	0.000	1	0.000	1	0.000	0.034	0.027	[redacted]	0.772	[redacted]
277	M28	6in Dia. Duct	Sec 4 - max	0.030	8	0.040	8	0.032	6	1.008	8	1.235	7	0.093	6	0.098	9	0.107	8	0.090	8	0.002	0.055	0.004	[redacted]	1.235	[redacted]
141	M15	6in Dia. Duct	Sec 1 - max	0.000	6	0.108	8	0.051	6	0.119	1	0.772	7	0.277	9	0.611	6	0.110	8	0.092	8	0.000	0.034	0.027	[redacted]	0.772	[redacted]
278	M28	6in Dia. Duct	Sec 4 - min	-0.027	7	-0.020	7	-0.004	9	-1.235	7	-1.008	8	-0.098	9	-0.093	6	0.000	1	0.000	1	0.002	0.055	0.004	[redacted]	1.235	[redacted]
20	M2	4in Dia. Duct	Sec 5 - min	0.004	1	0.088	1	-0.024	8	-0.552	8	0.109	1	-0.811	6	-0.555	9	-0.094	8	-0.206	8	0.000	0.025	0.036	[redacted]	0.811	[redacted]
22	M3	4in Dia. Duct	Sec 1- min	0.003	8	0.050	1	-0.005	8	-0.552	8	0.109	1	-0.811	6	-0.555	9	-0.094	8	-0.206	8	0.000	0.025	0.036	[redacted]	0.811	[redacted]
24	M3	4in Dia. Duct	Sec 2 - min	0.002	6	0.045	1	-0.003	6	-0.372	8	-0.042	1	-0.824	6	-0.990	9	-0.094	8	-0.206	8	0.000	0.017	0.044	[redacted]	0.990	[redacted]
275	M28	6in Dia. Duct	Sec 3 - max	0.031	8	0.043	8	0.033	6	0.954	8	1.209	7	0.051	6	0.092	9	0.107	8	0.090	8	0.003	0.054	0.004	[redacted]	1.209	[redacted]
72	M6	4in Dia. Duct	Sec 1- min	0.004	1	0.017	1	-0.075	9	0.171	8	-0.237	1	-0.600	6	-1.111	9	-0.112	1	-0.247	1	0.000	0.011	0.049	[redacted]	1.111	[redacted]
276	M28	6in Dia. Duct	Sec 3 - min	-0.028	7	-0.019	7	-0.006	9	-1.209	7	-0.954	8	-0.092	9	-0.051	6	0.000	1	0.000	1	0.002	0.054	0.004	[redacted]	1.209	[redacted]
76	M6	4in Dia. Duct	Sec 3 - max	0.062	7	0.004	8	0.022	6	0.400	6	-0.329	1	0.351	8	0.808	7	-0.044	8	-0.096	8	0.008	0.018	0.036	[redacted]	0.808	[redacted]
273	M28	6in Dia. Duct	Sec 2 - max	0.031	8	0.046	8	0.034	6	0.895	8	1.185	7	0.007	7	0.084	8	0.107	8	0.090	8	0.003	0.053	0.004	[redacted]	1.185	[redacted]
274	M28	6in Dia. Duct	Sec 2 - min	-0.024	7	-0.018	7	-0.007	9	-1.185	7	-0.895	8.	-0.084	8	-0.007	7	0.000	1	0.000	1	0.002	0.053	0.004	[redacted]	1.185	[redacted]
271	M28	6in Dia. Duct	Sec 1 - max	0.031	8	0.049	8	0.036	8	0.832	8	1.162	7	0.000	1	0.075	8	0.107	8	0.090	8	0.003	0.052	0.003	[redacted]	1.162	[redacted]
144	M15	6in Dia. Duct	Sec 2 - min	-0.008	9	-0.021	7	-0.020	9	-0.832	7	-0.155	1	-0.444	6	-0.204	9	0.000	1	0.000	1	0.000	0.037	0.020	[redacted]	0.832	[redacted]
272	M28	6in Dia. Duct	Sec 1- min	-0.023	7	-0.017	7	-0.009	9	-1.162	7	-0.832	8	-0.075	8	0.000	1	0.000	1	0.000	1	0.002	0.052	0.003	[redacted]	1.162	[redacted]
143	M15	6in Dia. Duct	Sec 2 - max	0.001	6	0.101	8	0.047	6	0.155	1	0.832	7	0.204	9	0.444	6	0.110	8	0.092	8	0.000	0.037	0.020	[redacted]	0.832	[redacted]
253	M26	6in Dia. Duct	Sec 2 - max	0.040	6	0.048	9	0.000	1	-0.002	1	0.596	9	0.606	7	-0.005	1	0.009	1	0.008	1	0.003	0.026	0.027	[redacted]	0.606	[redacted]
150	M15	6in Dia. Duct	Sec 5 - min	-0.012	9	-0.043	7	-0.009	9	-1.162	7	-0.832	8	-0.026	7	-0.065	8	0.000	1	0.000	1	0.001	0.052	0.003	[redacted]	1.162	[redacted]
149	M15	6in Dia. Duct	Sec 5 - max	0.007	6	0.079	8	0.038	6	0.832	8	1.162	7	0.065	8	0.028	7	0.110	8	0.092	8	0.001	0.052	0.003	[redacted]	1.162	[redacted]
146	M15	6in Dia. Duct	Sec 3 - min	-0.008	9	-0.028	7	-0.016	9	-0.917	7	-0.242	8	-0.290	6	-0.143	9	0.000	1	0.000	1	0.001	0.041	0.013	[redacted]	0.917	[redacted]
76	M8	4in Dia. Duct	Sec 3 - min	0.004	1	-0.005	1	-0.086	9	0.329	1	-0.400	6	-0.808	7	-0.351	8	-0.112	1	-0.247	1	0.000	0.018	0.036	[redacted]	0.808	[redacted]
145	M15	6in Dia. Duct	Sec 3 - max	0.003	6	0.094	8	0.043	6	0.242	8	0.917	7	0.143	9	0.290	6	0.110	8	0.092	8	0.000	0.041	0.013	[redacted]	0.917	[redacted]
254	M26	6in Dia. Duct	Sec 2 - min	0.000	1	0.024	1	-0.089	8	-0.596	9	0.002	1	0.005	1	-0.608	7	-0.924	6	-0.773	6	0.000	0.026	0.027	[redacted]	0.606	[redacted]
148	M15	6in Dia. Duct	Sec 4 - min	-0.010	9	-0.038	7	-0.012	9	-1.027	7	-0.550	8	-0.151	7	-0.097	8	0.000	1	0.000	1	0.001	0.046	0.007	[redacted]	1.027	[redacted]
147	M15	6in Dia. Duct	Sec 4 - max	0.005	6	0.086	8	0.039	6	0.550	8	1.027	7	0.097	8	0.151	7	0.110	8	0.092	8	0.000	0.046	0.007	[redacted]	1.027	[redacted]

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{sy}/σ_a	f_{sz}/σ_a	[redacted]	f_t (ksi)	[redacted]
113	M12	4in Dia. Duct	Sec 2 - max	0.053	9	-0.035	8	0.144	7	0.103	1	0.103	8	0.784	8	0.965	7	0.055	8	0.120	8	0.005	0.005	0.043	[redacted]	0.965	[redacted]
114	M12	4in Dia. Duct	Sec 2 - min	-0.021	6	-0.044	1	-0.011	8	-0.103	8	-0.103	1	-0.965	7	-0.784	8	0.002	1	0.005	1	0.002	0.005	0.043	[redacted]	0.965	[redacted]
259	M26	6in Dia. Duct	Sec 5 - max	0.047	6	0.021	9	0.000	1	0.129	1	0.176	9	0.012	1	0.785	8	0.009	1	0.008	1	0.004	0.008	0.035	[redacted]	0.785	[redacted]
73	M8	4in Dia. Duct	Sec 2 - max	0.059	7	0.015	8	0.017	6	0.328	6	-0.320	9	0.523	9	0.495	6	-0.044	8	-0.096	8	0.006	0.015	0.023	[redacted]	0.523	[redacted]
260	M26	6in Dia. Duct	Sec 5 - min	0.000	1	-0.002	1	-0.077	7	-0.176	9	-0.129	1	-0.785	8	-0.012	1	-0.924	6	-0.773	6	0.000	0.008	0.035	[redacted]	0.785	[redacted]
74	M8	4in Dia. Duct	Sec 2 - min	0.004	1	0.006	1	-0.081	9	0.320	9	-0.328	6	-0.495	6	-0.523	9	-0.112	1	-0.247	1	0.000	0.015	0.023	[redacted]	0.523	[redacted]
257	M26	6in Dia. Duct	Sec 4 - max	0.044	6	0.030	9	0.000	1	0.121	1	0.281	9	0.055	7	0.493	8	0.009	1	0.008	1	0.004	0.012	0.022	[redacted]	0.493	[redacted]
255	M26	6in Dia. Duct	Sec 3 - max	0.042	6	0.039	9	0.000	1	0.077	1	0.421	9	0.339	7	0.182	8	0.009	1	0.006	1	0.003	0.019	0.015	[redacted]	0.421	[redacted]
256	M26	6in Dia. Duct	Sec 4 - min	0.000	1	0.006	1	-0.080	6	-0.281	9	-0.121	1	-0.493	8	-0.055	7	-0.924	6	-0.773	8	0.000	0.012	0.022	[redacted]	0.493	[redacted]
258	M26	6in Dia. Duct	Sec 3 - min	0.000	1	0.015	1	-0.084	6	-0.421	9	-0.077	1	-0.182	8	-0.339	7	-0.924	8	-0.773	6	0.000	0.019	0.015	[redacted]	0.421	[redacted]
181	M19	6in Dia. Duct	Sec 1 - max	0.001	6	0.002	9	0.001	8	0.000	6	0.000	7	0.000	7	0.000	8	0.000	1	0.000	1	0.000	0.000	0.000	[redacted]	0.001	[redacted]
182	M19	6in Dia. Duct	Sec 1 - min	0.000	7	0.000	8	-0.001	6	0.000	7	0.000	6	0.000	8	0.000	7	0.000	1	0.000	1	0.000	0.000	0.000	[redacted]	0.000	[redacted]
183	M19	6in Dia. Duct	Sec 2 - max	0.000	6	0.002	9	0.000	8	0.000	6	0.000	7	0.000	7	0.000	8	0.000	1	0.000	1	0.000	0.000	0.000	[redacted]	0.000	[redacted]
184	M19	6in Dia. Duct	Sec 2 - min	0.000	7	0.000	8	0.000	6	0.000	7	0.000	6	0.000	8	0.000	7	0.000	1	0.000	1	0.000	0.000	0.000	[redacted]	0.000	[redacted]
185	M19	6in Dia. Duct	Sec 3 - max	0.000	6	0.001	9	0.000	8	0.000	6	0.000	7	0.000	7	0.000	8	0.000	1	0.000	1	0.000	0.000	0.000	[redacted]	0.000	[redacted]
186	M19	6in Dia. Duct	Sec 3 - min	0.000	7	0.000	8	0.000	6	0.000	7	0.000	6	0.000	8	0.000	7	0.000	1	0.000	1	0.000	0.000	0.000	[redacted]	0.000	[redacted]
187	M19	6in Dia. Duct	Sec 4 - max	0.000	6	0.000	9	0.000	8	0.000	6	0.000	7	0.000	7	0.000	9	0.000	1	0.000	1	0.000	0.000	0.000	[redacted]	0.000	[redacted]
188	M19	6in Dia. Duct	Sec 4 - min	0.000	7	0.000	8	0.000	8	0.000	7	0.000	6	0.000	9	0.000	7	0.000	1	0.000	1	0.000	0.000	0.000	[redacted]	0.000	[redacted]
189	M19	6in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	[redacted]	0.000	[redacted]
190	M19	6in Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	[redacted]	0.000	[redacted]

amec

CALCULATION SHEET

CALC. NO.:	145579-V-CA-005	REV:	1	DATE:	March 26, 2006
CALC. TITLE:	Off-Gas Treatment System Pipe Stress Analysis				
PROJECT NO.:	145579	PROJECT TITLE:	Final DBVS Design		

Attachment 12: Excel Spreadsheet – Model 4 AG-1 Analysis and Unity Checks

NOTE: This cover sheet represents the approval signatures of the originator and checker for all pages of this attachment

ORIGINATOR:	DATE:	CHECKER:	DATE:
Kevin M. Jones KMJ	3/26/06	J. Van Corbach JVC	3/26/06

Duct Size	σ_b (ksi) Eq. 1b	σ_a (ksi) Eq. 6 or 7	ϵ_a (ksi) Eq. 5	ϵ_b (ksi) Eq. 9	τ_t (ksi) Eq. 9	σ_s (ksi) Eq. 10	Temp	Material
2in Dia. Duct	4.5	27.0	22.5	32.3	15.6	15.6	100	CS
3in Dia. Duct	9.5	27.0	22.6	36.9	15.6	15.6	100	CS
4in Dia. Duct	11.8	27.0	22.5	34.3	15.6	15.6	100	CS
6in Dia. Duct	12.2	22.6	16.8	30.6	13.0	13.0	100	SS

Model 4

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a		f_s (ksi)	
511	M52	RIGID	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	NC	NC	NC		0.000	
512	M52	RIGID	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	NC	NC	NC		0.000	
513	M52	RIGID	Sec 2 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	NC	NC	NC		0.000	
514	M52	RIGID	Sec 2 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	NC	NC	NC		0.000	
515	M52	RIGID	Sec 3 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	NC	NC	NC		0.000	
516	M52	RIGID	Sec 3 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	NC	NC	NC		0.000	
517	M52	RIGID	Sec 4 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	NC	NC	NC		0.000	
518	M52	RIGID	Sec 4 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	NC	NC	NC		0.000	
519	M52	RIGID	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	NC	NC	NC		0.000	
520	M52	RIGID	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	NC	NC	NC		0.000	
579	M58	6in Dia. Duct	Sec 5 - max	0.556	6	-0.033	1	0.565	7	1.479	9	3.455	6	6.844	7	-0.153	1	0.938	7	0.765	7	0.048	0.154	0.304		6.844	
580	M58	6in Dia. Duct	Sec 5 - min	0.047	1	-0.439	6	-0.306	6	-3.455	6	-1.479	9	0.153	1	-6.844	7	0.061	1	0.051	1	0.004	0.154	0.304		6.844	
599	M60	4in Dia. Duct	Sec 5 - max	0.473	7	0.114	6	-0.001	1	0.050	1	4.117	7	-0.081	1	6.689	7	0.381	7	0.870	7	0.040	0.152	0.249		6.689	
597	M60	4in Dia. Duct	Sec 4 - max	0.474	7	0.115	6	-0.001	1	0.060	1	4.194	7	-0.080	1	6.515	7	0.381	7	0.870	7	0.040	0.155	0.241		6.515	
598	M59	4in Dia. Duct	Sec 5 - max	0.472	7	-0.017	1	-0.001	1	0.086	1	4.427	7	-0.058	1	6.238	7	0.010	6	0.022	6	0.040	0.164	0.231		6.238	
1179	M118	2in Dia. Duct	Sec 5 - max	0.065	6	0.008	3	0.000	1	-0.018	1	4.211	2	-0.018	1	7.121	6	0.004	3	0.055	3	0.014	0.156	0.264		7.121	
595	M60	4in Dia. Duct	Sec 3 - max	0.474	7	0.116	6	-0.001	1	0.069	1	4.271	7	-0.079	1	6.340	7	0.381	7	0.870	7	0.040	0.158	0.235		6.340	
449	M45	6in Dia. Duct	Sec 5 - max	0.298	6	0.241	6	-0.005	6	5.200	6	3.681	9	-0.183	1	3.984	7	0.613	6	0.514	6	0.024	0.231	0.177		5.200	
593	M60	4in Dia. Duct	Sec 2 - max	0.475	7	0.116	6	-0.001	1	0.078	1	4.349	7	-0.078	1	6.166	7	0.381	7	0.870	7	0.040	0.161	0.228		6.166	
1160	M118	2in Dia. Duct	Sec 5 - min	0.032	1	-0.074	2	-0.192	4	-4.211	2	0.018	1	-7.121	6	0.018	1	-0.010	2	-0.141	2	0.007	0.156	0.264		7.121	
447	M45	6in Dia. Duct	Sec 4 - max	0.296	6	0.241	6	-0.005	1	5.131	6	3.605	9	-0.181	1	3.922	7	0.613	6	0.514	6	0.024	0.228	0.174		5.131	
591	M60	4in Dia. Duct	Sec 1 - max	0.475	7	0.117	6	-0.001	1	0.088	1	4.427	7	-0.077	1	5.990	7	0.381	7	0.870	7	0.040	0.164	0.222		5.990	
1129	M113	2in Dia. Duct	Sec 5 - max	0.058	6	0.000	1	0.000	1	0.018	1	4.730	2	0.005	1	6.302	4	0.001	3	0.017	3	0.013	0.175	0.233		6.302	
421	M43	6in Dia. Duct	Sec 1 - max	0.154	6	0.065	9	0.317	9	5.398	6	1.606	9	3.792	6	2.762	9	1.015	9	0.850	9	0.013	0.240	0.169		5.398	
445	M45	6in Dia. Duct	Sec 3 - max	0.296	6	0.241	6	-0.005	1	5.063	6	3.530	9	-0.180	1	3.860	7	0.613	6	0.514	6	0.024	0.225	0.172		5.063	
458	M46	6in Dia. Duct	Sec 5 - max	0.321	6	-0.005	6	-0.003	6	5.194	6	3.853	9	-0.146	1	3.654	7	0.525	6	0.440	6	0.026	0.231	0.162		5.194	
457	M46	6in Dia. Duct	Sec 4 - max	0.321	6	-0.005	6	-0.004	6	5.196	6	3.840	9	-0.145	1	3.591	7	0.525	6	0.440	6	0.026	0.231	0.160		5.196	
1130	M113	2in Dia. Duct	Sec 6 - min	0.033	1	-0.091	2	-0.163	4	-4.730	2	-0.018	1	-6.302	4	-0.005	1	-0.013	2	-0.171	2	0.007	0.175	0.233		6.302	
443	M45	6in Dia. Duct	Sec 2 - max	0.295	6	0.241	6	-0.005	1	4.994	6	3.455	9	-0.178	1	3.798	7	0.613	6	0.514	6	0.024	0.222	0.169		4.994	
450	M45	6in Dia. Duct	Sec 5 - min	-0.077	9	-0.265	9	-0.219	7	-3.681	9	-5.200	6	-3.984	7	0.183	1	-0.432	7	-0.362	7	0.006	0.231	0.177		5.200	
455	M46	6in Dia. Duct	Sec 3 - max	0.321	6	-0.005	6	-0.004	6	5.197	6	3.786	9	-0.143	1	3.529	7	0.525	6	0.440	6	0.026	0.231	0.157		5.197	
453	M46	6in Dia. Duct	Sec 2 - max	0.320	6	-0.004	6	-0.004	6	5.199	6	3.733	9	-0.142	1	3.467	7	0.525	6	0.440	6	0.026	0.231	0.154		5.199	
971	M98	2in Dia. Duct	Sec 1 - max	0.136	7	0.036	5	0.114	8	0.431	8	0.192	1	0.025	1	9.840	6	0.017	2	0.225	2	0.030	0.018	0.384		9.840	
422	M43	6in Dia. Duct	Sec 1 - min	-0.016	9	-0.381	6	-0.317	8	-1.608	9	-5.398	6	-2.762	9	-3.792	6	0.021	1	0.018	1	0.001	0.240	0.169		5.398	
479	M48	6in Dia. Duct	Sec 5 - max	0.274	6	-0.048	9	0.014	6	1.159	6	4.342	9	-0.102	1	4.368	7	0.248	6	0.208	6	0.022	0.193	0.194		4.368	
441	M45	6in Dia. Duct	Sec 1 - max	0.295	6	0.241	6	-0.005	1	4.926	6	3.381	9	-0.177	1	3.736	7	0.613	6	0.514	6	0.024	0.219	0.166		4.926	
451	M40	6in Dia. Duct	Sec 1 - max	0.320	6	-0.004	6	-0.005	6	5.200	6	3.680	9	-0.140	1	3.414	9	0.525	6	0.440	6	0.026	0.231	0.152		5.200	
448	M45	6in Dia. Duct	Sec 4 - min	-0.077	9	-0.265	9	-0.218	7	-3.605	9	-5.131	6	-3.922	7	0.181	1	-0.432	7	-0.362	7	0.006	0.228	0.174		5.131	
577	M58	6in Dia. Duct	Sec 4 - max	0.553	6	-0.033	1	0.562	7	1.668	9	2.499	6	5.613	7	-0.151	1	0.938	7	0.765	7	0.045	0.111	0.249		5.613	
439	M44	6in Dia. Duct	Sec 5 - max	0.228	6	0.448	6	-0.005	1	4.926	6	3.377	9	0.234	8	3.732	7	0.645	9	0.540	9	0.019	0.219	0.166		4.926	
460	M46	6in Dia. Duct	Sec 5 - min	-0.122	9	-0.189	9	-0.221	7	-3.893	9	-5.194	6	-3.654	7	0.146	1	-1.310	7	-1.097	7	0.010	0.231	0.162		5.194	
446	M45	6in Dia. Duct	Sec 3 - min	-0.077	9	-0.284	9	-0.218	7	-3.530	9	-5.063	6	-3.860	7	0.180	1	-0.432	7	-0.362	7	0.006	0.225	0.172		5.063	
600	M60	4in Dia. Duct	Sec 6 - min	0.011	1	-0.014	1	-0.283	8	-4.117	7	-0.050	1	-6.689	7	0.081	1	-0.013	1	-0.029	1	0.001	0.152	0.248		6.689	
458	M46	6in Dia. Duct	Sec 4 - min	-0.122	9	-0.189	9	-0.220	7	-3.840	9	-5.196	6	-3.591	7	0.145	1	-1.310	7	-1.097	7	0.010	0.231	0.160		5.196	
973	M98	2in Dia. Duct	Sec 2 - max	0.135	7	0.034	5	0.112	6	0.557	8	0.050	1	0.024	1	9.446	8	0.017	2	0.225	2	0.030	0.021	0.350		9.446	
460	M48	6in Dia. Duct	Sec 6 - min	-0.162	9	-0.385	6	-0.238	7	-4.342	9	-1.158	6	-4.368	7	0.102	1	-2.332	7	-1.952	7	0.013	0.183	0.194		4.368	
456	M46	6in Dia. Duct	Sec 3 - min	-0.122	9	-0.188	9	-0.220	7	-3.786	9	-5.197	6	-3.529	7	0.143	1	-1.310	7	-1.097	7	0.010	0.231	0.157		5.197	
596	M60	4in Dia. Duct	Sec 4 - min	0.011	1	-0.013	1	-0.262	6	-4.194	7	-0.000	1	-6.515	7	0.080	1	-0.013	1	-0.029	1	0.001	0.155	0.241		6.515	
444	M45	6in Dia. Duct	Sec 2 - min	-0.077	9	-0.263	9	-0.217	7	-3.455	9	-4.994	6	-3.798	7	0.178	1	-0.432	7	-0.362	7	0.006	0.222	0.169		4.994	
590	M59	4in Dia. Duct	Sec 5 - min	0.010	1	-0.163	9	-0.261	6	-4.427	7	-0.086	1	-6.238	7	0.058	1	+0.022	9	-0.050	9	0.001	0.164	0.231		6.238	
454	M46	6in Dia. Duct	Sec 2 - min	-0.122	9	-0.187	9	-0.219	7	-3.733	9	-5.199	6	-3.467	7	0.142	1	-1.310	7	-1.097	7	0.010	0.231	0.154		5.199	
437	M44	6in Dia. Duct	Sec 4 - max	0.228	6	0.448	6	-0.005	1	4.798	6	3.291	9	0.235	8	3.670	7	0.645	9	0.540	9	0.019	0.213	0.163		4.798	
389	M39	6in Dia. Duct	Sec 5 - max	0.269	6	-0.014	9	-0.005	1	3.744	9	7.276	6	-0.037	1	1.099	9	0.995	7	0.833	7	0.022	0.323	0.049		7.276	
596	M60	4in Dia. Duct	Sec 3 - min	0.012	1	-0.012	1	-0.262	6	-4.271	7	-0.009	1	-6.340	7	0.079	1	-0.013	1	-0.029	1	0.001	0.158	0.235		6.340	
1001	M101	2in Dia. Duct	Sec 1 - max	0.129	7	0.047	7	0.105	6	0.319	6	0.561	7	0.016	1	9.279	8	0.023	7	0.315	7	0.029	0.021	0.344		9.278	
452	M48	6in Dia. Duct	Sec 1 - min	-0.122	9	-0.186	9	-0.219	7	-3.680	9	-5.200	6	-3.414	9	0.140	1	-1.310	7	-1.097	7	0.010	0.231	0.152		5.200	
821	M83	4in Dia. Duct	Sec 1 - max	0.353	7	0.556	7	0.377	9	0.010	1	3.605	7	-0.098	1	6.175	7	0.647	7	1.477	7	0.030	0.134	0.229		6.175	
11	M2	6in Dia. Duct	Sec 1 - max	0.156	6	-0.077	1	0.008	8	7.358	7	-0.133	1	0.094	1	1.168	8	0.244	1	0.204	1	0.013	0.327	0.052		7.359	
581	M59	4in Dia. Duct	Sec 1 - max	0.512	7	0.035	1	-0.001	1	2.723	7	0.366	1	6.681	7	-0.015	1	0.010	6	0.022	6	0.043	0.101	0.247		6.681	
442	M45	6in Dia. Duct	Sec 1 - min	-0.077	9	-0.263	9	-0.217	7	-3.381	9	-4.926	6	-3.736	7	0.177	1	-0.432	7	-0.362	7	0.006	0.219	0.166		4.926	
594	M60	4in Dia. Duct	Sec 2 - min	0.012	1	-0.011	1	-0.261	6	-4.349	7	-0.078	1	-6.166	7	0.076	1	-0.013	1	-0.029	1	0.001	0.161	0.228		6.166	
975	M98	2in Dia. Duct	Sec 3 - max	0.133	7	0.031	5	0.110	6	0.669	8	-0.078	1	0.022	1	9.051	8	0.017	2	0.225	2	0.030	0.025	0.335		9.051	
387	M39	6in Dia. Duct	Sec 4 - max	0.269	6	-0.013	9	-0.005	1	3.748	9	7.219	6	-0.036	1	1.048	9	0.995	7	0.833	7	0.022	0.321	0.047		7.219	
1079	M106	2in Dia. Duct	Sec 5 - max	0.060	7	0.000	1	0.000	1	0.003	1	4.189	2	-0.000	1	5.934	4	0.002	3	0.029	3	0.013	0.155	0.220		5.934	
592	M60	4in Dia. Duct	Sec 1 - min	0.012	1	-0.010	1	-0.261	6	-4.427	7	-0.086	1	-5.990	7	0.077	1	-0.013	1	-0.029	1	0.001	0.164	0.222		5.990	
435	M44	6in Dia. Duct	Sec 3 - max	0.228	6	0.448	6	-0.005	1	4.671	6	3.206	9	0.237	8	3.609	7	0.645	9	0.540	9	0.019	0.208	0.160		4.671	
440	M44	6in Dia. Duct	Sec 5 - min	-0.021	9	-0.302	9	-0.217	7	-3.377	9	-4.926	6	-3.732	7	-0.234	8	0.000	1	0.000	1	0.002	0.219	0.166		4.926	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{sy}/σ_a	f_{sz}/σ_a		f_s (ksi)	
379	M38	6in Dia. Duct	Sec 5 - max	0.245	8	0.041	9	-0.005	1	3.758	9	7.050	6	-0.021	1	1.179	9	0.907	7	0.759	7	0.020	0.313	0.052		7.050	
385	M39	6in Dia. Duct	Sec 3 - max	0.268	6	-0.012	9	-0.005	1	3.751	9	7.162	6	-0.034	1	0.997	9	0.995	7	0.833	7	0.022	0.316	0.044		7.162	
390	M39	6in Dia. Duct	Sec 5 - min	-0.134	8	-0.200	8	-0.178	9	-7.276	6	-3.744	9	-1.099	9	0.037	1	-0.031	1	-0.028	1	0.011	0.323	0.049		7.276	
1080	M108	2in Dia. Duct	Sec 5 - min	0.033	1	-0.078	2	-0.156	4	-4.189	2	-0.003	1	-5.934	4	0.006	1	-0.012	2	-0.165	2	0.007	0.155	0.220		6.934	
972	M98	2in Dia. Duct	Sec 1 - min	0.000	1	0.033	4	0.000	1	-0.192	1	-0.431	8	-9.640	8	-0.025	1	-0.007	1	-0.095	1	0.000	0.016	0.364		9.640	
383	M39	6in Dia. Duct	Sec 2 - max	0.268	6	-0.012	9	-0.005	1	3.755	9	7.106	6	-0.033	1	0.947	9	0.895	7	0.833	7	0.022	0.316	0.042		7.106	
12	M2	6in Dia. Duct	Sec 1 - min	0.008	1	-1.535	6	-0.006	6	0.133	1	-7.358	7	-1.166	8	-0.094	1	-0.419	9	-0.350	9	0.001	0.327	0.052		7.358	
623	M63	4in Dia. Duct	Sec 2 - max	0.352	7	0.555	7	0.378	9	0.006	1	3.396	7	-0.092	1	6.035	7	0.647	7	1.477	7	0.030	0.126	0.224		6.035	
109	M11	6in Dia. Duct	Sec 6 - max	0.011	6	-0.111	1	0.022	9	-0.782	1	7.439	6	0.013	1	1.063	8	0.250	1	0.209	1	0.001	0.331	0.047		7.439	
110	M11	6in Dia. Duct	Sec 5 - min	-0.011	7	-1.599	6	-0.022	7	-7.439	6	0.782	1	-1.063	8	-0.013	1	-0.495	6	-0.414	6	0.001	0.331	0.047		7.439	
1211	M122	6in Dia. Duct	Sec 1 - max	0.011	8	0.443	8	0.126	6	-0.782	1	7.439	6	0.013	1	1.063	6	0.250	1	0.209	1	0.001	0.331	0.047		7.439	
1212	M122	6in Dia. Duct	Sec 1 - min	-0.011	7	0.066	1	0.000	1	-7.439	6	0.782	1	-1.063	6	-0.013	1	-0.495	8	-0.414	6	0.001	0.331	0.047		7.439	
477	M46	6in Dia. Duct	Sec 4 - max	0.272	6	-0.041	9	0.010	8	2.116	6	4.233	9	-0.090	1	3.778	7	0.248	8	0.208	8	0.022	0.188	0.168		4.233	
977	M98	2in Dia. Duct	Sec 4 - max	0.132	7	0.028	5	0.108	6	0.769	8	-0.193	1	0.021	1	8.654	8	0.017	2	0.225	2	0.029	0.028	0.321		8.654	
388	M39	6in Dia. Duct	Sec 4 - min	-0.133	9	-0.199	6	-0.178	9	-7.219	6	-3.748	9	-1.048	9	0.036	1	-0.031	1	-0.028	1	0.011	0.321	0.047		7.219	
438	M44	6in Dia. Duct	Sec 4 - min	-0.021	9	-0.301	8	-0.217	7	-3.291	9	-4.798	6	-3.670	7	-0.235	8	0.000	1	0.000	1	0.002	0.213	0.163		4.798	
433	M44	6in Dia. Duct	Sec 2 - max	0.225	8	0.447	6	-0.005	1	4.544	8	3.120	9	0.239	8	3.547	7	0.645	9	0.540	9	0.016	0.202	0.158		4.544	
380	M38	6in Dia. Duct	Sec 5 - min	-0.133	7	-0.298	6	-0.178	9	-7.050	6	-3.758	9	-1.179	9	0.021	1	-0.034	1	-0.028	1	0.011	0.313	0.052		7.050	
978	M98	2in Dia. Duct	Sec 6 - max	0.131	7	0.025	5	0.105	6	0.854	8	-0.295	1	0.020	1	8.502	9	0.017	2	0.225	2	0.029	0.032	0.315		8.502	
1003	M101	2in Dia. Duct	Sec 2 - max	0.128	7	0.044	7	0.103	6	0.452	8	0.377	7	0.014	1	8.913	8	0.023	7	0.315	7	0.028	0.017	0.330		8.913	
381	M39	6in Dia. Duct	Sec 1 - max	0.268	6	-0.011	9	-0.005	1	3.758	9	7.050	6	-0.031	1	0.896	9	0.995	7	0.833	7	0.022	0.313	0.040		7.050	
1	M1	6in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	7.390	7	-0.164	1	0.013	1	1.027	8	0.250	1	0.209	1	0.000	0.328	0.046		7.390	
2	M1	6in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.164	1	-7.390	7	-1.027	8	-0.013	1	-0.536	8	-0.448	8	0.000	0.328	0.046		7.390	
3	M1	6in Dia. Duct	Sec 2 - max	0.000	6	-0.002	1	0.000	6	7.389	7	-0.164	1	0.013	1	1.026	8	0.250	1	0.209	1	0.000	0.328	0.046		7.389	
4	M1	6in Dia. Duct	Sec 2 - min	0.000	7	-0.002	1	0.000	6	0.164	1	-7.389	7	-1.026	8	-0.013	1	-0.536	8	-0.448	8	0.000	0.328	0.046		7.389	
5	M1	6in Dia. Duct	Sec 3 - max	0.000	6	-0.003	1	0.002	8	7.387	7	-0.162	1	0.013	1	1.025	8	0.250	1	0.209	1	0.000	0.328	0.046		7.387	
6	M1	6in Dia. Duct	Sec 3 - min	0.000	7	-0.003	1	-0.002	6	0.162	1	-7.387	7	-1.025	8	-0.013	1	-0.536	8	-0.448	8	0.000	0.328	0.046		7.387	
399	M40	6in Dia. Duct	Sec 5 - max	0.288	6	0.032	8	-0.005	1	3.611	9	7.252	6	0.150	6	0.628	9	1.103	9	0.923	9	0.024	0.322	0.028		7.252	
7	M1	6in Dia. Duct	Sec 4 - max	0.001	6	-0.005	1	0.003	8	7.383	7	-0.158	1	0.013	1	1.023	8	0.250	1	0.209	1	0.000	0.328	0.045		7.383	
8	M1	6in Dia. Duct	Sec 4 - min	-0.001	7	-0.005	1	-0.003	6	0.158	1	-7.383	7	-1.023	6	-0.013	1	-0.536	8	-0.448	8	0.000	0.328	0.045		7.383	
386	M39	6in Dia. Duct	Sec 3 - min	-0.133	9	-0.189	6	-0.179	9	-7.182	6	-3.751	9	-0.997	9	0.034	1	-0.031	1	-0.028	1	0.011	0.318	0.044		7.162	
9	M1	6in Dia. Duct	Sec 5 - max	0.002	6	-0.007	1	0.003	8	7.376	7	-0.153	1	0.013	1	1.021	8	0.250	1	0.209	1	0.000	0.328	0.045		7.376	
10	M1	6in Dia. Duct	Sec 5 - min	-0.002	7	-0.007	1	-0.003	6	0.153	1	-7.378	7	-1.021	8	-0.013	1	-0.536	8	-0.448	8	0.000	0.328	0.045		7.378	
1181	M119	6in Dia. Duct	Sec 1 - max	0.002	6	-0.007	6	0.003	8	7.378	7	-0.153	1	0.013	1	1.021	8	0.250	1	0.209	1	0.000	0.328	0.045		7.378	
1182	M119	6in Dia. Duct	Sec 1 - min	-0.002	7	-0.007	2	-0.003	8	0.153	1	-7.378	7	-1.021	8	-0.013	1	-0.536	8	-0.448	8	0.000	0.328	0.045		7.378	
401	M41	6in Dia. Duct	Sec 1 - max	0.262	6	0.247	8	-0.005	1	3.612	9	7.251	6	0.666	6	0.068	1	1.181	9	0.972	9	0.021	0.322	0.030		7.251	
461	M47	6in Dia. Duct	Sec 1 - max	0.298	6	-0.082	9	-0.003	8	5.194	6	3.693	9	-0.082	1	2.682	9	0.356	6	0.298	6	0.024	0.231	0.118		5.194	
1183	M119	6in Dia. Duct	Sec 2 - max	0.002	6	-0.008	6	0.004	8	7.374	7	-0.149	1	0.013	1	1.019	8	0.250	1	0.209	1	0.000	0.328	0.045		7.374	
1184	M119	6in Dia. Duct	Sec 2 - min	-0.002	7	-0.008	2	-0.004	6	0.149	1	-7.374	7	-1.019	8	-0.013	1	-0.536	8	-0.448	8	0.000	0.328	0.045		7.374	
1185	M119	6in Dia. Duct	Sec 3 - max	0.002	6	-0.009	6	0.005	8	7.370	7	-0.144	1	0.013	1	1.017	8	0.250	1	0.209	1	0.000	0.328	0.045		7.370	
1186	M119	6in Dia. Duct	Sec 3 - min	-0.002	7	-0.009	2	-0.005	6	0.144	1	-7.370	7	-1.017	8	-0.013	1	-0.536	8	-0.448	8	0.000	0.328	0.045		7.370	
1187	M119	6in Dia. Duct	Sec 4 - max	0.003	6	-0.010	6	0.005	6	7.364	7	-0.139	1	0.013	1	1.014	8	0.250	1	0.209	1	0.000	0.327	0.045		7.364	
1188	M119	6in Dia. Duct	Sec 4 - min	-0.003	7	-0.010	2	-0.005	6	0.139	1	-7.364	7	-1.014	8	-0.013	1	-0.536	8	-0.448	8	0.000	0.327	0.045		7.364	
483	M47	6in Dia. Duct	Sec 2 - max	0.296	6	-0.082	9	-0.003	8	5.123	6	3.916	9	-0.084	1	2.713	9	0.356	6	0.298	6	0.024	0.228	0.121		5.123	
13	M2	6in Dia. Duct	Sec 2 - max	0.156	6	-0.078	1	0.006	8	6.927	7	-0.111	1	0.094	1	1.165	6	0.244	1	0.204	1	0.013	0.308	0.052		6.927	
1189	M119	6in Dia. Duct	Sec 5 - max	0.003	6	-0.012	6	0.006	8	7.358	7	-0.133	1	0.013	1	1.011	8	0.250	1	0.209	1	0.000	0.327	0.045		7.358	
1190	M119	6in Dia. Duct	Sec 5 - min	-0.003	7	-0.012	2	-0.006	6	0.133	1	-7.358	7	-1.011	8	-0.013	1	-0.536	8	-0.448	8	0.000	0.327	0.045		7.358	
411	M42	6in Dia. Duct	Sec 1 - max	0.198	6	0.423	8	-0.005	1	3.380	9	6.981	6	1.027	6	0.071	1	1.091	9	0.913	9	0.016	0.310	0.048		6.981	
397	M40	6in Dia. Duct	Sec 4 - max	0.288	6	0.033	8	-0.005	1	3.645	9	7.258	6	0.163	6	0.577	9	1.103	9	0.923	9	0.024	0.323	0.026		7.258	
465	M47	6in Dia. Duct	Sec 3 - max	0.296	6	-0.083	9	-0.002	8	5.052	6	3.940	9	-0.085	1	2.764	9	0.356	6	0.298	6	0.024	0.225	0.123		5.052	
467	M47	6in Dia. Duct	Sec 4 - max	0.297	6	-0.084	9	-0.002	8	4.980	6	3.983	9	-0.087	1	2.814	9	0.356	6	0.298	6	0.024	0.221	0.125		4.980	
974	M98	2in Dia. Duct	Sec 2 - min	0.000	1	0.030	4	0.000	1	-0.050	1	-0.557	6	-9.446	6	-0.024	1	-0.007	1	-0.095	1	0.000	0.021	0.350		9.446	
631	M64	4in Dia. Duct	Sec 1 - max	0.223	6	0.554	7	0.674	7	-0.009	1	3.878	7	-0.072	1	5.817	7	0.257	7	0.588	7	0.019	0.144	0.208		5.617	
403	M41	6in Dia. Duct	Sec 2 - max	0.263	6	0.246	8	-0.005	1	3.555	9	7.183	6	0.655	6	0.069	1	1.161	9	0.972	9	0.022	0.319	0.029		7.183	
489	M47	6in Dia. Duct	Sec 5 - max	0.297	6	-0.084	9	-0.001	8	4.908	6	3.967	9	-0.088	1	2.805	9	0.356	6	0.298	6	0.024	0.216	0.127		4.908	
436	M44	6in Dia. Duct	Sec 3 - min	-0.022	9	-0.301	9	-0.216	7	-3.206	9	-4.671	6	-3.609	7	-0.237	8	0.000	1	0.000	1	0.002	0.208	0.160		4.671	
395	M40	6in Dia. Duct	Sec 3 - max	0.287	8	0.033	8	-0.005	1	3.678	9	7.264	6	0.176	6	0.526	9	1.103	9	0.923	9	0.024	0.323	0.023		7.264	
431	M44	6in Dia. Duct	Sec 1 - max	0.225	6	0.447	8	-0.005	1	4.417	6	3.035	9	0.242	8	3.466	7	0.645	9	0.540	9	0.016	0.196	0.155		4.417	
478	M48	6in Dia. Duct	Sec 4 - min	-0.160	9	-0.380	6	-0.234	7	-4.233	9	-2.116	6	-3.778	7	0.090	1	-2.332	7	-1.952	7	0.013	0.188	0.168		4.233	
384	M39	6in Dia. Duct	Sec 2 - min	-0.133	9	-0.198	6	-0.179	9	-7.106	6	-3.755	9	-0.947	9	0.033	1	-0.031	1	-0.028	1	0.011	0.316	0.042		7.106	
393	M40	6in Dia. Duct	Sec 2 - max	0.287	6	0.034	8	-0.005	1	3.711	9	7.270	6	0.189	6	0.475	9	1.103	9	0.923	9	0.024	0.323	0.021		7.270	
601	M61	4in Dia. Duct	Sec 1 - max	0.383	7	0.566	7	-0.001	1	0.050	1	4.117	7	-0.099	1	4.920	7	1.063	7	2.427	7	0.032	0.152	0.182		4.920	
405	M41	6in Dia. Duct	Sec 3 - max	0.263	6	0.246	8	-0.005	1	3.497	9	7.115	6	0.643	6	0.071	1	1.161	9	0.972	9	0.022	0.316	0.029		7.115	
413	M42	6in Dia. Duct	Sec 2 - max	0.198	6	0.423	8	-0.005	1	3.307	9	6.861	6	1.015	6	0.072	1	1.091	9	0.913	9	0.016	0.305	0.045		6.861	
625	M63	4in Dia. Duct	Sec 3 - max	0.352	7	0.555	7	0.378	9	0.001	1	3.188	7	-0.085	1	5.898	7	0.647	7	1.477	7	0.030	0.118	0.218		5.898	
1005	M101	2in Dia. Duct	Sec 3 - max	0.127	7	0.041	7	0.100	6	0.571	8	0.206	7	0.012	1	8.546	8	0.023	7	0.315	7	0.028	0.021	0.317		8.546	
391	M40	6in Dia. Duct	Sec 1 - max	0.287	8	0.034	8	-0.005	1	3.744	9	7.276	6	0.202	6	0.425	9	1.103	9	0.923	9	0.024	0.323	0.019		7.276	
1002	M101	2in Dia. Duct	Sec 1 - min	0.000	1	0.035	8	0.000	1	-0.561	7	-0.318	8	-0.279	8	-0.016	1	-0.006	1	-0.077	1	0.000	0.021	0.344		9.279	
576	M58	6in Dia. Duct	Sec 4 - min	0.045	1	-0.437	6	-0.305	8	-2.499	6	-1.668	9	0.151	1	-5.613	7	0.091	1	0.051	1	0.004	0.111	0.249		5.613	
382	M39	6in Dia. Duct	Sec 1 - min	-0.133	9	-0.197	6	-0.179	9	-7.050	6	-3.758	9	-0.896	9	0.031	1	-0.031	1	-0.028	1	0.011	0.313	0.040		7.050	
622	M63	4in Dia. Duct	Sec 1 - min	0.010	1	-0.011	1	0.017	1	-3.605	7	-0.010	1	-6.175	7	0.098	1	0.000	1	0.002	1	0.001	0.134	0.229		6.175	
407	M41	6in Dia. Duct	Sec 4 - max	0.283	6	0.246	8	-0.005	1	3.439	9	7.047	6	0.630	6	0.072	1	1.161	9	0.972	9	0.022	0.313	0.028		7.047	
434	M44	6in Dia. Duct	Sec 2 - min	-0.022	9	-0.300	9	-0.216	7	-3.120	9	-4.544	8	-3.547	7	-0.239	8	0.000	1	0.000	1	0.002	0.202	0.158		4.544	
482	M47	6in Dia. Duct	Sec 1 - min	-0.149	9	-0.251	6	-0.221	7	-3.893	8	-5.194	6	-2.662	9	0.082	1	-2.046	7	-1.713	7	0.012	0.231	0.116		5.194	
484	M47	6in Dia. Duct	Sec 2 - min	-0.149	9	-0.251	6	-0.221	7	-3.916	8	-5.123	6	-2.713	9	0.084	1	-2.046	7	-1.713	7	0.012	0.228	0.121		5.123	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{sy}/σ_a	f_{sz}/σ_a		f_t (ksi)	
415	M42	6in Dia. Duct	Sec 3 - max	0.198	8	0.424	6	-0.005	1	3.234	9	6.740	6	1.002	6	0.074	1	1.091	9	0.913	9	0.016	0.300	0.045		6.740	
14	M2	6in Dia. Duct	Sec 2 - min	0.008	1	-1.536	9	-0.006	6	0.111	1	-8.927	7	-1.165	8	-0.094	1	-0.419	9	-0.350	9	0.001	0.308	0.052		8.927	
400	M40	6in Dia. Duct	Sec 5 - min	-0.121	9	-0.130	7	-0.179	7	-7.252	6	-3.611	9	-0.628	9	-0.150	6	-0.020	1	-0.017	1	0.010	0.322	0.028		7.252	
976	M98	2in Dia. Duct	Sec 3 - min	0.000	1	0.026	4	0.000	1	0.078	1	-0.669	8	-9.051	8	-0.022	1	-0.007	1	-0.095	1	0.000	0.025	0.335		9.051	
466	M47	6in Dia. Duct	Sec 3 - min	-0.149	9	-0.252	6	-0.221	7	-3.940	9	-5.052	8	-2.764	9	0.085	1	-2.046	7	-1.713	7	0.012	0.225	0.123		5.052	
981	M99	2in Dia. Duct	Sec 1 - max	0.102	7	0.025	5	0.176	2	0.593	6	-0.294	7	0.020	1	8.502	9	0.028	2	0.384	2	0.023	0.022	0.315		8.502	
412	M42	6in Dia. Duct	Sec 1 - min	-0.043	9	-0.257	7	-0.161	7	-6.981	6	-3.380	9	-0.071	1	-1.027	6	0.013	1	0.011	1	0.004	0.310	0.046		6.981	
402	M41	6in Dia. Duct	Sec 1 - min	-0.089	8	-0.209	7	-0.179	7	-7.251	6	-3.612	9	-0.068	1	-0.668	6	-0.005	1	-0.004	1	0.007	0.322	0.030		7.251	
409	M41	6in Dia. Duct	Sec 5 - max	0.264	6	0.245	8	-0.005	1	3.381	9	6.979	6	0.617	6	0.079	9	1.161	9	0.872	8	0.022	0.310	0.027		6.979	
468	M47	6in Dia. Duct	Sec 4 - min	-0.149	9	-0.252	6	-0.222	7	-3.953	9	-4.980	6	-2.614	9	0.087	1	-2.046	7	-1.713	7	0.012	0.221	0.125		4.980	
398	M40	6in Dia. Duct	Sec 4 - min	-0.121	9	-0.129	7	-0.179	7	-7.258	6	-3.645	9	-0.577	9	-0.153	6	-0.020	1	-0.017	1	0.010	0.323	0.026		7.258	
470	M47	6in Dia. Duct	Sec 5 - min	-0.149	9	-0.253	6	-0.222	7	-3.987	9	-4.908	6	-2.865	9	0.088	1	-2.046	7	-1.713	7	0.012	0.216	0.127		4.908	
396	M40	6in Dia. Duct	Sec 3 - min	-0.121	9	-0.129	7	-0.179	9	-7.264	6	-3.678	9	-0.526	9	-0.178	6	-0.020	1	-0.017	1	0.010	0.323	0.023		7.264	
1007	M101	2in Dia. Duct	Sec 4 - max	0.126	7	0.037	7	0.098	6	0.676	8	0.049	7	0.011	1	8.176	8	0.023	7	0.315	7	0.028	0.026	0.303		8.176	
404	M41	6in Dia. Duct	Sec 2 - min	-0.089	9	-0.209	7	-0.180	7	-7.183	6	-3.555	9	-0.069	1	-0.655	6	-0.005	1	-0.004	1	0.007	0.319	0.029		7.183	
417	M42	6in Dia. Duct	Sec 4 - max	0.199	8	0.424	6	-0.005	1	3.161	9	6.620	6	0.989	6	0.075	1	1.091	9	0.913	9	0.016	0.294	0.044		6.620	
394	M40	6in Dia. Duct	Sec 2 - min	-0.121	9	-0.128	7	-0.179	9	-7.270	6	-3.711	9	-0.475	9	-0.189	6	-0.020	1	-0.017	1	0.010	0.323	0.021		7.270	
633	M64	4in Dia. Duct	Sec 2 - max	0.224	8	0.553	7	0.674	7	-0.014	1	3.671	7	-0.063	1	5.374	8	0.257	7	0.586	7	0.019	0.138	0.199		5.374	
414	M42	6in Dia. Duct	Sec 2 - min	-0.042	9	-0.257	7	-0.182	7	-6.861	6	-3.307	9	-0.072	1	-1.015	6	0.013	1	0.011	1	0.003	0.305	0.045		6.861	
15	M2	6in Dia. Duct	Sec 3 - max	0.168	8	-0.078	1	0.006	8	6.496	7	-0.089	1	0.094	1	1.163	8	0.244	1	0.204	1	0.013	0.289	0.052		6.496	
627	M63	4in Dia. Duct	Sec 4 - max	0.352	7	0.554	7	0.378	9	-0.003	1	2.980	7	-0.079	1	5.756	7	0.647	7	1.477	7	0.030	0.110	0.213		5.756	
432	M44	6in Dia. Duct	Sec 1 - min	-0.022	9	-0.299	9	-0.216	7	-3.035	9	-4.417	6	-3.486	7	-0.242	8	0.000	1	0.000	1	0.002	0.196	0.155		4.417	
611	M62	4in Dia. Duct	Sec 1 - max	0.399	7	0.558	7	0.005	1	0.025	1	2.480	7	-0.106	1	6.129	7	0.955	7	2.180	7	0.034	0.092	0.227		6.129	
392	M40	6in Dia. Duct	Sec 1 - min	-0.121	9	-0.128	7	-0.179	9	-7.276	6	-3.744	9	-0.425	9	-0.202	6	-0.020	1	-0.017	1	0.010	0.323	0.019		7.276	
406	M41	6in Dia. Duct	Sec 3 - min	-0.089	9	-0.210	7	-0.180	7	-7.115	6	-3.497	9	-0.071	1	-0.643	6	-0.005	1	-0.004	1	0.007	0.316	0.029		7.115	
632	M64	4in Dia. Duct	Sec 1 - min	0.004	1	-0.013	1	0.025	1	-3.878	7	0.009	1	-5.617	7	0.072	1	0.000	1	0.000	1	0.000	0.144	0.208		5.617	
603	M51	4in Dia. Duct	Sec 2 - max	0.383	7	0.564	7	-0.001	1	0.047	1	3.401	7	-0.101	1	5.224	7	1.063	7	2.427	7	0.032	0.128	0.193		5.224	
582	M59	4in Dia. Duct	Sec 1 - min	0.037	1	-0.132	7	-0.260	7	-0.386	1	-2.723	7	0.015	1	-6.681	7	-0.022	9	-0.050	9	0.003	0.101	0.247		6.681	
624	M63	4in Dia. Duct	Sec 2 - min	0.010	1	-0.012	1	0.017	1	-3.396	7	-0.008	1	-6.035	7	0.092	1	0.000	1	0.002	1	0.001	0.126	0.224		6.035	
329	M33	6in Dia. Duct	Sec 5 - max	0.136	8	0.140	6	0.259	9	2.993	6	0.334	1	4.623	9	-0.181	1	0.049	7	0.041	7	0.011	0.133	0.205		4.623	
330	M33	6in Dia. Duct	Sec 5 - min	-0.136	9	-0.039	1	0.010	1	-0.334	1	-2.993	6	0.181	1	-4.623	9	-0.151	8	-0.126	8	0.011	0.133	0.205		4.623	
351	M36	6in Dia. Duct	Sec 1 - max	0.136	8	0.121	9	0.104	7	2.993	6	0.334	1	4.623	9	-0.181	1	0.049	7	0.041	7	0.011	0.133	0.205		4.623	
352	M36	6in Dia. Duct	Sec 1 - min	-0.136	7	-0.218	6	-0.420	8	-0.334	1	-2.993	6	0.181	1	-4.623	9	-0.151	8	-0.126	8	0.011	0.133	0.205		4.623	
976	M98	2in Dia. Duct	Sec 4 - min	0.000	1	0.023	4	0.000	1	0.193	1	-0.769	8	-8.654	8	-0.021	1	-0.007	1	-0.095	1	0.000	0.028	0.321		8.654	
419	M42	6in Dia. Duct	Sec 5 - max	0.199	6	0.424	6	-0.005	1	3.088	9	6.499	6	0.976	6	0.077	1	1.091	9	0.913	9	0.016	0.289	0.043		6.499	
408	M41	6in Dia. Duct	Sec 4 - min	-0.089	9	-0.210	7	-0.181	7	-7.047	6	-3.439	9	-0.072	1	-0.630	8	-0.005	1	-0.004	1	0.007	0.313	0.028		7.047	
475	M46	6in Dia. Duct	Sec 3 - max	0.270	6	-0.035	9	0.006	6	3.060	8	4.138	9	-0.077	1	3.198	7	0.248	8	0.208	8	0.022	0.164	0.142		4.138	
416	M42	6in Dia. Duct	Sec 3 - min	-0.042	9	-0.257	9	-0.182	7	-6.740	6	-3.234	9	-0.074	1	-1.002	6	0.013	1	0.011	1	0.003	0.300	0.045		6.740	
1004	M101	2in Dia. Duct	Sec 2 - min	0.000	1	0.031	8	0.000	1	-0.377	7	-0.452	8	-8.913	8	-0.014	1	-0.006	1	-0.077	1	0.000	0.017	0.330		8.913	
980	M98	2in Dia. Duct	Sec 5 - min	0.000	1	0.020	4	0.000	1	0.295	1	-0.854	8	-8.502	9	-0.020	1	-0.007	1	-0.095	1	0.000	0.032	0.315		8.502	
21	M3	6in Dia. Duct	Sec 1 - max	0.439	8	-0.007	1	0.007	8	5.633	7	-0.044	1	0.243	1	1.332	8	0.203	1	0.170	1	0.036	0.250	0.059		5.633	
1009	M101	2in Dia. Duct	Sec 5 - max	0.125	7	0.034	7	0.096	6	0.769	8	-0.095	7	0.009	1	7.604	8	0.023	7	0.315	7	0.028	0.026	0.289		7.604	
613	M62	4in Dia. Duct	Sec 2 - max	0.399	7	0.557	7	0.005	1	0.022	1	2.271	7	-0.104	1	6.141	7	0.955	7	2.180	7	0.034	0.084	0.227		6.141	
410	M41	6in Dia. Duct	Sec 5 - min	-0.089	9	-0.210	7	-0.181	7	-6.979	6	-3.381	9	-0.076	9	-0.617	6	-0.005	1	-0.004	1	0.007	0.310	0.027		6.979	
429	M43	6in Dia. Duct	Sec 5 - max	0.177	6	0.088	9	0.340	9	0.023	9	3.004	6	4.395	7	3.365	8	1.015	9	0.850	9	0.015	0.134	0.195		4.395	
418	M42	6in Dia. Duct	Sec 4 - min	-0.042	9	-0.258	9	-0.183	7	-6.820	6	-3.161	9	-0.075	1	-0.989	6	0.013	1	0.011	1	0.003	0.294	0.044		6.820	
16	M2	6in Dia. Duct	Sec 3 - min	0.008	1	-1.536	6	-0.006	6	0.089	1	-6.496	7	-1.163	8	-0.094	1	-0.419	9	-0.350	9	0.001	0.289	0.052		6.496	
629	M63	4in Dia. Duct	Sec 5 - max	0.352	7	0.554	7	0.379	9	-0.008	1	2.773	7	-0.072	1	5.617	7	0.647	7	1.477	7	0.030	0.103	0.208		5.617	
353	M36	6in Dia. Duct	Sec 2 - max	0.137	6	0.118	9	0.103	7	2.759	6	0.274	1	4.645	9	-0.174	1	0.049	7	0.041	7	0.011	0.123	0.206		4.645	
354	M36	6in Dia. Duct	Sec 2 - min	-0.137	7	-0.220	6	-0.419	6	-0.274	1	-2.759	6	0.174	1	-4.645	9	-0.151	8	-0.126	8	0.011	0.123	0.206		4.645	
478	M48	6in Dia. Duct	Sec 3 - min	-0.159	9	-0.375	6	-0.230	7	-4.138	9	-3.060	6	-3.198	7	0.077	1	-2.332	7	-1.952	7	0.013	0.184	0.142		4.138	
471	M46	6in Dia. Duct	Sec 1 - max	0.267	6	-0.025	9	-0.001	8	4.908	6	3.986	9	-0.051	1	2.220	9	0.248	8	0.208	8	0.022	0.218	0.099		4.908	
615	M62	4in Dia. Duct	Sec 3 - max	0.399	7	0.557	7	0.005	1	0.018	1	2.062	7	-0.102	1	6.152	7	0.955	7	2.180	7	0.034	0.076	0.228		6.152	
1006	M101	2in Dia. Duct	Sec 3 - min	0.000	1	0.028	8	0.000	1	-0.206	7	-0.571	8	-8.546	8	-0.012	1	-0.006	1	-0.077	1	0.000	0.021	0.317		8.546	
635	M64	4in Dia. Duct	Sec 3 - max	0.224	6	0.552	7	0.674	7	-0.019	1	3.463	7	-0.054	1	5.139	6	0.257	7	0.586	7	0.019	0.126	0.190		5.139	
628	M63	4in Dia. Duct	Sec 3 - min	0.010	1	-0.012	1	0.017	1	-3.188	7	-0.001	1	-5.696	7	0.085	1	0.000	1	0.002	1	0.001	0.116	0.210		5.696	
982	M99	2in Dia. Duct	Sec 1 - min	0.000	1	0.020	4	0.000	1	0.294	7	-0.593	8	-8.502	9	-0.020	1	0.000	1	-0.002	1	0.000	0.022	0.315		8.502	
605	M61	4in Dia. Duct	Sec 3 - max	0.382	7	0.562	7	-0.001	1	0.042	1	2.687	7	-0.102	1	5.527	7	1.063	7	2.427	7	0.032	0.100	0.205		5.527	
602	M61	4in Dia. Duct	Sec 1 - min	0.013	1	-0.001	1	-0.263	6	-4.117	7	-0.050	1	-4.920	7	0.059	1	-0.002	1	-0.004	1	0.001	0.152	0.182		4.920	
420	M42	6in Dia. Duct	Sec 5 - min	-0.042	9	-0.258	9	-0.183	7	-6.499	6	-3.088	9	-0.077	1	-0.976	6	0.013	1	0.011	1	0.003	0.289	0.043		6.499	
634	M64	4in Dia. Duct	Sec 2 - min	0.004	1	-0.014	1	0.025	1	-3.671	7	0.014	1	-5.374	6	0.063	1	0.000	1	0.000	1	0.000	0.136	0.199		5.374	
481	M49	6in Dia. Duct	Sec 1 - max	0.019	8	0.376	6	0.419	6	4.776	7	0.050	8	-0.104	1	2.726	7	0.000	1	0.000	1	0.002	0.212	0.121		4.776	
482	M49	6in Dia. Duct	Sec 1 - min	-0.019	7	-0.281	7	-0.012	1	-0.050	8	-4.776	7	-2.726	7	0.104	1	0.000	1	0.000	1	0.002	0.212	0.121		4.776	
17	M2	6in Dia. Duct	Sec 4 - max	0.156	8	-0.079	1	0.007	8	6.085	7	-0.067	1	0.094	1	1.161	8	0.244	1	0.204	1	0.013	0.270	0.052		6.085	
1011	M102	2in Dia. Duct	Sec 1 - max	0.100	7	0.034	7	0.161	2	0.553	8	0.252	7	0.009	1	7.604	8	0.023	2	0.316	2	0.022	0.020	0.289		7.604	
355	M36	6in Dia. Duct	Sec 3 - max	0.137	8	0.117	9	0.101	7	2.522	6	0.217	1	4.688	9	-0.168	1	0.049	7	0.041	7	0.011	0.112	0.207		4.688	
350	M36	6in Dia. Duct	Sec 3 - min	-0.137	7	-0.222	8	-0.418	8	-0.217	1	-2.522	6	0.166	1	-4.688	9	-0.151	8	-0.126	8	0.011	0.112	0.207		4.688	
617	M62	4in Dia. Duct	Sec 4 - max	0.399	7	0.556	7	0.005	1	0.014	1	1.854	7	-0.100	1	6.164	7	0.955	7	2.180	7	0.034	0.069	0.228		6.164	
472	M48	6in Dia. Duct	Sec 1 - min	-0.155	9	-0.364	6	-0.222	7	-3.988	9	-4.908	6	-2.220	9	0.051	1	-2.332	7	-1.952	7	0.013	0.218	0.099		4.908	
430	M43	6in Dia. Duct	Sec 5 - min	0.007	8	-0.404	6	-0.340	8	-3.004	6	-0.023	9	-3.365	8	-4.395	7	0.021	1	0.018	1	0.001	0.134	0.195		4.395	
23	M3	6in Dia. Duct	Sec 2 - max	0.439	6	-0.088	1	0.007	8	5.266	7	-0.025	1	0.243	1	1.330	8	0.203	1	0.170	1	0.036	0.234	0.059		5.266	
1008	M101	2in Dia. Duct	Sec 4 - min	0.000	1	0.025	8	0.000	1	-0.049	7	-0.678	8	-8.176	8	-0.011	1	-0.006	1	-0.077	1	0.000	0.025	0.303		8.176	
628	M63	4in Dia. Duct	Sec 4 - min	0.010	1	-0.013	1	0.017	1	-2.980	7	0.003	1	-5.756	7	0.079	1	0.000	1	0.002	1	0.001	0.110	0.213		5.756	
649	M65	4in Dia. Duct	Sec 5 - max	0.140	6	0.533	7	0.750	7	3.446	6	0.331	1	4.992	9	-0.282	1	0.079	6	0.180	6	0.012	0.128	0.165		4.992	
1221	M123	4in Dia. Duct	Sec 1 - max	0.14	6	0.034	1	-0.009	1	3.446	6	0.331	1	4.992	9	-0.282	1	0.079	6	0.180	6	0.012	0.128	0.165		4.992	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a		f_c (ksi)	
499	M50	6in Dia. Duct	Sec 5 - max	0.004	8	0.317	8	0.448	6	4.126	8	0.654	1	3.138	6	0.327	9	0.000	1	0.000	1	0.000	0.183	0.139		4.126	
500	M50	6in Dia. Duct	Sec 5 - min	-0.004	7	-0.339	7	-0.012	1	-0.654	1	-4.126	8	-0.327	9	-3.138	8	0.000	1	0.000	1	0.000	0.183	0.139		4.126	
619	M62	4in Dia. Duct	Sec 5 - max	0.398	7	0.556	7	0.005	1	0.010	1	1.645	7	-0.098	1	6.175	7	0.955	7	2.180	7	0.033	0.061	0.229		6.175	
919	M92	2in Dia. Duct	Sec 5 - max	0.085	7	0.044	3	-0.002	1	0.076	1	1.715	2	0.022	1	6.584	4	0.007	3	0.093	3	0.014	0.064	0.244		6.584	
18	M2	6in Dia. Duct	Sec 4 - min	0.008	1	-1.537	6	-0.007	8	0.087	1	-6.065	7	-1.181	8	-0.094	1	-0.419	9	-0.350	9	0.001	0.270	0.052		6.065	
357	M36	6in Dia. Duct	Sec 4 - max	0.138	6	0.115	9	0.100	7	2.283	8	0.162	1	4.692	9	-0.158	1	0.049	7	0.041	7	0.011	0.101	0.209		4.692	
358	M36	6in Dia. Duct	Sec 4 - min	-0.138	7	-0.225	6	-0.417	8	-0.162	1	-2.283	6	0.158	1	-4.692	9	-0.151	8	-0.126	8	0.011	0.101	0.209		4.692	
607	M61	4in Dia. Duct	Sec 4 - max	0.382	7	0.560	7	-0.001	1	0.034	1	1.976	7	-0.104	1	5.829	7	1.063	7	2.427	7	0.032	0.073	0.216		5.829	
637	M64	4in Dia. Duct	Sec 4 - max	0.224	6	0.552	7	0.674	7	-0.025	1	3.256	7	-0.044	1	4.903	6	0.257	7	0.586	7	0.019	0.121	0.182		4.903	
473	M48	6in Dia. Duct	Sec 2 - max	0.289	6	-0.030	9	0.002	8	3.991	8	4.056	9	-0.064	1	2.687	9	0.248	8	0.208	8	0.022	0.180	0.119		4.056	
604	M61	4in Dia. Duct	Sec 2 - min	0.013	1	-0.003	1	-0.264	6	-3.401	7	-0.047	1	-5.224	7	0.101	1	-0.002	1	-0.004	1	0.001	0.126	0.193		5.224	
612	M62	4in Dia. Duct	Sec 1 - min	0.013	1	-0.009	1	-0.070	6	-2.480	7	-0.025	1	-6.129	7	0.106	1	0.000	1	-0.001	1	0.001	0.092	0.227		6.129	
636	M64	4in Dia. Duct	Sec 3 - min	0.004	1	-0.015	1	0.025	1	-3.463	7	0.019	1	-5.139	6	0.054	1	0.000	1	0.000	1	0.000	0.128	0.190		5.139	
1010	M101	2in Dia. Duct	Sec 5 - min	0.000	1	0.021	6	0.000	1	0.095	7	-0.769	8	-7.804	8	-0.009	1	-0.006	1	-0.077	1	0.000	0.028	0.289		7.804	
987	M99	2in Dia. Duct	Sec 4 - max	0.085	5	-0.048	5	0.208	3	-0.683	5	0.895	4	7.153	3	0.007	1	0.028	2	0.384	2	0.019	0.033	0.265		7.153	
920	M92	2in Dia. Duct	Sec 5 - min	0.034	1	-0.030	2	-0.173	4	-1.715	2	-0.078	1	-6.584	4	-0.022	1	-0.005	2	-0.067	2	0.008	0.064	0.244		6.584	
107	M11	6in Dia. Duct	Sec 4 - max	0.011	6	-0.110	1	0.021	9	-0.683	1	6.020	7	0.013	1	1.044	6	0.250	1	0.209	1	0.001	0.268	0.046		6.020	
108	M11	6in Dia. Duct	Sec 4 - min	-0.011	7	-1.598	6	-0.021	7	-6.020	7	0.683	1	-1.044	6	-0.013	1	-0.495	6	-0.414	6	0.001	0.268	0.046		6.020	
19	M2	6in Dia. Duct	Sec 5 - max	0.150	6	-0.080	1	0.007	8	5.633	7	-0.044	1	0.094	1	1.159	8	0.244	1	0.204	1	0.013	0.250	0.052		5.633	
25	M3	6in Dia. Duct	Sec 3 - max	0.439	6	-0.088	1	0.008	6	4.699	7	-0.006	1	0.243	1	1.326	8	0.203	1	0.170	1	0.036	0.218	0.059		4.699	
359	M36	6in Dia. Duct	Sec 5 - max	0.138	6	0.112	9	0.099	7	2.064	7	0.110	1	4.717	9	-0.150	1	0.049	7	0.041	7	0.011	0.092	0.210		4.717	
360	M36	6in Dia. Duct	Sec 5 - min	-0.138	7	-0.227	6	-0.416	8	-0.110	1	-2.064	7	0.150	1	-4.717	9	-0.151	8	-0.126	8	0.011	0.092	0.210		4.717	
614	M62	4in Dia. Duct	Sec 2 - min	0.013	1	-0.010	1	-0.071	6	-2.271	7	-0.022	1	-6.141	7	0.104	1	0.000	1	-0.001	1	0.001	0.084	0.227		6.141	
650	M65	4in Dia. Duct	Sec 5 - min	0.000	1	-0.034	1	0.028	1	-0.331	1	-3.446	6	0.282	1	-4.992	9	-0.002	1	-0.005	1	0.000	0.128	0.185		4.992	
1222	M123	4in Dia. Duct	Sec 1 - min	0	1	-0.063	8	-0.164	9	-0.331	1	-3.446	6	0.282	1	-4.992	9	-0.002	1	-0.005	1	0.000	0.128	0.185		4.992	
474	M48	6in Dia. Duct	Sec 2 - min	-0.157	9	-0.369	6	-0.226	7	-4.058	9	-3.991	6	-2.687	9	0.064	1	-2.332	7	-1.952	7	0.013	0.180	0.119		4.056	
630	M63	4in Dia. Duct	Sec 5 - min	0.010	1	-0.013	1	0.017	1	-2.773	7	0.008	1	-5.617	7	0.072	1	0.000	1	0.002	1	0.001	0.103	0.206		5.617	
22	M3	6in Dia. Duct	Sec 1 - min	0.023	1	-1.301	6	-0.007	6	0.044	1	-5.633	7	-1.332	8	-0.243	1	-0.149	9	-0.125	9	0.002	0.250	0.059		5.633	
1012	M102	2in Dia. Duct	Sec 1 - min	0.000	1	0.021	8	0.000	1	-0.252	7	-0.553	8	-7.804	8	-0.009	1	-0.001	1	-0.020	1	0.000	0.020	0.289		7.804	
609	M61	4in Dia. Duct	Sec 5 - max	0.381	7	0.556	7	-0.001	1	0.024	1	1.267	7	-0.108	1	6.129	7	1.063	7	2.427	7	0.032	0.047	0.227		6.129	
606	M61	4in Dia. Duct	Sec 3 - min	0.013	1	-0.005	1	-0.265	6	-2.687	7	-0.042	1	-5.527	7	0.102	1	-0.002	1	-0.004	1	0.001	0.100	0.205		5.527	
616	M62	4in Dia. Duct	Sec 3 - min	0.013	1	-0.010	1	-0.071	6	-2.062	7	-0.016	1	-6.152	7	0.102	1	0.000	1	-0.001	1	0.001	0.076	0.226		6.152	
639	M64	4in Dia. Duct	Sec 5 - max	0.224	6	0.551	7	0.673	7	-0.031	1	3.049	7	-0.035	1	4.668	6	0.257	7	0.586	7	0.019	0.113	0.173		4.668	
641	M65	4in Dia. Duct	Sec 1 - max	0.135	6	0.551	7	0.760	7	-0.029	1	3.249	7	-0.035	1	4.668	6	0.079	6	0.180	6	0.011	0.120	0.173		4.668	
20	M2	6in Dia. Duct	Sec 5 - min	0.008	1	-1.538	6	-0.007	8	0.044	1	-5.633	7	-1.159	8	-0.094	1	-0.419	9	-0.350	9	0.001	0.250	0.052		5.633	
638	M64	4in Dia. Duct	Sec 4 - min	0.004	1	-0.015	1	0.025	1	-3.258	7	0.025	1	-4.903	8	0.044	1	0.000	1	0.000	1	0.000	0.121	0.182		4.903	
381	M37	6in Dia. Duct	Sec 1 - max	0.245	8	0.112	9	-0.005	1	1.620	8	0.099	1	4.717	9	-0.150	1	0.906	7	0.759	7	0.020	0.072	0.210		4.717	
1177	M118	2in Dia. Duct	Sec 4 - max	0.059	5	0.001	1	0.000	1	-0.039	1	3.174	2	-0.020	1	4.544	2	0.004	3	0.055	3	0.013	0.118	0.188		4.544	
363	M37	6in Dia. Duct	Sec 2 - max	0.245	8	0.112	9	-0.005	1	1.576	6	0.090	1	4.682	9	-0.149	1	0.906	7	0.759	7	0.020	0.070	0.208		4.682	
988	M99	2in Dia. Duct	Sec 4 - min	0.000	1	-0.053	4	0.000	1	-0.895	4	0.683	5	-0.007	1	-7.153	3	0.000	1	-0.002	1	0.000	0.033	0.265		7.153	
618	M62	4in Dia. Duct	Sec 4 - min	0.013	1	-0.011	1	-0.071	6	-1.854	7	-0.014	1	-6.164	7	0.100	1	0.000	1	-0.001	1	0.001	0.069	0.228		6.164	
849	M85	2in Dia. Duct	Sec 5 - max	0.119	7	0.039	7	0.033	6	0.630	8	-0.102	1	0.024	1	6.501	9	0.028	7	0.386	7	0.026	0.031	0.241		6.501	
31	M4	6in Dia. Duct	Sec 1 - max	0.856	6	-0.048	1	0.008	9	4.167	9	0.034	1	0.355	1	1.294	8	0.221	6	0.185	6	0.054	0.185	0.058		4.167	
27	M3	6in Dia. Duct	Sec 4 - max	0.440	6	-0.069	1	0.008	8	4.533	9	0.014	1	0.243	1	1.326	8	0.203	1	0.170	1	0.036	0.201	0.059		4.533	
24	M3	6in Dia. Duct	Sec 2 - min	0.023	1	-1.301	6	-0.007	6	0.025	1	-5.286	7	-1.330	8	-0.243	1	-0.149	9	-0.125	9	0.002	0.234	0.059		5.266	
365	M37	6in Dia. Duct	Sec 3 - max	0.245	8	0.111	9	-0.005	1	1.532	6	0.081	1	4.648	9	-0.148	1	0.906	7	0.759	7	0.020	0.068	0.207		4.648	
1213	M122	6in Dia. Duct	Sec 2 - max	0.013	6	0.436	6	0.122	6	-0.554	1	5.821	8	0.010	1	0.770	7	0.250	1	0.209	1	0.001	0.259	0.034		5.821	
1214	M122	6in Dia. Duct	Sec 2 - min	-0.013	7	0.058	1	0.000	1	-5.821	6	0.554	1	-0.770	7	-0.010	1	-0.495	6	-0.414	6	0.001	0.259	0.034		5.821	
642	M65	4in Dia. Duct	Sec 1 - min	0.000	1	-0.016	1	0.028	1	-3.249	7	0.029	1	-4.668	8	0.035	1	-0.002	1	-0.005	1	0.000	0.120	0.173		4.668	
382	M37	6in Dia. Duct	Sec 1 - min	-0.133	7	-0.227	6	-0.179	9	-0.099	1	-1.620	6	0.150	1	-4.717	9	-0.034	1	-0.028	1	0.011	0.072	0.210		4.717	
483	M49	6in Dia. Duct	Sec 2 - max	0.018	6	0.372	8	0.421	8	4.282	7	-0.805	6	-0.125	1	2.256	7	0.000	1	0.000	1	0.001	0.190	0.100		4.282	
484	M49	6in Dia. Duct	Sec 2 - min	-0.018	7	-0.265	7	-0.012	1	0.608	6	-4.282	7	-2.256	7	0.125	1	0.000	1	0.000	1	0.001	0.190	0.100		4.282	
1178	M118	2in Dia. Duct	Sec 4 - min	0.028	1	-0.083	2	-0.171	4	-3.174	2	0.039	1	-4.544	2	0.020	1	-0.010	2	-0.141	2	0.006	0.118	0.188		4.544	
367	M37	6in Dia. Duct	Sec 4 - max	0.245	8	0.111	9	-0.005	1	1.488	6	0.072	1	4.614	9	-0.147	1	0.906	7	0.759	7	0.020	0.066	0.205		4.614	
620	M62	4in Dia. Duct	Sec 5 - min	0.013	1	-0.011	1	-0.072	6	-1.645	7	-0.010	1	-6.175	7	0.098	1	0.000	1	-0.001	1	0.001	0.061	0.229		6.175	
606	M61	4in Dia. Duct	Sec 4 - min	0.013	1	-0.007	1	-0.268	6	-1.976	7	-0.034	1	-5.829	7	0.104	1	-0.002	1	-0.004	1	0.001	0.073	0.216		5.829	
369	M37	6in Dia. Duct	Sec 6 - max	0.245	8	0.111	9	-0.005	1	1.475	7	0.063	1	4.579	9	-0.146	1	0.906	7	0.759	7	0.020	0.066	0.204		4.579	
371	M38	6in Dia. Duct	Sec 1 - max	0.245	8	0.111	9	-0.005	1	1.475	7	0.063	1	4.579	9	-0.146	1	0.907	7	0.759	7	0.020	0.066	0.204		4.579	
364	M37	6in Dia. Duct	Sec 2 - min	-0.133	7	-0.227	6	-0.179	9	-0.090	1	-1.576	6	0.149	1	-4.682	9	-0.034	1	-0.028	1	0.011	0.070	0.208		4.682	
851	M86	2in Dia. Duct	Sec 1 - max	0.104	7	0.039	7	0.137	2	0.859	8	0.423	7	0.024	1	6.501	9	0.028	2	0.359	2	0.023	0.024	0.241		6.501	
640	M64	4in Dia. Duct	Sec 5 - min	0.004	1	-0.016	1	0.025	1	-3.049	7	0.031	1	-4.668	6	0.035	1	0.000	1	0.000	1	0.000	0.113	0.173		4.668	
1127	M113	2in Dia. Duct	Sec 4 - max	0.051	5	0.000	1	0.000	1	0.018	1	3.434	2	0.006	1	3.983	2	0.001	3	0.017	3	0.011	0.127	0.148		3.983	
368	M37	6in Dia. Duct	Sec 3 - min	-0.133	7	-0.226	6	-0.179	9	-0.081	1	-1.532	6	0.148	1	-4.648	9	-0.034	1	-0.028	1	0.011	0.068	0.207		4.648	
33	M4	6in Dia. Duct	Sec 2 - max	0.856	6	-0.047	1	0.009	8	3.921	9	0.047	1	0.355	1	1.292	8	0.221	6	0.185	6	0.054	0.174	0.057		3.921	
1017	M102	2in Dia. Duct	Sec 4 - max	0.063	5	-0.038	7	0.193	3	-0.419	5	0.762	4	6.437	3	0.025	1	0.023	2	0.318	2	0.016	0.026	0.238		6.437	
847	M85	2in Dia. Duct	Sec 4 - max	0.120	7	0.042	7	0.035	6	0.729	8	0.030	1	0.029	1	6.224	9	0.028	7	0.386	7	0.027	0.027	0.231		6.224	
949	M95	2in Dia. Duct	Sec 5 - max	0.091	7	0.036	5	0.000	1	0.478	2	0.143	1	0.018	1	6.625	4	0.004	7	0.060	7	0.020	0.018	0.245		6.625	
841	M85	2in Dia. Duct	Sec 1 - max	0.124	7	0.052	7	0.042	6	0.339	8	0.576	7	0.043	1	6.314	8	0.028	7	0.386	7	0.028	0.021	0.234		6.314	
366	M37	6in Dia. Duct	Sec 4 - min	-0.133	7	-0.226	6	-0.179	9	-0.072	1	-1.488	6	0.147	1	-4.614	9	-0.034	1	-0.028	1	0.011	0.066	0.205		4.614	
497	M50	6in Dia. Duct	Sec 4 - max	0.005	8	0.320	8	0.447	6	3.733	8	0.487	1	2.586	6	0.503	9	0.000	1	0.000	1	0.000	0.166	0.115		3.733	
498	M50	6in Dia. Duct	Sec 4 - min	-0.005	7	-0.337	7	-0.012	1	-0.487	1	-3.733	8	-0.503	9	-2.586	6	0.000	1	0.000	1	0.000	0.166	0.115		3.733	
1128	M113	2in Dia. Duct	Sec 4 - min	0.026	1	-0.080	2	-0.163	4	-3.434	2	-0.016	1	-3.983	2	-0.006	1	-0.013	2	-0.171	2	0.006	0.127	0.148		3.983	
29	M3	6in Dia. Duct	Sec 5 - max	0.440	6	-0.069	1	0.008	8	4.167	9	0.034	1	0.243	1	1.323	8	0.203	1	0.170	1	0.036	0.185	0.059		4.167	
370	M37	6in Dia. Duct	Sec 5 - min	-0.133	7	-0.229	6	-0.179	9	-0.063	1	-1.475	7	0.146	1	-4.579	9	-0.034	1	-0.028	1	0.011	0.066	0.204		4.579	
372	M38	6in Dia. Duct	Sec 1 - min	-0.133	7	-0.229	6	-0.179	9	-0.063	1	-1.475	7	0.146	1	-4.579	9	-0.034	1	-0.028	1	0.011	0.066	0.204		4.579	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{sy}/σ_s	f_{sz}/σ_s	f_b (ksi)
26	M3	6in Dia. Duct	Sec 3 - min	0.023	1	-1.301	6	-0.008	6	0.006	1	-4.899	7	-1.328	8	-0.243	1	-0.149	9	-0.125	9	0.002	0.218	0.059	4.899
845	M85	2in Dia. Duct	Sec 3 - max	0.121	7	0.046	7	0.038	6	0.613	8	0.177	1	0.034	1	6.116	8	0.026	7	0.366	7	0.027	0.023	0.227	6.116
843	M85	2in Dia. Duct	Sec 2 - max	0.123	7	0.049	7	0.040	6	0.483	8	0.367	7	0.038	1	6.215	8	0.026	7	0.388	7	0.027	0.018	0.230	6.215
957	M96	2in Dia. Duct	Sec 4 - max	0.098	5	-0.043	5	0.164	3	-0.377	5	0.597	1	6.251	3	0.052	1	0.018	2	0.245	2	0.022	0.022	0.232	6.251
610	M61	4in Dia. Duct	Sec 5 - min	0.013	1	-0.009	1	-0.267	6	-1.287	7	-0.024	1	-6.129	7	0.106	1	-0.002	1	-0.004	1	0.001	0.047	0.227	6.129
35	M4	6in Dia. Duct	Sec 3 - max	0.656	6	-0.047	1	0.009	9	3.675	9	0.080	1	0.355	1	1.289	8	0.221	6	0.185	8	0.054	0.163	0.057	3.675
951	M96	2in Dia. Duct	Sec 1 - max	0.115	7	0.036	5	0.146	2	0.042	6	0.068	1	0.018	1	6.625	4	0.018	2	0.245	2	0.026	0.002	0.245	6.625
959	M96	2in Dia. Duct	Sec 5 - max	0.098	5	0.016	1	0.001	1	0.000	1	1.681	2	5.069	5	0.015	1	-0.018	2	0.245	2	0.022	0.002	0.188	5.069
850	M85	2in Dia. Duct	Sec 5 - min	0.000	1	0.023	8	-0.066	9	0.102	1	-0.830	8	-6.501	9	-0.024	1	-0.005	1	-0.069	1	0.000	0.031	0.241	6.501
575	M58	6in Dia. Duct	Sec 3 - max	0.366	8	0.288	9	0.407	7	2.646	9	0.867	6	2.707	9	-0.126	1	0.071	1	0.059	1	0.032	0.118	0.120	2.707
1016	M102	2in Dia. Duct	Sec 4 - min	0.000	1	-0.051	6	0.000	1	-0.762	4	0.419	5	-0.025	1	-6.437	3	-0.001	1	-0.020	1	0.000	0.028	0.238	6.437
1077	M108	2in Dia. Duct	Sec 4 - max	0.054	7	0.000	1	0.000	1	-0.006	1	3.079	2	-0.004	1	3.782	2	0.002	3	0.029	3	0.012	0.114	0.140	3.782
852	M86	2in Dia. Duct	Sec 1 - min	0.000	1	0.023	8	0.000	1	-0.423	7	-0.659	8	-6.501	9	-0.024	1	0.000	1	-0.013	1	0.000	0.024	0.241	6.501
37	M4	6in Dia. Duct	Sec 4 - max	0.657	6	-0.047	1	0.009	9	3.429	9	0.074	1	0.355	1	1.267	8	0.221	6	0.185	6	0.054	0.152	0.057	3.429
950	M95	2in Dia. Duct	Sec 5 - min	0.000	1	0.033	4	-0.195	9	-0.143	1	-0.478	2	-6.625	4	-0.018	1	0.001	1	0.017	1	0.000	0.018	0.245	6.625
26	M3	6in Dia. Duct	Sec 4 - min	0.023	1	-1.302	6	-0.008	6	-0.014	1	-4.533	9	-1.326	8	-0.243	1	-0.149	9	-0.125	9	0.002	0.201	0.059	4.533
989	M99	2in Dia. Duct	Sec 5 - max	0.085	5	0.015	1	0.000	1	-0.027	1	1.501	2	5.043	5	0.005	1	0.026	2	0.394	2	0.018	0.056	0.187	5.043
1078	M108	2in Dia. Duct	Sec 4 - min	0.027	1	-0.068	2	-0.145	4	-3.079	2	0.006	1	-3.782	2	0.004	1	-0.012	2	-0.166	2	0.006	0.114	0.140	3.782
859	M86	2in Dia. Duct	Sec 5 - max	0.091	5	0.026	1	0.052	2	-0.276	1	1.135	4	5.296	9	-0.045	1	0.026	2	0.359	2	0.020	0.042	0.196	5.296
846	M85	2in Dia. Duct	Sec 4 - min	0.000	1	0.026	8	-0.068	9	-0.030	1	-0.723	8	-6.224	9	-0.029	1	-0.005	1	-0.069	1	0.000	0.027	0.231	6.224
587	M59	4in Dia. Duct	Sec 4 - max	0.482	7	-0.004	1	-0.001	1	0.212	1	2.668	6	-0.040	1	3.180	7	0.010	6	0.022	6	0.041	0.099	0.118	3.180
373	M38	6in Dia. Duct	Sec 2 - max	0.245	8	0.093	9	-0.005	1	2.178	7	0.514	8	3.140	9	-0.104	1	0.907	7	0.759	7	0.020	0.097	0.140	3.140
842	M85	2in Dia. Duct	Sec 1 - min	0.000	1	0.037	8	-0.076	9	-0.576	7	-0.339	8	-6.314	8	-0.043	1	-0.005	1	-0.069	1	0.000	0.021	0.234	6.314
423	M43	6in Dia. Duct	Sec 2 - max	0.160	6	0.070	9	0.323	9	3.344	6	1.245	9	2.080	6	1.049	9	1.015	9	0.850	9	0.013	0.149	0.092	3.344
958	M96	2in Dia. Duct	Sec 4 - min	0.000	1	-0.046	4	0.000	1	-0.597	1	0.377	5	-0.052	1	-6.251	3	-0.005	1	-0.069	1	0.000	0.022	0.232	6.251
39	M4	6in Dia. Duct	Sec 5 - max	0.657	6	-0.048	1	0.009	9	3.182	9	0.087	1	0.355	1	1.284	8	0.221	6	0.185	6	0.054	0.141	0.057	3.182
41	M5	6in Dia. Duct	Sec 1 - max	0.773	6	-0.017	1	0.009	9	3.182	9	0.087	1	0.413	1	1.058	8	0.478	8	0.400	8	0.063	0.141	0.047	3.182
105	M11	6in Dia. Duct	Sec 3 - max	0.010	6	-0.108	1	0.020	9	-0.587	1	4.618	7	0.013	1	1.025	6	0.250	1	0.209	1	0.001	0.205	0.046	4.618
108	M11	6in Dia. Duct	Sec 3 - min	-0.010	7	-1.596	6	-0.020	7	-4.618	7	0.587	1	-1.025	6	-0.013	1	-0.495	6	-0.414	6	0.001	0.205	0.046	4.618
377	M38	6in Dia. Duct	Sec 4 - max	0.245	8	0.056	9	-0.005	1	3.358	9	4.716	6	0.462	7	0.384	8	0.907	7	0.759	7	0.020	0.210	0.021	4.716
960	M96	2in Dia. Duct	Sec 5 - min	0.000	1	-0.049	5	-0.083	3	-1.681	2	0.000	1	-0.015	1	-5.069	5	-0.005	1	-0.066	1	0.000	0.062	0.188	5.069
848	M85	2in Dia. Duct	Sec 3 - min	0.000	1	0.030	8	-0.071	9	-0.177	1	-0.613	8	-6.116	8	-0.034	1	-0.005	1	-0.068	1	0.000	0.023	0.227	6.116
485	M49	6in Dia. Duct	Sec 3 - max	0.017	8	0.398	8	0.423	6	3.779	7	-0.444	1	-0.146	1	1.783	7	0.000	1	0.000	1	0.001	0.168	0.079	3.779
486	M49	6in Dia. Duct	Sec 3 - min	-0.017	7	-0.288	7	-0.012	1	0.444	1	-3.779	7	-1.783	7	0.146	1	0.000	1	0.000	1	0.001	0.168	0.079	3.779
844	M85	2in Dia. Duct	Sec 2 - min	0.000	1	0.033	8	-0.073	9	-0.367	7	-0.483	8	-6.215	8	-0.038	1	-0.005	1	-0.069	1	0.000	0.018	0.230	6.215
952	M96	2in Dia. Duct	Sec 1 - min	0.000	1	0.033	4	0.000	1	-0.068	1	-0.042	8	-6.625	4	-0.018	1	-0.005	1	-0.066	1	0.000	0.002	0.245	6.625
43	M5	6in Dia. Duct	Sec 2 - max	0.773	6	-0.017	1	0.010	9	3.094	9	0.092	1	0.413	1	1.056	8	0.478	8	0.400	8	0.063	0.138	0.047	3.094
374	M38	6in Dia. Duct	Sec 2 - min	-0.133	7	-0.246	6	-0.179	9	-0.514	8	-2.178	7	0.104	1	-3.140	9	-0.034	1	-0.028	1	0.011	0.097	0.140	3.140
30	M3	6in Dia. Duct	Sec 5 - min	0.023	1	-1.302	6	-0.008	6	-0.034	1	-4.167	9	-1.323	8	-0.243	1	-0.149	9	-0.125	9	0.002	0.185	0.059	4.167
576	M58	6in Dia. Duct	Sec 3 - min	-0.097	7	-0.015	1	-0.407	6	-0.867	6	-2.646	9	0.126	1	-2.707	9	-0.441	6	-0.359	6	0.008	0.118	0.120	2.707
32	M4	6in Dia. Duct	Sec 1 - min	0.035	1	-0.888	7	-0.008	7	-0.034	1	-4.167	9	-1.294	8	-0.355	1	0.132	1	0.111	1	0.003	0.185	0.058	4.167
327	M33	6in Dia. Duct	Sec 4 - max	0.133	6	0.152	6	0.252	9	2.142	6	0.144	1	3.134	9	-0.125	1	0.049	7	0.041	7	0.011	0.095	0.139	3.134
328	M33	6in Dia. Duct	Sec 4 - min	-0.133	9	-0.026	1	0.010	1	-0.144	1	-2.142	6	0.125	1	-3.134	9	-0.151	6	-0.126	6	0.011	0.095	0.139	3.134
45	M5	6in Dia. Duct	Sec 3 - max	0.773	6	-0.017	1	0.010	9	3.005	9	0.097	1	0.413	1	1.053	8	0.478	8	0.400	8	0.063	0.134	0.047	3.005
990	M99	2in Dia. Duct	Sec 5 - min	0.000	1	-0.035	5	-0.080	3	-1.501	2	0.027	1	-0.005	1	-5.043	5	0.000	1	-0.002	1	0.000	0.056	0.187	5.043
424	M43	6in Dia. Duct	Sec 2 - min	-0.010	9	-0.387	6	-0.323	8	-1.245	9	-3.344	6	-1.049	9	-2.080	6	0.021	1	0.018	1	0.001	0.149	0.092	3.344
378	M38	6in Dia. Duct	Sec 4 - min	-0.133	7	-0.281	6	-0.179	9	-4.716	6	-3.358	9	-0.384	8	-0.462	7	-0.034	1	-0.028	1	0.011	0.210	0.021	4.716
47	M5	6in Dia. Duct	Sec 4 - max	0.774	6	-0.017	1	0.010	9	2.918	9	0.102	1	0.413	1	1.050	8	0.478	8	0.400	8	0.063	0.130	0.047	2.918
499	M50	6in Dia. Duct	Sec 3 - max	0.006	8	0.322	6	0.445	6	3.337	8	0.284	1	2.036	6	0.681	9	0.000	1	0.000	1	0.000	0.148	0.090	3.337
498	M50	6in Dia. Duct	Sec 3 - min	-0.006	7	-0.334	7	-0.012	1	-0.284	1	-3.337	8	-0.681	9	-2.036	6	0.000	1	0.000	1	0.000	0.148	0.090	3.337
1019	M102	2in Dia. Duct	Sec 5 - max	0.083	5	0.015	1	0.000	1	-0.005	1	1.358	6	4.590	5	0.007	1	0.023	2	0.318	2	0.018	0.050	0.170	4.590
941	M95	2in Dia. Duct	Sec 1 - max	0.134	2	0.067	4	0.000	1	-1.306	1	1.624	8	4.013	5	0.005	1	0.004	7	0.060	7	0.030	0.060	0.149	4.013
860	M86	2in Dia. Duct	Sec 5 - min	0.000	1	-0.037	7	-0.038	3	-1.135	4	0.276	1	0.045	1	-5.296	9	0.000	1	-0.013	1	0.000	0.042	0.196	5.296
49	M5	6in Dia. Duct	Sec 5 - max	0.774	6	-0.017	1	0.011	9	2.828	9	0.106	1	0.413	1	1.047	8	0.478	8	0.400	8	0.063	0.126	0.047	2.828
61	M7	6in Dia. Duct	Sec 1 - max	0.777	6	-0.018	1	0.013	9	2.831	8	0.108	1	0.413	1	1.016	8	0.481	8	0.403	8	0.064	0.126	0.045	2.831
34	M4	6in Dia. Duct	Sec 2 - min	0.035	1	-0.869	7	-0.009	7	-0.047	1	-3.921	9	-1.292	8	-0.355	1	0.132	1	0.111	1	0.003	0.174	0.057	3.921
961	M97	2in Dia. Duct	Sec 1 - max	0.061	5	0.016	1	0.001	1	-0.094	1	0.855	5	5.069	5	0.015	1	0.056	2	0.767	2	0.014	0.032	0.188	5.069
63	M7	6in Dia. Duct	Sec 2 - max	0.777	6	-0.018	1	0.014	9	2.747	8	0.112	1	0.413	1	1.012	8	0.481	8	0.403	8	0.064	0.122	0.045	2.747
1223	M123	4in Dia. Duct	Sec 2 - max	0.143	6	0.019	1	-0.009	1	2.525	6	0.059	1	3.365	9	-0.193	1	0.079	6	0.180	6	0.012	0.094	0.125	3.365
51	M8	6in Dia. Duct	Sec 1 - max	0.788	6	0.011	9	0.011	9	0.416	1	0.871	8	0.106	1	2.828	9	0.591	8	0.494	8	0.065	0.039	0.126	2.828
53	M8	6in Dia. Duct	Sec 2 - max	0.789	6	0.011	9	0.011	9	0.416	1	0.864	8	0.106	1	2.820	9	0.591	8	0.494	8	0.065	0.038	0.125	2.820
59	M8	6in Dia. Dict	Sec 5 - max	0.791	6	0.013	9	0.013	9	0.418	1	0.839	8	0.106	1	2.831	8	0.591	8	0.494	8	0.065	0.037	0.126	2.831
55	M8	6in Dia. Duct	Sec 3 - max	0.790	6	0.012	8	0.012	9	0.418	1	0.858	8	0.106	1	2.814	8	0.591	8	0.494	8	0.065	0.038	0.125	2.814
57	M8	6in Dia. Duct	Sec 4 - max	0.790	6	0.013	9	0.013	9	0.418	1	0.848	8	0.106	1	2.822	8	0.591	8	0.494	8	0.065	0.038	0.125	2.822
861	M87	2in Dia. Duct	Sec 1 - max	0.073	7	0.025	1	-0.002	1	-0.091	7	0.403	8	5.296	9	-0.045	1	0.046	6	0.622	6	0.016	0.015	0.196	5.296
65	M7	6in Dia. Duct	Sec 3 - max	0.776	6	-0.019	1	0.014	9	2.664	8	0.117	1	0.413	1	1.008	8	0.481	8	0.403	8	0.064	0.118	0.045	2.664
36	M4	6in Dia. Duct	Sec 3 - min	0.035	1	-0.869	7	-0.009	7	-0.060	1	-3.875	9	-1.269	8	-0.355	1	0.132	1	0.111	1	0.003	0.163	0.057	3.875
67	M7	6in Dia. Duct	Sec 4 - max	0.778	6	-0.019	1	0.014	9	2.580	8	0.122	1	0.413	1	1.004	8	0.481	8	0.403	8	0.064	0.115	0.045	2.580
375	M38	6in Dia. Duct	Sec 3 - max	0.245	8	0.076	9	-0.005	1	2.815	9	2.523	6	1.731	7	-0.063	1	0.907	7	0.759	7	0.020	0.125	0.077	2.815
1020	M102	2in Dia. Duct	Sec 5 - min	0.000	1	-0.040	7	-0.070	3	-1.358	6	0.005	1	-0.007	1	-4.590	5	-0.001	1	-0.020	1	0.000	0.050	0.170	4.590
71	M8	6in Dia. Duct	Sec 1 - max	0.663	8	-0.054	1	0.015	9	2.497	8	0.128	1	0.355	1	1.232	8	0.216	8	0.181	8	0.054	0.111	0.055	2.497
962	M97	2in Dia. Duct	Sec 1 - min	0.000	1	-0.049	5	-0.155	9	-0.855	5	0.094	1	-0.015	1	-5.069	5	-0.003	1	-0.046	1	0.000	0.032	0.188	5.069
69	M7	6in Dia. Duct	Sec 5 - max	0.778	6	-0.019	1	0.015	9	2.497	8	0.128	1	0.413	1	1.000	8	0.481	8	0.403	8	0.064	0.111	0.044	2.497
1224	M123	4in Dia. Duct	Sec 2 - min	0	1	-0.098	6	-0.156	9	-0.059	1	-2.525	6	0.193	1	-3.365	9	-0.002	1	-0.005	1	0.000	0.094	0.125	3.365
888	M59	4in Dia. Duct	Sec 4 - min	0.017	1	-0.151	7	-0.252	7	-2.668	6	-0.212	1	-3.180	7	0.040	1	-0.022	9	-0.050	9	0.001	0.099	0.118	3.180

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_{cy}/σ_c	f_{cz}/σ_c	f_c (ksi)
991	M100	2in Dia. Duct	Sec 1 - max	0.046	7	0.015	1	0.000	1	-0.023	1	0.538	8	5.043	5	0.005	1	0.059	2	0.801	2	0.010	0.020	0.187	5.043
1215	M122	6in Dia. Duct	Sec 3 - max	0.016	8	0.428	6	0.118	6	-0.356	1	4.232	6	0.007	1	0.612	7	0.250	1	0.209	1	0.001	0.186	0.027	4.232
1218	M122	6in Dia. Duct	Sec 3 - min	-0.015	7	0.05	1	0.000	1	-4.232	6	0.356	1	-0.612	7	-0.007	1	-0.485	6	-0.414	6	0.001	0.188	0.027	4.232
917	M92	2in Dia. Duct	Sec 4 - max	0.059	7	0.033	3	-0.002	1	0.084	1	1.346	2	0.050	1	4.056	4	0.007	3	0.093	3	0.013	0.050	0.150	4.056
376	M38	6in Dia. Duct	Sec 3 - min	-0.133	7	-0.283	6	-0.179	9	-2.523	6	-2.815	9	0.083	1	-1.731	7	-0.034	1	-0.028	1	0.011	0.125	0.077	2.815
38	M4	6in Dia. Duct	Sec 4 - min	0.035	1	-0.870	7	-0.009	7	-0.074	1	-3.429	9	-1.287	8	-0.355	1	0.132	1	0.111	1	0.003	0.152	0.057	3.429
682	M87	2in Dia. Duct	Sec 1 - min	0.000	1	-0.037	7	-0.122	9	-0.403	8	0.091	7	0.045	1	-5.298	9	0.006	1	0.089	1	0.000	0.015	0.196	5.298
73	M8	6in Dia. Duct	Sec 2 - max	0.663	6	-0.054	1	0.015	9	2.251	8	0.143	1	0.355	1	1.228	8	0.216	8	0.181	8	0.054	0.100	0.055	2.251
942	M95	2in Dia. Duct	Sec 1 - min	0.000	1	0.060	1	-0.108	5	-1.624	8	1.306	1	-0.005	1	-4.013	5	0.001	1	0.017	1	0.000	0.060	0.148	4.013
992	M100	2in Dia. Duct	Sec 1 - min	0.000	1	-0.035	5	-0.152	9	-0.536	8	0.023	1	-0.005	1	-5.043	5	0.000	1	0.008	1	0.000	0.020	0.187	5.043
569	M57	6in Dia. Duct	Sec 5 - max	0.414	8	0.249	8	0.263	9	-0.128	1	2.521	8	1.364	9	0.656	6	0.184	9	0.154	9	0.034	0.112	0.061	2.521
583	M59	4in Dia. Duct	Sec 2 - max	0.502	7	0.022	1	-0.001	1	1.051	7	0.014	1	3.383	6	0.003	1	0.010	6	0.022	6	0.042	0.039	0.125	3.383
916	M92	2in Dia. Duct	Sec 4 - min	0.026	1	-0.019	2	-0.182	4	-1.346	2	-0.084	1	-4.056	4	-0.050	1	-0.005	2	-0.067	2	0.006	0.050	0.150	4.056
567	M57	6in Dia. Duct	Sec 4 - max	0.413	8	0.249	8	0.283	9	-0.124	1	2.590	8	1.283	9	0.653	6	0.184	9	0.154	9	0.034	0.115	0.057	2.590
487	M49	6in Dia. Duct	Sec 4 - max	0.016	8	0.384	8	0.425	6	3.269	7	-0.262	1	0.193	6	1.332	9	0.000	1	0.000	1	0.001	0.145	0.059	3.269
488	M49	6in Dia. Duct	Sec 4 - min	-0.016	7	-0.292	7	-0.012	1	0.262	1	-3.269	7	-1.332	9	-0.193	8	0.000	1	0.000	1	0.001	0.145	0.059	3.269
565	M57	6in Dia. Duct	Sec 3 - max	0.413	8	0.248	8	0.283	9	-0.122	1	2.660	8	1.203	9	0.651	6	0.184	9	0.154	9	0.034	0.118	0.053	2.660
571	M58	6in Dia. Duct	Sec 1 - max	0.382	8	0.283	9	0.402	7	1.398	9	0.815	6	2.521	8	-0.126	1	0.071	1	0.059	1	0.031	0.062	0.112	2.521
563	M57	6in Dia. Duct	Sec 2 - max	0.413	8	0.248	6	0.282	9	-0.121	1	2.730	8	1.123	9	0.646	6	0.184	9	0.154	9	0.034	0.121	0.050	2.730
561	M57	6in Dia. Duct	Sec 1 - max	0.412	8	0.248	8	0.282	9	-0.119	1	2.799	8	1.042	9	0.646	6	0.184	9	0.154	9	0.034	0.124	0.046	2.799
993	M97	2in Dia. Duct	Sec 2 - max	0.059	5	0.009	1	0.001	1	0.008	1	1.284	5	3.829	5	0.007	1	0.056	2	0.767	2	0.013	0.046	0.142	3.829
573	M58	6in Dia. Duct	Sec 2 - max	0.384	8	0.288	9	0.405	7	2.019	9	0.839	6	1.820	9	-0.126	1	0.071	1	0.059	1	0.031	0.090	0.081	2.019
40	M4	6in Dia. Duct	Sec 5 - min	0.036	1	-0.870	7	-0.009	7	-0.087	1	-3.182	9	-1.284	8	-0.355	1	0.132	1	0.111	1	0.003	0.141	0.057	3.182
1021	M103	2in Dia. Duct	Sec 1 - max	0.049	7	0.015	1	0.000	1	-0.032	1	0.535	8	4.590	5	0.007	1	0.052	2	0.704	2	0.011	0.020	0.170	4.590
75	M6	6in Dia. Duct	Sec 3 - max	0.663	6	-0.054	1	0.015	9	2.005	8	0.158	1	0.355	1	1.224	8	0.216	8	0.181	8	0.054	0.089	0.054	2.005
493	M50	6in Dia. Duct	Sec 2 - max	0.006	8	0.325	8	0.444	6	2.937	8	0.103	1	1.487	6	0.861	9	0.000	1	0.000	1	0.000	0.131	0.066	2.937
494	M50	6in Dia. Duct	Sec 2 - min	-0.008	7	-0.331	7	-0.012	1	-0.103	1	-2.937	8	-0.861	9	-1.487	8	0.000	1	0.000	1	0.000	0.131	0.066	2.937
559	M56	6in Dia. Duct	Sec 5 - max	0.428	8	-0.017	1	0.282	9	-0.119	1	2.799	8	0.845	9	0.259	6	0.408	9	0.342	9	0.035	0.124	0.038	2.799
557	M56	6in Dia. Duct	Sec 4 - max	0.427	8	-0.017	1	0.282	9	-0.114	1	2.774	8	0.765	9	0.258	6	0.408	9	0.342	9	0.035	0.123	0.034	2.774
42	M5	6in Dia. Duct	Sec 1 - min	0.042	1	-0.312	7	-0.009	6	-0.087	1	-3.182	9	-1.058	8	-0.413	1	0.041	1	0.034	1	0.003	0.141	0.047	3.182
947	M95	2in Dia. Duct	Sec 4 - max	0.096	2	-0.022	4	0.000	1	0.653	2	-0.385	1	0.014	1	3.728	8	0.004	7	0.060	7	0.021	0.032	0.138	3.728
983	M99	2in Dia. Duct	Sec 2 - max	0.090	7	0.000	5	0.189	9	0.815	8	-0.657	7	0.011	1	3.738	3	0.028	2	0.384	2	0.021	0.030	0.138	3.738
1022	M103	2in Dia. Duct	Sec 1 - min	0.000	1	-0.040	7	-0.140	9	-0.535	8	0.032	1	-0.007	1	-4.590	5	0.000	1	-0.012	1	0.000	0.020	0.170	4.590
984	M97	2in Dia. Duct	Sec 2 - min	0.000	1	-0.056	5	-0.151	9	-1.284	5	-0.006	1	-0.007	1	-3.829	5	-0.003	1	-0.046	1	0.000	0.046	0.142	3.829
103	M11	6in Dia. Duct	Sec 2 - max	0.010	8	-0.108	1	0.019	9	-0.492	1	3.218	7	0.013	1	1.008	6	0.250	1	0.209	1	0.001	0.143	0.045	3.218
104	M11	6in Dia. Duct	Sec 2 - min	-0.010	7	-1.594	8	-0.019	7	-3.218	7	0.492	1	-1.008	6	-0.013	1	-0.495	6	-0.414	6	0.001	0.143	0.045	3.218
853	M86	2in Dia. Duct	Sec 2 - max	0.099	7	0.017	7	0.120	5	0.960	8	-0.313	7	0.032	1	3.501	9	0.026	2	0.359	2	0.022	0.036	0.130	3.501
44	M5	6in Dia. Duct	Sec 2 - min	0.042	1	-0.313	7	-0.010	6	-0.092	1	-3.094	9	-1.056	8	-0.413	1	0.041	1	0.034	1	0.003	0.138	0.047	3.094
863	M87	2in Dia. Duct	Sec 2 - max	0.089	7	0.015	1	-0.002	1	0.027	1	0.793	8	3.863	9	-0.025	1	0.046	6	0.622	6	0.015	0.029	0.143	3.863
555	M56	6in Dia. Duct	Sec 3 - max	0.427	8	-0.017	1	0.282	9	-0.109	1	2.748	8	0.685	9	0.254	6	0.408	9	0.342	9	0.035	0.122	0.030	2.748
77	M6	6in Dia. Duct	Sec 4 - max	0.664	8	-0.055	1	0.016	9	1.759	8	0.174	1	0.355	1	1.220	8	0.216	8	0.181	8	0.054	0.078	0.054	1.759
709	M71	4in Dia. Duct	Sec 5 - max	0.318	7	-0.010	1	-0.001	1	0.138	7	-0.018	1	1.049	7	4.120	8	0.016	8	0.037	8	0.027	0.005	0.153	4.120
711	M72	4in Dia. Duct	Sec 1 - max	0.318	7	0.010	1	0.124	8	0.138	7	-0.018	1	1.049	7	4.120	8	0.016	8	0.037	8	0.027	0.005	0.153	4.120
691	M70	4in Dia. Duct	Sec 1 - max	0.359	8	0.011	1	0.044	7	0.332	7	0.000	1	3.828	6	0.488	9	0.033	8	0.076	8	0.030	0.012	0.142	3.828
570	M57	6in Dia. Duct	Sec 5 - min	-0.139	7	-0.358	9	-0.019	1	-2.521	8	0.126	1	-0.658	6	-1.364	9	-0.527	6	-0.441	6	0.011	0.112	0.061	2.521
46	M5	6in Dia. Duct	Sec 3 - min	0.043	1	-0.313	7	-0.010	6	-0.097	1	-3.005	9	-1.053	8	-0.413	1	0.041	1	0.034	1	0.004	0.134	0.047	3.005
1013	M102	2in Dia. Duct	Sec 2 - max	0.094	7	0.010	7	0.153	8	0.822	8	-0.392	7	-0.002	1	3.578	3	0.023	2	0.316	2	0.021	0.030	0.133	3.578
568	M57	6in Dia. Duct	Sec 4 - min	-0.139	7	-0.358	9	-0.019	1	-2.590	8	0.124	1	-0.653	6	-1.283	9	-0.527	6	-0.441	6	0.011	0.115	0.057	2.590
566	M57	6in Dia. Duct	Sec 3 - min	-0.139	7	-0.357	9	-0.019	1	-2.660	8	0.122	1	-0.651	6	-1.203	9	-0.527	6	-0.441	6	0.011	0.118	0.053	2.660
553	M56	6in Dia. Duct	Sec 2 - max	0.427	8	-0.016	1	0.281	9	-0.104	1	2.723	8	0.605	9	0.252	6	0.408	9	0.342	9	0.035	0.121	0.027	2.723
564	M57	6in Dia. Duct	Sec 2 - min	-0.140	7	-0.357	9	-0.019	1	-2.730	8	0.121	1	-0.648	6	-1.123	9	-0.527	6	-0.441	6	0.011	0.121	0.050	2.730
572	M58	6in Dia. Duct	Sec 1 - min	-0.101	7	-0.019	1	-0.402	8	-0.815	6	-1.398	9	0.128	1	-2.521	8	-0.441	6	-0.389	6	0.008	0.062	0.112	2.521
562	M57	6in Dia. Duct	Sec 1 - min	-0.140	7	-0.356	9	-0.019	1	-2.799	8	0.119	1	-0.646	6	-1.042	9	-0.527	6	-0.441	6	0.011	0.124	0.046	2.799
993	M100	2in Dia. Duct	Sec 2 - max	0.043	7	0.009	1	0.000	1	0.076	1	0.822	5	3.830	5	0.005	1	0.059	2	0.801	2	0.010	0.030	0.142	3.830
693	M70	4in Dia. Duct	Sec 2 - max	0.358	6	0.011	1	0.044	7	0.330	7	-0.004	1	3.754	6	0.551	9	0.033	8	0.076	8	0.030	0.012	0.139	3.754
689	M69	4in Dia. Duct	Sec 5 - max	0.380	6	0.011	1	0.387	7	0.251	7	0.019	1	3.828	8	0.488	9	0.061	6	0.140	6	0.030	0.009	0.142	3.828
647	M65	4in Dia. Duct	Sec 4 - max	0.139	6	0.538	7	0.753	7	1.856	6	0.235	1	2.724	9	-0.203	1	0.079	6	0.180	6	0.012	0.069	0.101	2.724
659	M66	4in Dia. Duct	Sec 5 - max	0.184	6	-0.030	7	0.143	8	-0.022	7	0.218	1	4.249	8	3.543	7	0.079	6	0.180	6	0.015	0.008	0.157	4.249
661	M67	4in Dia. Duct	Sec 1 - max	0.184	6	0.026	1	0.654	7	-0.022	7	0.218	1	4.249	8	3.543	7	0.079	6	0.180	6	0.015	0.008	0.157	4.249
48	M5	6in Dia. Duct	Sec 4 - min	0.043	1	-0.313	7	-0.010	6	-0.102	1	-2.916	9	-1.050	8	-0.413	1	0.041	1	0.034	1	0.004	0.130	0.047	2.916
965	M97	2in Dia. Duct	Sec 3 - max	0.057	5	0.002	1	0.001	1	0.052	1	1.767	5	2.743	2	-0.002	1	0.056	2	0.767	2	0.013	0.065	0.102	2.743
574	M58	6in Dia. Duct	Sec 2 - min	-0.099	7	-0.019	1	-0.405	6	-0.839	6	-2.019	9	0.126	1	-1.820	9	-0.441	6	-0.369	6	0.008	0.090	0.081	2.019
687	M69	4in Dia. Duct	Sec 4 - max	0.360	6	0.012	1	0.387	7	0.252	7	0.023	1	3.757	6	0.385	9	0.061	6	0.140	6	0.030	0.009	0.139	3.757
695	M70	4in Dia. Duct	Sec 3 - max	0.358	8	0.010	1	0.045	7	0.329	7	-0.006	1	3.680	6	0.613	9	0.033	8	0.076	8	0.030	0.012	0.136	3.680
551	M58	6in Dia. Duct	Sec 1 - max	0.426	8	-0.016	1	0.281	9	-0.100	1	2.698	8	0.525	9	0.250	6	0.408	9	0.342	9	0.035	0.120	0.023	2.698
560	M58	6in Dia. Duct	Sec 5 - min	-0.197	7	-0.228	9	-0.019	1	-2.799	8	0.119	1	-0.259	6	-0.645	9	-0.635	6	-0.531	6	0.016	0.124	0.038	2.799
1175	M118	2in Dia. Duct	Sec 3 - max	0.052	5	0.001	1	0.000	1	-0.060	1	2.343	4	-0.022	1	2.129	2	0.004	3	0.055	3	0.012	0.087	0.079	2.343
685	M69	4in Dia. Duct	Sec 3 - max	0.360	6	0.012	1	0.387	7	0.254	7	0.028	1	3.686	6	0.281	9	0.061	6	0.140	6	0.030	0.009	0.137	3.686
697	M70	4in Dia. Duct	Sec 4 - max	0.358	6	0.009	1	0.045	7	0.327	7	-0.011	1	3.606	6	0.676	9	0.033	8	0.076	8	0.030	0.012	0.134	3.606
50	M5	6in Dia. Duct	Sec 5 - min	0.043	1	-0.314	7	-0.011	6	-0.100	1	-2.828	9	-1.047	8	-0.413	1	0.041	1	0.034	1	0.004	0.126	0.047	2.828
79	M9	6in Dia. Duct	Sec 5 - max	0.684	6	-0.055	1	0.016	9	1.513	8	0.189	1	0.355	1	1.215	8	0.216	8	0.181	8	0.054	0.067	0.054	1.513
1151	M116	2in Dia. Duct	Sec 1 - max	0.081	5	0.043	5	0.001	1	-0.048	1	2.985	5	1.404	2	0.065	1	0.025	3	0.347	3	0.014	0.110	0.052	2.985
62	M7	6in Dia. Duct	Sec 1 - min	0.048	1	-0.318	7	-0.013	7	-0.108	1	-2.831	8	-1.016	8	-0.413	1	0.041	1	0.034	1	0.004	0.126	0.045	2.831
1153	M116	2in Dia. Duct	Sec 2 - max	0.081	5	0.043	5	0.001	1	-0.047	1	2.953	5	1.368	2	0.064	1	0.025	3	0.347	3	0.014	0.109	0.051	2.953
683	M69	4in Dia. Duct	Sec 2 - max	0.360	6	0.013	1	0.387	7	0.254	7	0.032	1	3.615	6	0.177	9	0.061	6	0.140	6	0.030	0.009	0.134	3.615

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_b/σ_b	f_s/σ_s		f_t (ksi)	
558	M56	6in Dia. Duct	Sec 4 - min	-0.197	7	-0.228	9	-0.019	1	-2.774	8	0.114	1	-0.256	6	-0.765	9	-0.635	6	-0.531	6	0.016	0.123	0.034		2.774	
699	M70	4in Dia. Duct	Sec 5 - max	0.358	6	0.009	1	0.045	7	0.324	7	-0.015	1	3.531	6	0.738	9	0.033	6	0.076	6	0.030	0.012	0.131		3.531	
884	M87	2in Dia. Duct	Sec 2 - min	0.000	1	-0.047	7	-0.115	9	-0.793	8	-0.027	1	0.025	1	-3.863	9	0.006	1	0.089	1	0.000	0.029	0.143		3.863	
994	M100	2in Dia. Duct	Sec 2 - min	0.000	1	-0.041	5	-0.147	9	-0.822	5	-0.075	1	-0.005	1	-3.830	5	0.000	1	0.008	1	0.000	0.030	0.142		3.830	
1155	M116	2in Dia. Duct	Sec 3 - max	0.081	5	0.043	5	0.001	1	-0.049	1	2.941	5	1.332	2	0.064	1	0.025	3	0.347	3	0.014	0.109	0.049		2.941	
681	M69	4in Dia. Duct	Sec 1 - max	0.380	6	0.013	1	0.367	7	0.255	7	0.037	1	3.544	6	0.074	9	0.061	6	0.140	6	0.030	0.009	0.131		3.544	
64	M7	6in Dia. Duct	Sec 2 - min	0.040	1	-0.316	7	-0.014	7	-0.112	1	-2.747	8	-1.012	8	-0.413	1	0.041	1	0.034	1	0.004	0.122	0.045		2.747	
1141	M115	2in Dia. Duct	Sec 1 - max	0.065	5	-0.008	5	0.001	1	-0.035	1	2.958	5	1.263	2	0.034	1	0.039	5	0.532	5	0.014	0.110	0.047		2.958	
701	M71	4in Dia. Duct	Sec 1 - max	0.323	7	0.009	1	-0.001	1	0.341	6	-0.024	1	3.531	6	0.738	9	0.016	6	0.037	6	0.027	0.013	0.131		3.531	
1023	M103	2in Dia. Duct	Sec 2 - max	0.047	7	0.008	1	0.000	1	0.061	1	0.046	5	3.476	5	0.004	1	0.052	2	0.704	2	0.010	0.031	0.129		3.476	
1167	M118	2in Dia. Duct	Sec 4 - max	0.061	5	0.043	5	0.001	1	-0.051	1	2.930	5	1.296	2	0.064	1	0.025	3	0.347	3	0.014	0.109	0.048		2.930	
1170	M118	2in Dia. Duct	Sec 3 - min	0.020	1	-0.052	2	-0.163	6	-2.343	4	0.060	1	-2.129	2	0.022	1	-0.010	2	-0.141	2	0.004	0.087	0.079		2.343	
489	M49	6in Dia. Duct	Sec 5 - max	0.015	8	0.301	8	0.420	6	2.753	7	-0.073	1	0.939	6	1.042	9	0.000	1	0.000	1	0.001	0.122	0.046		2.753	
490	M49	6in Dia. Duct	Sec 5 - min	-0.015	7	-0.296	7	-0.012	1	0.073	1	-2.753	7	-1.042	9	-0.939	6	0.000	1	0.000	1	0.001	0.122	0.046		2.753	
710	M71	4in Dia. Duct	Sec 5 - min	-0.145	8	-0.027	6	-0.386	6	0.016	1	-0.138	7	-4.120	8	-1.049	7	-0.003	7	-0.007	7	0.012	0.005	0.153		4.120	
712	M72	4in Dia. Duct	Sec 1 - min	-0.145	8	0.006	7	-0.035	7	0.018	1	-0.138	7	-4.120	8	-1.049	7	-0.003	7	-0.007	7	0.012	0.005	0.153		4.120	
948	M95	2in Dia. Duct	Sec 4 - min	0.000	1	-0.029	1	-0.088	4	0.385	1	-0.853	2	-3.728	8	-0.014	1	0.001	1	0.017	1	0.000	0.032	0.138		3.728	
848	M85	4in Dia. Duct	Sec 4 - min	0.000	1	-0.029	1	0.028	1	-0.235	1	-1.856	6	0.203	1	-2.724	9	-0.002	1	-0.005	1	0.000	0.069	0.101		2.724	
1143	M115	2in Dia. Duct	Sec 2 - max	0.065	5	-0.006	5	0.001	1	-0.037	1	2.959	5	1.227	2	0.034	1	0.039	5	0.532	5	0.014	0.110	0.045		2.959	
491	M50	6in Dia. Duct	Sec 1 - max	0.007	8	0.328	8	0.443	8	2.753	7	-0.073	1	0.939	6	1.042	9	0.000	1	0.000	1	0.001	0.122	0.046		2.753	
492	M50	6in Dia. Duct	Sec 1 - min	-0.007	7	-0.329	7	-0.012	1	0.073	1	-2.753	7	-1.042	9	-0.939	6	0.000	1	0.000	1	0.001	0.122	0.046		2.753	
72	M8	6in Dia. Duct	Sec 1 - min	0.040	1	-0.881	7	-0.015	7	-0.126	1	-2.497	8	-1.232	8	-0.355	1	0.132	1	0.111	1	0.003	0.111	0.055		2.497	
556	M56	6in Dia. Duct	Sec 3 - min	-0.197	7	-0.227	9	-0.019	1	-2.748	8	0.109	1	-0.254	6	-0.885	9	-0.635	6	-0.531	6	0.016	0.122	0.030		2.748	
1161	M117	2in Dia. Duct	Sec 1 - max	0.049	5	0.086	5	0.001	1	-0.053	1	2.918	5	1.342	2	0.085	1	0.011	3	0.150	3	0.011	0.108	0.050		2.918	
984	M99	2in Dia. Duct	Sec 2 - min	0.000	1	-0.004	4	0.000	1	0.857	7	-0.815	8	-3.738	3	-0.011	1	0.000	1	-0.002	1	0.000	0.030	0.138		3.738	
1159	M116	2in Dia. Duct	Sec 5 - max	0.082	5	0.042	5	0.001	1	-0.053	1	2.918	5	1.259	2	0.063	1	0.025	3	0.347	3	0.014	0.108	0.047		2.918	
1145	M115	2in Dia. Duct	Sec 3 - max	0.065	5	-0.000	5	0.001	1	-0.040	1	2.961	5	1.191	2	0.034	1	0.039	5	0.532	5	0.014	0.110	0.044		2.981	
52	M6	6in Dia. Duct	Sec 1 - min	0.044	1	-0.011	6	-0.011	6	-0.871	8	-0.418	1	-2.828	9	-0.106	1	-0.008	1	-0.006	1	0.004	0.039	0.126		2.828	
54	M6	6in Dia. Duct	Sec 2 - min	0.045	1	-0.011	6	-0.011	6	-0.864	8	-0.418	1	-2.820	9	-0.106	1	-0.008	1	-0.006	1	0.004	0.038	0.125		2.820	
427	M43	6in Dia. Duct	Sec 4 - max	0.171	6	0.082	9	0.334	9	-0.337	1	0.857	6	2.590	7	1.560	8	1.015	9	0.850	9	0.014	0.038	0.115		2.590	
66	M7	6in Dia. Duct	Sec 3 - min	0.047	1	-0.316	7	-0.014	7	-0.117	1	-2.684	8	-1.008	8	-0.413	1	0.041	1	0.034	1	0.004	0.118	0.045		2.684	
988	M97	2in Dia. Duct	Sec 3 - min	0.000	1	-0.063	5	-0.146	5	-1.767	5	-0.052	1	0.002	1	-2.743	2	-0.003	1	-0.046	1	0.000	0.065	0.102		2.743	
60	M6	6in Dia. Duct	Sec 5 - min	0.047	1	-0.013	6	-0.013	6	-0.839	8	-0.418	1	-2.831	8	-0.106	1	-0.008	1	-0.006	1	0.004	0.037	0.126		2.831	
1147	M115	2in Dia. Duct	Sec 4 - max	0.065	5	-0.007	5	0.001	1	-0.043	1	2.963	5	1.155	2	0.034	1	0.039	5	0.532	5	0.014	0.110	0.043		2.963	
56	M6	6in Dia. Duct	Sec 3 - min	0.046	1	-0.012	6	-0.012	6	-0.856	8	-0.418	1	-2.814	6	-0.106	1	-0.008	1	-0.006	1	0.004	0.038	0.125		2.814	
58	M6	6in Dia. Duct	Sec 4 - min	0.046	1	-0.013	6	-0.013	6	-0.848	8	-0.418	1	-2.822	6	-0.106	1	-0.008	1	-0.006	1	0.004	0.038	0.125		2.822	
584	M59	4in Dia. Duct	Sec 2 - min	0.030	1	-0.138	7	-0.270	7	-0.014	1	-1.051	7	-0.003	1	-3.383	6	-0.022	9	-0.050	9	0.003	0.039	0.125		3.383	
1163	M117	2in Dia. Duct	Sec 2 - max	0.049	5	0.086	5	0.001	1	-0.053	1	2.895	5	1.306	2	0.085	1	0.011	3	0.150	3	0.011	0.107	0.049		2.895	
854	M86	2in Dia. Duct	Sec 2 - min	0.000	1	0.001	8	0.000	1	0.313	7	-0.880	8	-3.591	9	-0.032	1	0.000	1	-0.013	1	0.000	0.036	0.130		3.591	
1149	M115	2in Dia. Duct	Sec 5 - max	0.065	5	-0.007	5	0.001	1	-0.046	1	2.955	5	1.119	2	0.033	1	0.039	5	0.532	5	0.014	0.110	0.041		2.985	
880	M66	4in Dia. Duct	Sec 5 - min	0.000	1	-0.032	8	-0.135	7	-0.216	1	0.022	7	-3.543	7	-4.249	8	-0.002	1	-0.005	1	0.000	0.008	0.157		4.249	
662	M67	4in Dia. Duct	Sec 1 - min	0.000	1	0.009	6	-0.308	8	-0.216	1	0.022	7	-3.543	7	-4.249	8	-0.002	1	-0.005	1	0.000	0.008	0.157		4.249	
1125	M113	2in Dia. Duct	Sec 3 - max	0.045	5	0.000	1	0.000	1	0.015	1	2.304	4	0.007	1	1.891	2	0.001	3	0.017	3	0.010	0.085	0.070		2.304	
692	M70	4in Dia. Duct	Sec 1 - min	-0.131	9	-0.006	6	-0.408	8	0.000	1	-0.332	7	-0.488	9	-3.828	6	0.008	1	0.019	1	0.011	0.012	0.142		3.828	
1165	M117	2in Dia. Duct	Sec 3 - max	0.049	5	0.086	5	0.001	1	-0.054	1	2.871	5	1.269	2	0.084	1	0.011	3	0.150	3	0.011	0.106	0.047		2.871	
554	M56	6in Dia. Duct	Sec 2 - min	-0.197	7	-0.227	9	-0.019	1	-2.723	8	0.104	1	-0.252	6	-0.605	9	-0.635	6	-0.531	6	0.016	0.121	0.027		2.723	
1152	M116	2in Dia. Duct	Sec 1 - min	0.000	1	-0.006	1	-0.136	5	-2.965	5	0.046	1	-0.085	1	-1.404	2	-0.003	1	-0.034	1	0.001	0.110	0.052		2.985	
58	M7	6in Dia. Duct	Sec 4 - min	0.047	1	-0.319	7	-0.014	7	-0.122	1	-2.580	8	-1.004	8	-0.413	1	0.041	1	0.034	1	0.004	0.115	0.045		2.580	
1014	M102	2in Dia. Duct	Sec 2 - min	0.000	1	-0.003	8	0.000	1	0.392	7	-0.822	8	-3.576	3	0.002	1	-0.001	1	-0.020	1	0.000	0.030	0.133		3.576	
691	M69	2in Dia. Duct	Sec 1 - max	0.065	7	0.053	7	-0.002	1	-0.006	1	2.901	5	1.088	6	-0.124	1	0.021	3	0.291	3	0.014	0.107	0.040		2.901	
694	M70	4in Dia. Duct	Sec 2 - min	-0.130	9	-0.007	6	-0.409	8	0.004	1	-0.330	7	-0.551	9	-3.754	8	0.008	1	0.019	1	0.011	0.012	0.139		3.754	
1167	M117	2in Dia. Duct	Sec 4 - max	0.049	5	0.086	5	0.001	1	-0.054	1	2.846	5	1.233	2	0.084	1	0.011	3	0.150	3	0.011	0.105	0.046		2.846	
843	M85	4in Dia. Duct	Sec 2 - max	0.136	6	0.547	7	0.757	7	-0.084	1	1.579	7	0.044	1	2.478	6	0.079	6	0.180	6	0.011	0.058	0.092		2.478	
549	M55	6in Dia. Duct	Sec 5 - max	0.377	8	-0.024	1	0.281	9	-0.100	1	2.698	8	0.241	4	-0.159	5	0.497	9	0.416	9	0.031	0.120	0.011		2.698	
1154	M116	2in Dia. Duct	Sec 2 - min	0.006	1	-0.007	1	-0.136	5	-2.953	5	0.047	1	-0.084	1	-1.388	2	-0.003	1	-0.034	1	0.001	0.109	0.051		2.953	
967	M97	2in Dia. Duct	Sec 4 - max	0.055	5	-0.005	1	0.001	1	0.042	1	2.305	5	1.715	2	-0.011	1	0.056	2	0.767	2	0.012	0.085	0.084		2.305	
893	M90	2in Dia. Duct	Sec 2 - max	0.085	7	0.053	7	-0.002	1	-0.008	1	2.886	5	1.083	6	-0.123	1	0.021	3	0.291	3	0.014	0.107	0.039		2.886	
1024	M103	2in Dia. Duct	Sec 2 - min	0.000	1	-0.047	7	-0.135	9	-0.846	5	-0.061	1	-0.004	1	-3.476	5	0.000	1	-0.012	1	0.000	0.031	0.129		3.476	
81	M9	6in Dia. Duct	Sec 1 - max	0.447	6	-0.082	1	0.016	8	1.513	8	0.189	1	0.243	1	1.261	8	0.203	1	0.170	1	0.037	0.067	0.056		1.513	
1169	M117	2in Dia. Duct	Sec 5 - max	0.049	5	0.086	5	0.001	1	-0.055	1	2.825	5	1.196	2	0.084	1	0.011	3	0.150	3	0.011	0.105	0.044		2.825	
1126	M113	2in Dia. Duct	Sec 3 - min	0.020	1	-0.069	2	-0.142	4	-2.304	4	-0.015	1	-1.891	2	-0.007	1	-0.013	2	-0.171	2	0.004	0.085	0.070		2.304	
1156	M116	2in Dia. Duct	Sec 3 - min	0.006	1	-0.007	1	-0.136	5	-2.941	5	0.049	1	-0.084	1	-1.332	2	-0.003	1	-0.034	1	0.001	0.109	0.049		2.941	
698	M70	4in Dia. Duct	Sec 3 - min	-0.130	9	-0.008	6	-0.409	8	0.008	1	-0.329	7	-0.613	9	-3.680	6	0.008	1	0.019	1	0.011	0.012	0.138		3.680	
552	M56	6in Dia. Duct	Sec 1 - min	-0.197	7	-0.228	9	-0.019	1	-2.698	8	0.100	1	-0.250	6	-0.525	9	-0.635	6	-0.531	6	0.016	0.120	0.023		2.698	
1162	M117	2in Dia. Duct	Sec 1 - min	0.007	1	-0.002	1	-0.136	5	-2.918	5	0.053	1	-0.085	1	-1.342	2	-0.002	2	-0.025	2	0.002	0.108	0.050		2.918	
895	M90	2in Dia. Duct	Sec 3 - max	0.085	7	0.052	7	-0.002	1	-0.011	1	2.872	5	1.039	6	-0.123	1	0.021	3	0.291	3	0.014	0.106	0.038		2.872	
70	M7	6in Dia. Duct	Sec 5 - min	0.047	1	-0.319	7	-0.015	7	-0.126	1	-2.497	8	-1.000	8	-0.413	1	0.041	1	0.034	1	0.004	0.111	0.044		2.497	
663	M67	4in Dia. Duct	Sec 2 - max	0.185	6	0.024	1	0.653	7	-0.005	7	0.174	1	3.706	8	2.369	7	0.079	6	0.180	6	0.016	0.006	0.137		3.706	
911	M92	2in Dia. Duct	Sec 1 - max	0.040	7	0.019	7	-0.002	1	0.109	1	1.451	5	2.600	6	-0.135	1	0.007	3	0.093	3	0.009	0.054	0.096		2.600	
74	M8	6in Dia. Duct	Sec 2 - min	0.040	1	-0.881	7	-0.015	7	-0.143	1	-2.251	8	-1.228	6	-0.355	1	0.132	1	0.111	1	0.003	0.100	0.055		2.251	
897	M90	2in Dia. Duct	Sec 4 - max	0.085	7	0.052	7	-0.002	1	-0.013	1	2.858	5	1.014	6	-0.122	1	0.021	3	0.291	3	0.014	0.106	0.038		2.858	
1158	M116	2in Dia. Duct	Sec 4 - min	0.006	1	-0.007	1	-0.136	5	-2.930	5	0.051	1	-0.064	1	-1.298	2	-0.003	1	-0.034	1	0.001	0.109	0.048		2.930	
878	M88	4in Dia. Duct	Sec 5 - max	0.284	6	0.013	1	0.593	7	0.108	7	0.048	1	3.544	6	0.074	9	0.078	6	0.178	6	0.022	0.004	0.131		3.544	
1142	M115	2in Dia. Duct	Sec 1 - min	0.004	1	-0.021	4	-0.137	5	-2.958	5	0.035	1	-0.034	1	-1.263	2	-0.003	1	-0.044	1	0.001	0.110	0.047		2.959	
1164	M117	2in Dia. Duct	Sec 2 - min	0.007	1	-0.002	1	-0.136	5	-2.895	5	0.053	1	-0.085	1	-1.308	2	-0.002	2	-0.025	2	0.002	0.107	0.048		2.895	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a		f_s (ksi)	
901	M91	2in Dia. Duct	Sec 1 - max	0.050	7	0.098	7	+0.002	1	-0.016	1	2.844	5	1.098	6	+0.163	1	0.012	3	0.159	3	0.011	0.105	0.041		2.844	
890	M69	4in Dia. Duct	Sec 5 - min	-0.071	9	-0.006	6	-0.455	8	-0.019	1	-0.251	7	-0.488	9	-3.828	6	0.007	1	0.016	1	0.006	0.009	0.142		3.828	
881	M89	2in Dia. Duct	Sec 1 - max	0.070	7	0.001	2	-0.002	1	0.008	1	2.901	5	0.919	6	-0.066	1	0.032	6	0.430	6	0.016	0.107	0.034		2.901	
1171	M116	2in Dia. Duct	Sec 1 - max	0.040	5	0.001	1	0.000	1	-0.102	1	1.260	5	2.735	5	0.025	1	0.004	3	0.055	3	0.009	0.047	0.101		2.735	
865	M67	2in Dia. Duct	Sec 3 - max	0.086	7	0.005	1	-0.002	1	0.147	1	1.304	8	2.529	8	-0.004	1	0.046	6	0.622	6	0.015	0.048	0.094		2.529	
698	M70	4in Dia. Duct	Sec 4 - min	-0.130	9	-0.006	6	-0.409	8	0.011	1	-0.327	7	-0.676	9	-3.606	6	0.008	1	0.019	1	0.011	0.012	0.134		3.606	
899	M90	2in Dia. Duct	Sec 5 - max	0.065	7	0.052	7	-0.002	1	-0.010	1	2.844	5	0.989	6	-0.122	1	0.021	3	0.291	3	0.014	0.105	0.037		2.844	
883	M89	2in Dia. Duct	Sec 2 - max	0.070	7	0.000	2	-0.002	1	0.005	1	2.800	5	0.894	6	-0.065	1	0.032	6	0.430	6	0.016	0.107	0.033		2.800	
1160	M116	2in Dia. Duct	Sec 5 - min	0.006	1	-0.007	1	+0.136	5	-2.918	5	0.053	1	-0.063	1	+1.259	2	-0.003	1	-0.034	1	0.001	0.108	0.047		2.918	
702	M71	4in Dia. Duct	Sec 1 - min	-0.150	8	-0.009	6	-0.377	6	0.024	1	-0.341	6	-0.738	9	-3.531	6	-0.003	7	-0.007	7	0.013	0.013	0.131		3.531	
1144	M115	2in Dia. Duct	Sec 2 - min	0.004	1	-0.021	4	-0.137	5	-2.959	5	0.037	1	-0.034	1	-1.227	2	-0.003	1	-0.044	1	0.001	0.110	0.046		2.959	
1131	M114	2in Dia. Duct	Sec 1 - max	0.059	5	-0.011	1	0.001	1	-0.022	1	2.899	5	0.940	2	0.000	1	0.050	2	0.688	2	0.013	0.107	0.035		2.899	
903	M91	2in Dia. Duct	Sec 2 - max	0.050	7	0.097	7	-0.002	1	-0.016	1	2.818	5	1.074	6	-0.162	1	0.012	3	0.159	3	0.011	0.104	0.040		2.818	
885	M89	2in Dia. Duct	Sec 3 - max	0.070	7	0.000	2	-0.002	1	0.001	1	2.901	5	0.870	6	-0.065	1	0.032	6	0.430	6	0.016	0.107	0.032		2.901	
1075	M108	2in Dia. Duct	Sec 3 - max	0.046	7	0.000	1	0.000	1	-0.016	1	2.133	2	-0.002	1	1.766	2	0.002	3	0.029	3	0.011	0.079	0.065		2.133	
953	M96	2in Dia. Duct	Sec 2 - max	0.108	7	0.010	5	0.123	9	0.738	3	-0.609	1	-0.008	1	2.801	3	0.016	2	0.245	2	0.024	0.027	0.104		2.801	
547	M55	6in Dia. Duct	Sec 4 - max	0.377	6	-0.023	1	0.261	7	-0.093	1	2.582	8	0.210	4	-0.111	5	0.497	8	0.416	9	0.031	0.115	0.009		2.582	
1168	M117	2in Dia. Duct	Sec 3 - min	0.007	1	-0.002	1	-0.136	5	-2.871	5	0.054	1	-0.084	1	+1.269	2	-0.002	2	-0.025	2	0.002	0.106	0.047		2.871	
895	M100	2in Dia. Duct	Sec 3 - max	0.041	7	0.002	1	0.000	1	0.117	1	1.188	6	2.745	2	0.005	1	0.059	2	0.801	2	0.009	0.044	0.102		2.745	
1146	M115	2in Dia. Duct	Sec 3 - min	0.004	1	-0.021	4	-0.137	5	-2.961	5	0.040	1	-0.034	1	-1.191	2	-0.003	1	-0.044	1	0.001	0.110	0.044		2.961	
1133	M114	2in Dia. Duct	Sec 2 - max	0.059	5	-0.011	1	0.001	1	-0.025	1	2.913	5	0.904	2	-0.001	1	0.050	2	0.688	2	0.013	0.108	0.033		2.913	
258	M26	6in Dia. Duct	Sec 5 - max	0.145	8	-0.025	7	0.235	9	-0.099	7	0.273	8	0.000	1	2.935	7	0.049	7	0.841	7	0.012	0.012	0.130		2.935	
888	M69	4in Dia. Duct	Sec 4 - min	-0.071	9	-0.006	6	-0.455	8	-0.023	1	-0.252	7	-0.385	9	-3.757	6	0.007	1	0.016	1	0.006	0.009	0.139		3.757	
887	M89	2in Dia. Duct	Sec 4 - max	0.070	7	0.000	2	-0.002	1	-0.002	1	2.901	5	0.845	6	-0.064	1	0.032	6	0.430	6	0.016	0.107	0.031		2.901	
1135	M114	2in Dia. Duct	Sec 3 - max	0.059	5	-0.011	1	0.001	1	-0.029	1	2.928	5	0.868	2	-0.001	1	0.050	2	0.688	2	0.013	0.108	0.032		2.928	
700	M70	4in Dia. Duct	Sec 5 - min	-0.130	9	-0.009	8	-0.409	8	0.015	1	-0.324	7	-0.738	9	-3.531	6	0.008	1	0.019	1	0.011	0.012	0.131		3.531	
889	M89	2in Dia. Duct	Sec 5 - max	0.070	7	0.000	2	+0.002	1	-0.006	1	2.901	5	0.821	6	-0.064	1	0.032	6	0.430	6	0.016	0.107	0.030		2.901	
1148	M115	2in Dia. Duct	Sec 4 - min	0.004	1	-0.021	4	-0.137	5	-2.963	5	0.043	1	-0.034	1	-1.155	2	-0.003	1	-0.044	1	0.001	0.110	0.043		2.963	
428	M43	6in Dia. Duct	Sec 4 - min	0.002	9	-0.398	6	-0.334	8	-0.657	6	0.337	1	-1.560	8	-2.590	7	0.021	1	0.016	1	0.000	0.038	0.115		2.590	
905	M91	2in Dia. Duct	Sec 3 - max	0.050	7	0.097	7	-0.002	1	-0.017	1	2.791	5	1.049	6	-0.162	1	0.012	3	0.159	3	0.011	0.103	0.039		2.791	
229	M23	6in Dia. Duct	Sec 5 - max	0.170	8	0.000	7	0.000	1	0.093	7	0.178	8	0.000	1	2.951	9	0.008	7	0.007	7	0.014	0.008	0.131		2.951	
1137	M114	2in Dia. Duct	Sec 4 - max	0.059	5	-0.012	1	0.001	1	-0.032	1	2.943	5	0.832	2	-0.002	1	0.050	2	0.688	2	0.013	0.109	0.031		2.943	
1168	M117	2in Dia. Duct	Sec 4 - min	0.007	1	-0.002	1	-0.135	5	-2.848	5	0.054	1	-0.084	1	-1.233	2	-0.002	2	-0.025	2	0.002	0.105	0.046		2.848	
1139	M114	2in Dia. Duct	Sec 5 - max	0.059	5	-0.012	1	0.001	1	-0.035	1	2.958	5	0.786	2	-0.002	1	0.050	2	0.688	2	0.013	0.110	0.029		2.958	
1150	M115	2in Dia. Duct	Sec 5 - min	0.004	1	-0.021	4	-0.138	5	-2.985	5	0.046	1	-0.033	1	-1.119	2	-0.003	1	-0.044	1	0.001	0.110	0.041		2.985	
912	M92	2in Dia. Duct	Sec 1 - min	0.009	1	-0.005	8	-0.145	2	-1.451	5	-0.109	1	0.135	1	-2.600	6	-0.005	2	-0.067	2	0.002	0.054	0.098		2.600	
888	M69	4in Dia. Duct	Sec 3 - min	-0.071	9	-0.005	6	-0.455	8	-0.028	1	-0.254	7	-0.281	9	-3.686	6	0.007	1	0.016	1	0.008	0.009	0.137		3.686	
227	M23	6in Dia. Duct	Sec 4 - max	0.170	8	0.000	7	0.000	1	0.093	7	0.174	8	0.000	1	2.922	9	0.008	7	0.007	7	0.014	0.008	0.130		2.922	
907	M91	2in Dia. Duct	Sec 4 - max	0.050	7	0.097	7	-0.002	1	-0.018	1	2.765	5	1.024	6	-0.162	1	0.012	3	0.159	3	0.011	0.102	0.038		2.765	
857	M88	2in Dia. Duct	Sec 4 - max	0.091	5	-0.027	7	0.147	3	0.111	5	0.161	4	3.371	3	-0.047	1	0.029	2	0.359	2	0.020	0.006	0.125		3.371	
1170	M117	2in Dia. Duct	Sec 5 - min	0.007	1	-0.002	1	-0.135	5	-2.825	5	0.055	1	-0.084	1	-1.196	2	-0.002	2	-0.025	2	0.002	0.105	0.044		2.825	
231	M24	6in Dia. Duct	Sec 1 - max	0.178	8	0.000	7	0.036	9	0.081	7	0.104	8	0.000	1	2.951	9	0.029	7	0.024	7	0.015	0.005	0.131		2.951	
644	M65	4in Dia. Duct	Sec 2 - min	0.000	1	-0.020	1	0.028	1	-1.579	7	0.084	1	-2.478	6	-0.044	1	-0.002	1	-0.005	1	0.000	0.058	0.092		2.478	
677	M68	4in Dia. Duct	Sec 4 - max	0.264	8	0.014	1	0.593	7	0.107	7	0.054	1	3.348	6	-0.006	1	0.078	6	0.178	6	0.022	0.004	0.124		3.348	
225	M23	6in Dia. Duct	Sec 3 - max	0.170	8	0.000	7	0.000	1	0.093	7	0.170	8	0.000	1	2.894	9	0.008	7	0.007	7	0.014	0.008	0.129		2.894	
233	M24	6in Dia. Duct	Sec 2 - max	0.178	8	-0.001	7	0.036	9	0.080	7	0.108	8	0.000	1	2.941	9	0.029	7	0.024	7	0.015	0.005	0.131		2.941	
235	M24	6in Dia. Duct	Sec 3 - max	0.178	8	-0.002	7	0.037	9	0.080	7	0.113	8	0.000	1	2.930	9	0.029	7	0.024	7	0.015	0.005	0.130		2.930	
237	M24	6in Dia. Duct	Sec 4 - max	0.179	8	-0.003	7	0.037	9	0.079	7	0.118	8	0.000	1	2.920	9	0.029	7	0.024	7	0.015	0.005	0.130		2.920	
909	M91	2in Dia. Duct	Sec 5 - max	0.050	7	0.097	7	-0.002	1	-0.019	1	2.739	5	0.999	6	-0.161	1	0.012	3	0.159	3	0.011	0.101	0.037		2.739	
1172	M118	2in Dia. Duct	Sec 1 - min	0.007	1	-0.043	4	-0.169	5	-1.280	5	0.102	1	-0.025	1	-2.735	5	-0.010	2	-0.141	2	0.002	0.047	0.101		2.735	
239	M24	6in Dia. Duct	Sec 5 - max	0.179	8	-0.003	7	0.038	9	0.078	7	0.124	8	0.000	1	2.909	9	0.029	7	0.024	7	0.015	0.005	0.129		2.909	
892	M90	2in Dia. Duct	Sec 1 - min	0.007	1	-0.009	1	-0.095	8	-2.901	5	0.008	1	0.124	1	-1.088	6	0.005	1	0.066	1	0.002	0.107	0.040		2.901	
884	M69	4in Dia. Duct	Sec 2 - min	-0.071	9	-0.005	6	-0.455	8	-0.032	1	-0.254	7	-0.177	9	-3.615	6	0.007	1	0.016	1	0.006	0.009	0.134		3.615	
550	M55	6in Dia. Duct	Sec 5 - min	-0.224	7	-0.409	8	-0.019	1	-2.698	8	0.100	1	0.158	5	-0.241	4	-0.844	6	-0.539	6	0.018	0.120	0.011		2.698	
868	M97	2in Dia. Duct	Sec 4 - min	0.000	1	-0.069	5	-0.142	5	-2.305	5	-0.042	1	0.011	1	-1.715	2	-0.003	1	-0.046	1	0.000	0.085	0.064		2.305	
1025	M103	2in Dia. Duct	Sec 3 - max	0.044	7	0.001	1	0.000	1	0.099	1	1.254	7	2.501	2	0.001	1	0.052	2	0.704	2	0.010	0.048	0.093		2.501	
1076	M106	2in Dia. Duct	Sec 3 - min	0.020	1	-0.057	2	-0.135	6	-2.133	2	0.016	1	-1.766	2	0.002	1	-0.012	2	-0.165	2	0.004	0.078	0.085		2.133	
545	M55	6in Dia. Duct	Sec 3 - max	0.376	8	-0.023	1	0.281	7	-0.087	1	2.468	8	0.167	8	-0.057	7	0.497	9	0.416	9	0.031	0.110	0.008		2.468	
223	M23	6in Dia. Duct	Sec 2 - max	0.170	8	0.001	7	0.000	1	0.093	7	0.165	8	0.000	1	2.865	9	0.008	7	0.007	7	0.014	0.007	0.127		2.865	
902	M91	2in Dia. Duct	Sec 1 - min	0.009	1	-0.003	1	-0.095	8	-2.844	5	0.016	1	0.163	1	-1.088	6	0.002	2	0.028	2	0.002	0.105	0.041		2.844	
894	M90	2in Dia. Duct	Sec 2 - min	0.007	1	-0.009	1	-0.095	6	-2.886	5	0.008	1	0.123	1	-1.063	6	0.005	1	0.066	1	0.002	0.107	0.039		2.886	
539	M54	6in Dia. Duct	Sec 5 - max	0.289	8	0.128	7	0.282	7	-0.074	1	2.234	8	0.581	8	0.406	9	0.438	9	0.368	9	0.022	0.099	0.026		2.234	
221	M23	6in Dia. Duct	Sec 1 - max	0.169	8	0.002	7	0.000	1	0.093	7	0.161	8	0.000	1	2.836	9	0.008	7	0.007	7	0.014	0.007	0.128		2.836	
76	M8	6in Dia. Duct	Sec 3 - min	0.041	1	-0.082	7	-0.015	7	-0.158	1	-2.005	8	-1.224	8	-0.355	1	0.132	1	0.111	1	0.003	0.089	0.054		2.005	
682	M69	4in Dia. Duct	Sec 1 - min	-0.071	9	-0.004	6	+0.455	8	-0.037	1	-0.255	7	-0.074	9	-3.544	6	0.007	1	0.016	1	0.006	0.009	0.131		3.544	
219	M22	6in Dia. Duct	Sec 5 - max	0.138	8	0.002	7	0.000	1	0.091	7	0.210	8	0.000	1	2.838	9	-0.013	9	-0.011	9	0.011	0.009	0.126		2.838	
707	M71	4in Dia. Duct	Sec 4 - max	0.319	7	-0.005	1	-0.001	1	0.209	7	-0.041	1	1.418	7	3.023	8	0.016	8	0.037	8	0.027	0.008	0.112		3.023	
896	M90	2in Dia. Duct	Sec 3 - min	0.007	1	-0.009	1	-0.095	8	-2.872	5	0.011	1	0.123	1	-1.039	6	0.005	1	0.066	1	0.002	0.106	0.038		2.872	
904	M91	2in Dia. Duct	Sec 2 - min	0.009	1	-0.003	1	-0.095	8	-2.818	5	0.016	1	0.162	1	-1.074	6	0.002	2	0.028	2	0.002	0.104	0.040		2.818	
1051	M106	2in Dia. Duct	Sec 1 - max	0.050	7	0.027	5	0.000	1	-0.015	1	2.312	7	1.330	2	0.017	1	0.022	3	0.302	3	0.011	0.086	0.049		2.312	
956	M100	2in Dia. Duct	Sec 3 - min	0.009	1	-0.046	5	-0.142	9	-1.188	5	-0.117	1	-0.005	1	-2.745	2	0.000	1	0.006	1	0.000	0.044	0.102		2.745	
696	M90	2in Dia. Duct	Sec 4 - min	0.008	1	-0.009	1	-0.095	8	-2.858	5	0.013	1	0.122	1	-1.014	6	0.005	1	0.066	1	0.002	0.106	0.038		2.858	
1101	M111	2in Dia. Duct	Sec 1 - max	0.048	5	0.024	7	0.000	1	0.014	1	2.148	5	1.496	2	-0.010	1	0.024	3	0.323	3	0.010	0.060	0.055		2.148	
241	M25	6in Dia. Duct	Sec 1 - max	0.159	8	-0.003	7	0.168	9	0.054	7	0.032	8	0.000	1	2.909	9	0.045	7	0.037	7	0.013	0.002	0.129		2.909	
99	M10	6in Dia. Duct	Sec 5 - max	0.164	6	-0.102	1	0.016	8	-0.398	1	1.819	7	0.094	1	1.133	8	0.244	1	0.204	1	0.013	0.081	0.050		1.819	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_a	f_v/σ_a		f_t (ksi)	
1053	M106	2in Dia. Duct	Sec 2 - max	0.060	7	0.026	5	0.000	1	-0.017	1	2.304	7	1.298	2	0.017	1	0.022	3	0.302	3	0.011	0.085	0.048		2.304	
230	M23	6in Dia. Duct	Sec 5 - min	-0.065	7	-0.016	8	-0.215	6	-0.178	8	-0.093	7	-2.951	9	0.000	1	-0.095	8	-0.080	8	0.005	0.008	0.131		2.951	
906	M91	2in Dia. Duct	Sec 3 - min	0.009	1	-0.003	1	-0.095	8	-2.791	5	0.017	1	0.162	1	-1.049	6	0.002	2	0.028	2	0.002	0.103	0.039		2.791	
543	M55	6in Dia. Duct	Sec 2 - max	0.376	8	-0.022	1	0.281	7	-0.080	1	2.350	8	0.192	1	0.023	7	0.497	9	0.416	9	0.031	0.104	0.009		2.350	
900	M90	2in Dia. Duct	Sec 5 - min	0.008	1	-0.009	1	-0.095	8	-2.844	5	0.016	1	0.122	1	-0.999	6	0.005	1	0.066	1	0.002	0.103	0.037		2.844	
664	M67	4in Dia. Duct	Sec 2 - min	0.000	1	0.006	6	-0.307	8	-0.174	1	0.005	7	-3.389	7	-3.706	8	-0.002	1	-0.005	1	0.000	0.006	0.137		3.706	
1103	M111	2in Dia. Duct	Sec 2 - max	0.046	5	0.024	7	0.000	1	0.012	1	2.142	5	1.460	2	-0.010	1	0.024	3	0.323	3	0.010	0.079	0.054		2.142	
217	M22	6in Dia. Duct	Sec 4 - max	0.136	8	0.002	7	0.000	1	0.090	7	0.206	8	0.000	1	2.773	9	-0.013	9	-0.011	9	0.011	0.009	0.123		2.773	
220	M22	6in Dia. Duct	Sec 5 - min	-0.099	7	-0.014	8	-0.229	6	-0.210	8	-0.091	7	-2.836	9	0.000	1	-0.052	6	-0.043	6	0.008	0.009	0.126		2.836	
969	M97	2in Dia. Duct	Sec 5 - max	0.053	5	-0.011	1	0.001	1	-0.022	1	2.899	5	0.653	2	-0.019	1	0.056	2	0.767	2	0.012	0.107	0.024		2.899	
83	M9	6in Dia. Duct	Sec 2 - max	0.448	6	-0.083	1	0.016	8	1.142	8	0.213	1	0.243	1	1.256	8	0.203	1	0.170	1	0.037	0.051	0.056		1.256	
1055	M108	2in Dia. Duct	Sec 3 - max	0.050	7	0.026	5	0.000	1	-0.019	1	2.297	7	1.268	2	0.017	1	0.022	3	0.302	3	0.011	0.085	0.047		2.297	
228	M23	6in Dia. Duct	Sec 4 - min	-0.065	7	-0.016	8	-0.215	6	-0.174	8	-0.093	7	-2.922	9	0.000	1	-0.095	8	-0.080	8	0.005	0.008	0.130		2.922	
679	M68	4in Dia. Duct	Sec 3 - max	0.264	8	0.015	1	0.593	7	0.107	7	0.059	1	3.151	6	-0.006	1	0.078	6	0.176	6	0.022	0.004	0.117		3.151	
540	M54	6in Dia. Duct	Sec 5 - min	-0.218	7	-0.684	6	-0.019	1	-2.234	8	0.074	1	-0.406	9	-0.581	6	-0.553	6	-0.463	8	0.018	0.099	0.026		2.234	
671	M68	2in Dia. Duct	Sec 1 - max	0.065	7	-0.015	1	-0.002	1	0.024	1	2.844	5	0.818	2	0.002	1	0.042	6	0.573	6	0.014	0.105	0.023		2.844	
261	M27	6in Dia. Duct	Sec 1 - max	0.001	7	0.016	8	0.119	7	-0.099	7	0.273	8	0.000	1	2.935	7	0.049	7	0.041	7	0.000	0.012	0.130		2.935	
262	M27	6in Dia. Duct	Sec 1- min	-0.001	6	0.009	7	0.000	1	-0.273	8	0.099	7	-2.935	7	0.000	1	-0.151	8	-0.126	8	0.000	0.012	0.130		2.935	
1132	M114	2in Dia. Duct	Sec 1- min	0.002	1	-0.057	3	-0.138	5	-2.899	5	0.022	1	0.000	1	-0.840	2	-0.003	1	-0.047	1	0.000	0.107	0.035		2.899	
882	M99	2in Dia. Duct	Sec 1- min	0.005	1	+0.013	1	-0.095	8	-2.901	5	-0.008	1	0.066	1	-0.919	6	0.006	1	0.084	1	0.001	0.107	0.034		2.901	
260	M26	6in Dia. Duct	Sec 5 - min	0.000	1	-0.040	8	-0.235	7	-0.273	8	0.099	7	-2.935	7	0.000	1	-0.151	8	-0.126	8	0.000	0.012	0.130		2.935	
243	M25	6in Dia. Duct	Sec 2 - max	0.159	8	-0.004	7	0.166	9	0.053	7	0.037	8	0.000	1	2.861	9	0.045	7	0.037	7	0.013	0.002	0.127		2.861	
548	M55	6in Dia. Duct	Sec 4 - min	-0.224	7	-0.498	8	-0.019	1	-2.582	8	0.093	1	0.111	5	-0.210	4	-0.644	6	-0.539	6	0.018	0.115	0.009		2.582	
908	M91	2in Dia. Duct	Sec 4 - min	0.009	1	-0.003	1	-0.095	8	-2.765	5	0.016	1	0.162	1	-1.024	6	0.002	2	0.028	2	0.002	0.102	0.038		2.765	
521	M53	6in Dia. Duct	Sec 1 - max	0.197	8	0.220	7	0.287	7	1.052	8	1.041	7	0.766	6	1.787	9	0.345	9	0.289	9	0.016	0.047	0.079		1.787	
522	M53	6in Dia. Duct	Sec 1- min	-0.197	7	-0.746	8	-0.019	1	-1.041	7	-1.052	8	-1.767	9	-0.766	6	-0.474	8	-0.397	6	0.016	0.047	0.079		1.787	
873	M88	2in Dia. Duct	Sec 2 - max	0.065	7	-0.015	1	-0.002	1	0.020	1	2.858	5	0.593	2	0.003	1	0.042	6	0.573	6	0.014	0.108	0.022		2.858	
1105	M111	2in Dia. Duct	Sec 3 - max	0.046	5	0.023	7	0.000	1	0.010	1	2.135	5	1.425	2	-0.010	1	0.024	3	0.323	3	0.010	0.079	0.053		2.135	
868	M87	2in Dia. Duct	Sec 3 - min	0.000	1	-0.057	7	-0.108	9	-1.304	8	-0.147	1	0.004	1	-2.529	8	0.008	1	0.089	1	0.000	0.048	0.094		2.529	
875	M88	2in Dia. Duct	Sec 3 - max	0.065	7	-0.015	1	-0.002	1	0.016	1	2.872	5	0.589	2	0.003	1	0.042	6	0.573	6	0.014	0.108	0.021		2.872	
1057	M106	2in Dia. Duct	Sec 4 - max	0.051	7	0.026	5	0.000	1	-0.021	1	2.290	7	1.234	2	0.017	1	0.022	3	0.302	3	0.011	0.085	0.046		2.290	
1134	M114	2in Dia. Duct	Sec 2 - min	0.002	1	-0.057	3	-0.137	5	-2.913	5	0.025	1	0.001	1	-0.904	2	-0.003	1	-0.047	1	0.000	0.108	0.033		2.913	
884	M89	2in Dia. Duct	Sec 2 - min	0.005	1	-0.013	1	-0.095	8	-2.900	5	-0.005	1	0.065	1	-0.894	6	0.006	1	0.084	1	0.001	0.107	0.033		2.900	
1041	M105	2in Dia. Duct	Sec 1 - max	0.052	7	+0.011	1	0.000	1	-0.003	1	2.297	7	1.214	2	0.009	1	0.034	9	0.468	9	0.012	0.085	0.045		2.297	
677	M68	2in Dia. Duct	Sec 4 - max	0.065	7	+0.015	1	-0.002	1	0.012	1	2.886	5	0.544	2	0.004	1	0.042	6	0.573	6	0.014	0.107	0.020		2.886	
199	M20	6in Dia. Duct	Sec 5 - max	0.100	9	-0.047	1	0.089	9	-0.344	1	0.366	8	2.632	9	0.000	1	-0.022	9	-0.019	9	0.008	0.016	0.117		2.632	
200	M20	6in Dia. Duct	Sec 5 - min	-0.100	6	-0.049	6	0.000	1	-0.366	8	0.344	1	0.000	1	-2.632	9	-0.028	6	-0.024	6	0.008	0.016	0.117		2.632	
201	M21	6in Dia. Duct	Sec 1 - max	0.100	9	0.044	7	0.000	1	-0.344	1	0.366	8	2.632	9	0.000	1	-0.022	9	-0.019	9	0.008	0.016	0.117		2.632	
202	M21	6in Dia. Duct	Sec 1- min	-0.100	7	0.028	8	-0.292	9	-0.366	8	0.344	1	0.000	1	-2.632	9	-0.028	6	-0.024	6	0.008	0.016	0.117		2.632	
1217	M122	6in Dia. Duct	Sec 4 - max	0.017	8	0.42	6	0.114	6	-0.187	1	2.672	6	0.258	8	0.479	9	0.250	1	0.209	1	0.001	0.119	0.021		2.672	
1218	M122	6in Dia. Duct	Sec 4 - min	-0.017	7	0.042	1	0.000	1	-2.672	6	0.187	1	-0.479	9	-0.258	6	-0.495	6	-0.414	6	0.001	0.119	0.021		2.672	
226	M23	6in Dia. Duct	Sec 3 - min	-0.064	7	-0.015	8	-0.214	6	-0.170	8	-0.093	7	-2.894	9	0.000	1	-0.095	8	-0.080	8	0.005	0.008	0.129		2.894	
879	M88	2in Dia. Duct	Sec 5 - max	0.065	7	-0.015	1	-0.002	1	0.008	1	2.901	5	0.519	2	0.004	1	0.042	6	0.573	6	0.014	0.107	0.019		2.901	
1136	M114	2in Dia. Duct	Sec 3 - min	0.002	1	-0.057	3	-0.137	5	-2.928	5	0.029	1	0.001	1	-0.868	2	-0.003	1	-0.047	1	0.000	0.108	0.032		2.928	
867	M87	2in Dia. Duct	Sec 4 - max	0.082	7	-0.005	1	-0.002	1	0.146	1	1.983	5	1.448	2	0.017	1	0.046	6	0.622	6	0.014	0.073	0.054		1.983	
866	M89	2in Dia. Duct	Sec 3 - min	0.005	1	-0.013	1	-0.095	8	-2.901	5	-0.001	1	0.065	1	-0.870	6	0.006	1	0.084	1	0.001	0.107	0.032		2.901	
215	M22	6in Dia. Duct	Sec 3 - max	0.136	8	0.003	7	0.000	1	0.090	7	0.203	8	0.000	1	2.709	9	-0.013	9	-0.011	9	0.011	0.009	0.120		2.709	
1107	M111	2in Dia. Duct	Sec 4 - max	0.046	5	0.023	7	0.000	1	0.008	1	2.129	5	1.390	2	-0.010	1	0.024	3	0.323	3	0.010	0.079	0.051		2.129	
1043	M105	2in Dia. Duct	Sec 2 - max	0.052	7	-0.011	1	0.000	1	-0.006	1	2.300	7	1.182	2	0.009	1	0.034	9	0.468	9	0.012	0.085	0.044		2.300	
218	M22	6in Dia. Duct	Sec 4 - min	-0.099	7	-0.013	8	-0.229	6	-0.206	6	-0.090	7	-2.773	9	0.000	1	-0.052	6	-0.043	6	0.008	0.009	0.123		2.773	
245	M25	6in Dia. Duct	Sec 3 - max	0.160	8	-0.004	7	0.169	9	0.052	7	0.043	8	0.000	1	2.614	9	0.045	7	0.037	7	0.013	0.002	0.125		2.614	
910	M91	2in Dia. Duct	Sec 5 - min	0.009	1	-0.003	1	-0.095	8	-2.739	5	0.019	1	0.181	1	-0.999	6	0.002	2	0.028	2	0.002	0.101	0.037		2.739	
1059	M106	2in Dia. Duct	Sec 5 - max	0.051	7	0.026	5	0.000	1	-0.024	1	2.283	7	1.202	2	0.017	1	0.022	3	0.302	3	0.011	0.085	0.045		2.283	
1061	M107	2in Dia. Duct	Sec 1 - max	0.042	7	0.062	7	0.000	1	-0.024	1	2.283	7	1.254	2	0.022	1	0.009	3	0.118	3	0.009	0.085	0.046		2.283	
1138	M114	2in Dia. Duct	Sec 4 - min	0.002	1	-0.057	3	-0.137	5	-2.943	5	0.032	1	0.002	1	-0.832	2	-0.003	1	-0.047	1	0.000	0.109	0.031		2.943	
1111	M112	2in Dia. Duct	Sec 1 - max	0.038	5	0.057	5	0.000	1	0.006	1	2.123	5	1.427	2	-0.015	1	0.008	3	0.116	3	0.008	0.079	0.053		2.123	
224	M23	6in Dia. Duct	Sec 2 - min	-0.064	7	-0.014	6	-0.214	6	-0.165	8	-0.093	7	-2.865	9	0.000	1	-0.095	8	-0.080	8	0.005	0.007	0.127		2.865	
888	M89	2in Dia. Duct	Sec 4 - min	0.005	1	-0.013	1	-0.095	8	-2.901	5	0.002	1	0.064	1	-0.845	6	0.006	1	0.084	1	0.001	0.107	0.031		2.901	
263	M27	6in Dia. Duct	Sec 2 - max	0.000	7	0.015	8	0.119	7	-0.095	7	0.265	8	0.000	1	2.877	7	0.049	7	0.041	7	0.000	0.012	0.128		2.877	
264	M27	6in Dia. Duct	Sec 2 - min	0.000	6	0.008	7	0.000	1	-0.265	8	0.095	7	-2.877	7	0.000	1	-0.151	8	-0.126	8	0.000	0.012	0.128		2.877	
325	M33	6in Dia. Duct	Sec 3 - max	0.130	6	0.165	6	0.246	9	1.218	6	0.027	1	1.681	9	-0.068	1	0.049	7	0.041	7	0.011	0.054	0.075		1.681	
326	M33	6in Dia. Duct	Sec 3 - min	-0.130	9	-0.014	1	0.010	1	-0.027	1	-1.218	6	0.068	1	-1.681	9	-0.151	8	-0.126	8	0.011	0.054	0.075		1.681	
1045	M105	2in Dia. Duct	Sec 3 - max	0.052	7	-0.011	1	0.000	1	-0.009	1	2.304	7	1.150	2	0.009	1	0.034	9	0.468	9	0.012	0.085	0.043		2.304	
1140	M114	2in Dia. Duct	Sec 5 - min	0.002	1	-0.057	3	-0.137	5	-2.958	5	0.035	1	0.002	1	-0.796	2	-0.003	1	-0.047	1	0.000	0.110	0.029		2.958	
1091	M110	2in Dia. Duct	Sec 1 - max	0.047	5	-0.010	1	0.000	1	0.025	1	2.134	5	1.347	2	-0.005	1	0.038	5	0.515	5	0.010	0.079	0.050		2.134	
945	M95	2in Dia. Duct	Sec 3 - max	0.109	2	0.006	4	0.000	1	1.133	2	-0.900	1	0.008	1	1.975	5	0.004	7	0.060	7	0.024	0.042	0.073		1.975	
1028	M103	2in Dia. Duct	Sec 3 - min	0.000	1	-0.054	7	-0.131	9	-1.254	7	-0.099	1	-0.001	1	-2.501	2	0.000	1	-0.012	1	0.000	0.046	0.093		2.501	
1109	M111	2in Dia. Duct	Sec 5 - max	0.046	5	0.023	7	0.000	1	0.006	1	2.123	5	1.354	2	-0.010	1	0.024	3	0.323	3	0.010	0.079	0.050		2.123	
890	M89	2in Dia. Duct	Sec 5 - min	0.005	1	-0.013	1	-0.095	8	-2.901	5	0.006	1	0.064	1	-0.821	6	0.006	1	0.084	1	0.001	0.107	0.030		2.901	
541	M55	6in Dia. Duct	Sec 1 - max	0.376	8	-0.022	1	0.282	7	-0.074	1	2.234	8	0.198	1	0.103	7	0.497	9	0.416	9	0.031	0.099	0.009		2.234	
537	M54	6in Dia. Duct	Sec 4 - max	0.269	8	0.129	7	0.282	7	-0.067	1	2.045	8	0.583	6	0.486	9	0.438	9	0.368	9	0.022	0.091	0.026		2.045	
713	M72	4in Dia. Duct	Sec 2 - max	0.314	7	-0.005	1	0.116	8	0.122	7	-0.040	1	0.730	7	2.906	8	0.016	8	0.037	8	0.026	0.005	0.108		2.906	
1083	M107	2in Dia. Duct	Sec 2 - max	0.042	7	0.062	7	0.000	1	-0.024	1	2.266	7	1.221	2	0.022	1	0.009	3	0.118	3	0.009	0.084	0.045		2.266	
222	M23	6in Dia. Duct	Sec 1- min	-0.064	7	-0.014	8	-0.214	6	-0.161	8	-0.093	7	-2.836	9	0.000	1	-0.095	8	-0.080	8	0.005	0.007	0.126		2.836	
1047	M105	2in Dia. Duct	Sec 4 - max	0.052	7	-0.011	1	0.000	1	-0.012	1	2.308	7	1.118	2	0.009	1	0.034	9	0.468	9	0.012	0.085	0.041		2.308	

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a		f_s (ksi)	
																		0-2250									
247	M25	6in Dia. Duct	Sec 4 - max	0.160	8	-0.005	7	0.169	9	0.050	7	0.048	8	0.000	1	2.766	9	0.045	7	0.037	7	0.013	0.002	0.123		2.766	
1113	M112	2in Dia. Duct	Sec 2 - max	0.039	5	0.057	5	0.000	1	0.005	1	2.107	5	1.391	2	-0.015	1	0.008	3	0.116	3	0.009	0.078	0.052		2.107	
1093	M110	2in Dia. Duct	Sec 2 - max	0.047	5	-0.011	1	0.000	1	0.023	1	2.138	5	1.312	2	-0.005	1	0.038	5	0.515	5	0.010	0.079	0.048		2.138	
665	M87	4in Dia. Duct	Sec 3 - max	0.165	6	0.021	1	0.652	7	0.008	7	0.135	1	3.165	8	1.236	7	0.079	6	0.180	6	0.016	0.005	0.117		3.165	
216	M22	6in Dia. Duct	Sec 3 - min	-0.099	7	-0.013	8	-0.228	8	-0.203	8	-0.090	7	-2.709	9	0.000	1	-0.052	8	-0.043	6	0.008	0.009	0.120		2.709	
213	M22	6in Dia. Duct	Sec 2 - max	0.135	8	0.003	7	0.000	1	0.089	7	0.199	8	0.008	6	2.846	9	-0.013	9	-0.011	9	0.011	0.009	0.118		2.646	
232	M24	6in Dia. Duct	Sec 1- min	-0.020	7	-0.018	8	-0.247	6	-0.104	8	-0.081	7	-2.951	9	0.000	1	-0.129	8	-0.108	8	0.002	0.005	0.131		2.951	
1049	M105	2in Dia. Duct	Sec 5 - max	0.052	7	-0.011	1	0.000	1	-0.015	1	2.312	7	1.086	2	0.009	1	0.034	9	0.468	9	0.012	0.086	0.040		2.312	
234	M24	6in Dia. Duct	Sec 2 - min	-0.020	7	-0.017	8	-0.247	6	-0.108	8	-0.080	7	-2.941	9	0.000	1	-0.129	8	-0.108	8	0.002	0.005	0.131		2.941	
1095	M110	2in Dia. Duct	Sec 3 - max	0.047	5	-0.011	1	0.000	1	0.020	1	2.141	5	1.277	2	-0.005	1	0.038	5	0.515	5	0.010	0.079	0.047		2.141	
236	M24	6in Dia. Duct	Sec 3 - min	-0.021	7	-0.018	8	-0.247	6	-0.113	8	-0.080	7	-2.930	9	0.000	1	-0.129	8	-0.108	8	0.002	0.005	0.130		2.930	
265	M27	6in Dia. Duct	Sec 3 - max	0.000	7	0.014	8	0.116	7	-0.091	7	0.258	8	0.000	1	2.819	7	0.049	7	0.041	7	0.000	0.011	0.125		2.819	
268	M27	6in Dia. Duct	Sec 3 - min	0.000	8	0.007	7	0.000	1	-0.258	8	0.091	7	-2.819	7	0.000	1	-0.151	8	-0.126	8	0.000	0.011	0.125		2.819	
239	M24	6in Dia. Duct	Sec 4 - min	-0.021	7	-0.018	8	-0.248	8	-0.116	8	-0.079	7	-2.920	9	0.000	1	-0.129	8	-0.108	8	0.002	0.005	0.130		2.920	
1085	M107	2in Dia. Duct	Sec 3 - max	0.042	7	0.062	7	0.000	1	-0.025	1	2.250	7	1.189	2	0.022	1	0.009	3	0.116	3	0.009	0.083	0.044		2.250	
240	M24	6in Dia. Duct	Sec 5 - min	-0.021	7	-0.019	8	-0.248	8	-0.124	8	-0.078	7	-2.909	9	0.000	1	-0.129	8	-0.108	8	0.002	0.006	0.129		2.909	
1115	M112	2in Dia. Duct	Sec 3 - max	0.039	5	0.056	5	0.000	1	0.004	1	2.092	5	1.358	2	-0.015	1	0.008	3	0.116	3	0.009	0.077	0.050		2.092	
249	M25	6in Dia. Duct	Sec 5 - max	0.160	8	-0.006	7	0.169	9	0.049	7	0.054	8	0.000	1	2.718	9	0.045	7	0.037	7	0.013	0.002	0.121		2.718	
1102	M111	2in Dia. Duct	Sec 1- min	0.006	1	-0.007	1	-0.133	5	-2.148	5	-0.014	1	0.010	1	-1.496	2	0.000	1	0.007	1	0.001	0.080	0.055		2.148	
546	M55	6in Dia. Duct	Sec 3 - min	-0.224	7	-0.408	8	-0.019	1	-2.466	8	0.067	1	0.057	7	-0.187	6	-0.644	6	-0.539	6	0.018	0.110	0.008		2.466	
1052	M106	2in Dia. Duct	Sec 1- min	0.006	1	-0.007	1	-0.121	5	-2.312	7	0.015	1	-0.017	1	-1.330	2	0.000	1	-0.009	1	0.001	0.086	0.049		2.312	
1097	M110	2in Dia. Duct	Sec 4 - max	0.047	5	-0.011	1	0.000	1	0.017	1	2.145	5	1.242	2	-0.005	1	0.038	5	0.515	5	0.010	0.079	0.048		2.145	
78	M5	6in Dia. Duct	Sec 4 - min	0.041	1	-0.882	7	-0.016	7	-0.174	1	-1.759	8	-1.220	8	-0.355	1	0.132	1	0.111	1	0.003	0.078	0.054		1.759	
873	M66	4in Dia. Duct	Sec 2 - max	0.264	6	0.015	1	0.593	7	0.107	7	0.064	1	2.954	6	-0.097	1	0.076	6	0.178	6	0.022	0.004	0.109		2.954	
680	M66	4in Dia. Duct	Sec 5 - min	0.000	1	-0.004	6	-0.380	8	-0.048	1	-0.106	7	-0.074	9	-3.544	6	0.002	1	0.005	1	0.000	0.004	0.131		3.544	
1067	M107	2in Dia. Duct	Sec 4 - max	0.042	7	0.062	7	0.000	1	-0.026	1	2.233	7	1.157	2	0.022	1	0.009	3	0.116	3	0.009	0.083	0.043		2.233	
1054	M106	2in Dia. Duct	Sec 2 - min	0.006	1	-0.007	1	-0.121	5	-2.304	7	0.017	1	-0.017	1	-1.298	2	0.000	1	-0.009	1	0.001	0.085	0.048		2.304	
1104	M111	2in Dia. Duct	Sec 2 - min	0.000	1	-0.007	1	-0.133	5	-2.142	5	-0.012	1	0.010	1	-1.460	2	0.000	1	0.007	1	0.001	0.079	0.054		2.142	
1099	M110	2in Dia. Duct	Sec 5 - max	0.047	5	-0.011	1	0.000	1	0.014	1	2.148	5	1.206	2	-0.005	1	0.038	5	0.515	5	0.010	0.080	0.045		2.148	
211	M22	6in Dia. Duct	Sec 1 - max	0.135	8	0.004	7	0.000	1	0.088	7	0.196	8	0.050	6	2.583	9	-0.013	9	-0.011	9	0.011	0.009	0.115		2.583	
536	M54	6in Dia. Duct	Sec 4 - min	-0.216	7	-0.863	8	-0.019	1	-2.045	8	0.067	1	-0.488	9	-0.583	6	-0.553	6	-0.463	8	0.018	0.091	0.028		2.045	
1117	M112	2in Dia. Duct	Sec 4 - max	0.039	5	0.056	5	0.000	1	0.003	1	2.077	5	1.320	2	-0.015	1	0.008	3	0.116	3	0.009	0.077	0.048		2.077	
214	M22	6in Dia. Duct	Sec 2 - min	-0.099	7	-0.012	8	-0.228	8	-0.199	8	-0.089	7	-2.646	9	-0.008	6	-0.052	6	-0.043	6	0.008	0.009	0.118		2.646	
287	M27	6in Dia. Duct	Sec 4 - max	0.000	7	0.013	8	0.118	7	-0.088	7	0.252	8	0.000	1	2.762	7	0.049	7	0.041	7	0.000	0.011	0.123		2.762	
288	M27	6in Dia. Duct	Sec 4 - min	0.000	8	0.006	7	0.000	1	-0.252	8	0.088	7	-2.762	7	0.000	1	-0.151	8	-0.126	8	0.000	0.011	0.123		2.762	
251	M26	6in Dia. Duct	Sec 1 - max	0.141	8	-0.006	7	0.228	9	0.033	7	0.005	8	0.000	1	2.718	9	0.049	7	0.041	7	0.012	0.001	0.121		2.718	
1058	M106	2in Dia. Duct	Sec 3 - min	0.006	1	-0.008	1	-0.121	5	-2.297	7	0.019	1	-0.017	1	-1.266	2	0.000	1	-0.009	1	0.001	0.085	0.047		2.297	
1225	M123	4in Dia. Duct	Sec 3 - max	0.147	8	0.004	1	-0.009	1	1.449	8	-0.059	1	1.615	9	-0.104	1	0.079	6	0.180	6	0.012	0.054	0.087		1.815	
1106	M111	2in Dia. Duct	Sec 3 - min	0.006	1	-0.008	1	-0.133	5	-2.135	5	-0.010	1	0.010	1	-1.425	2	0.000	1	0.007	1	0.001	0.079	0.053		2.135	
209	M21	6in Dia. Duct	Sec 5 - max	0.110	9	0.004	7	0.000	1	0.082	7	0.209	8	0.050	6	2.583	9	-0.022	9	-0.019	9	0.009	0.009	0.115		2.583	
210	M21	6in Dia. Duct	Sec 5 - min	-0.110	7	-0.011	8	-0.276	8	-0.209	8	-0.082	7	-2.583	9	-0.050	6	-0.026	6	-0.024	6	0.009	0.009	0.115		2.583	
1069	M107	2in Dia. Duct	Sec 3 - max	0.042	7	0.062	7	0.000	1	-0.026	1	2.216	7	1.124	2	0.022	1	0.009	3	0.116	3	0.009	0.082	0.042		2.216	
1112	M112	2in Dia. Duct	Sec 1- min	0.007	1	-0.003	1	-0.132	5	-2.123	5	-0.006	1	0.015	1	-1.427	2	-0.003	2	-0.047	2	0.002	0.079	0.053		2.123	
869	M87	2in Dia. Duct	Sec 5 - max	0.059	7	-0.015	1	-0.002	1	0.024	1	2.844	5	0.389	2	0.037	1	0.046	6	0.622	6	0.013	0.105	0.014		2.844	
997	M100	2in Dia. Duct	Sec 4 - max	0.039	7	-0.005	1	0.000	1	0.105	1	1.608	5	1.742	2	0.005	1	0.059	2	0.601	2	0.009	0.060	0.089		1.742	
1119	M112	2in Dia. Duct	Sec 5 - max	0.039	5	0.056	5	0.000	1	0.003	1	2.062	5	1.284	2	-0.015	1	0.008	3	0.116	3	0.009	0.076	0.048		2.062	
1062	M107	2in Dia. Duct	Sec 1- min	0.007	1	-0.002	1	-0.120	5	-2.283	7	0.024	1	-0.022	1	-1.254	2	-0.004	2	-0.057	2	0.002	0.085	0.046		2.283	
1027	M103	2in Dia. Duct	Sec 4 - max	0.042	7	-0.005	1	0.000	1	0.062	1	1.721	7	1.597	2	-0.002	1	0.052	2	0.704	2	0.009	0.064	0.059		1.721	
100	M10	6in Dia. Duct	Sec 5 - min	0.010	1	-1.558	6	-0.018	7	-1.818	7	0.398	1	-1.133	6	-0.094	1	-0.381	7	-0.319	7	0.001	0.081	0.050		1.819	
708	M71	4in Dia. Duct	Sec 4 - min	-0.148	8	-0.023	8	-0.384	6	0.041	1	-0.209	7	-3.023	8	-1.416	7	-0.003	7	-0.007	7	0.012	0.008	0.112		3.023	
1058	M106	2in Dia. Duct	Sec 4 - min	0.006	1	-0.008	1	-0.121	5	-2.290	7	0.021	1	-0.017	1	-1.234	2	0.000	1	-0.009	1	0.001	0.085	0.046		2.290	
242	M25	6in Dia. Duct	Sec 1- min	0.000	1	-0.019	8	-0.242	8	-0.032	8	-0.054	7	-2.909	9	0.000	1	-0.147	8	-0.123	8	0.000	0.002	0.129		2.909	
1108	M111	2in Dia. Duct	Sec 4 - min	0.006	1	-0.008	1	-0.133	5	-2.129	5	-0.008	1	0.010	1	-1.390	2	0.000	1	0.007	1	0.001	0.079	0.051		2.129	
970	M97	2in Dia. Duct	Sec 5 - min	0.000	1	-0.076	5	-0.138	5	-2.899	5	0.022	1	0.019	1	-0.653	2	-0.003	1	-0.046	1	0.000	0.107	0.024		2.899	
212	M22	6in Dia. Duct	Sec 1- min	-0.099	7	-0.011	8	-0.228	8	-0.196	8	-0.088	7	-2.583	9	-0.050	6	-0.052	6	-0.043	6	0.008	0.009	0.115		2.583	
544	M55	6in Dia. Duct	Sec 2 - min	-0.224	7	-0.408	8	-0.019	1	-2.350	8	0.069	1	-0.023	7	-0.192	1	-0.644	6	-0.539	6	0.018	0.104	0.009		2.350	
269	M27	6in Dia. Duct	Sec 5 - max	0.000	1	0.012	8	0.117	7	-0.086	7	0.248	8	0.000	1	2.705	7	0.049	7	0.041	7	0.000	0.011	0.120		2.705	
270	M27	6in Dia. Duct	Sec 5 - min	0.000	1	0.005	7	0.000	1	-0.248	8	0.086	7	-2.705	7	0.000	1	-0.151	8	-0.126	8	0.000	0.011	0.120		2.705	
781	M79	6in Dia. Duct	Sec 1 - max	0.000	1	0.012	8	0.117	7	-0.086	7	0.248	8	0.000	1	2.705	7	0.049	7	0.041	7	0.000	0.011	0.120		2.705	
782	M79	6in Dia. Duct	Sec 1- min	0.000	1	0.005	7	0.000	1	-0.248	8	0.086	7	-2.705	7	0.000	1	-0.151	8	-0.126	8	0.000	0.011	0.120		2.705	
1114	M112	2in Dia. Duct	Sec 2 - min	0.007	1	-0.003	1	-0.132	5	-2.107	5	-0.005	1	0.015	1	-1.391	2	-0.003	2	-0.047	2	0.002	0.078	0.052		2.107	
954	M96	2in Dia. Duct	Sec 2 - min	0.000	1	0.007	4	0.000	1	0.669	1	-0.736	3	-2.801	3	0.006	1	-0.005	1	-0.096	1	0.000	0.027	0.104		2.801	
1042	M105	2in Dia. Duct	Sec 1- min	0.004	1	-0.024	4	-0.121	5	-2.297	7	0.003	1	-0.009	1	-1.214	2	0.000	1	-0.011	1	0.001	0.085	0.045		2.297	
858	M66	2in Dia. Duct	Sec 4 - min	0.000	1	-0.042	8	0.000	1	-0.181	4	-0.111	5	0.047	1	-3.371	3	0.000	1	-0.013	1	0.000	0.006	0.125		3.371	
1064	M107	2in Dia. Duct	Sec 2 - min	0.007	1	-0.002	1	-0.120	5	-2.266	7	0.024	1	-0.022	1	-1.221	2	-0.004	2	-0.057	2	0.002	0.084	0.045		2.266	
535	M54	6in Dia. Duct	Sec 3 - max	0.269	8	0.130	7	0.282	7	-0.000	1	1.857	8	0.585	6	0.565	9	0.436	9	0.366	9	0.022	0.083	0.026		1.857	
1060	M108	2in Dia. Duct	Sec 5 - min	0.006	1	-0.008	1	-0.120	5	-2.283	7	0.024	1	-0.017	1	-1.202	2	0.000	1	-0.009	1	0.001	0.085	0.045		2.283	
1110	M111	2in Dia. Duct	Sec 5 - min	0.006	1	-0.008	1	-0.132	5	-2.123	5	-0.006	1	0.010	1	-1.354	2	0.000	1	0.007	1	0.001	0.079	0.050		2.123	
857	M66	4in Dia. Duct	Sec 4 - max	0.169	6	-0.015	7	0.138	8	0.193	7	0.002	1	2.909	8	2.275	7	0.079	6	0.180	6	0.015	0.007	0.108		2.909	
1044	M105	2in Dia. Duct	Sec 2 - min	0.004	1	-0.025	4	-0.121	5	-2.300	7	0.006	1	-0.009	1	-1.182	2	0.000	1	-0.011	1	0.001	0.085	0.044		2.300	
1092	M110	2in Dia. Duct	Sec 1- min	0.004	1	-0.025	8	-0.134	5	-2.134	5	-0.025	1	0.005	1	-1.347	2	0.000	1	0.008	1	0.001	0.078	0.050		2.134	
244	M25	6in Dia. Duct	Sec 2 - min	0.000	1	-0.019	8	-0.242	8	-0.037	8	-0.053	7	-2.861	9	0.000	1	-0.147	8	-0.123	8	0.000	0.002	0.127		2.861	
1116	M112	2in Dia. Duct	Sec 3 - min	0.007	1	-0.003	1	-0.132	5	-2.092	5	-0.004	1	0.015	1	-1.356	2	-0.003	2	-0.047	2	0.002	0.077	0.050		2.092	
1066	M107	2in Dia. Duct	Sec 3 - min	0.008	1	-0.002	1	-0.120	5	-2.250	7	0.025	1	-0.022	1	-1.189	2	-0.004	2	-0.057	2	0.002	0.083	0.044		2.250	
1046	M105	2in Dia. Duct	Sec 3 - min	0.004	1	-0.025	4	-0.121	5	-2.304	7	0.009	1	-0.009	1	-1.150	2	0.000	1	-0.011	1	0.001	0.085	0.043		2.304	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{sy}/σ_a	f_{sz}/σ_a		f_c (ksi)	
872	M88	2in Dia. Duct	Sec 1- min	0.002	1	-0.052	7	-0.095	8	-2.844	5	-0.024	1	-0.002	1	-0.618	2	0.007	1	0.091	1	0.000	0.105	0.023		2.844	
1094	M110	2in Dia. Duct	Sec 2 - min	0.004	1	-0.025	8	-0.133	5	-2.136	5	-0.023	1	0.005	1	-1.312	2	0.000	1	0.008	1	0.001	0.079	0.049		2.138	
874	M88	2in Dia. Duct	Sec 2 - min	0.002	1	-0.052	7	-0.095	8	-2.856	5	-0.020	1	-0.003	1	-0.593	2	0.007	1	0.091	1	0.000	0.106	0.022		2.856	
671	M68	4in Dia. Duct	Sec 1 - max	0.264	6	0.016	1	0.593	7	0.107	7	0.070	1	2.757	6	-0.007	1	0.078	6	0.178	6	0.022	0.004	0.102		2.757	
257	M26	6in Dia. Duct	Sec 4 - max	0.144	8	-0.020	7	0.233	9	-0.050	7	0.190	8	0.000	1	2.424	7	0.049	7	0.041	7	0.012	0.008	0.108		2.424	
678	M68	4in Dia. Duct	Sec 4 - min	0.000	1	-0.004	8	-0.380	8	-0.054	1	-0.107	7	0.006	1	-3.348	6	0.002	1	0.005	1	0.000	0.004	0.124		3.348	
876	M88	2in Dia. Duct	Sec 3 - min	0.002	1	-0.053	7	-0.095	8	-2.872	5	-0.016	1	-0.003	1	-0.569	2	0.007	1	0.091	1	0.000	0.108	0.021		2.872	
1048	M105	2in Dia. Duct	Sec 4 - min	0.004	1	-0.025	4	-0.121	5	-2.308	7	0.012	1	-0.009	1	-1.118	2	0.000	1	-0.011	1	0.001	0.085	0.041		2.308	
876	M88	2in Dia. Duct	Sec 4 - min	0.002	1	-0.053	7	-0.095	8	-2.886	5	-0.012	1	-0.004	1	-0.544	2	0.007	1	0.091	1	0.000	0.107	0.020		2.886	
1098	M110	2in Dia. Duct	Sec 3 - min	0.004	1	-0.025	8	-0.133	5	-2.141	5	-0.020	1	0.005	1	-1.277	2	0.000	1	0.008	1	0.001	0.079	0.047		2.141	
246	M25	6in Dia. Duct	Sec 3 - min	0.000	1	-0.020	6	-0.243	8	-0.043	8	-0.052	7	-2.814	9	0.000	1	-0.147	8	-0.123	8	0.000	0.002	0.125		2.814	
1118	M112	2in Dia. Duct	Sec 4 - min	0.007	1	-0.003	1	-0.132	5	-2.077	5	-0.003	1	0.015	1	-1.320	2	-0.003	2	-0.047	2	0.002	0.077	0.049		2.077	
1068	M107	2in Dia. Duct	Sec 4 - min	0.008	1	-0.003	1	-0.120	5	-2.233	7	0.026	1	-0.022	1	-1.157	2	-0.004	2	-0.057	2	0.002	0.083	0.043		2.233	
1031	M104	2in Dia. Duct	Sec 1 - max	0.046	7	-0.012	1	0.000	1	0.010	1	2.242	7	0.921	2	0.000	1	0.046	2	0.626	2	0.010	0.083	0.034		2.242	
880	M88	2in Dia. Duct	Sec 5 - min	0.002	1	-0.053	7	-0.095	8	-2.901	5	-0.008	1	-0.004	1	-0.519	2	0.007	1	0.091	1	0.000	0.107	0.019		2.901	
868	M87	2in Dia. Duct	Sec 4 - min	0.000	1	-0.087	7	-0.101	9	-1.983	5	-0.146	1	-0.017	1	-1.448	2	0.006	1	0.089	1	0.000	0.073	0.054		1.983	
85	M9	6in Dia. Duct	Sec 3 - max	0.448	6	-0.083	1	0.017	8	0.771	8	0.236	1	0.243	1	1.256	6	0.203	1	0.170	1	0.037	0.034	0.056		1.256	
1050	M105	2in Dia. Duct	Sec 5 - min	0.004	1	-0.025	4	-0.121	5	-2.312	7	0.015	1	-0.009	1	-1.086	2	0.000	1	-0.011	1	0.001	0.086	0.040		2.312	
1033	M104	2in Dia. Duct	Sec 2 - max	0.045	7	-0.012	1	0.000	1	0.007	1	2.255	7	0.890	2	0.000	1	0.046	2	0.626	2	0.010	0.084	0.033		2.255	
542	M55	6in Dia. Duct	Sec 1- min	-0.224	7	-0.407	8	-0.019	1	-2.234	8	0.074	1	-0.103	7	-0.196	1	-0.844	6	-0.539	8	0.018	0.099	0.009		2.234	
1098	M110	2in Dia. Duct	Sec 4 - min	0.004	1	-0.025	8	-0.133	5	-2.145	5	-0.017	1	0.005	1	-1.242	2	0.000	1	0.008	1	0.001	0.079	0.048		2.145	
536	M54	6in Dia. Duct	Sec 3 - min	-0.216	7	-0.663	8	-0.019	1	-1.857	8	0.060	1	-0.565	9	-0.585	6	-0.553	6	-0.463	6	0.018	0.083	0.028		1.857	
783	M79	6in Dia. Duct	Sec 2 - max	0.000	6	0.010	8	0.116	7	-0.082	7	0.237	8	0.000	1	2.601	7	0.049	7	0.041	7	0.000	0.011	0.116		2.601	
784	M79	6in Dia. Duct	Sec 2 - min	0.000	7	0.003	7	0.000	1	-0.237	8	0.082	7	-2.601	7	0.000	1	-0.151	8	-0.126	8	0.000	0.011	0.116		2.601	
1035	M104	2in Dia. Duct	Sec 3 - max	0.045	7	-0.012	1	0.000	1	0.003	1	2.269	7	0.858	2	0.000	1	0.046	2	0.626	2	0.010	0.084	0.032		2.269	
916	M92	2in Dia. Duct	Sec 3 - max	0.053	7	0.022	3	-0.002	1	0.092	1	1.272	4	0.079	1	1.803	2	0.007	3	0.093	3	0.012	0.047	0.067		1.803	
101	M11	8in Dia. Duct	Sec 1 - max	0.009	8	-0.104	1	0.018	9	-0.398	1	1.819	7	0.013	1	0.991	6	0.250	1	0.209	1	0.001	0.081	0.044		1.819	
102	M11	8in Dia. Duct	Sec 1- min	-0.009	7	-1.692	8	-0.018	7	-1.819	7	0.398	1	-0.991	6	-0.013	1	-0.495	6	-0.414	6	0.001	0.081	0.044		1.819	
703	M71	4in Dia. Duct	Sec 2 - max	0.322	7	0.004	1	-0.001	1	0.307	6	-0.044	1	2.352	6	1.024	8	0.016	8	0.037	8	0.027	0.011	0.087		2.352	
82	M9	6in Dia. Duct	Sec 1- min	0.027	1	-1.311	6	-0.016	6	-0.189	1	-1.513	8	-1.261	6	-0.243	1	-0.125	7	-0.105	7	0.002	0.057	0.056		1.513	
1070	M107	2in Dia. Duct	Sec 5 - min	0.008	1	-0.003	1	-0.120	5	-2.216	7	0.026	1	-0.022	1	-1.124	2	-0.004	2	-0.057	2	0.002	0.082	0.042		2.216	
1120	M112	2in Dia. Duct	Sec 5 - min	0.007	1	-0.003	1	-0.132	5	-2.062	5	-0.003	1	0.015	1	-1.284	2	-0.003	2	-0.047	2	0.002	0.076	0.048		2.062	
248	M25	6in Dia. Duct	Sec 4 - min	0.000	1	-0.021	8	-0.243	6	-0.048	8	-0.050	7	-2.766	9	0.000	1	-0.147	8	-0.123	8	0.000	0.002	0.123		2.766	
1037	M104	2in Dia. Duct	Sec 4 - max	0.045	7	-0.012	1	0.000	1	0.000	1	2.283	7	0.826	2	0.000	1	0.046	2	0.626	2	0.010	0.085	0.031		2.283	
1100	M110	2in Dia. Duct	Sec 5 - min	0.004	1	-0.025	8	-0.133	5	-2.148	5	-0.014	1	0.005	1	-1.206	2	0.000	1	0.008	1	0.001	0.080	0.045		2.148	
97	M10	6in Dia. Duct	Sec 4 - max	0.164	6	-0.101	1	0.016	6	-0.369	1	1.381	7	0.094	1	1.128	8	0.244	1	0.204	1	0.013	0.051	0.050		1.381	
533	M54	6in Dia. Duct	Sec 2 - max	0.269	6	0.130	7	0.283	7	-0.053	1	1.669	6	0.588	8	0.845	9	0.436	9	0.366	9	0.022	0.074	0.029		1.669	
1071	M108	2in Dia. Duct	Sec 1 - max	0.038	7	0.000	1	0.000	1	-0.035	1	0.895	5	2.267	2	-0.002	1	0.002	3	0.029	3	0.008	0.033	0.084		2.267	
80	M8	6in Dia. Duct	Sec 6 - min	0.041	1	-0.883	7	-0.016	7	-0.189	1	-1.513	8	-1.215	8	-0.355	1	0.132	1	0.111	1	0.003	0.067	0.054		1.513	
1039	M104	2in Dia. Duct	Sec 5 - max	0.045	7	-0.013	1	0.000	1	-0.003	1	2.297	7	0.784	2	0.000	1	0.046	2	0.626	2	0.010	0.065	0.029		2.297	
998	M100	2in Dia. Duct	Sec 4 - min	0.000	1	-0.055	5	-0.138	5	-1.608	5	-0.105	1	-0.005	1	-1.742	2	0.000	1	0.008	1	0.000	0.060	0.065		1.742	
714	M72	4in Dia. Duct	Sec 2 - min	-0.141	6	-0.009	7	-0.026	7	0.040	1	-0.122	7	-2.906	8	-0.730	7	-0.003	7	-0.007	7	0.012	0.005	0.108		2.906	
1081	M109	2in Dia. Duct	Sec 1 - max	0.042	7	-0.011	1	0.000	1	0.038	1	2.084	5	1.004	2	0.002	1	0.053	2	0.717	2	0.009	0.077	0.037		2.084	
523	M53	6in Dia. Duct	Sec 2 - max	0.197	8	0.218	7	0.286	7	0.421	8	0.856	7	0.765	6	1.555	9	0.345	9	0.289	9	0.016	0.038	0.069		1.555	
524	M53	6in Dia. Duct	Sec 2 - min	-0.197	7	-0.748	8	-0.019	1	-0.856	7	-0.421	8	-1.555	9	-0.765	6	-0.474	8	-0.397	6	0.016	0.038	0.069		1.555	
250	M25	6in Dia. Duct	Sec 5 - min	0.000	1	-0.021	8	-0.243	6	-0.054	8	-0.049	7	-2.718	9	0.000	1	-0.147	8	-0.123	8	0.000	0.002	0.121		2.718	
1028	M103	2in Dia. Duct	Sec 4 - min	0.000	1	-0.061	7	-0.128	5	-1.721	7	-0.082	1	0.002	1	-1.597	2	0.000	1	-0.012	1	0.000	0.064	0.059		1.721	
1063	M109	2in Dia. Duct	Sec 2 - max	0.041	7	-0.012	1	0.000	1	0.035	1	2.096	5	0.969	2	0.002	1	0.053	2	0.717	2	0.009	0.078	0.038		2.096	
252	M26	6in Dia. Duct	Sec 1- min	0.000	1	-0.021	8	-0.226	7	-0.005	8	-0.033	7	-2.718	9	0.000	1	-0.151	8	-0.126	8	0.000	0.001	0.121		2.718	
686	M87	4in Dia. Duct	Sec 3 - min	0.000	1	0.003	6	-0.306	8	-0.135	1	-0.006	7	-1.236	7	-3.165	8	-0.002	1	-0.005	1	0.000	0.005	0.117		3.165	
1085	M109	2in Dia. Duct	Sec 3 - max	0.041	7	-0.012	1	0.000	1	0.032	1	2.109	5	0.934	2	0.002	1	0.053	2	0.717	2	0.009	0.076	0.035		2.109	
785	M79	6in Dia. Duct	Sec 3 - max	0.000	6	0.008	6	0.115	7	-0.081	7	0.229	8	0.000	1	2.498	7	0.049	7	0.041	7	0.000	0.010	0.111		2.498	
786	M79	6in Dia. Duct	Sec 3 - min	0.000	7	0.000	7	0.000	1	-0.229	8	0.081	7	-2.498	7	0.000	1	-0.151	8	-0.126	8	0.000	0.010	0.111		2.498	
1087	M109	2in Dia. Duct	Sec 4 - max	0.041	7	-0.012	1	0.000	1	0.029	1	2.122	5	0.899	2	0.002	1	0.053	2	0.717	2	0.009	0.079	0.033		2.122	
1228	M123	4in Dia. Duct	Sec 3 - min	0	1	-0.114	6	-0.151	7	0.059	1	-1.449	6	0.104	1	-1.815	9	-0.002	1	-0.005	1	0.000	0.054	0.067		1.815	
676	M88	4in Dia. Duct	Sec 3 - min	0.000	1	-0.003	6	-0.380	8	-0.059	1	-0.107	7	0.006	1	-3.151	8	0.002	1	0.005	1	0.000	0.004	0.117		3.151	
534	M54	6in Dia. Duct	Sec 2 - min	-0.216	7	-0.662	8	-0.019	1	-1.669	8	0.053	1	-0.645	9	-0.586	6	-0.553	6	-0.463	6	0.018	0.074	0.029		1.669	
669	M87	4in Dia. Duct	Sec 5 - max	0.187	6	0.016	1	0.649	7	0.019	7	0.070	1	2.757	6	-0.007	1	0.079	6	0.180	6	0.016	0.003	0.102		2.757	
1089	M109	2in Dia. Duct	Sec 6 - max	0.041	7	-0.012	1	0.000	1	0.025	1	2.134	5	0.863	2	0.002	1	0.053	2	0.717	2	0.009	0.079	0.032		2.134	
529	M53	6in Dia. Duct	Sec 5 - max	0.199	8	0.213	7	0.283	7	-0.046	1	1.481	8	0.757	6	0.853	9	0.345	9	0.289	9	0.016	0.066	0.038		1.481	
530	M53	6in Dia. Duct	Sec 5 - min	-0.199	7	-0.754	8	-0.019	1	-1.481	6	0.046	1	-0.853	9	-0.757	6	-0.474	8	-0.397	6	0.016	0.066	0.038		1.481	
171	M18	6in Dia. Duct	Sec 1 - max	0.024	8	0.082	1	0.032	8	-0.644	8	1.587	1	1.068	7	0.339	8	-0.022	9	-0.019	9	0.002	0.071	0.047		1.587	
172	M18	6in Dia. Duct	Sec 1- min	-0.024	8	0.057	8	-0.046	7	-1.587	1	0.644	8	-0.339	8	-1.068	7	-0.028	8	-0.024	6	0.002	0.071	0.047		1.587	
531	M54	6in Dia. Duct	Sec 1 - max	0.268	8	0.131	7	0.283	7	-0.046	1	1.481	8	0.587	6	0.724	9	0.438	9	0.366	9	0.022	0.066	0.032		1.481	
1209	M121	6in Dia. Duct	Sec 5 - max	0.024	8	-0.096	1	0.046	9	-0.644	8	1.587	1	1.068	7	0.339	8	-0.022	9	-0.019	9	0.002	0.071	0.047		1.587	
1210	M121	6in Dia. Duct	Sec 5 - min	-0.024	6	-0.098	4	-0.048	6	-1.587	1	0.844	8	-0.339	8	-1.068	7	-0.028	6	-0.024	6	0.002	0.071	0.047		1.587	
870	M87	2in Dia. Duct	Sec 5 - min	0.000	1	-0.076	7	-0.095	8	-2.844	5	-0.024	1	-0.037	1	-0.389	2	0.008	1	0.089	1	0.000	0.105	0.014		2.844	
1121	M113	2in Dia. Duct	Sec 1 - max	0.033	5	0.000	1	0.000	1	0.013	1	0.731	3	2.293	2	-0.009	1	0.001	3	0.017	3	0.007	0.027	0.085		2.293	
1072	M108	2in Dia. Duct	Sec 1- min	0.008	1	-0.050	8	-0.139	5	-0.895	5	0.035	1	0.002	1	-2.267	2	-0.012	2	-0.165	2	0.002	0.033	0.084		2.267	
916	M92	2in Dia. Duct	Sec 3 - min	0.022	1	-0.008	2	-0.151	4	-1.272	4	-0.092	1	-1.803	2	-0.079	1	-0.005	2	-0.067	2	0.005	0.047	0.067		1.803	
1032	M104	2in Dia. Duct	Sec 1- min	0.001	1	-0.050	7	-0.122	5	-2.242	7	-0.010	1	0.000	1	-0.921	2	0.000	1	-0.012	1	0.000	0.083	0.034		2.242	
1034	M104	2in Dia. Duct	Sec 2 - min	0.001	1	-0.051	7	-0.122	5	-2.255	7	-0.007	1	0.000	1	-0.890	2	0.000	1	-0.012	1	0.000	0.084	0.033		2.255	
687	M87	4in Dia. Duct	Sec 4 - max	0.186	6	0.018	1	0.650	7	0.016	7	0.100	1	2.626	6	0.086	7	0.079	6	0.180	6	0.018	0.004	0.097		2.626	
787	M79	6in Dia. Duct	Sec 4 - max	0.001	6	0.006	8	0.114	7	-0.081	7	0.223	8	0.000	1	2.398	7	0.049	7	0.041	7	0.000	0.010	0.106		2.398	
788	M79	6in Dia. Duct	Sec 4 - min	-0.001	7	-0.001	7	0.000	1	-0.223	8	0.081	7	-2.398	7	0.000	1	-0.151	8	-0.126	8	0.000	0.010	0.106		2.398	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_{by}/σ_a	f_{bz}/σ_a		f_c (ksi)	
1029	M103	2in Dia. Duct	Sec 5 - max	0.040	7	-0.012	1	0.000	1	0.010	1	2.242	7	0.659	2	-0.005	1	0.052	2	0.704	2	0.009	0.083	0.024		2.242	
258	M26	6in Dia. Duct	Sec 4 - min	0.000	1	-0.035	8	-0.293	7	-0.190	8	0.050	7	-2.424	7	0.000	1	-0.151	8	-0.126	8	0.000	0.008	0.108		2.424	
931	M94	3in Dia. Duct	Sec 1 - max	0.144	2	0.058	2	0.000	6	-0.819	1	1.210	2	1.515	5	0.018	1	0.013	7	0.054	7	0.015	0.045	0.058		1.515	
1036	M104	2in Dia. Duct	Sec 3 - min	0.001	1	-0.051	7	-0.122	5	-2.269	7	-0.003	1	0.000	1	-0.858	2	0.000	1	-0.012	1	0.000	0.084	0.032		2.269	
532	M54	6in Dia. Duct	Sec 1 - min	-0.216	7	-0.662	8	-0.019	1	-1.481	8	0.046	1	-0.724	9	-0.587	6	-0.553	6	-0.463	6	0.018	0.086	0.032		1.481	
1038	M104	2in Dia. Duct	Sec 4 - min	0.002	1	-0.051	7	-0.122	5	-2.283	7	0.000	1	0.000	1	-0.826	2	0.000	1	-0.012	1	0.000	0.085	0.031		2.283	
946	M95	2in Dia. Duct	Sec 3 - min	0.000	1	0.000	1	-0.067	6	0.900	1	-1.133	2	-1.975	5	-0.008	1	0.001	1	0.017	1	0.000	0.042	0.073		1.975	
1040	M104	2in Dia. Duct	Sec 5 - min	0.002	1	-0.051	7	-0.121	5	-2.297	7	0.003	1	0.000	1	-0.784	2	0.000	1	-0.012	1	0.000	0.085	0.029		2.297	
658	M66	4in Dia. Duct	Sec 4 - min	0.000	1	-0.017	8	-0.128	7	-0.002	1	-0.193	7	-2.275	7	-2.909	6	-0.002	1	-0.005	1	0.000	0.007	0.108		2.909	
1082	M109	2in Dia. Duct	Sec 1 - min	0.001	1	-0.049	3	-0.134	5	-2.064	5	-0.038	1	-0.002	1	-1.004	2	0.000	1	0.008	1	0.000	0.077	0.037		2.064	
1228	M123	4in Dia. Duct	Sec 5 - max	0.155	6	-0.027	1	-0.009	1	-0.170	1	1.167	6	-0.075	1	1.566	7	0.079	6	0.180	6	0.013	0.043	0.058		1.566	
1231	M124	4in Dia. Duct	Sec 1 - max	0.155	6	0.06	6	0.063	7	-0.170	1	1.167	6	-0.075	1	1.566	7	0.079	6	0.180	6	0.013	0.043	0.058		1.566	
1122	M113	2in Dia. Duct	Sec 1 - min	0.008	1	-0.059	8	-0.143	5	-0.731	3	-0.013	1	0.009	1	-2.293	2	-0.013	2	-0.171	2	0.002	0.027	0.085		2.293	
1094	M109	2in Dia. Duct	Sec 2 - min	0.001	1	-0.049	3	-0.134	5	-2.096	5	-0.035	1	-0.002	1	-0.969	2	0.000	1	0.008	1	0.000	0.078	0.036		2.096	
674	M68	4in Dia. Duct	Sec 2 - min	0.000	1	-0.003	0	-0.380	8	-0.064	1	-0.107	7	0.007	1	-2.954	6	0.002	1	0.005	1	0.000	0.004	0.109		2.954	
253	M26	6in Dia. Duct	Sec 2 - max	0.142	8	-0.010	7	0.228	9	0.016	7	0.057	8	0.000	1	2.222	9	0.049	7	0.041	7	0.012	0.003	0.099		2.222	
1088	M109	2in Dia. Duct	Sec 3 - min	0.001	1	-0.049	3	-0.134	5	-2.109	5	-0.032	1	-0.002	1	-0.934	2	0.000	1	0.008	1	0.000	0.078	0.035		2.109	
98	M10	6in Dia. Duct	Sec 4 - min	0.010	1	-1.557	6	-0.018	7	-1.381	7	0.369	1	-1.128	6	-0.094	1	-0.381	7	-0.319	7	0.001	0.061	0.050		1.381	
1088	M109	2in Dia. Duct	Sec 4 - min	0.001	1	-0.050	3	-0.134	5	-2.122	5	-0.029	1	-0.002	1	-0.899	2	0.000	1	0.008	1	0.000	0.079	0.033		2.122	
769	M79	6in Dia. Duct	Sec 5 - max	0.002	6	0.004	8	0.113	7	-0.083	7	0.218	8	0.000	1	2.294	7	0.049	7	0.041	7	0.000	0.010	0.102		2.294	
790	M79	6in Dia. Duct	Sec 5 - min	-0.002	7	-0.003	7	0.000	1	-0.218	8	0.083	7	-2.294	7	0.000	1	-0.151	8	-0.128	8	0.000	0.010	0.102		2.294	
791	M80	6in Dia. Duct	Sec 1 - max	0.002	6	0.004	8	0.113	7	-0.083	7	0.218	8	0.000	1	2.294	7	0.049	7	0.041	7	0.000	0.010	0.102		2.294	
782	M80	6in Dia. Duct	Sec 1 - min	-0.002	9	-0.003	7	0.000	1	-0.218	8	0.083	7	-2.294	7	0.000	1	-0.151	8	-0.128	8	0.000	0.010	0.102		2.294	
999	M100	2in Dia. Duct	Sec 5 - max	0.038	7	-0.012	1	0.000	1	0.038	1	2.084	5	0.704	2	0.005	1	0.059	2	0.801	2	0.008	0.077	0.026		2.084	
1090	M109	2in Dia. Duct	Sec 5 - min	0.001	1	-0.050	3	-0.134	5	-2.134	5	-0.025	1	-0.002	1	-0.863	2	0.000	1	0.008	1	0.000	0.079	0.032		2.134	
704	M71	4in Dia. Duct	Sec 2 - min	-0.149	8	-0.013	6	-0.379	6	0.044	1	-0.307	6	-1.024	9	-2.352	6	-0.003	7	-0.007	7	0.013	0.011	0.087		2.352	
739	M74	4in Dia. Duct	Sec 5 - max	0.231	7	-0.077	1	0.044	5	-1.478	1	1.622	2	0.843	5	0.790	4	0.016	8	0.037	8	0.019	0.060	0.031		1.622	
741	M75	4in Dia. Duct	Sec 1 - max	0.231	7	0.091	2	0.047	4	-1.478	1	1.622	2	0.843	5	0.790	4	0.018	8	0.037	8	0.019	0.060	0.031		1.622	
87	M9	6in Dia. Duct	Sec 4 - max	0.448	6	-0.084	1	0.017	9	0.400	8	0.260	1	0.243	1	1.261	6	0.203	1	0.170	1	0.037	0.018	0.056		1.261	
84	M9	6in Dia. Duct	Sec 2 - min	0.028	1	-1.311	7	-0.016	6	-0.213	1	-1.142	6	-1.256	8	-0.243	1	-0.125	7	-0.105	7	0.002	0.051	0.056		1.256	
705	M71	4in Dia. Duct	Sec 3 - max	0.321	7	0.000	1	-0.001	1	0.284	7	-0.050	1	1.795	7	1.933	8	0.016	8	0.037	8	0.027	0.010	0.072		1.933	
1030	M103	2in Dia. Duct	Sec 5 - min	0.000	1	-0.087	7	-0.122	5	-2.242	7	-0.010	1	0.005	1	-0.659	2	0.000	1	-0.012	1	0.000	0.003	0.024		2.242	
672	M68	4in Dia. Duct	Sec 1 - min	0.000	1	-0.002	6	-0.381	8	-0.070	1	-0.107	7	0.007	1	-2.757	6	0.002	1	0.005	1	0.000	0.004	0.102		2.757	
425	M43	6in Dia. Duct	Sec 3 - max	0.166	6	0.078	9	0.329	9	1.259	6	0.853	9	0.816	7	0.118	1	1.015	9	0.850	9	0.014	0.056	0.036		1.259	
89	M9	6in Dia. Duct	Sec 5 - max	0.449	6	-0.084	1	0.017	8	0.028	8	0.284	1	0.243	1	1.265	8	0.203	1	0.170	1	0.037	0.013	0.056		1.265	
95	M10	6in Dia. Duct	Sec 3 - max	0.164	6	-0.101	1	0.018	6	-0.341	1	0.942	7	0.094	1	1.123	8	0.244	1	0.204	1	0.013	0.042	0.050		1.123	
525	M53	6in Dia. Duct	Sec 3 - max	0.198	8	0.216	7	0.285	7	-0.009	1	0.673	7	0.763	8	1.321	9	0.345	9	0.289	9	0.016	0.030	0.059		1.321	
526	M53	6in Dia. Duct	Sec 3 - min	-0.198	7	-0.750	8	-0.019	1	-0.673	7	0.009	1	-1.321	9	-0.763	6	-0.474	6	-0.397	6	0.016	0.030	0.059		1.321	
670	M67	4in Dia. Duct	Sec 5 - min	0.000	1	-0.002	6	-0.303	8	-0.070	1	-0.019	7	0.007	1	-2.757	6	-0.002	1	-0.005	1	0.000	0.003	0.102		2.757	
159	M16	8in Dia. Duct	Sec 5 - max	0.060	6	0.390	6	0.046	9	1.502	8	-0.559	1	0.738	8	0.009	9	-0.022	9	-0.019	9	0.005	0.067	0.033		1.502	
1000	M100	2in Dia. Duct	Sec 5 - min	0.000	1	-0.062	5	-0.134	5	-2.084	5	-0.038	1	-0.005	1	-0.704	2	0.000	1	0.008	1	0.000	0.077	0.026		2.084	
255	M26	6in Dia. Duct	Sec 3 - max	0.143	8	-0.015	7	0.230	9	-0.012	7	0.118	8	0.000	1	1.918	7	0.049	7	0.041	7	0.012	0.005	0.085		1.918	
527	M53	6in Dia. Duct	Sec 4 - max	0.198	8	0.215	7	0.284	7	-0.026	1	0.845	8	0.760	6	1.087	9	0.345	9	0.289	9	0.016	0.038	0.048		1.087	
528	M53	8in Dia. Duct	Sec 4 - min	-0.198	7	-0.752	8	-0.019	1	-0.845	8	0.026	1	-1.087	9	-0.760	6	-0.474	6	-0.397	6	0.016	0.038	0.048		1.087	
793	M80	6in Dia. Duct	Sec 2 - max	0.003	6	0.000	6	0.111	7	-0.092	7	0.215	8	0.000	1	2.078	7	0.049	7	0.041	7	0.000	0.010	0.092		2.076	
794	M60	6in Dia. Duct	Sec 2 - min	-0.003	9	-0.007	7	0.000	1	-0.215	8	0.092	7	-2.076	7	0.000	1	-0.151	8	-0.128	8	0.000	0.010	0.092		2.078	
932	M94	3in Dia. Duct	Sec 1 - min	-0.005	3	0.052	1	-0.059	9	-1.210	2	0.819	1	-0.018	1	-1.515	5	-0.003	8	-0.011	8	0.001	0.045	0.056		1.515	
254	M26	6in Dia. Duct	Sec 2 - min	0.000	1	-0.028	8	-0.228	7	-0.057	8	-0.016	7	-2.222	9	0.000	1	-0.151	8	-0.126	8	0.000	0.003	0.099		2.222	
1230	M123	4in Dia. Duct	Sec 5 - min	0	1	-0.144	6	-0.166	7	-1.167	6	0.170	1	-1.566	7	0.075	1	-0.002	1	-0.005	1	0.000	0.043	0.058		1.566	
1232	M124	4in Dia. Duct	Sec 1 - min	0	1	0.029	1	-0.012	8	-1.167	6	0.170	1	-1.566	7	0.075	1	-0.002	1	-0.005	1	0.000	0.043	0.058		1.566	
819	M82	4in Dia. Duct	Sec 5 - max	0.187	2	-0.033	3	0.019	5	-0.191	3	2.081	2	0.221	7	0.199	8	0.016	8	0.037	8	0.016	0.077	0.008		2.081	
688	M67	4in Dia. Duct	Sec 4 - min	0.000	1	0.000	6	-0.304	8	-0.100	1	-0.016	7	-0.086	7	-2.626	8	-0.002	1	-0.005	1	0.000	0.004	0.097		2.626	
955	M96	2in Dia. Duct	Sec 3 - max	0.102	7	-0.017	5	0.141	3	0.602	3	-0.431	1	1.487	5	0.029	1	0.018	2	0.245	2	0.023	0.022	0.055		1.487	
167	M17	6in Dia. Duct	Sec 4 - max	0.000	6	0.001	3	0.000	8	1.506	8	-0.563	1	0.740	6	0.011	9	-0.022	9	-0.019	9	0.000	0.067	0.033		1.506	
168	M17	6in Dia. Duct	Sec 4 - min	0.000	8	0.001	1	0.000	7	0.563	1	-1.506	6	-0.011	9	-0.740	8	-0.028	6	-0.024	8	0.000	0.067	0.033		1.506	
169	M17	6in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	1.508	8	-0.563	1	0.740	6	0.011	9	-0.022	9	-0.019	9	0.000	0.067	0.033		1.506	
170	M17	6in Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.563	1	-1.506	8	-0.011	9	-0.740	6	-0.028	6	-0.024	8	0.000	0.067	0.033		1.506	
1191	M120	6in Dia. Duct	Sec 1 - max	0	1	0	1	0.000	1	1.506	8	-0.563	1	0.740	6	0.011	9	-0.022	9	-0.019	9	0.000	0.067	0.033		1.506	
1192	M120	6in Dia. Duct	Sec 1 - min	0	1	0	1	0.000	1	0.563	1	-1.506	8	-0.011	9	-0.740	6	-0.028	6	-0.024	6	0.000	0.067	0.033		1.506	
165	M17	6in Dia. Duct	Sec 3 - max	0.000	6	0.002	3	0.001	6	1.505	8	-0.562	1	0.739	8	0.010	9	-0.022	9	-0.019	9	0.000	0.067	0.033		1.505	
166	M17	6in Dia. Duct	Sec 3 - min	0.000	8	0.002	1	-0.001	7	0.562	1	-1.505	8	-0.010	9	-0.739	6	-0.028	6	-0.024	6	0.000	0.067	0.033		1.505	
1193	M120	6in Dia. Duct	Sec 2 - max	0	8	-0.002	1	0.000	7	1.505	8	-0.562	1	0.739	8	0.010	9	-0.022	9	-0.019	9	0.000	0.067	0.033		1.505	
1194	M120	6in Dia. Duct	Sec 2 - min	0	8	-0.002	1	0.000	8	0.562	1	-1.505	8	-0.010	9	-0.739	6	-0.028	6	-0.024	6	0.000	0.067	0.033		1.505	
163	M17	6in Dia. Duct	Sec 2 - max	0.000	8	0.003	3	0.002	6	1.504	8	-0.561	1	0.739	8	0.010	9	-0.022	9	-0.019	9	0.000	0.067	0.033		1.504	
164	M17	6in Dia. Duct	Sec 2 - min	0.000	8	0.003	1	-0.002	7	0.561	1	-1.504	8	-0.010	9	-0.739	8	-0.028	6	-0.024	8	0.000	0.067	0.033		1.504	
161	M17	6in Dia. Duct	Sec 1 - max	0.001	6	0.004	3	0.002	6	1.502	6	-0.559	1	0.738	6	0.009	9	-0.022	9	-0.019	9	0.000	0.067	0.033		1.502	
162	M17	6in Dia. Duct	Sec 1 - min	-0.001	8	0.004	1	-0.002	7	0.559	1	-1.502	8	-0.009	9	-0.738	6	-0.028	8	-0.024	6	0.000	0.067	0.033		1.502	
1195	M120	6in Dia. Duct	Sec 3 - max	0	8	-0.004	1	0.002	7	1.503	8	-0.560	1	0.738	6	0.009	9	-0.022	9	-0.019	9	0.000	0.067	0.033		1.503	
1196	M120	6in Dia. Duct	Sec 3 - min	0	6	-0.004	1	-0.002	6	0.560	1	-1.503	8	-0.009	9	-0.738	6	-0.028	6	-0.024	6	0.000	0.067	0.033		1.503	
160	M16	6in Dia. Duct	Sec 5 - min	0.000	1	0.018	1	-0.046	8	0.559	1	-1.502	8	-0.009	9	-0.738	6	-0.028	6	-0.024	6	0.000	0.067	0.033		1.502	
1197	M120	6in Dia. Duct	Sec 4 - max	0.001	8	-0.008	1	0.003	7	1.498	8	-0.556	1	0.736	6	0.007	9	-0.022	9	-0.019	9	0.000	0.067	0.033		1.498	
1198	M120	6in Dia. Duct	Sec 4 - min	-0.001	6	-0.008	1	-0.003	6	0.556	1	-1.498	8	-0.007	9	-0.736	6	-0.028	6	-0.024	8	0.000	0.067	0.033		1.498	
1199	M120	6in Dia. Duct	Sec 5 - max	0.002	8	-0.008	1	0.004	7	1.492	8	-0.550	1	0.733	6	0.004	9	-0.022	9	-0.019	9	0.000	0.066	0.033		1.492	
1200	M120	6in Dia. Duct	Sec 5 - min	-0.002	6	-0.008	1	-0.004	6	0.550	1	-1.492	8	-0.004	9	-0.733	6	-0.028	6	-0.024	6	0.000	0.066	0.033		1.492	
1201	M121	6in Dia. Duct	Sec 1 - max	0.002	8	-0.008	2	0.004	9	1.492	8	-0.550	1	0.733	6	0.004	9	-0.022	9	-0.019	9	0.000	0.066	0.033		1.492	

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	D-2250 f_b/σ_a	f_c/σ_a		f_c (ksi)	
1202	M121	6in Dia. Duct	Sec 1- min	-0.002	6	-0.008	5	-0.004	8	0.550	1	-1.492	8	-0.004	9	-0.733	6	-0.028	6	-0.024	6	0.000	0.056	0.033		1.492	
585	M59	4in Dia. Duct	Sec 3 - max	0.492	7	0.009	1	-0.001	1	0.179	1	1.076	6	0.443	6	0.293	9	0.010	6	0.022	6	0.041	0.040	0.016		1.076	
319	M32	6in Dia. Duct	Sec 5 - max	0.123	8	-0.017	1	-0.002	1	-0.014	1	0.851	6	-0.046	1	1.115	9	0.049	7	0.041	7	0.010	0.038	0.050		1.115	
320	M32	6in Dia. Duct	Sec 5 - min	-0.123	9	-0.060	6	-0.058	7	-0.851	6	0.014	1	-1.115	9	0.046	1	-0.151	8	-0.126	8	0.010	0.038	0.050		1.115	
321	M33	6in Dia. Duct	Sec 1 - max	0.123	6	0.190	6	0.234	9	-0.014	1	0.851	6	-0.046	1	1.115	9	0.049	7	0.041	7	0.010	0.038	0.050		1.115	
322	M33	6in Dia. Duct	Sec 1- min	-0.123	9	0.011	1	0.010	1	-0.851	6	0.014	1	-1.115	9	0.046	1	-0.151	8	-0.126	8	0.010	0.038	0.050		1.115	
740	M74	4in Dia. Duct	Sec 5 - min	-0.056	8	-0.079	2	-0.042	4	-1.622	2	1.478	1	-0.790	4	-0.843	5	-0.003	7	-0.007	7	0.005	0.060	0.031		1.622	
742	M75	4in Dia. Duct	Sec 1- min	-0.056	8	0.085	1	-0.048	5	-1.622	2	1.478	1	-0.790	4	-0.843	5	-0.003	7	-0.007	7	0.005	0.060	0.031		1.622	
821	M83	4in Dia. Duct	Sec 1 - max	0.157	2	0.215	2	0.019	5	-0.191	3	2.081	2	0.146	7	0.088	8	0.042	8	0.097	8	0.013	0.077	0.005		2.081	
715	M72	4in Dia. Duct	Sec 3 - max	0.311	7	-0.021	1	0.108	8	-0.049	7	0.093	1	0.488	7	1.769	8	0.016	8	0.037	8	0.026	0.003	0.068		1.769	
708	M71	4in Dia. Duct	Sec 3 - min	-0.147	8	-0.018	6	-0.382	6	0.050	1	-0.264	7	-1.933	8	-1.795	7	-0.003	7	-0.007	7	0.012	0.010	0.072		1.933	
157	M16	6in Dia. Duct	Sec 4 - max	0.059	8	0.397	6	0.045	9	1.223	8	-0.546	1	0.770	6	0.041	9	-0.022	9	-0.019	9	0.005	0.054	0.034		1.223	
795	M80	6in Dia. Duct	Sec 3 - max	0.004	6	-0.004	8	0.109	7	-0.110	7	0.219	8	0.000	1	1.862	7	0.049	7	0.041	7	0.000	0.010	0.083		1.862	
798	M80	6in Dia. Duct	Sec 3 - min	-0.004	9	-0.011	7	0.000	1	-0.219	8	0.110	7	-1.862	7	0.000	1	-0.151	8	-0.126	8	0.000	0.010	0.083		1.862	
729	M73	4in Dia. Duct	Sec 5 - max	0.288	7	-0.072	2	0.039	7	-1.097	2	1.142	1	0.616	7	0.753	8	0.016	8	0.037	8	0.023	0.042	0.026		1.142	
731	M74	4in Dia. Duct	Sec 1 - max	0.268	7	0.071	1	0.041	4	-1.097	2	1.142	1	0.616	7	0.753	8	0.016	8	0.037	8	0.023	0.042	0.026		1.142	
98	M10	6in Dia. Duct	Sec 3 - min	0.010	1	-1.557	6	-0.018	7	-0.942	7	0.341	1	-1.123	6	-0.094	1	-0.381	7	-0.319	7	0.001	0.042	0.050		1.123	
426	M43	6in Dia. Duct	Sec 3 - min	-0.004	9	-0.393	6	-0.329	8	-0.853	9	-1.259	6	-0.118	1	-0.816	7	0.021	1	0.018	1	0.000	0.056	0.036		1.259	
86	M9	6in Dia. Duct	Sec 3 - min	0.028	1	-1.312	7	-0.017	6	-0.236	1	-0.771	8	-1.256	6	-0.243	1	-0.125	7	-0.105	7	0.002	0.034	0.056		1.256	
256	M26	8in Dia. Duct	Sec 3 - min	0.000	1	-0.031	8	-0.230	7	-0.118	8	0.012	7	-1.918	7	0.000	1	-0.151	8	-0.126	8	0.000	0.005	0.085		1.918	
1173	M118	2in Dia. Duct	Sec 2 - max	0.048	5	0.001	1	0.000	1	-0.081	1	1.726	8	0.436	8	0.023	1	0.004	3	0.055	3	0.010	0.064	0.016		1.726	
111	M12	8in Dia. Duct	Sec 1 - max	0.030	8	0.412	6	0.102	8	0.035	1	1.284	7	0.669	6	0.360	9	0.251	1	0.210	1	0.002	0.057	0.030		1.284	
203	M21	6in Dia. Duct	Sec 2 - max	0.103	9	0.034	7	0.000	1	-0.180	1	0.258	8	1.559	7	0.000	1	-0.022	9	-0.019	9	0.008	0.011	0.069		1.559	
204	M21	6in Dia. Duct	Sec 2 - min	-0.103	7	0.018	8	-0.287	9	-0.258	8	0.180	1	0.000	1	-1.559	7	-0.028	6	-0.024	6	0.008	0.011	0.069		1.559	
197	M20	6in Dia. Duct	Sec 4 - max	0.094	9	-0.022	1	0.077	9	0.056	7	-0.056	1	1.775	8	0.000	1	-0.022	9	-0.019	9	0.008	0.003	0.079		1.775	
198	M20	6in Dia. Duct	Sec 4 - min	-0.094	6	-0.024	8	0.000	1	0.056	1	-0.056	7	0.000	1	-1.775	8	-0.028	6	-0.024	6	0.008	0.003	0.079		1.775	
156	M16	6in Dia. Duct	Sec 4 - min	0.000	1	0.020	1	-0.045	8	0.546	1	-1.223	8	-0.041	9	-0.770	6	-0.028	6	-0.024	6	0.000	0.054	0.034		1.223	
749	M75	4in Dia. Duct	Sec 5 - max	0.190	7	-0.074	2	0.045	5	-0.686	2	1.190	1	0.676	5	0.756	4	0.016	8	0.037	8	0.016	0.044	0.028		1.190	
811	M82	4in Dia. Duct	Sec 1 - max	0.190	7	0.063	3	0.037	4	-0.686	2	1.190	1	0.676	5	0.756	4	0.016	8	0.037	8	0.016	0.044	0.028		1.190	
112	M12	6in Dia. Duct	Sec 1- min	-0.015	7	0.034	1	0.000	1	-1.284	7	-0.035	1	-0.360	9	-0.669	6	-0.352	6	-0.295	6	0.001	0.057	0.030		1.284	
985	M99	2in Dia. Duct	Sec 3 - max	0.090	7	-0.024	5	0.186	3	0.401	3	-0.250	2	1.414	8	-0.002	1	0.028	2	0.384	2	0.020	0.015	0.052		1.414	
1203	M121	6in Dia. Duct	Sec 2 - max	0.007	8	-0.03	2	0.015	9	1.300	6	-0.357	1	0.637	6	0.000	1	-0.022	9	-0.019	9	0.001	0.058	0.028		1.300	
1204	M121	6in Dia. Duct	Sec 2 - min	-0.007	6	-0.03	5	-0.015	8	0.357	1	-1.300	8	0.000	1	-0.637	6	-0.028	6	-0.024	6	0.001	0.058	0.028		1.300	
820	M82	4in Dia. Duct	Sec 5 - min	-0.014	3	-0.070	2	-0.017	4	-2.081	2	0.191	3	-0.199	8	-0.221	7	-0.003	7	-0.007	7	0.001	0.077	0.008		2.081	
655	M66	4in Dia. Duct	Sec 3 - max	0.177	6	0.000	7	0.128	8	0.270	7	-0.076	1	1.638	8	1.077	7	0.079	6	0.180	6	0.015	0.010	0.001		1.638	
93	M10	6in Dia. Duct	Sec 2 - max	0.164	6	-0.100	1	0.017	8	-0.312	1	0.504	7	0.094	1	1.118	6	0.244	1	0.204	1	0.013	0.022	0.050		1.118	
113	M12	6in Dia. Duct	Sec 2 - max	0.030	8	0.411	6	0.102	8	0.045	1	1.168	7	0.698	6	0.348	9	0.251	1	0.210	1	0.002	0.052	0.031		1.168	
943	M95	2in Dia. Duct	Sec 2 - max	0.121	2	0.037	4	0.000	1	0.338	1	-0.282	3	1.215	4	-0.001	1	0.004	7	0.060	7	0.027	0.012	0.045		1.215	
114	M12	6in Dia. Duct	Sec 2 - min	-0.016	7	0.033	1	0.000	1	-1.168	7	-0.045	1	-0.348	9	-0.698	6	-0.352	6	-0.295	6	0.001	0.052	0.031		1.168	
797	M80	6in Dia. Duct	Sec 4 - max	0.005	6	-0.009	8	0.107	7	-0.136	7	0.232	8	0.000	1	1.652	7	0.049	7	0.041	7	0.000	0.010	0.073		1.652	
798	M80	6in Dia. Duct	Sec 4 - min	-0.005	9	-0.016	7	0.000	1	-0.232	8	0.136	7	-1.652	7	0.000	1	-0.151	8	-0.126	8	0.000	0.010	0.073		1.852	
719	M72	4in Dia. Duct	Sec 5 - max	0.303	7	-0.051	1	0.093	8	-0.822	1	0.854	7	0.713	9	0.204	6	0.016	8	0.037	8	0.025	0.032	0.028		0.854	
721	M73	4in Dia. Duct	Sec 1 - max	0.303	7	0.067	2	0.033	4	-0.822	1	0.854	7	0.713	9	0.204	6	0.016	8	0.037	8	0.025	0.032	0.026		0.854	
1174	M118	2in Dia. Duct	Sec 2 - min	0.014	1	-0.043	4	-0.160	2	-1.726	8	0.081	1	-0.023	1	-0.436	8	-0.010	2	-0.141	2	0.003	0.064	0.016		1.726	
822	M83	4in Dia. Duct	Sec 1- min	0.002	3	-0.042	3	-0.017	4	-2.081	2	0.191	3	-0.088	8	-0.146	7	-0.036	7	-0.083	7	0.000	0.077	0.005		2.081	
155	M16	6in Dia. Duct	Sec 3 - max	0.059	8	0.399	6	0.045	9	0.943	8	-0.531	1	0.802	6	0.073	9	-0.022	9	-0.019	9	0.005	0.042	0.038		0.943	
121	M13	8in Dia. Duct	Sec 1 - max	0.048	8	0.409	6	0.077	4	0.227	1	0.980	7	0.782	6	0.312	9	0.215	1	0.180	1	0.004	0.044	0.035		0.980	
1219	M122	6in Dia. Duct	Sec 5 - max	0.019	8	0.412	8	0.111	8	-0.048	1	1.146	7	0.669	6	0.360	9	0.250	1	0.209	1	0.002	0.051	0.030		1.146	
1220	M122	6in Dia. Duct	Sec 5 - min	-0.019	7	0.034	1	0.000	1	-1.146	7	0.048	1	-0.360	9	-0.669	6	-0.495	6	-0.414	6	0.002	0.051	0.030		1.146	
115	M12	6in Dia. Duct	Sec 3 - max	0.030	8	0.411	6	0.102	8	0.054	1	1.051	7	0.726	8	0.336	9	0.251	1	0.210	1	0.002	0.047	0.032		1.051	
716	M72	4in Dia. Duct	Sec 3 - min	-0.137	8	-0.024	7	-0.020	7	-0.093	1	0.049	7	-1.769	8	-0.488	7	-0.003	7	-0.007	7	0.012	0.003	0.068		1.769	
116	M12	6in Dia. Duct	Sec 3 - min	-0.016	7	0.033	1	0.000	1	-1.051	7	-0.054	1	-0.336	9	-0.726	6	-0.352	6	-0.295	6	0.001	0.047	0.032		1.051	
122	M13	6in Dia. Duct	Sec 1- min	-0.008	7	0.032	1	0.000	1	-0.980	7	-0.227	1	-0.312	9	-0.782	6	-0.139	8	-0.117	6	0.001	0.044	0.035		0.980	
745	M75	4in Dia. Duct	Sec 3 - max	0.210	7	0.008	2	0.000	6	1.123	2	-0.942	1	0.509	4	0.522	5	0.016	8	0.037	8	0.018	0.042	0.019		1.123	
730	M73	4in Dia. Duct	Sec 5 - min	-0.095	8	-0.073	1	-0.046	8	-1.142	1	1.097	2	-0.753	8	-0.616	7	-0.003	7	-0.007	7	0.008	0.042	0.028		1.142	
732	M74	4in Dia. Duct	Sec 1- min	-0.095	8	0.069	2	-0.039	5	-1.142	1	1.097	2	-0.753	8	-0.616	7	-0.003	7	-0.007	7	0.008	0.042	0.028		1.142	
123	M13	6in Dia. Duct	Sec 2 - max	0.048	8	0.409	6	0.077	4	0.230	1	0.865	7	0.692	6	0.298	9	0.215	1	0.180	1	0.004	0.038	0.036		0.865	
1015	M102	2in Dia. Duct	Sec 3 - max	0.088	7	-0.014	7	0.171	3	0.452	3	-0.268	2	1.121	3	0.013	1	0.023	2	0.318	2	0.020	0.017	0.042		1.121	
156	M16	6in Dia. Duct	Sec 3 - min	0.000	1	0.021	1	-0.045	8	0.531	1	-0.943	8	-0.073	9	-0.802	6	-0.028	6	-0.024	6	0.000	0.042	0.036		0.943	
117	M12	6in Dia. Duct	Sec 4 - max	0.030	6	0.410	8	0.102	8	0.063	1	0.935	7	0.754	6	0.324	9	0.251	1	0.210	1	0.002	0.042	0.034		0.935	
956	M99	2in Dia. Duct	Sec 3 - min	0.000	1	-0.020	4	0.000	1	0.431	1	-0.802	3	-0.029	1	-1.487	5	-0.005	1	-0.066	1	0.000	0.022	0.055		1.487	
913	M92	2in Dia. Duct	Sec 2 - max	0.048	7	0.018	5	-0.002	1	0.101	1	1.294	3	0.503	4	-0.107	1	0.007	3	0.093	3	0.010	0.048	0.019		1.294	
1123	M113	2in Dia. Duct	Sec 2 - max	0.039	5	0.000	1	0.000	1	0.014	1	1.474	8	0.363	4	-0.008	1	0.001	3	0.017	3	0.009	0.055	0.013		1.474	
118	M12	6in Dia. Duct	Sec 4 - min	-0.016	7	0.032	1	0.000	1	-0.935	7	-0.063	1	-0.324	9	-0.754	6	-0.352	6	-0.295	6	0.001	0.042	0.034		0.935	
1073	M108	2in Dia. Duct	Sec 2 - max	0.042	7	0.000	1	0.000	1	-0.025	1	1.412	8	0.392	4	0.000	1	0.002	3	0.029	3	0.009	0.052	0.015		1.412	
88	M9	6in Dia. Duct	Sec 4 - min	0.028	1	-1.313	7	-0.017	6	-0.260	1	-0.400	6	-1.261	6	-0.243	1	-0.125	7	-0.105	7	0.002	0.018	0.056		1.261	
799	M80	6in Dia. Duct	Sec 5 - max	0.008	6	-0.013	8	0.105	7	-0.171	7	0.253	6	0.000	1	1.446	7	0.049	7	0.041	7	0.000	0.011	0.064		1.446	
800	M80	6in Dia. Duct	Sec 5 - min	-0.008	9	-0.020	7	0.000	1	-0.253	8	0.171	7	-1.446	7	0.000	1	-0.151	8	-0.126	8	0.000	0.011	0.064		1.446	
801	M81	6in Dia. Duct	Sec 1 - max	0.008	8	-0.013	8	0.105	7	-0.171	7	0.253	8	0.000	1	1.446	7	0.049	7	0.041	7	0.000	0.011	0.064		1.446	
802	M81	6in Dia. Duct	Sec 1- min	-0.008	9	-0.020	7	0.000	1	-0.253	8	0.171	7	-1.446	7	0.000	1	-0.151	8	-0.126	8	0.000	0.011	0.064		1.446	
91	M10	6in Dia. Duct	Sec 1 - max	0.183	6	-0.099	1	0.017	8	0.028	8	0.264	1	0.094	1	1.113	6	0.244	1	0.204	1	0.013	0.013	0.049		1.113	
207	M21	6in Dia. Duct	Sec 4 - max	0.106	9	0.014	7	0.000	1	0.040	7	0.179	8	0.535	6	1.313	9	-0.022	9	-0.019	9	0.009	0.009	0.058		1.313	
208	M21	6in Dia. Duct	Sec 4 - min	-0.108	7	-0.001	6	-0.277	9	-0.179	8	-0.040	7	-1.313	9	-0.535	6	-0.028	6	-0.024	6	0.009	0.006	0.058		1.313	
124	M13	6in Dia. Duct	Sec 2 - min	-0.008	7	0.031	1	0.000	1	-0.865	7	-0.236	1	-0.298	9	-0.802	6	-0.139	6	-0.117	6	0.001	0.038	0.036		0.865	
125	M13	6in Dia. Duct	Sec 3 - max	0.048	8	0.408	6	0.077	4	0.245	1	0.749	7	0.821	6	0.283	9	0.215	1	0.180	1	0.004	0.033	0.036		0.821	

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_b/σ_c	f_s/σ_s	D-2250	f_c (ksi)
823	M83	4in Dia. Duct	Sec 2 - max	0.157	2	0.210	2	0.021	5	-0.323	3	1.429	2	0.205	7	0.141	8	0.042	8	0.097	8	0.013	0.053	0.008		1.429
119	M12	6in Dia. Duct	Sec 5 - max	0.030	8	0.409	6	0.102	8	0.072	1	0.819	7	0.782	6	0.312	9	0.251	1	0.210	1	0.002	0.036	0.035		0.819
750	M75	4in Dia. Duct	Sec 5 - min	-0.017	8	-0.080	1	-0.046	4	-1.190	1	0.886	2	-0.756	4	-0.676	5	-0.003	7	-0.007	7	0.001	0.044	0.028		1.190
812	M82	4in Dia. Duct	Sec 1 - min	-0.017	8	0.028	2	-0.035	5	-1.190	1	0.886	2	-0.756	4	-0.676	5	-0.003	7	-0.007	7	0.001	0.044	0.028		1.190
923	M93	4in Dia. Duct	Sec 2 - max	0.154	2	0.014	3	0.000	1	1.189	2	-0.565	3	0.465	8	0.349	7	0.044	7	0.100	7	0.013	0.043	0.017		1.169
94	M10	6in Dia. Duct	Sec 2 - min	0.010	1	-1.556	6	-0.017	7	-0.504	7	0.312	1	-1.118	6	-0.094	1	-0.381	7	-0.319	7	0.001	0.022	0.050		1.118
1233	M124	4in Dia. Duct	Sec 2 - max	0.159	6	0.045	8	0.078	7	0.042	1	0.654	6	-0.052	1	0.950	9	0.079	6	0.180	6	0.013	0.024	0.035		0.950
120	M12	6in Dia. Duct	Sec 5 - min	-0.016	7	0.032	1	0.000	1	-0.819	7	-0.072	1	-0.312	9	-0.782	6	-0.352	6	-0.295	6	0.001	0.036	0.035		0.819
839	M94	3in Dia. Duct	Sec 5 - max	0.062	2	0.031	4	0.000	1	-0.409	1	0.508	8	1.255	5	0.002	1	0.004	7	0.019	7	0.007	0.019	0.046		1.255
921	M93	4in Dia. Duct	Sec 1 - max	0.162	2	0.044	3	0.014	6	0.915	2	0.010	3	0.651	8	0.016	7	0.044	7	0.100	7	0.014	0.034	0.024		0.915
839	M84	4in Dia. Duct	Sec 5 - max	0.158	2	0.044	3	0.000	1	0.924	2	0.003	3	0.651	8	0.016	7	0.020	9	0.046	9	0.013	0.034	0.024		0.924
153	M16	6in Dia. Duct	Sec 2 - max	0.058	8	0.400	6	0.044	9	0.662	9	-0.516	1	0.833	6	0.104	9	-0.022	9	-0.019	9	0.005	0.029	0.037		0.833
1124	M113	2in Dia. Duct	Sec 2 - min	0.014	1	-0.058	2	-0.138	2	-1.474	8	-0.014	1	0.008	1	-0.363	4	-0.013	2	-0.171	2	0.003	0.055	0.013		1.474
90	M9	6in Dia. Duct	Sec 5 - min	0.028	1	-1.313	7	-0.017	6	-0.294	1	-0.028	8	-1.265	6	-0.243	1	-0.125	7	-0.106	7	0.002	0.013	0.056		1.265
856	M86	4in Dia. Duct	Sec 3 - min	0.000	1	-0.003	6	-0.121	7	0.076	1	-0.270	7	-1.077	7	-1.638	8	-0.002	1	-0.005	1	0.000	0.010	0.061		1.638
128	M13	6in Dia. Duct	Sec 3 - min	-0.008	7	0.030	1	0.000	1	-0.749	7	-0.245	1	-0.283	9	-0.821	6	-0.139	6	-0.117	6	0.001	0.033	0.038		0.821
914	M92	2in Dia. Duct	Sec 2 - min	0.016	1	-0.004	4	-0.145	2	-1.294	3	-0.101	1	0.107	1	-0.506	4	-0.005	2	-0.067	2	0.004	0.048	0.019		1.294
1074	M108	2in Dia. Duct	Sec 2 - min	0.014	1	-0.048	4	-0.133	2	-1.412	8	0.025	1	0.000	1	-0.392	4	-0.012	2	-0.165	2	0.003	0.052	0.015		1.412
317	M32	6in Dia. Duct	Sec 4 - max	0.120	8	-0.004	1	-0.002	1	0.047	1	0.539	6	-0.032	1	0.807	9	0.049	7	0.041	7	0.010	0.024	0.036		0.807
318	M32	6in Dia. Duct	Sec 4 - min	-0.120	9	-0.047	6	-0.056	9	-0.539	8	-0.047	1	-0.807	9	0.032	1	-0.151	8	-0.126	6	0.010	0.024	0.036		0.807
937	M94	3in Dia. Duct	Sec 4 - max	0.118	2	-0.030	2	0.000	1	-0.137	8	0.212	1	0.002	1	1.326	4	0.013	7	0.054	7	0.012	0.008	0.049		1.328
127	M13	6in Dia. Duct	Sec 4 - max	0.048	6	0.407	6	0.077	4	0.253	1	0.633	7	0.840	6	0.266	9	0.215	1	0.180	1	0.004	0.028	0.037		0.840
833	M84	4in Dia. Duct	Sec 2 - max	0.158	2	0.059	3	0.003	8	0.566	2	0.524	3	0.941	5	-0.049	1	0.020	9	0.046	9	0.013	0.021	0.035		0.941
720	M72	4in Dia. Duct	Sec 5 - min	-0.130	8	-0.055	7	-0.005	7	-0.854	7	0.822	1	-0.204	6	-0.713	9	-0.003	7	-0.007	7	0.011	0.032	0.026		0.854
722	M73	4in Dia. Duct	Sec 1 - min	-0.130	8	0.066	1	-0.040	5	-0.854	7	0.822	1	-0.204	8	-0.713	9	-0.003	7	-0.007	7	0.011	0.032	0.026		0.854
725	M73	4in Dia. Duct	Sec 3 - max	0.286	7	-0.003	2	0.004	7	0.839	2	-0.629	3	0.557	8	0.381	7	0.016	8	0.037	6	0.024	0.024	0.021		0.639
837	M84	4in Dia. Duct	Sec 4 - max	0.158	2	0.049	3	0.000	1	0.822	2	0.160	3	0.863	8	-0.044	1	0.020	9	0.046	9	0.013	0.030	0.025		0.822
131	M14	6in Dia. Duct	Sec 1 - max	0.058	8	0.407	6	0.054	9	0.380	1	0.565	7	0.859	6	0.253	9	0.139	1	0.116	1	0.005	0.025	0.038		0.859
191	M20	6in Dia. Duct	Sec 1 - max	0.075	9	0.054	1	0.095	6	-0.433	8	0.500	1	0.000	1	0.878	8	-0.022	9	-0.019	9	0.006	0.022	0.039		0.878
192	M20	6in Dia. Duct	Sec 1 - min	-0.075	6	0.052	6	0.000	1	-0.500	1	0.433	8	-0.878	8	0.000	1	-0.028	6	-0.024	6	0.006	0.022	0.039		0.878
779	M78	6in Dia. Duct	Sec 5 - max	0.075	9	-0.054	8	0.019	7	-0.433	8	0.500	1	0.000	1	0.878	8	-0.022	9	-0.019	9	0.005	0.022	0.039		0.878
780	M78	6in Dia. Duct	Sec 5 - min	-0.075	7	-0.061	1	-0.044	8	-0.500	1	0.433	8	-0.878	8	0.000	1	-0.028	6	-0.024	6	0.008	0.022	0.039		0.878
986	M99	2in Dia. Duct	Sec 3 - min	0.000	1	-0.029	4	0.000	1	0.250	2	-0.401	3	0.002	1	-1.414	8	0.000	1	-0.002	1	0.000	0.015	0.052		1.414
154	M16	6in Dia. Duct	Sec 2 - min	0.000	1	0.023	1	-0.044	8	0.516	1	-0.662	9	-0.104	9	-0.833	6	-0.028	6	-0.024	6	0.000	0.029	0.037		0.833
717	M72	4in Dia. Duct	Sec 4 - max	0.307	7	-0.036	1	0.101	8	-0.370	9	0.380	1	0.323	7	0.709	8	0.016	8	0.037	8	0.026	0.014	0.026		0.709
128	M13	6in Dia. Duct	Sec 4 - min	-0.008	7	0.030	1	0.000	1	-0.833	7	-0.253	1	-0.268	9	-0.040	6	-0.139	6	-0.117	6	0.001	0.028	0.037		0.840
835	M84	4in Dia. Duct	Sec 3 - max	0.158	2	0.054	3	0.000	8	0.703	2	0.333	3	0.720	9	-0.047	1	0.020	9	0.046	9	0.013	0.026	0.027		0.720
149	M15	6in Dia. Duct	Sec 5 - max	0.061	8	0.402	6	0.050	9	0.498	1	-0.355	7	0.864	6	0.135	9	0.034	1	0.029	1	0.005	0.022	0.038		0.864
147	M15	6in Dia. Duct	Sec 4 - max	0.061	8	0.403	6	0.049	9	0.491	1	-0.241	6	0.870	6	0.149	9	0.034	1	0.029	1	0.005	0.022	0.039		0.870
145	M15	6in Dia. Duct	Sec 3 - max	0.061	8	0.403	8	0.049	9	0.484	1	-0.127	6	0.876	6	0.163	9	0.034	1	0.029	1	0.005	0.022	0.039		0.876
143	M15	6in Dia. Duct	Sec 2 - max	0.061	8	0.404	6	0.049	9	0.476	1	-0.012	6	0.882	6	0.177	9	0.034	1	0.029	1	0.005	0.021	0.039		0.882
151	M16	6in Dia. Duct	Sec 1 - max	0.058	8	0.402	6	0.043	9	0.499	1	-0.353	6	0.864	6	0.135	9	-0.022	9	-0.019	9	0.005	0.022	0.038		0.864
940	M94	3in Dia. Duct	Sec 5 - min	0.000	1	0.028	1	-0.050	5	-0.508	8	0.409	1	-0.002	1	-1.255	5	0.001	1	0.005	1	0.000	0.019	0.046		1.255
141	M15	6in Dia. Duct	Sec 1 - max	0.060	8	0.404	6	0.048	9	0.469	1	0.103	6	0.888	6	0.191	9	0.034	1	0.029	1	0.005	0.021	0.039		0.888
129	M13	6in Dia. Duct	Sec 5 - max	0.048	8	0.407	8	0.077	4	0.262	1	0.518	7	0.859	6	0.253	9	0.215	1	0.180	1	0.004	0.023	0.038		0.859
279	M28	6in Dia. Duct	Sec 5 - max	0.053	8	-0.078	7	0.037	8	-0.801	9	0.811	6	0.358	8	0.555	7	0.049	7	0.041	7	0.004	0.036	0.025		0.811
280	M28	6in Dia. Duct	Sec 5 - min	-0.053	9	-0.079	8	-0.048	7	-0.811	6	0.801	9	-0.555	7	-0.358	8	-0.151	8	-0.126	8	0.004	0.036	0.025		0.811
281	M29	6in Dia. Duct	Sec 1 - max	0.053	6	0.063	8	0.036	7	-0.801	9	0.811	6	0.358	8	0.555	7	0.049	7	0.041	7	0.004	0.036	0.025		0.811
282	M29	6in Dia. Duct	Sec 1 - min	-0.053	7	0.063	1	-0.030	8	-0.811	6	0.801	9	-0.555	7	-0.358	8	-0.151	8	-0.126	8	0.004	0.036	0.025		0.811
173	M18	6in Dia. Duct	Sec 2 - max	0.030	8	0.057	1	0.020	8	-0.130	8	0.775	1	0.613	9	0.041	6	-0.022	9	-0.019	9	0.002	0.034	0.027		0.775
174	M18	6in Dia. Duct	Sec 2 - min	-0.030	6	0.032	8	-0.033	7	-0.775	1	0.130	8	-0.041	6	-0.613	9	-0.028	6	-0.024	6	0.002	0.034	0.027		0.775
748	M75	4in Dia. Duct	Sec 3 - min	-0.037	8	0.003	1	-0.002	9	0.942	1	-1.123	2	-0.522	5	-0.509	4	-0.003	7	-0.007	7	0.003	0.042	0.019		1.123
271	M28	6in Dia. Duct	Sec 1 - max	0.015	8	0.077	7	0.031	2	-0.720	8	0.755	7	0.653	3	0.071	2	0.049	7	0.041	7	0.001	0.034	0.029		0.755
272	M28	6in Dia. Duct	Sec 1 - min	-0.015	9	0.076	8	-0.042	3	-0.755	7	0.726	8	-0.071	2	-0.653	3	-0.151	8	-0.126	8	0.001	0.034	0.029		0.755
809	M81	6in Dia. Duct	Sec 5 - max	0.015	8	-0.047	8	0.099	3	-0.726	8	0.755	7	0.653	3	0.071	2	0.049	7	0.041	7	0.001	0.034	0.029		0.755
610	M81	6in Dia. Duct	Sec 5 - min	-0.015	9	-0.054	7	0.000	1	-0.755	7	0.726	8	-0.071	2	-0.653	3	-0.151	6	-0.126	8	0.001	0.034	0.029		0.755
133	M14	6in Dia. Duct	Sec 2 - max	0.059	8	0.406	6	0.055	9	0.388	1	0.450	7	0.867	6	0.238	9	0.139	1	0.116	1	0.005	0.020	0.039		0.867
132	M14	6in Dia. Duct	Sec 1 - min	0.000	1	0.029	1	0.000	1	-0.565	7	-0.380	1	-0.253	9	-0.859	6	-0.011	6	-0.009	6	0.000	0.025	0.038		0.859
92	M10	6in Dia. Duct	Sec 1 - min	0.010	1	-1.555	6	-0.017	7	-0.284	1	-0.028	8	-1.113	6	-0.094	1	-0.381	7	-0.319	7	0.001	0.013	0.049		1.113
205	M21	6in Dia. Duct	Sec 3 - max	0.105	9	0.024	7	0.000	1	-0.049	7	0.195	8	1.025	7	0.050	8	-0.022	9	-0.019	9	0.009	0.009	0.046		1.025
206	M21	6in Dia. Duct	Sec 3 - min	-0.105	7	0.009	8	-0.282	9	-0.195	8	0.049	7	-0.050	8	-1.025	7	-0.028	6	-0.024	6	0.009	0.009	0.046		1.025
139	M14	6in Dia. Duct	Sec 5 - max	0.059	8	0.404	8	0.058	9	0.411	1	0.105	7	0.888	6	0.191	9	0.139	1	0.116	1	0.005	0.018	0.039		0.888
929	M93	4in Dia. Duct	Sec 5 - max	0.109	2	0.040	2	0.000	6	-0.438	1	0.647	2	0.810	5	0.010	1	0.013	7	0.030	7	0.008	0.024	0.030		0.810
651	M86	4in Dia. Duct	Sec 1 - max	0.170	6	0.028	7	0.114	8	0.022	6	0.186	1	1.112	7	0.696	8	0.079	6	0.180	6	0.014	0.007	0.041		1.112
1239	M124	4in Dia. Duct	Sec 5 - max	0.17	6	0	6	0.054	7	0.022	6	0.186	1	1.112	7	0.696	8	0.079	6	0.180	6	0.014	0.007	0.041		1.112
137	M14	6in Dia. Duct	Sec 4 - max	0.059	8	0.405	6	0.055	9	0.404	1	0.220	7	0.881	6	0.207	9	0.139	1	0.116	1	0.005	0.016	0.039		0.881
130	M13	6in Dia. Duct	Sec 5 - min	-0.008	7	0.029	1	0.000	1	-0.518	7	-0.262	1	-0.253	9	-0.859	6	-0.139	6	-0.117	6	0.001	0.023	0.038		0.859
185	M20	6in Dia. Duct	Sec 3 - max	0.088	9	0.003	1	0.070	8	0.186	9	-0.163	1	1.037	8	0.000	1	-0.022	9	-0.019	9	0.007	0.008	0.046		1.037
196	M20	6in Dia. Duct	Sec 3 - min	-0.088	6	0.001	8	0.000	1	0.163	1	-0.186	9	0.000	1	-1.037	8	-0.028	6	-0.024	6	0.007	0.008	0.046		1.037
817	M82	4in Dia. Duct	Sec 4 - max	0.187	2	-0.009	3	0.008	7	0.138	3	1.162	2	0.067	6	0.071	9	0.016	8	0.037	9	0.016	0.043	0.003		1.162
924	M93	4in Dia. Duct	Sec 2 - min	-0.010	3	-0.002	2	-0.022	9	0.565	3	-1.169	2	-0.349	7	-0.465	6	-0.006	6	-0.013	8	0.001	0.043	0.017		1.169
135	M14	6in Dia. Duct	Sec 3 - max	0.059	8	0.406	6	0.055	9	0.390	1	0.335	7	0.874	6	0.222	9	0.139	1	0.116	1	0.005	0.018	0.039		0.874
1207	M121	6in Dia. Duct	Sec 4 - max	0.019	8	-0.074	2	0.037	9	0.232	8	0.711	1	0.630	7	0.000	1	-0.022	9	-0.019	9	0.002	0.032	0.028		0.711
1208	M121	6in Dia. Duct	Sec 4 - min	-0.019	6	-0.074	5	-0.037	8	-0.711	1	-0.232	8	0.000	1	-0.630	7	-0.028	6	-0.024	6	0.002	0.032	0.028		0.711
603	M81	6in Dia. Duct	Sec 2 - max	0.008	8	-0.021	8	0.101	7	-0.268	7	0.320	8	0.000	1	1.038	7	0.049	7	0.041	7	0.001	0.014	0.046		1.038

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_{by}/σ_a	f_{bz}/σ_a		f_c (ksi)	
804	M91	6in Dia. Duct	Sec 2 - min	-0.008	9	-0.026	7	0.000	1	-0.320	8	0.268	7	-1.038	7	0.000	1	-0.151	8	-0.126	8	0.001	0.014	0.046		1.038	
824	M83	4in Dia. Duct	Sec 2 - min	0.004	3	-0.044	3	-0.020	4	-1.429	2	0.323	3	-0.141	8	-0.205	7	-0.036	7	-0.083	7	0.000	0.053	0.008		1.429	
825	M93	4in Dia. Duct	Sec 3 - max	0.145	2	-0.016	3	0.000	7	0.819	2	-0.536	3	0.092	4	0.492	5	0.044	7	0.100	7	0.012	0.030	0.018		0.819	
152	M16	8in Dia. Duct	Sec 1 - min	0.000	1	0.024	1	-0.043	8	0.353	6	-0.499	1	-0.135	9	-0.864	6	-0.026	6	-0.024	6	0.000	0.022	0.038		0.864	
150	M15	8in Dia. Duct	Sec 5 - min	0.000	1	0.024	1	-0.022	8	0.355	7	-0.498	1	-0.135	9	-0.864	6	0.013	6	0.011	6	0.000	0.022	0.038		0.864	
146	M15	8in Dia. Duct	Sec 4 - min	0.000	1	0.025	1	-0.021	8	0.241	6	-0.491	1	-0.149	9	-0.870	6	0.013	6	0.011	6	0.000	0.022	0.039		0.870	
148	M15	6in Dia. Duct	Sec 3 - min	0.000	1	0.025	1	-0.021	6	0.127	6	-0.484	1	-0.183	9	-0.876	6	0.013	6	0.011	6	0.000	0.022	0.039		0.876	
144	M15	6in Dia. Duct	Sec 2 - min	0.000	1	0.026	1	-0.021	8	0.012	6	-0.476	1	-0.177	9	-0.882	6	0.013	6	0.011	6	0.000	0.021	0.039		0.882	
142	M15	6in Dia. Duct	Sec 1 - min	0.000	1	0.027	1	-0.020	6	-0.103	6	-0.469	1	-0.191	9	-0.888	6	0.013	6	0.011	6	0.000	0.021	0.039		0.888	
840	M84	4in Dia. Duct	Sec 5 - min	-0.021	3	0.028	2	-0.084	7	-0.003	3	-0.924	2	-0.018	7	-0.651	8	-0.027	6	-0.062	6	0.002	0.034	0.024		0.924	
922	M93	4in Dia. Duct	Sec 1 - min	-0.019	3	0.028	2	-0.040	9	-0.010	3	-0.915	2	-0.018	7	-0.651	8	-0.006	8	-0.013	8	0.002	0.034	0.024		0.915	
1205	M121	6in Dia. Duct	Sec 3 - max	0.013	8	-0.052	2	0.026	9	0.879	8	0.063	1	0.437	4	0.000	1	-0.022	9	-0.019	9	0.001	0.039	0.019		0.879	
1208	M121	6in Dia. Duct	Sec 3 - min	-0.013	6	-0.052	5	-0.026	8	-0.083	1	-0.879	8	0.000	1	-0.437	4	-0.028	6	-0.024	6	0.001	0.039	0.019		0.879	
1234	M124	4in Dia. Duct	Sec 2 - min	0	1	0.014	1	-0.005	8	-0.654	6	-0.042	1	-0.950	9	0.052	1	-0.002	1	-0.005	1	0.000	0.024	0.035		0.950	
723	M73	4in Dia. Duct	Sec 2 - max	0.294	7	0.032	2	0.013	4	0.309	1	-0.295	7	0.622	8	0.274	7	0.016	8	0.037	8	0.025	0.011	0.023		0.622	
134	M14	8in Dia. Duct	Sec 2 - min	0.000	1	0.028	1	0.000	1	-0.450	7	-0.388	1	-0.238	9	-0.867	6	-0.011	6	-0.009	6	0.000	0.020	0.039		0.867	
588	M59	4in Dia. Duct	Sec 3 - min	0.024	1	-0.144	7	-0.281	7	-1.076	6	-0.179	1	-0.293	9	-0.443	6	-0.022	9	-0.050	9	0.002	0.040	0.016		1.076	
1016	M102	2in Dia. Duct	Sec 3 - min	0.000	1	-0.027	8	0.000	1	0.268	2	-0.452	3	-0.013	1	-1.121	3	-0.001	1	-0.020	1	0.000	0.017	0.042		1.121	
831	M84	4in Dia. Duct	Sec 1 - max	0.181	2	0.078	9	-0.001	1	0.433	2	0.746	3	0.416	7	0.381	8	0.045	5	0.103	5	0.015	0.028	0.015		0.746	
140	M14	6in Dia. Duct	Sec 5 - min	0.000	1	0.027	1	0.000	1	-0.105	7	-0.411	1	-0.191	9	-0.888	6	-0.011	6	-0.009	6	0.000	0.018	0.039		0.888	
834	M84	4in Dia. Duct	Sec 2 - min	-0.021	3	0.043	2	-0.092	7	-0.524	3	-0.568	2	0.049	1	-0.941	5	-0.027	6	-0.062	6	0.002	0.021	0.035		0.941	
944	M95	2in Dia. Duct	Sec 2 - min	0.000	1	0.031	1	-0.083	5	0.262	3	-0.336	1	0.001	1	-1.215	4	0.001	1	0.017	1	0.000	0.012	0.045		1.215	
1235	M124	4in Dia. Duct	Sec 3 - max	0.162	6	0.03	6	0.068	7	0.110	1	0.284	6	-0.029	1	0.893	8	0.079	6	0.180	6	0.014	0.011	0.033		0.893	
138	M14	6in Dia. Duct	Sec 4 - min	0.000	1	0.027	1	0.000	1	-0.220	7	-0.404	1	-0.207	9	-0.881	6	-0.011	6	-0.009	6	0.000	0.018	0.039		0.881	
938	M94	3in Dia. Duct	Sec 4 - min	0.000	1	-0.038	1	-0.053	4	-0.212	1	0.137	8	-1.328	4	-0.002	1	-0.003	8	-0.011	6	0.000	0.008	0.049		1.328	
855	M88	2in Dia. Duct	Sec 3 - max	0.093	7	-0.005	7	0.130	9	0.725	8	-0.472	7	0.076	2	0.254	3	0.026	2	0.359	2	0.021	0.027	0.009		0.725	
838	M84	4in Dia. Duct	Sec 4 - min	-0.021	3	0.033	2	-0.087	7	-0.160	3	-0.822	2	0.044	1	-0.663	8	-0.027	6	-0.062	6	0.002	0.030	0.025		0.822	
829	M83	4in Dia. Duct	Sec 5 - max	0.159	2	0.194	2	0.029	5	0.433	2	0.746	3	0.423	7	0.345	8	0.042	8	0.097	8	0.013	0.028	0.016		0.746	
136	M14	6in Dia. Duct	Sec 3 - min	0.000	1	0.028	1	0.000	1	-0.335	7	-0.398	1	-0.222	9	-0.874	6	-0.011	6	-0.009	6	0.000	0.018	0.039		0.874	
747	M75	4in Dia. Duct	Sec 4 - max	0.200	7	-0.033	2	0.022	5	0.787	2	-0.445	1	0.197	4	0.244	5	0.016	8	0.037	8	0.017	0.029	0.009		0.787	
838	M84	4in Dia. Duct	Sec 3 - min	-0.021	3	0.038	2	-0.089	7	-0.333	3	-0.703	2	0.047	1	-0.720	9	-0.027	6	-0.062	6	0.002	0.026	0.027		0.720	
930	M93	4in Dia. Duct	Sec 5 - min	-0.003	3	0.036	1	-0.041	9	-0.647	2	0.438	1	-0.010	1	-0.810	5	-0.002	8	-0.005	8	0.000	0.024	0.030		0.810	
728	M73	4in Dia. Duct	Sec 3 - min	-0.112	8	-0.003	1	-0.011	8	0.628	3	-0.639	2	-0.381	7	-0.567	8	-0.003	7	-0.007	7	0.009	0.024	0.021		0.639	
825	M83	4in Dia. Duct	Sec 3 - max	0.158	2	0.204	2	0.024	5	-0.446	8	0.806	7	0.271	7	0.202	8	0.042	8	0.097	8	0.013	0.030	0.010		0.806	
718	M72	4in Dia. Duct	Sec 4 - min	-0.134	8	-0.040	7	-0.012	7	-0.380	1	0.370	9	-0.709	8	-0.323	7	-0.003	7	-0.007	7	0.011	0.014	0.026		0.709	
735	M74	4in Dia. Duct	Sec 3 - max	0.250	7	-0.003	1	0.003	9	0.513	1	-0.463	2	0.268	4	0.309	5	0.016	8	0.037	8	0.021	0.019	0.011		0.513	
275	M28	8in Dia. Duct	Sec 3 - max	0.034	8	0.000	7	0.000	1	0.622	8	-0.613	7	0.460	6	0.267	9	0.049	7	0.041	7	0.003	0.028	0.020		0.622	
276	M28	6in Dia. Duct	Sec 3 - min	-0.034	9	-0.001	8	-0.009	7	0.613	7	-0.622	8	-0.267	9	-0.460	6	-0.151	8	-0.126	8	0.003	0.028	0.020		0.622	
935	M94	3in Dia. Duct	Sec 3 - max	0.126	2	0.000	2	0.000	1	0.359	3	-0.228	2	-0.005	1	0.604	9	0.013	7	0.054	7	0.013	0.013	0.022		0.604	
928	M93	4in Dia. Duct	Sec 3 - min	-0.002	3	-0.032	2	-0.026	8	0.536	3	-0.819	2	-0.492	5	-0.092	4	-0.006	8	-0.013	8	0.000	0.030	0.018		0.819	
827	M83	4in Dia. Duct	Sec 4 - max	0.159	2	0.199	2	0.026	5	-0.170	6	0.603	9	0.344	7	0.270	8	0.042	8	0.097	8	0.013	0.022	0.013		0.603	
805	M91	8in Dia. Duct	Sec 3 - max	0.010	8	-0.030	8	0.098	7	-0.395	7	0.422	8	0.081	9	0.647	6	0.049	7	0.041	7	0.001	0.019	0.029		0.647	
808	M81	6in Dia. Duct	Sec 3 - min	-0.010	9	-0.037	7	0.000	1	-0.422	8	0.395	7	-0.647	6	-0.081	9	-0.151	8	-0.126	8	0.001	0.019	0.029		0.647	
652	M69	4in Dia. Duct	Sec 1 - min	0.000	1	0.026	8	-0.106	7	-0.186	1	-0.022	6	-0.696	8	-1.112	7	-0.002	1	-0.005	1	0.000	0.007	0.041		1.112	
1240	M124	4in Dia. Duct	Sec 5 - min	0	1	-0.03	1	0.002	1	-0.186	1	-0.022	6	-0.696	8	-1.112	7	-0.002	1	-0.005	1	0.000	0.007	0.041		1.112	
1237	M124	4in Dia. Duct	Sec 4 - max	0.166	6	0.018	6	0.061	7	0.034	1	0.084	7	0.551	7	0.831	8	0.079	6	0.180	8	0.014	0.002	0.031		0.831	
818	M82	4in Dia. Duct	Sec 4 - min	-0.014	3	-0.048	2	-0.004	8	-1.162	2	-0.138	3	-0.071	9	-0.067	6	-0.003	7	-0.007	7	0.001	0.043	0.003		1.162	
724	M73	4in Dia. Duct	Sec 2 - min	-0.121	8	0.031	1	-0.020	5	0.295	7	-0.309	1	-0.274	7	-0.622	8	-0.003	7	-0.007	7	0.010	0.011	0.023		0.622	
830	M83	4in Dia. Duct	Sec 5 - min	0.012	3	-0.048	3	-0.027	4	-0.746	3	-0.433	2	-0.346	8	-0.423	7	-0.036	7	-0.083	7	0.001	0.028	0.016		0.746	
832	M84	4in Dia. Duct	Sec 1 - min	-0.008	3	0.062	8	-0.183	7	-0.746	3	-0.433	2	-0.381	8	-0.416	7	-0.029	4	-0.055	4	0.001	0.028	0.015		0.746	
1236	M124	4in Dia. Duct	Sec 3 - min	0	1	0	1	0.002	1	-0.264	6	-0.110	1	-0.893	8	0.029	1	-0.002	1	-0.005	1	0.000	0.011	0.033		0.893	
315	M32	8in Dia. Duct	Sec 3 - max	0.117	8	0.009	1	-0.002	1	0.033	1	0.300	6	-0.018	1	0.462	9	0.049	7	0.041	7	0.010	0.013	0.021		0.462	
316	M32	6in Dia. Duct	Sec 3 - min	-0.117	8	-0.035	8	-0.062	9	-0.300	6	-0.033	1	-0.462	9	0.018	1	-0.151	8	-0.126	8	0.010	0.013	0.021		0.462	
813	M82	4in Dia. Duct	Sec 2 - max	0.187	2	0.039	3	0.023	4	-0.345	3	0.464	2	0.223	5	0.278	4	0.016	8	0.037	8	0.016	0.017	0.010		0.464	
815	M82	4in Dia. Duct	Sec 3 - max	0.187	2	0.015	3	0.010	4	0.087	3	0.623	2	0.031	7	0.060	8	0.016	8	0.037	8	0.016	0.023	0.002		0.623	
645	M65	4in Dia. Duct	Sec 3 - max	0.137	8	0.542	7	0.755	7	0.320	8	0.153	1	0.464	9	0.295	6	0.079	6	0.180	6	0.012	0.012	0.017		0.464	
828	M83	4in Dia. Duct	Sec 3 - min	0.007	3	-0.045	3	-0.022	4	-0.808	7	0.446	8	-0.202	8	-0.271	7	-0.036	7	-0.083	7	0.001	0.030	0.010		0.808	
748	M75	4in Dia. Duct	Sec 4 - min	-0.027	8	-0.039	1	-0.023	4	0.445	1	-0.787	2	-0.244	5	-0.197	4	-0.003	7	-0.007	7	0.002	0.029	0.009		0.787	
927	M93	4in Dia. Duct	Sec 4 - max	0.137	2	-0.047	3	0.015	5	-0.084	8	0.145	7	0.000	1	0.588	8	0.044	7	0.100	7	0.012	0.005	0.022		0.588	
653	M66	4in Dia. Duct	Sec 2 - max	0.173	6	0.014	7	0.121	8	0.211	6	-0.014	1	0.438	8	-0.015	1	0.079	6	0.180	6	0.015	0.008	0.016		0.436	
807	M81	8in Dia. Duct	Sec 4 - max	0.012	8	-0.038	8	0.095	3	-0.557	6	0.558	1	0.281	9	0.273	6	0.049	7	0.041	7	0.001	0.025	0.012		0.558	
808	M81	8in Dia. Duct	Sec 4 - min	-0.013	9	-0.045	7	0.000	1	-0.558	1	0.557	6	-0.273	6	-0.281	9	-0.151	8	-0.126	8	0.001	0.025	0.012		0.558	
773	M78	6in Dia. Duct	Sec 2 - max	0.081	9	0.005	8	0.000	1	0.351	1	-0.242	8	0.000	1	0.394	9	-0.022	9	-0.019	9	0.005	0.016	0.018		0.394	
774	M78	6in Dia. Duct	Sec 2 - min	-0.081	7	-0.001	1	-0.015	8	0.242	8	-0.351	1	-0.394	9	0.000	1	-0.028	6	-0.024	6	0.005	0.016	0.018		0.394	
775	M78	6in Dia. Duct	Sec 3 - max	0.065	9	-0.015	8	0.000	1	0.248	1	-0.197	9	0.000	1	0.475	9	-0.022	9	-0.019	9	0.005	0.011	0.021		0.475	
776	M78	6in Dia. Duct	Sec 3 - min	-0.065	7	-0.021	1	-0.025	8	0.197	9	-0.246	1	-0.475	9	0.000	1	-0.028	6	-0.024	6	0.005	0.011	0.021		0.475	
743	M75	4in Dia. Duct	Sec 2 - max	0.221	7	0.050	2	0.024	4	0.320	2	-0.301	1	0.180	4	0.160	5	0.016	8	0.037	8	0.019	0.012	0.007		0.320	
738	M74	4in Dia. Duct	Sec 3 - min	-0.077	8	-0.005	2	0.000	6	0.463	2	-0.513	1	-0.309	5	-0.268	4	-0.003	7	-0.007	7	0.006	0.019	0.011		0.513	
933	M94	3in Dia. Duct	Sec 2 - max	0.139	2	0.028	2	0.000	1	0.127	3	0.122	2	0.479	6	0.012	1	0.013	7	0.054	7	0.014	0.005	0.018		0.479	
856	M86	2in Dia. Duct	Sec 3 - min	0.000	1	-0.021	8	0.000	1	0.472	7	-0.725	8	-0.254	3	-0.076	2	0.000	1	-0.013	1	0.000	0.027	0.009		0.725	
828	M83	4in Dia. Duct	Sec 4 - min	0.010	3	-0.047	3	-0.025	4	-0.603	9	0.170	6	-0.270	8	-0.344	7	-0.036	7	-0.083	7	0.001	0.022	0.013		0.603	
938	M94	3in Dia. Duct	Sec 3 - min	0.000	1	-0.007	1	-0.035	4	0.228	2	-0.359	3	-0.604	9	0.005	1	-0.003	8	-0.011	8	0.000	0.013	0.022		0.604	
1227	M123	4in Dia. Duct	Sec 4 - max	0.151	6	-0.011	1	-0.009	1	0.218	6	-0.022	1	0.398	8	-0.015	1	0.079	6	0.180	6	0.013	0.008	0.015		0.398	
273	M28	6in Dia. Duct	Sec 2 - max	0.024	8	0.038	7	0.013	2	0.295	8	-0.277	7	0.446	7	0.058	8	0.049	7	0.041	7	0.002	0.013	0.020		0.446	
274	M28	6in Dia. Duct	Sec 2 - min	-0.024	9	0.038	8	-0.023	3	0.277	7	-0.295	8	-0.058	8	-0.446	7	-0.151	8	-0.126	8	0.002	0.013	0.020		0.446	

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_{by}/σ_a	f_{bz}/σ_a		f_t (ksi)	
																								0-2250				
727	M73	4in Dia. Duct	Sec 4 - max	0.277	7	-0.037	2	0.022	7	0.175	2	-0.149	1	0.109	8	0.084	7	0.016	8	0.037	8	0.023	0.006	0.004		0.277	
309	M31	6in Dia. Duct	Sec 5 - max	0.111	8	-0.034	6	0.028	9	-0.041	6	0.212	1	0.336	9	-0.009	1	0.049	7	0.041	7	0.009	0.009	0.015		0.336	
310	M31	6in Dia. Duct	Sec 5 - min	-0.111	9	-0.040	1	-0.015	6	-0.212	1	0.041	6	0.009	1	-0.336	9	-0.151	8	-0.126	8	0.009	0.009	0.015		0.336	
311	M32	6in Dia. Duct	Sec 1 - max	0.111	8	0.034	1	-0.002	1	-0.041	6	0.212	1	0.336	9	-0.009	1	0.049	7	0.041	7	0.009	0.009	0.015		0.336	
312	M32	6in Dia. Duct	Sec 1 - min	-0.111	9	-0.010	6	-0.075	9	-0.212	1	0.041	8	0.009	1	-0.336	9	-0.151	8	-0.126	6	0.009	0.009	0.015		0.336	
1238	M124	4in Dia. Duct	Sec 4 - min	0	1	-0.015	1	0.002	1	-0.054	7	-0.034	1	-0.831	8	-0.551	7	-0.002	1	-0.005	1	0.000	0.002	0.031		0.831	
323	M33	6in Dia. Duct	Sec 2 - max	0.127	8	0.178	6	0.240	9	0.220	6	-0.016	1	0.265	9	-0.011	1	0.049	7	0.041	7	0.010	0.010	0.012		0.265	
324	M33	6in Dia. Duct	Sec 2 - min	-0.127	9	-0.001	1	0.010	1	0.016	1	-0.220	6	0.011	1	-0.265	9	-0.151	8	-0.126	8	0.010	0.010	0.012		0.265	
733	M74	4in Dia. Duct	Sec 2 - max	0.259	7	0.034	1	0.020	4	0.143	3	-0.139	2	0.035	6	0.124	9	0.016	8	0.037	8	0.022	0.005	0.005		0.259	
777	M78	6in Dia. Duct	Sec 4 - max	0.070	9	-0.034	8	0.009	7	-0.028	8	0.036	1	0.000	1	0.518	8	-0.022	9	-0.019	9	0.006	0.002	0.023		0.518	
778	M78	6in Dia. Duct	Sec 4 - min	-0.070	7	-0.041	1	-0.034	8	-0.038	1	0.028	8	-0.518	8	0.000	1	-0.028	6	-0.024	6	0.006	0.002	0.023		0.518	
648	M65	4in Dia. Duct	Sec 3 - min	0.000	1	-0.025	1	0.028	1	-0.153	1	-0.320	8	-0.295	6	-0.464	9	-0.002	1	-0.005	1	0.000	0.012	0.017		0.464	
814	M82	4in Dia. Duct	Sec 2 - min	-0.014	3	0.002	2	-0.022	5	-0.464	2	0.345	3	-0.278	4	-0.223	5	-0.003	7	-0.007	7	0.001	0.017	0.010		0.464	
175	M18	6in Dia. Duct	Sec 3 - max	0.037	8	0.032	1	0.007	8	0.092	8	0.257	1	0.309	9	0.000	1	-0.022	9	-0.019	9	0.003	0.011	0.014		0.309	
178	M18	6in Dia. Duct	Sec 3 - min	-0.037	6	0.006	8	-0.021	7	-0.257	1	-0.092	8	0.000	1	-0.309	9	-0.028	6	-0.024	6	0.003	0.011	0.014		0.309	
928	M93	4in Dia. Duct	Sec 4 - min	0.000	1	-0.083	2	-0.041	4	-0.145	7	0.084	8	-0.588	8	0.000	1	-0.008	8	-0.013	8	0.000	0.005	0.022		0.588	
299	M30	6in Dia. Duct	Sec 5 - max	0.091	8	-0.034	1	0.014	8	-0.214	1	0.265	6	0.055	8	0.175	7	0.049	7	0.041	7	0.007	0.012	0.008		0.265	
300	M30	6in Dia. Duct	Sec 5 - min	-0.091	7	-0.038	6	-0.022	7	-0.265	6	0.214	1	-0.175	7	-0.055	8	-0.151	8	-0.128	8	0.007	0.012	0.008		0.265	
301	M31	6in Dia. Duct	Sec 1 - max	0.091	8	0.046	6	0.027	7	-0.214	1	0.265	6	0.055	8	0.175	7	0.049	7	0.041	7	0.007	0.012	0.008		0.265	
302	M31	6in Dia. Duct	Sec 1 - min	-0.091	9	0.040	1	-0.014	8	-0.265	8	0.214	1	-0.175	7	-0.055	8	-0.151	8	-0.128	8	0.007	0.012	0.008		0.265	
769	M77	6in Dia. Duct	Sec 5 - max	0.056	8	0.025	8	0.000	1	0.275	1	-0.107	8	0.026	6	0.222	9	-0.022	9	-0.019	9	0.005	0.012	0.010		0.275	
770	M77	6in Dia. Duct	Sec 5 - min	-0.056	6	0.018	1	-0.024	9	0.107	8	-0.275	1	-0.222	9	-0.026	6	-0.028	6	-0.024	6	0.005	0.012	0.010		0.275	
771	M78	6in Dia. Duct	Sec 1 - max	0.056	9	0.025	8	0.000	1	0.275	1	-0.107	8	0.026	6	0.222	9	-0.022	9	-0.019	9	0.005	0.012	0.010		0.275	
772	M78	6in Dia. Duct	Sec 1 - min	-0.056	7	0.018	1	-0.024	9	0.107	8	-0.275	1	-0.222	9	-0.026	6	-0.028	6	-0.024	6	0.005	0.012	0.010		0.275	
283	M29	8in Dia. Duct	Sec 2 - max	0.059	8	0.040	6	0.025	7	-0.254	7	0.260	8	0.102	9	0.229	6	0.049	7	0.041	7	0.005	0.012	0.010		0.260	
284	M29	6in Dia. Duct	Sec 2 - min	-0.059	7	0.040	1	-0.018	8	-0.260	8	0.254	7	-0.229	6	-0.102	9	-0.151	8	-0.126	8	0.005	0.012	0.010		0.260	
816	M82	4in Dia. Duct	Sec 3 - min	-0.014	3	-0.022	2	-0.008	5	-0.823	2	-0.087	3	-0.080	8	-0.031	7	-0.003	7	-0.007	7	0.001	0.023	0.002		0.823	
179	M18	6in Dia. Duct	Sec 5 - max	0.049	8	-0.018	1	0.005	9	-0.098	1	0.343	8	0.140	9	0.035	6	-0.022	9	-0.019	9	0.004	0.015	0.006		0.343	
180	M18	6in Dia. Duct	Sec 5 - min	-0.049	6	-0.044	8	-0.019	6	-0.343	8	0.098	1	-0.035	6	-0.140	9	-0.028	6	-0.024	6	0.004	0.015	0.006		0.343	
181	M19	6in Dia. Duct	Sec 1 - max	0.049	9	0.050	8	0.012	6	-0.098	1	0.343	8	0.140	9	0.035	8	-0.022	9	-0.019	9	0.004	0.015	0.006		0.343	
182	M19	6in Dia. Duct	Sec 1 - min	-0.049	0	0.044	1	-0.037	9	-0.343	8	0.098	1	-0.035	6	-0.140	9	-0.028	6	-0.024	6	0.004	0.015	0.006		0.343	
737	M74	4in Dia. Duct	Sec 4 - max	0.240	7	-0.040	1	0.023	5	-0.027	1	0.124	2	0.016	7	0.010	8	0.016	8	0.037	8	0.020	0.005	0.001		0.240	
305	M31	6in Dia. Duct	Sec 3 - max	0.101	8	0.000	8	0.008	9	0.214	6	-0.154	1	0.147	7	0.020	8	0.049	7	0.041	7	0.008	0.010	0.006		0.214	
306	M31	6in Dia. Duct	Sec 3 - min	-0.101	9	0.000	1	0.000	1	0.154	1	-0.214	6	-0.020	8	-0.147	7	-0.151	8	-0.126	8	0.008	0.010	0.006		0.214	
654	M68	4in Dia. Duct	Sec 2 - min	0.000	1	0.012	6	-0.114	7	0.014	1	-0.211	6	0.015	1	-0.436	8	-0.002	1	-0.005	1	0.000	0.008	0.016		0.436	
307	M31	6in Dia. Duct	Sec 4 - max	0.106	8	-0.014	8	0.018	9	0.178	8	-0.062	1	0.163	7	-0.006	1	0.049	7	0.041	7	0.009	0.008	0.007		0.178	
308	M31	6in Dia. Duct	Sec 4 - min	-0.108	9	-0.020	1	-0.005	8	0.082	1	-0.178	6	0.006	1	-0.163	7	-0.151	8	-0.126	8	0.009	0.008	0.007		0.178	
183	M19	6in Dia. Duct	Sec 2 - max	0.049	9	0.049	8	0.011	6	-0.077	1	0.319	8	0.122	9	0.030	6	-0.022	9	-0.019	9	0.004	0.014	0.005		0.319	
184	M19	6in Dia. Duct	Sec 2 - min	-0.049	8	0.043	1	-0.038	9	-0.319	8	0.077	1	-0.030	8	-0.122	9	-0.028	6	-0.024	6	0.004	0.014	0.005		0.319	
787	M77	8in Dia. Duct	Sec 4 - max	0.055	8	0.028	8	0.000	8	0.243	1	-0.064	8	0.027	6	0.182	9	-0.022	9	-0.019	9	0.005	0.011	0.008		0.243	
788	M77	8in Dia. Duct	Sec 4 - min	-0.055	6	0.022	1	-0.025	9	0.064	8	-0.243	1	-0.182	9	-0.027	6	-0.028	6	-0.024	6	0.005	0.011	0.008		0.243	
1228	M123	4in Dia. Duct	Sec 4 - min	0	1	-0.129	8	-0.159	7	0.022	1	-0.218	6	0.015	1	-0.398	8	-0.002	1	-0.005	1	0.000	0.008	0.015		0.398	
744	M75	4in Dia. Duct	Sec 2 - min	-0.048	8	0.044	1	-0.025	5	0.301	1	-0.320	2	-0.160	5	-0.180	4	-0.003	7	-0.007	7	0.004	0.012	0.007		0.320	
934	M94	3in Dia. Duct	Sec 2 - min	0.000	1	0.023	1	-0.042	9	-0.122	2	-0.127	3	-0.012	1	-0.479	6	-0.003	8	-0.011	8	0.000	0.005	0.018		0.479	
185	M19	6in Dia. Duct	Sec 3 - max	0.050	9	0.048	8	0.011	6	-0.056	1	0.295	8	0.105	9	0.025	6	-0.022	9	-0.019	9	0.004	0.013	0.005		0.295	
186	M19	6in Dia. Duct	Sec 3 - min	-0.050	8	0.042	1	-0.036	9	-0.295	8	0.056	1	-0.025	6	-0.105	9	-0.028	6	-0.024	6	0.004	0.013	0.005		0.295	
277	M28	6in Dia. Duct	Sec 4 - max	0.044	8	-0.039	7	0.017	6	0.254	1	-0.253	6	0.127	6	0.129	9	0.049	7	0.041	7	0.004	0.011	0.006		0.254	
278	M28	6in Dia. Duct	Sec 4 - min	-0.044	9	-0.040	8	-0.028	7	0.253	6	-0.254	1	-0.129	9	-0.127	6	-0.151	8	-0.126	8	0.004	0.011	0.006		0.254	
313	M32	6in Dia. Duct	Sec 2 - max	0.114	8	0.021	1	-0.002	1	-0.053	1	0.134	6	-0.004	1	0.117	7	0.049	7	0.041	7	0.009	0.008	0.005		0.134	
314	M32	6in Dia. Duct	Sec 2 - min	-0.114	9	-0.022	8	-0.069	9	-0.134	6	0.053	1	-0.117	7	0.004	1	-0.151	8	-0.126	8	0.009	0.008	0.005		0.134	
187	M19	6in Dia. Duct	Sec 4 - max	0.050	9	0.047	8	0.010	6	-0.038	1	0.272	8	0.087	9	0.020	6	-0.022	9	-0.019	9	0.004	0.012	0.004		0.272	
188	M19	6in Dia. Duct	Sec 4 - min	-0.050	6	0.041	1	-0.035	9	-0.272	8	0.036	1	-0.020	6	-0.087	9	-0.028	6	-0.024	6	0.004	0.012	0.004		0.272	
765	M77	6in Dia. Duct	Sec 3 - max	0.054	8	0.032	8	0.002	6	0.205	1	-0.018	8	0.029	8	0.144	7	-0.022	9	-0.019	9	0.004	0.009	0.006		0.205	
766	M77	6in Dia. Duct	Sec 3 - min	-0.054	6	0.025	1	-0.027	9	0.016	8	-0.205	1	-0.144	7	-0.029	8	-0.028	6	-0.024	6	0.004	0.009	0.006		0.205	
728	M73	4in Dia. Duct	Sec 4 - min	-0.104	8	-0.038	1	-0.026	8	0.149	1	-0.175	2	-0.084	7	-0.109	8	-0.003	7	-0.007	7	0.009	0.006	0.004		0.175	
189	M19	6in Dia. Duct	Sec 5 - max	0.050	9	0.046	8	0.009	6	-0.018	1	0.249	8	0.070	9	0.015	6	-0.022	9	-0.019	9	0.004	0.011	0.003		0.249	
190	M19	6in Dia. Duct	Sec 5 - min	-0.050	6	0.040	1	-0.035	9	-0.249	8	0.016	1	-0.015	6	-0.070	9	-0.028	6	-0.024	6	0.004	0.011	0.003		0.249	
751	M76	6in Dia. Duct	Sec 1 - max	0.050	8	0.046	8	0.009	6	-0.018	1	0.249	8	0.070	9	0.015	6	-0.022	9	-0.019	9	0.004	0.011	0.003		0.249	
752	M76	6in Dia. Duct	Sec 1 - min	-0.050	6	0.040	1	-0.035	9	-0.249	8	0.016	1	-0.015	6	-0.070	9	-0.028	6	-0.024	6	0.004	0.011	0.003		0.249	
734	M74	4in Dia. Duct	Sec 2 - min	-0.086	8	0.032	2	-0.018	5	0.139	2	-0.143	3	-0.124	9	-0.035	6	-0.003	7	-0.007	7	0.007	0.005	0.005		0.143	
763	M77	6in Dia. Duct	Sec 2 - max	0.053	8	0.035	8	0.004	8	0.161	1	0.038	8	0.030	8	0.104	7	-0.022	9	-0.019	9	0.004	0.007	0.005		0.161	
764	M77	6in Dia. Duct	Sec 2 - min	-0.053	6	0.029	1	-0.029	9	-0.038	8	-0.161	1	-0.104	7	-0.030	8	-0.028	6	-0.024	6	0.004	0.007	0.005		0.161	
753	M76	6in Dia. Duct	Sec 2 - max	0.051	8	0.044	8	0.009	6	0.018	1	0.209	8	0.040	9	0.007	6	-0.022	9	-0.019	9	0.004	0.009	0.002		0.209	
754	M76	6in Dia. Duct	Sec 2 - min	-0.051	8	0.038	1	-0.034	9	-0.209	8	-0.018	1	-0.007	6	-0.040	9	-0.028	6	-0.024	6	0.004	0.009	0.002		0.209	
193	M20	6in Dia. Duct	Sec 2 - max	0.082	9	0.028	1	0.082	8	0.023	9	0.022	1	0.162	9	0.000	1	-0.022	9	-0.019	9	0.007	0.001	0.007		0.162	
194	M20	6in Dia. Duct	Sec 2 - min	-0.082	6	0.027	8	0.000	1	-0.022	1	-0.023	9	0.000	1	-0.162	9	-0.028	6	-0.024	6	0.007	0.001	0.007		0.162	
289	M29	6in Dia. Duct	Sec 5 - max	0.078	6	-0.029	8	0.017	3	-0.081	6	0.094	1	0.087	3	0.005	2	0.049	7	0.041	7	0.006	0.004	0.004		0.094	
290	M29	6in Dia. Duct	Sec 5 - min	-0.076	7	-0.029	1	-0.011	2	-0.094	1	0.081	6	-0.005	2	-0.087	3	-0.151	8	-0.126	8	0.006	0.004	0.004		0.094	
291	M30	6in Dia. Duct	Sec 1 - max	0.076	6	0.025	1	0.009	6	-0.081	6	0.094	1	0.087	3	0.005	2	0.049	7	0.041	7	0.006	0.004	0.004		0.094	
292	M30	6in Dia. Duct	Sec 1 - min	-0.076	7	0.023	6	-0.010	9	-0.094	1	0.081	6	-0.005	2	-0.087	3	-0.151	8	-0.126	8	0.006	0.004	0.004		0.094	
287	M29	6in Dia. Duct	Sec 4 - max	0.071	6	-0.006	6	0.006	3	0.105	8	-0.098	1	0.055	7	0.043	8	0.049	7	0.041	7	0.006	0.005	0.002		0.105	
288	M29	6in Dia. Duct	Sec 4 - min	-0.071	7	-0.008	1	0.000	1	0.098	1	-0.105	6	-0.043	8	-0.055	7	-0.151	8	-0.126	8	0.006	0.005	0.002		0.105	
755	M76	6in Dia. Duct	Sec 3 - max	0.051	8	0.042	8	0.008	6	0.051	1	0.170	8	0.022	8	0.011	7	-0.022	9	-0.019	9	0.004	0.008	0.001		0.170	
756	M76	6in Dia. Duct	Sec 3 - min	-0.051	6	0.036	1	-0.033	9	-0.170	8	-0.051	1	-0.011	7	-0.022	8	-0.028	6	-0.024	6	0.004	0.008	0.001		0.170	
297	M30	6in Dia. Duct	Sec 4 - max	0.087	8	-0.019	1	0.007	8	-0.035	1	0.070	6	-0.002	1	0.054	7	0.049	7	0.041	7	0.007	0.003	0.002		0.087	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_b/σ_a	f_s/σ_a		f_c (ksi)	
288	M30	6in Dia. Duct	Sec 4 - min	-0.087	7	-0.021	6	-0.014	7	-0.070	6	0.035	1	-0.054	7	0.002	1	-0.151	8	-0.126	8	0.007	0.003	0.002		0.067	
303	M31	6in Dia. Duct	Sec 2 - max	0.098	8	0.028	6	0.017	7	0.066	6	-0.061	1	0.029	2	0.028	3	0.049	7	0.041	7	0.008	0.003	0.001		0.096	
304	M31	6in Dia. Duct	Sec 2 - min	-0.098	9	0.020	1	-0.004	8	0.061	1	-0.066	6	-0.028	3	-0.029	2	-0.151	8	-0.126	8	0.008	0.003	0.001		0.096	
759	M76	6in Dia. Duct	Sec 5 - max	0.052	8	0.039	6	0.006	6	0.112	1	0.098	8	0.028	8	0.061	7	-0.022	9	-0.019	9	0.004	0.005	0.003		0.112	
780	M76	6in Dia. Duct	Sec 5 - min	-0.052	8	0.032	1	-0.031	9	-0.098	8	-0.112	1	-0.061	7	-0.028	8	-0.026	6	-0.024	6	0.004	0.005	0.003		0.112	
781	M77	6in Dia. Duct	Sec 1 - max	0.052	6	0.039	8	0.006	6	0.112	1	0.098	8	0.028	8	0.061	7	-0.022	9	-0.019	9	0.004	0.005	0.003		0.112	
782	M77	6in Dia. Duct	Sec 1 - min	-0.052	6	0.032	1	-0.031	9	-0.098	8	-0.112	1	-0.061	7	-0.028	8	-0.026	6	-0.024	6	0.004	0.005	0.003		0.112	
757	M76	6in Dia. Duct	Sec 4 - max	0.052	8	0.041	8	0.007	6	0.082	1	0.133	8	0.025	8	0.037	7	-0.022	9	-0.019	9	0.004	0.006	0.002		0.133	
758	M76	6in Dia. Duct	Sec 4 - min	-0.052	6	0.034	1	-0.032	9	-0.133	8	-0.082	1	-0.037	7	-0.025	8	-0.028	6	-0.024	6	0.004	0.006	0.002		0.133	
177	M18	8in Dia. Duct	Sec 4 - max	0.043	8	0.007	1	0.000	1	0.021	8	0.031	1	0.151	9	0.000	1	-0.022	9	-0.019	9	0.004	0.001	0.007		0.151	
178	M18	8in Dia. Duct	Sec 4 - min	-0.043	6	-0.019	8	-0.008	7	-0.031	1	-0.021	8	0.000	1	-0.151	9	-0.028	6	-0.024	6	0.004	0.001	0.007		0.151	
295	M30	6in Dia. Duct	Sec 3 - max	0.084	6	-0.004	1	0.000	1	0.045	1	-0.026	6	0.026	6	0.045	9	0.049	7	0.041	7	0.007	0.002	0.002		0.084	
296	M30	6in Dia. Duct	Sec 3 - min	-0.084	7	-0.007	6	-0.007	7	0.026	6	-0.045	1	-0.045	9	-0.026	6	-0.151	8	-0.126	8	0.007	0.002	0.002		0.084	
738	M74	4in Dia. Duct	Sec 4 - min	-0.067	8	-0.042	2	-0.021	4	-0.124	2	0.027	1	-0.010	8	-0.016	7	-0.003	7	-0.007	7	0.008	0.005	0.001		0.124	
285	M29	6in Dia. Duct	Sec 3 - max	0.065	8	0.017	6	0.013	7	0.047	7	-0.044	1	0.000	1	0.050	3	0.049	7	0.041	7	0.005	0.002	0.002		0.065	
286	M29	6in Dia. Duct	Sec 3 - min	-0.065	7	0.017	1	-0.007	8	0.044	1	-0.047	7	-0.050	3	0.000	1	-0.151	8	-0.126	8	0.005	0.002	0.002		0.065	
293	M30	6in Dia. Duct	Sec 2 - max	0.080	8	0.010	1	0.001	2	0.025	1	-0.022	6	0.042	6	0.010	9	0.049	7	0.041	7	0.007	0.001	0.002		0.080	
294	M30	6in Dia. Duct	Sec 2 - min	-0.080	7	0.008	6	-0.009	3	0.022	6	-0.025	1	-0.010	9	-0.042	6	-0.151	8	-0.126	8	0.007	0.001	0.002		0.080	
501	M51	6in Dia. Duct	Sec 1 - max	0.004	8	0.017	9	0.008	8	-0.066	3	0.066	1	0.033	7	0.033	8	0.000	1	0.000	1	0.000	0.003	0.001		0.066	
502	M51	6in Dia. Duct	Sec 1 - min	-0.004	9	0.017	6	-0.008	8	-0.066	1	0.066	3	-0.033	8	-0.033	7	0.000	1	0.000	1	0.000	0.003	0.001		0.066	
503	M51	6in Dia. Duct	Sec 2 - max	0.003	8	0.013	9	0.008	8	-0.037	3	0.037	9	0.019	7	0.019	8	0.000	1	0.000	1	0.000	0.002	0.001		0.037	
504	M51	6in Dia. Duct	Sec 2 - min	-0.003	9	0.013	6	-0.008	8	-0.037	9	0.037	3	-0.019	8	-0.019	7	0.000	1	0.000	1	0.000	0.002	0.001		0.037	
505	M51	6in Dia. Duct	Sec 3 - max	0.002	8	0.008	9	0.004	8	-0.017	3	0.017	1	0.008	7	0.008	8	0.000	1	0.000	1	0.000	0.001	0.000		0.017	
506	M51	6in Dia. Duct	Sec 3 - min	-0.002	9	0.008	6	-0.004	6	-0.017	1	0.017	3	-0.008	8	-0.008	7	0.000	1	0.000	1	0.000	0.001	0.000		0.017	
507	M51	6in Dia. Duct	Sec 4 - max	0.001	8	0.004	9	0.002	8	-0.004	3	0.004	6	0.002	7	0.002	8	0.000	1	0.000	1	0.000	0.000	0.000		0.004	
508	M51	6in Dia. Duct	Sec 4 - min	-0.001	8	0.004	6	-0.002	6	-0.004	6	0.004	3	-0.002	8	-0.002	7	0.000	1	0.000	1	0.000	0.000	0.000		0.004	
509	M51	6in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000		0.000	
510	M51	6in Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000		0.000	

amec

CALCULATION SHEET

CALC. NO.:	145579-V-CA-005	REV:	1	DATE:	March 26, 2006
CALC. TITLE:	Off-Gas Treatment System Pipe Stress Analysis				
PROJECT NO.:	145579	PROJECT TITLE:	Final DBVS Design		

Attachment 13: Excel Spreadsheet – Model 5 AG-1 Analysis and Unity Checks

NOTE: This cover sheet represents the approval signatures of the originator and checker for all pages of this attachment

ORIGINATOR:	DATE:	CHECKER:	DATE:
Kevin M. Jones KMJ	3/26/06	J. Van Corbach JVC	3/26/06

Duct Size	σ_c (ksi) Eq. 1b	σ_a (ksi) Eq. 6 or 7	ε_c (ksi) Eq. 5	ε_s (ksi) Eq. 9	v_t (ksi) Eq. 9	σ_s (ksi) Eq. 10	Temp	Material
12in Dia. Duct	13.7	22.6	18.0	10.6	13.0	13.0	100	SS
14in Dia. Duct	13.9	22.5	18.8	10.6	13.0	13.0	100	SS
16in Dia. Duct	14.0	22.5	18.6	9.8	13.0	13.0	100	SS
20in Dia. Duct	14.2	22.5	18.2	9.8	13.0	13.0	100	SS
20in Dia. CS Duct	17.0	27.0	21.8	12.0	15.6	15.6	100	CS
24in Dia. CS Duct	17.2	27.0	21.1	10.4	13.6	15.6	100	CS

Model 5

D-2250

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_{sy}/σ_s	f_{sz}/σ_s		f_t (ksi)	
271	M41	RIGID	Sec 1 - max	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	530.767	3	0.000	1	0.000	0.000	0.000		0.000	
272	M41	RIGID	Sec 1 - min	0.000	8	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-530.444	2	0.000	1	0.000	0.000	0.000		0.000	
273	M41	RIGID	Sec 2 - max	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	530.767	3	0.000	1	0.000	0.000	0.000		0.000	
274	M41	RIGID	Sec 2 - min	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-530.444	2	0.000	1	0.000	0.000	0.000		0.000	
275	M41	RIGID	Sec 3 - max	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	530.767	3	0.000	1	0.000	0.000	0.000		0.000	
276	M41	RIGID	Sec 3 - min	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-530.444	2	0.000	1	0.000	0.000	0.000		0.000	
277	M41	RIGID	Sec 4 - max	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	530.767	3	0.000	1	0.000	0.000	0.000		0.000	
278	M41	RIGID	Sec 4 - min	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-530.444	2	0.000	1	0.000	0.000	0.000		0.000	
279	M41	RIGID	Sec 5 - max	0.000	7	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	530.767	3	0.000	1	0.000	0.000	0.000		0.000	
280	M41	RIGID	Sec 5 - min	0.000	6	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	-530.444	2	0.000	1	0.000	0.000	0.000		0.000	
700	M83	24in Dia. CS Duct	Sec 5 - min	-0.905	8	-1.008	2	-0.128	4	-13.762	2	-0.063	1	-0.772	4	-0.772	5	-3675.459	4	-0.251	4	0.053	0.510	0.029		13.762	
698	M83	24in Dia. CS Duct	Sec 4 - min	-0.909	8	-1.003	2	-0.123	4	-12.619	2	-0.060	1	-0.630	4	-0.630	5	-3675.459	4	-0.251	4	0.053	0.467	0.023		12.619	
699	M83	24in Dia. CS Duct	Sec 5 - max	0.047	1	0.003	1	0.128	5	0.063	1	13.762	2	0.772	5	0.772	4	3675.459	5	0.251	5	0.003	0.510	0.029		13.762	
695	M83	24in Dia. CS Duct	Sec 3 - min	-0.914	8	-0.998	2	-0.118	4	-11.482	2	-0.057	1	-0.494	4	-0.494	5	-3675.459	4	-0.251	4	0.053	0.425	0.018		11.482	
697	M83	24in Dia. CS Duct	Sec 4 - max	0.043	1	0.003	1	0.123	5	0.060	1	12.619	2	0.630	5	0.630	4	3675.459	5	0.251	5	0.003	0.467	0.023		12.619	
611	M75	24in Dia. CS Duct	Sec 1 - max	1.070	9	0.319	3	0.053	4	-0.012	1	10.780	8	0.192	5	0.192	4	1599.134	9	0.109	9	0.062	0.399	0.007		10.780	
613	M75	24in Dia. CS Duct	Sec 2 - max	1.069	9	0.319	3	0.054	4	-0.004	1	10.689	8	0.177	5	0.177	4	1599.134	9	0.109	9	0.062	0.396	0.007		10.689	
609	M74	24in Dia. CS Duct	Sec 5 - max	1.047	8	0.012	1	0.053	4	-0.012	1	10.780	9	0.098	5	0.098	4	1976.337	9	0.135	9	0.061	0.399	0.004		10.780	
615	M75	24in Dia. CS Duct	Sec 3 - max	1.068	9	0.318	3	0.055	4	0.004	1	10.599	8	0.160	5	0.160	4	1599.134	9	0.109	9	0.062	0.393	0.006		10.599	
607	M74	24in Dia. CS Duct	Sec 4 - max	1.048	8	0.012	1	0.052	4	-0.015	1	10.619	8	0.113	5	0.113	4	1976.337	9	0.135	9	0.061	0.393	0.004		10.619	
617	M75	24in Dia. CS Duct	Sec 4 - max	1.066	9	0.318	3	0.057	4	0.011	1	10.509	8	0.144	5	0.144	4	1599.134	9	0.109	9	0.062	0.389	0.005		10.509	
605	M74	24in Dia. CS Duct	Sec 3 - max	1.050	6	0.013	1	0.050	4	-0.019	1	10.459	8	0.128	5	0.128	4	1976.337	9	0.135	9	0.061	0.387	0.005		10.459	
619	M75	24in Dia. CS Duct	Sec 5 - max	1.065	9	0.318	3	0.058	4	0.018	1	10.419	8	0.127	5	0.127	4	1599.134	9	0.109	9	0.062	0.386	0.005		10.419	
694	M83	24in Dia. CS Duct	Sec 2 - min	-0.919	8	-0.994	2	-0.113	4	-10.351	2	-0.053	1	-0.363	4	-0.363	5	-3675.459	4	-0.251	4	0.053	0.383	0.013		10.351	
603	M74	24in Dia. CS Duct	Sec 2 - max	1.051	8	0.013	1	0.049	4	-0.023	1	10.299	8	0.143	5	0.143	4	1976.337	9	0.135	9	0.061	0.381	0.005		10.299	
621	M76	24in Dia. CS Duct	Sec 1 - max	0.930	2	1.102	3	0.058	4	0.018	1	10.419	8	0.197	5	0.197	4	1150.530	9	0.079	9	0.054	0.386	0.007		10.419	
695	M83	24in Dia. CS Duct	Sec 3 - max	0.038	1	0.003	1	0.118	5	0.057	1	11.482	2	0.494	5	0.494	4	3675.459	5	0.251	5	0.002	0.425	0.016		11.482	
601	M74	24in Dia. CS Duct	Sec 1 - max	1.052	6	0.013	1	0.046	4	-0.026	1	10.139	8	0.157	5	0.157	4	1976.337	9	0.135	9	0.061	0.375	0.006		10.139	
39	M5	24in Dia. CS Duct	Sec 5 - max	0.976	0	0.003	1	0.048	4	-0.026	1	10.138	8	0.102	5	0.102	4	2141.320	5	0.146	5	0.057	0.375	0.004		10.139	
623	M76	24in Dia. CS Duct	Sec 2 - max	0.929	2	1.100	3	0.059	4	0.027	1	10.093	8	0.180	5	0.180	4	1150.530	9	0.079	9	0.054	0.374	0.007		10.093	
625	M76	24in Dia. CS Duct	Sec 3 - max	0.929	2	1.099	3	0.061	4	0.035	1	9.768	9	0.162	5	0.162	4	1150.530	9	0.079	9	0.054	0.362	0.006		9.768	
627	M76	24in Dia. CS Duct	Sec 4 - max	0.929	2	1.098	3	0.062	4	0.042	1	9.444	9	0.144	5	0.144	4	1150.530	9	0.079	9	0.054	0.350	0.005		9.444	
812	M75	24in Dia. CS Duct	Sec 1 - min	0.016	1	0.027	1	-0.053	5	-10.760	8	0.012	1	-0.192	4	-0.192	5	-1599.134	6	-0.109	6	0.001	0.399	0.007		10.780	
692	M83	24in Dia. CS Duct	Sec 1 - min	-0.924	8	-0.989	2	-0.108	4	-9.254	8	-0.050	1	-0.238	4	-0.238	5	-3675.459	4	-0.251	4	0.054	0.343	0.009		9.254	
810	M74	24in Dia. CS Duct	Sec 5 - min	0.022	1	-0.585	2	-0.053	5	-10.780	9	0.012	1	-0.098	4	-0.098	5	-1976.337	6	-0.135	6	0.001	0.399	0.004		10.780	
614	M75	24in Dia. CS Duct	Sec 2 - min	0.017	1	0.026	1	-0.054	5	-10.689	8	0.004	1	-0.177	4	-0.177	5	-1599.134	6	-0.109	6	0.001	0.396	0.007		10.689	
690	M82	24in Dia. CS Duct	Sec 5 - min	-0.817	9	-0.014	1	-0.108	5	-0.050	1	-9.254	8	-0.331	5	-0.331	4	-3265.402	4	-0.223	4	0.048	0.343	0.012		9.254	
618	M75	24in Dia. CS Duct	Sec 3 - min	0.016	1	0.025	1	-0.055	5	-10.599	8	-0.004	1	-0.160	4	-0.160	5	-1599.134	6	-0.109	6	0.001	0.393	0.006		10.599	
608	M74	24in Dia. CS Duct	Sec 4 - min	0.023	1	-0.563	2	-0.052	5	-10.619	8	0.015	1	-0.113	4	-0.113	5	-1976.337	6	-0.135	6	0.001	0.393	0.004		10.619	
693	M83	24in Dia. CS Duct	Sec 2 - max	0.033	1	0.003	1	0.113	5	0.053	1	10.351	2	0.363	5	0.363	4	3675.459	5	0.251	5	0.002	0.383	0.013		10.351	
629	M76	24in Dia. CS Duct	Sec 5 - max	0.929	2	1.096	3	0.063	4	0.049	1	9.120	9	0.125	5	0.125	6	1150.530	9	0.079	9	0.054	0.338	0.005		9.120	
616	M75	24in Dia. CS Duct	Sec 4 - min	0.015	1	0.023	1	-0.057	5	-10.509	8	-0.011	1	-0.144	4	-0.144	5	-1599.134	6	-0.109	6	0.001	0.389	0.005		10.509	
622	M76	24in Dia. CS Duct	Sec 1 - min	0.009	1	0.031	1	-0.059	5	-10.419	8	-0.018	1	-0.197	4	-0.197	5	-1150.530	6	-0.079	6	0.001	0.386	0.007		10.419	
606	M74	24in Dia. CS Duct	Sec 3 - min	0.024	1	-0.561	2	-0.050	5	-10.459	8	0.019	1	-0.128	4	-0.128	5	-1976.337	6	-0.135	6	0.001	0.387	0.005		10.459	
620	M75	24in Dia. CS Duct	Sec 5 - min	0.014	1	0.022	1	-0.058	5	-10.419	8	-0.018	1	-0.127	4	-0.127	5	-1599.134	6	-0.109	6	0.001	0.386	0.005		10.419	
604	M74	24in Dia. CS Duct	Sec 2 - min	0.025	1	-0.560	2	-0.049	5	-10.299	8	0.023	1	-0.143	4	-0.143	5	-1976.337	6	-0.135	6	0.001	0.381	0.005		10.299	
686	M82	24in Dia. CS Duct	Sec 4 - min	-0.818	9	-0.014	1	-0.106	5	-0.046	1	-8.886	8	-0.300	5	-0.300	4	-3265.402	4	-0.223	4	0.048	0.329	0.011		8.886	
602	M74	24in Dia. CS Duct	Sec 1 - min	0.027	1	-0.558	2	-0.048	5	-10.138	8	0.026	1	-0.157	4	-0.157	5	-1976.337	6	-0.135	6	0.002	0.375	0.006		10.138	
631	M77	24in Dia. CS Duct	Sec 1 - max	0.660	2	1.711	8	0.063	4	0.049	1	9.120	8	0.176	9	0.176	6	712.022	9	0.049	9	0.038	0.338	0.007		9.120	
624	M76	24in Dia. CS Duct	Sec 2 - min	0.008	1	0.029	1	-0.059	5	-10.093	8	-0.027	1	-0.180	4	-0.180	5	-1150.530	6	-0.079	6	0.000	0.374	0.007		10.093	
40	M5	24in Dia. CS Duct	Sec 5 - min	0.026	1	-0.952	2	-0.048	5	-10.138	8	0.026	1	-0.102	4	-0.102	5	-2141.320	4	-0.146	4	0.002	0.375	0.004		10.138	
688	M82	24in Dia. CS Duct	Sec 3 - min	-0.819	9	-0.013	1	-0.105	5	-0.042	1	-8.517	8	-0.268	5	-0.268	4	-3265.402	4	-0.223	4	0.048	0.315	0.010		8.517	
626	M76	24in Dia. CS Duct	Sec 3 - min	0.007	1	0.027	1	-0.061	5	-9.768	9	-0.035	1	-0.162	4	-0.162	5	-1150.530	6	-0.079	6	0.000	0.362	0.006		9.768	
633	M77	24in Dia. CS Duct	Sec 2 - max	0.659	2	1.709	8	0.065	4	0.056	1	8.612	2	0.159	9	0.159	6	712.022	9	0.049	9	0.038	0.319	0.006		8.612	
684	M82	24in Dia. CS Duct	Sec 2 - min	-0.821	9	-0.013	1	-0.104	5	-0.038	1	-8.148	8	-0.237	5	-0.237	4	-3265.402	4	-0.223	4	0.048	0.302	0.009		8.148	
689	M82	24in Dia. CS Duct	Sec 5 - max	0.029	1	1.323	2	0.108	4	9.254	8	0.050	1	0.331	4	0.331	5	3265.402	5	0.223	5	0.002	0.343	0.012		9.254	
628	M76	24in Dia. CS Duct	Sec 4 - min	0.006	1	0.024	1	-0.062	5	-9.444	9	-0.042	1	-0.144	4	-0.144	5	-1150.530	6	-0.079	6	0.000	0.350	0.005		9.444	
691	M83	24in Dia. CS Duct	Sec 1 - max	0.028	1	0.003	1	0.108	5	0.050	1	9.254	8	0.238	5	0.238	4	3675.459	5	0.251	5	0.002	0.343	0.009		9.254	
632	M77	24in Dia. CS Duct	Sec 1 - min	0.001	1	0.025	1	-0.063	5	-9.120	8	-0.049	1	-0.176	6	-0.176	9	-712.022	8	-0.049	6	0.000	0.338	0.007		9.120	
635	M77	24in Dia. CS Duct	Sec 3 - max	0.659	2	1.706	8	0.066	4	0.063	1	8.116	2	0.141	9	0.141	6	712.022	9	0.049	9	0.038	0.301	0.005		8.116	
682	M82	24in Dia. CS Duct	Sec 1 - min	-0.822	9	-0.012	1	-0.102	5	-0.034	1	-7.782	3	-0.206	5	-0.206	4	-3265.402	4	-0.223	4	0.048	0.288	0.008		7.782	
630	M76	24in Dia. CS Duct	Sec 6 - min	0.006	1	0.022	1	-0.063	5	-9.120	9	-0.049	1	-0.125	6	-0.125	9	-1150.530	6	-0.079	6	0.000	0.338	0.005		9.120	
687	M82	24in Dia. CS Duct	Sec 4 - max	0.028	1	1.322	2	0.106	4	8.886	8	0.046	1	0.300	4	0.300	5	3265.402	5	0.223	5	0.002	0.329	0.011		8.886	
680	M81	24in Dia. CS Duct	Sec 5 - min	-0.521	3	-0.030	1	-0.102	5	-0.034	1	-7.782	3	-0.362	5	-0.362	4	-2439.283	4	-0.167	4	0.030	0.288	0.013		7.782	
685	M82	24in Dia. CS Duct	Sec 3 - max	0.027	1	1.321	2	0.105	4	8.517	8	0.042	1	0.268	4	0.268	5	3265.402	5	0.223	5	0.002	0.315	0.010		8.517	
637	M77	24in Dia. CS Duct	Sec 4 - max	0.659	2	1.704	8	0.067	4	0.068	1	7.621	2	0.123	9	0.123	6	712.022	9	0.049	9	0.038	0.282	0.005		7.621	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_{sy}/σ_a	f_{sz}/σ_a		f_c (ksi)	
634	M77	24in Dia. CS Duct	Sec 2 - min	0.000	1	0.023	1	-0.065	5	-8.612	2	-0.056	1	-0.159	6	-0.159	9	-712.022	6	-0.049	6	0.000	0.319	0.008		8.612	
683	M82	24in Dia. CS Duct	Sec 2 - max	0.025	1	1.321	2	0.104	4	8.148	8	0.038	1	0.237	4	0.237	5	3265.402	5	0.223	5	0.001	0.302	0.009		8.148	
678	M81	24in Dia. CS Duct	Sec 4 - min	-0.522	9	-0.029	1	-0.101	5	-0.026	1	-7.256	3	-0.331	5	-0.331	4	-2439.283	4	-0.167	4	0.030	0.269	0.012		7.256	
639	M77	24in Dia. CS Duct	Sec 5 - max	0.859	2	1.702	8	0.068	4	0.073	1	7.126	2	0.105	7	0.105	6	712.022	9	0.049	9	0.038	0.264	0.004		7.126	
638	M77	24in Dia. CS Duct	Sec 3 - min	0.000	1	0.020	1	-0.068	5	-8.116	2	-0.063	1	-0.141	6	-0.141	9	-712.022	6	-0.049	6	0.000	0.301	0.005		8.116	
679	M81	24in Dia. CS Duct	Sec 5 - max	0.020	1	1.830	2	0.102	4	7.782	3	0.034	1	0.362	4	0.362	5	2439.283	5	0.167	5	0.001	0.288	0.013		7.782	
37	M5	24in Dia. CS Duct	Sec 4 - max	0.995	9	0.003	1	0.032	6	-0.038	1	6.340	3	0.259	5	0.259	4	2141.320	5	0.146	5	0.058	0.235	0.010		6.340	
681	M82	24in Dia. CS Duct	Sec 1 - max	0.024	1	1.320	2	0.102	4	7.782	3	0.034	1	0.206	4	0.206	5	3265.402	5	0.223	5	0.001	0.288	0.008		7.782	
641	M78	24in Dia. CS Duct	Sec 1 - max	0.482	2	1.919	8	0.068	4	0.073	1	7.126	2	0.122	9	0.122	6	548.338	9	0.038	9	0.028	0.264	0.005		7.126	
676	M81	24in Dia. CS Duct	Sec 3 - min	-0.523	9	-0.027	1	-0.100	5	-0.017	1	-6.730	3	-0.302	5	-0.302	4	-2439.283	4	-0.167	4	0.030	0.249	0.011		6.730	
638	M77	24in Dia. CS Duct	Sec 4 - min	0.000	1	0.018	1	-0.067	5	-7.621	2	-0.068	1	-0.123	6	-0.123	9	-712.022	6	-0.049	6	0.000	0.282	0.005		7.621	
31	M5	24in Dia. CS Duct	Sec 1 - max	1.046	9	0.003	1	0.024	5	5.611	8	0.072	1	0.381	9	0.381	6	2141.320	5	0.146	5	0.061	0.208	0.014		5.611	
677	M81	24in Dia. CS Duct	Sec 4 - max	0.019	1	1.830	2	0.101	4	7.256	3	0.026	1	0.331	4	0.331	5	2439.283	5	0.167	5	0.001	0.269	0.012		7.256	
674	M81	24in Dia. CS Duct	Sec 2 - min	-0.524	9	-0.026	1	-0.098	5	-0.009	1	-6.203	3	-0.272	5	-0.272	4	-2439.283	4	-0.167	4	0.030	0.230	0.010		6.203	
642	M78	24in Dia. CS Duct	Sec 1 - min	-0.003	1	0.015	1	-0.068	5	-7.126	2	-0.073	1	-0.122	6	-0.122	9	-548.338	6	-0.038	6	0.000	0.264	0.005		7.126	
640	M77	24in Dia. CS Duct	Sec 6 - min	0.000	1	0.015	1	-0.068	5	-7.126	2	-0.073	1	-0.105	6	-0.105	7	-712.022	6	-0.049	6	0.000	0.264	0.004		7.126	
675	M81	24in Dia. CS Duct	Sec 3 - max	0.018	1	1.830	2	0.100	4	6.730	3	0.017	1	0.302	4	0.302	5	2439.283	5	0.167	5	0.001	0.249	0.011		6.730	
672	M81	24in Dia. CS Duct	Sec 1 - min	-0.524	9	-0.024	1	-0.097	5	-0.002	1	-5.676	3	-0.243	5	-0.243	4	-2439.283	4	-0.167	4	0.030	0.210	0.009		5.676	
38	M5	24in Dia. CS Duct	Sec 4 - min	0.043	1	-0.954	8	-0.032	9	-6.340	3	0.038	1	-0.259	4	-0.259	5	-2141.320	4	-0.146	4	0.003	0.235	0.010		6.340	
673	M81	24in Dia. CS Duct	Sec 2 - max	0.017	1	1.830	2	0.098	4	6.203	3	0.009	1	0.272	4	0.272	5	2439.283	5	0.167	5	0.001	0.230	0.010		6.203	
599	M73	24in Dia. CS Duct	Sec 6 - max	0.223	7	0.354	8	0.155	9	5.611	8	0.072	1	0.431	9	0.431	6	1679.632	5	0.115	5	0.013	0.208	0.016		5.611	
670	M80	24in Dia. CS Duct	Sec 5 - min	-0.145	3	-0.035	1	-0.097	5	-0.002	1	-5.676	3	-0.352	5	-0.352	4	-1574.144	4	-0.108	4	0.008	0.210	0.013		5.676	
597	M73	24in Dia. CS Duct	Sec 4 - max	0.224	7	0.354	8	0.156	9	5.505	8	0.067	1	0.385	9	0.385	6	1679.632	5	0.115	5	0.013	0.204	0.014		5.505	
32	M5	24in Dia. CS Duct	Sec 1 - min	0.094	1	-0.995	8	-0.024	4	-0.072	1	-5.611	8	-0.381	6	-0.381	9	-2141.320	4	-0.146	4	0.005	0.208	0.014		5.611	
600	M73	24in Dia. CS Duct	Sec 6 - min	-0.038	1	-0.219	7	-0.155	6	-0.072	1	-5.611	8	-0.431	6	-0.431	9	-1679.632	4	-0.115	4	0.002	0.208	0.016		5.611	
595	M73	24in Dia. CS Duct	Sec 3 - max	0.225	7	0.353	8	0.157	9	5.400	8	0.062	1	0.338	9	0.338	6	1679.632	5	0.115	5	0.013	0.200	0.013		5.400	
669	M80	24in Dia. CS Duct	Sec 5 - max	0.010	1	2.066	2	0.097	4	5.676	3	0.002	1	0.352	4	0.352	5	1574.144	5	0.108	5	0.001	0.210	0.013		5.676	
643	M78	24in Dia. CS Duct	Sec 2 - max	0.482	2	1.910	8	0.073	4	0.085	1	5.173	2	0.056	9	0.056	6	548.338	9	0.038	9	0.028	0.192	0.002		5.173	
598	M73	24in Dia. CS Duct	Sec 4 - min	-0.038	1	-0.218	7	-0.156	6	-0.067	1	-5.505	8	-0.385	6	-0.385	9	-1679.632	4	-0.115	4	0.002	0.204	0.014		5.505	
671	M81	24in Dia. CS Duct	Sec 1 - max	0.016	1	1.831	2	0.097	4	5.676	3	0.002	1	0.243	4	0.243	5	2439.283	5	0.167	5	0.001	0.210	0.009		5.676	
593	M73	24in Dia. CS Duct	Sec 2 - max	0.227	7	0.353	8	0.156	9	5.295	8	0.057	1	0.291	9	0.291	6	1679.632	5	0.115	5	0.013	0.196	0.011		5.295	
589	M72	24in Dia. CS Duct	Sec 5 - max	0.252	7	0.432	8	0.159	9	5.197	3	0.052	1	0.307	9	0.307	6	1011.873	5	0.069	5	0.015	0.192	0.011		5.197	
591	M73	24in Dia. CS Duct	Sec 1 - max	0.228	7	0.352	6	0.159	9	5.197	3	0.052	1	0.244	9	0.244	6	1679.632	5	0.115	5	0.013	0.192	0.009		5.197	
596	M73	24in Dia. CS Duct	Sec 3 - min	-0.035	1	-0.216	7	-0.157	6	-0.062	1	-5.400	8	-0.338	6	-0.338	9	-1679.632	4	-0.115	4	0.002	0.200	0.013		5.400	
587	M72	24in Dia. CS Duct	Sec 4 - max	0.253	7	0.433	8	0.160	9	5.106	3	0.041	1	0.259	9	0.259	6	1011.873	5	0.069	5	0.015	0.189	0.010		5.106	
594	M73	24in Dia. CS Duct	Sec 2 - min	-0.034	1	-0.215	7	-0.158	6	-0.057	1	-5.295	8	-0.291	6	-0.291	9	-1679.632	4	-0.115	4	0.002	0.196	0.011		5.295	
585	M72	24in Dia. CS Duct	Sec 3 - max	0.254	7	0.433	8	0.161	9	5.015	3	0.030	1	0.212	9	0.212	6	1011.873	5	0.069	5	0.015	0.186	0.008		5.015	
588	M80	24in Dia. CS Duct	Sec 4 - min	-0.145	3	-0.032	1	-0.096	5	0.008	1	-5.068	3	-0.323	5	-0.323	4	-1574.144	4	-0.108	4	0.008	0.189	0.012		5.068	
583	M72	24in Dia. CS Duct	Sec 2 - max	0.255	7	0.434	8	0.162	9	5.007	7	0.020	1	0.163	9	0.163	6	1011.873	5	0.069	5	0.015	0.185	0.006		5.007	
590	M72	24in Dia. CS Duct	Sec 6 - min	-0.026	1	-0.038	1	-0.159	6	-0.052	1	-5.197	3	-0.307	6	-0.307	9	-1011.873	4	-0.069	4	0.002	0.192	0.011		5.197	
579	M71	24in Dia. CS Duct	Sec 5 - max	0.238	7	0.452	8	0.163	9	5.011	7	0.010	1	0.151	5	0.151	4	636.828	5	0.044	5	0.014	0.186	0.006		5.011	
581	M72	24in Dia. CS Duct	Sec 1 - max	0.255	7	0.435	8	0.163	9	5.011	7	0.010	1	0.115	9	0.115	6	1011.873	5	0.069	5	0.015	0.186	0.004		5.011	
592	M73	24in Dia. CS Duct	Sec 1 - min	-0.033	1	-0.213	7	-0.159	6	-0.052	1	-5.197	3	-0.244	6	-0.244	9	-1679.632	4	-0.115	4	0.002	0.192	0.009		5.197	
577	M71	24in Dia. CS Duct	Sec 4 - max	0.239	7	0.453	8	0.164	9	4.956	7	-0.004	1	0.111	5	0.111	4	636.828	5	0.044	5	0.014	0.184	0.004		4.956	
587	M80	24in Dia. CS Duct	Sec 4 - max	0.009	1	2.068	2	0.098	4	5.068	3	-0.008	1	0.323	4	0.323	5	1574.144	5	0.108	5	0.001	0.188	0.012		5.068	
588	M72	24in Dia. CS Duct	Sec 4 - min	-0.025	1	-0.037	1	-0.160	6	-0.041	1	-5.106	3	-0.259	6	-0.259	9	-1011.873	4	-0.069	4	0.001	0.189	0.010		5.106	
575	M71	24in Dia. CS Duct	Sec 3 - max	0.239	7	0.455	8	0.165	9	4.900	7	-0.017	1	0.069	5	0.069	4	636.828	5	0.044	5	0.014	0.181	0.003		4.900	
586	M72	24in Dia. CS Duct	Sec 3 - min	-0.024	1	-0.035	1	-0.161	6	-0.030	1	-5.015	3	-0.212	6	-0.212	9	-1011.873	4	-0.069	4	0.001	0.186	0.008		5.015	
573	M71	24in Dia. CS Duct	Sec 2 - max	0.239	7	0.457	8	0.166	9	4.843	7	-0.029	1	0.028	5	0.028	4	636.828	5	0.044	5	0.014	0.179	0.001		4.843	
19	M2	24in Dia. CS Duct	Sec 5 - max	0.119	7	-0.069	1	0.238	6	-0.205	1	2.259	7	2.798	6	2.798	9	833.704	5	0.057	5	0.007	0.084	0.104		2.798	
20	M2	24in Dia. CS Duct	Sec 5 - min	-0.119	8	-0.172	7	-0.238	9	-2.259	7	0.205	1	-2.798	9	-2.798	6	-833.704	4	-0.057	4	0.007	0.084	0.104		2.798	
391	M53	24in Dia. CS Duct	Sec 1 - max	0.119	7	0.550	7	0.216	9	-0.205	1	2.259	7	2.798	6	2.798	9	833.704	5	0.057	5	0.007	0.084	0.104		2.798	
392	M53	24in Dia. CS Duct	Sec 1 - min	-0.119	8	0.078	1	-0.216	6	-2.259	7	0.205	1	-2.798	9	-2.798	6	-833.704	4	-0.057	4	0.007	0.084	0.104		2.798	
644	M78	24in Dia. CS Duct	Sec 2 - min	-0.003	1	0.006	1	-0.073	5	-5.173	2	-0.085	1	-0.056	6	-0.056	9	-548.338	6	-0.038	6	0.000	0.192	0.002		5.173	
571	M71	24in Dia. CS Duct	Sec 1 - max	0.240	7	0.458	8	0.167	9	4.785	7	-0.041	1	0.051	6	0.051	9	636.828	5	0.044	5	0.014	0.177	0.002		4.785	
584	M72	24in Dia. CS Duct	Sec 2 - min	-0.023	1	-0.034	1	-0.162	6	-0.020	1	-5.007	7	-0.163	6	-0.163	9	-1011.873	4	-0.069	4	0.001	0.185	0.006		5.007	
580	M71	24in Dia. CS Duct	Sec 5 - min	-0.022	8	-0.047	1	-0.163	6	-0.010	1	-5.011	7	-0.151	4	-0.151	5	-636.828	4	-0.044	4	0.001	0.186	0.006		5.011	
582	M72	24in Dia. CS Duct	Sec 1 - min	-0.022	1	-0.033	1	-0.163	6	-0.010	1	-5.011	7	-0.115	6	-0.115	9	-1011.873	4	-0.069	4	0.001	0.186	0.004		5.011	
569	M70	24in Dia. CS Duct	Sec 6 - max	0.184	7	0.410	8	0.167	9	4.785	7	-0.041	1	0.028	6	0.028	9	628.842	5	0.043	5	0.011	0.177	0.001		4.785	
578	M71	24in Dia. CS Duct	Sec 4 - min	-0.021	8	-0.045	1	-0.164	6	0.004	1	-4.956	7	-0.111	4	-0.111	5	-636.828	4	-0.044	4	0.001	0.184	0.004		4.956	
567	M70	24in Dia. CS Duct	Sec 4 - max	0.184	7	0.412	8	0.168	9	4.677	7	-0.053	1	0.077	6	0.077	9	628.842	5	0.043	5	0.011	0.173	0.003		4.677	
576	M71	24in Dia. CS Duct	Sec 3 - min	-0.020	8	-0.043	1	-0.165	6	0.017	1	-4.900	7	-0.069	4	-0.069	5	-636.828	4	-0.044	4	0.001	0.181	0.003		4.900	
565	M70	24in Dia. CS Duct	Sec 3 - max	0.184	7	0.414	8	0.169	9	4.568	7	-0.065	1	0.128	6	0.128	9	628.842	5	0.043	5	0.011	0.169	0.005		4.568	
588	M80	24in Dia. CS Duct	Sec 3 - min	-0.145	3	-0.030	1	-0.095	5	0.017	1	-4.460	3	-0.295	5	-0.295	4	-1574.144	4	-0.108	4	0.008	0.165	0.011		4.460	
570	M70	24in Dia. CS Duct	Sec 5 - min	-0.104	8	-0.044	1	-0.167	6	0.041	1	-4.785	7	-0.028	9	-0.028	6	-628.842	4	-0.043	4	0.006	0.177	0.001		4.785	
563	M70	24in Dia. CS Duct	Sec 2 - max	0.183	7	0.416	8	0.170	9	4.458	7	-0.077	1	0.178	6	0.178	9	628.842	5	0.043	5	0.011	0.165	0.007		4.458	
568	M70	24in Dia. CS Duct	Sec 4 - min	-0.103	8	-0.041	1	-0.168	6	0.053	1	-4.677	7	-0.077	9	-0.077	6	-628.842	4	-0.043	4	0.006	0.173	0.003		4.677	
574	M71	24in Dia. CS Duct	Sec 2 - min	-0.019	8	-0.041	1	-0.166	6	0.029	1	-4.843	7	-0.028	4	-0.028	5	-636.828	4	-0.044	4	0.001	0.179	0.001		4.843	
572	M71	24in Dia. CS Duct	Sec 1 - min	-0.018	8	-0.038	1	-0.167	6	0.041	1	-4.785	7	-0.051	9	-0.051	6	-636.828	4	-0.044	4	0.001	0.177	0.002		4.785	
561	M70	24in Dia. CS Duct	Sec 1 - max	0.183	7	0.419	8	0.171	9	4.347	7	-0.087	1	0.229	6	0.229	9	628.842	5	0.043	5	0.011	0.161	0.008		4.347	
566	M70	24in Dia. CS Duct	Sec 3 - min	-0.103	8	-0.039	1	-0.169	6	0.065	1	-4.568	7	-0.128	9	-0.128	6	-628.842	4	-0.043	4	0.006	0.169	0.005		4.568	
564	M70	24in Dia. CS Duct	Sec 2 - min	-0.102	8	-0.037	1	-0.170	6	0.077	1	-4.458	7	-0.178	9	-0.178	6	-628.842	4	-0.043	4	0.006	0.165	0.007		4.458	
29	M4	24in Dia. CS Duct	Sec 5 - max	0.142	7	0.438	7	0.171	9	4.347	7	-0.087	1	0.211	6	0.211	9	833.704	5	0.057	5	0.008	0.161	0.008		4.347	
30	M4	24in Dia. CS Duct	Sec 5 - min	-0.142	8	-0.034	1	-0.171	6	0.087	1	-4.347	7	-0.211	9	-0.211	6	-833.704	4	-0.057	4	0.008	0.161	0.008		4.347	
685	M80	24in Dia. CS Duct	Sec 3 - max	0.008	1	2.069	2	0.095	4	4.460	3	-0.017	1	0.295	4	0.295	5	1574.144	5	0.108	5	0.000	0.165	0.011		4.460	
562	M70	24in Dia. CS Duct	Sec 1 - min	-0.101	8	-0.034	1	-0.171	6	0.087	1	-4.347	7	-0.229	9	-0.229	6	-628.842	4	-0.043	4	0.006	0.161	0.008		4.347	
35	M5	24in Dia. CS Duct	Sec 3 - max	1.012	9	0.003	1	0.018	6	-0.049	1	2.511	7	0.344	5	0.344	4	2141.320	5	0.146	5	0.059	0.093	0.013		2.511	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{by}/σ_a	f_{bz}/σ_a		f_c (ksi)	
684	M80	24in Dia. CS Duct	Sec 2 - min	-0.145	3	-0.028	1	-0.093	5	0.026	1	-3.851	3	-0.267	5	-0.267	4	-1574.144	4	-0.108	4	0.008	0.143	0.010		3.851	
27	M4	24in Dia. CS Duct	Sec 4 - max	0.139	7	0.453	7	0.177	8	3.570	7	-0.134	1	0.515	6	0.515	9	833.704	5	0.057	5	0.008	0.132	0.019		3.570	
28	M4	24in Dia. CS Duct	Sec 4 - min	-0.139	8	-0.020	1	-0.177	6	0.134	1	-3.570	7	-0.515	9	-0.515	6	-833.704	4	-0.057	4	0.008	0.132	0.019		3.570	
663	M80	24in Dia. CS Duct	Sec 2 - max	0.008	1	2.070	2	0.093	4	3.851	3	-0.026	1	0.267	4	0.267	5	1574.144	5	0.108	5	0.000	0.143	0.010		3.851	
393	M53	24in Dia. CS Duct	Sec 2 - max	0.122	7	0.537	7	0.210	9	-0.091	1	1.391	7	2.457	6	2.457	9	833.704	5	0.057	5	0.007	0.052	0.091		2.457	
394	M53	24in Dia. CS Duct	Sec 2 - min	-0.122	8	0.055	1	-0.210	6	-1.391	7	0.091	1	-2.457	9	-2.457	6	-833.704	4	-0.057	4	0.007	0.052	0.091		2.457	
645	M78	24in Dia. CS Duct	Sec 3 - max	0.482	2	1.902	8	0.078	4	0.087	1	3.229	2	0.044	4	0.044	5	548.338	9	0.038	9	0.028	0.120	0.002		3.229	
659	M79	24in Dia. CS Duct	Sec 5 - max	0.297	2	2.015	8	0.092	4	3.241	3	-0.034	1	0.304	4	0.304	5	784.068	5	0.054	5	0.017	0.120	0.011		3.241	
25	M4	24in Dia. CS Duct	Sec 3 - max	0.138	7	0.467	7	0.163	9	2.767	7	-0.156	1	0.829	6	0.829	9	833.704	5	0.057	5	0.008	0.102	0.031		2.767	
26	M4	24in Dia. CS Duct	Sec 3 - min	-0.136	8	-0.005	1	-0.183	6	0.156	1	-2.767	7	-0.829	9	-0.829	6	-833.704	4	-0.057	4	0.008	0.102	0.031		2.767	
662	M80	24in Dia. CS Duct	Sec 1 - min	-0.145	3	-0.026	1	-0.092	5	0.034	1	-3.241	3	-0.240	5	-0.240	4	-1574.144	4	-0.108	4	0.008	0.120	0.009		3.241	
33	M5	24in Dia. CS Duct	Sec 2 - max	1.029	9	0.003	1	0.006	5	1.590	8	0.061	1	0.390	5	0.390	6	2141.320	5	0.146	5	0.060	0.059	0.014		1.590	
660	M79	24in Dia. CS Duct	Sec 5 - min	0.002	1	-0.030	1	-0.092	5	0.034	1	-3.241	3	-0.304	5	-0.304	4	-784.068	4	-0.054	4	0.000	0.120	0.011		3.241	
661	M80	24in Dia. CS Duct	Sec 1 - max	0.007	1	2.072	2	0.092	4	3.241	3	-0.034	1	0.240	4	0.240	5	1574.144	5	0.108	5	0.000	0.120	0.009		3.241	
657	M79	24in Dia. CS Duct	Sec 4 - max	0.297	2	2.018	8	0.091	4	2.643	3	-0.043	1	0.277	4	0.277	5	784.068	5	0.054	5	0.017	0.098	0.010		2.643	
23	M4	24in Dia. CS Duct	Sec 2 - max	0.133	7	0.482	7	0.189	9	1.939	7	-0.151	1	1.153	6	1.153	9	833.704	5	0.057	5	0.008	0.072	0.043		1.939	
24	M4	24in Dia. CS Duct	Sec 2 - min	-0.133	8	0.010	1	-0.189	6	0.151	1	-1.939	7	-1.153	9	-1.153	6	-833.704	4	-0.057	4	0.008	0.072	0.043		1.939	
646	M78	24in Dia. CS Duct	Sec 3 - min	-0.003	1	-0.002	1	-0.078	5	-3.229	2	-0.087	1	-0.044	5	-0.044	4	-548.338	6	-0.038	6	0.000	0.120	0.002		3.229	
9	M1	24in Dia. CS Duct	Sec 5 - max	0.078	6	-0.392	1	0.157	6	-0.543	7	1.007	1	1.998	9	1.998	8	833.704	5	0.057	5	0.005	0.037	0.074		1.998	
10	M1	24in Dia. CS Duct	Sec 5 - min	-0.078	8	-0.392	5	-0.157	7	-1.007	1	0.543	7	-1.998	8	-1.998	9	-833.704	4	-0.057	4	0.005	0.037	0.074		1.998	
11	M2	24in Dia. CS Duct	Sec 1 - max	0.078	7	0.135	1	0.157	6	-0.543	7	1.007	1	1.998	9	1.998	6	833.704	5	0.057	5	0.005	0.037	0.074		1.998	
12	M2	24in Dia. CS Duct	Sec 1 - min	-0.078	8	0.031	7	-0.157	9	-1.007	1	0.543	7	-1.998	6	-1.998	9	-833.704	4	-0.057	4	0.005	0.037	0.074		1.998	
7	M1	24in Dia. CS Duct	Sec 4 - max	0.078	6	-0.388	1	0.155	6	-0.361	7	0.826	1	2.071	9	2.071	6	833.704	5	0.057	5	0.005	0.051	0.077		2.071	
8	M1	24in Dia. CS Duct	Sec 4 - min	-0.078	8	-0.368	5	-0.155	7	-0.826	1	0.361	7	-2.071	8	-2.071	9	-833.704	4	-0.057	4	0.005	0.051	0.077		2.071	
17	M2	24in Dia. CS Duct	Sec 4 - max	0.109	7	-0.018	1	0.218	6	0.058	1	1.366	7	1.414	6	1.414	9	833.704	5	0.057	5	0.006	0.051	0.052		1.414	
18	M2	24in Dia. CS Duct	Sec 4 - min	-0.109	8	-0.122	7	-0.218	9	-1.366	7	-0.058	1	-1.414	9	-1.414	6	-833.704	4	-0.057	4	0.006	0.051	0.052		1.414	
36	M5	24in Dia. CS Duct	Sec 3 - min	0.060	1	-0.967	8	-0.018	9	-2.511	7	0.049	1	-0.344	4	-0.344	5	-2141.320	4	-0.146	4	0.003	0.093	0.013		2.511	
656	M79	24in Dia. CS Duct	Sec 4 - min	0.001	1	-0.027	1	-0.091	5	0.043	1	-2.643	3	-0.277	5	-0.277	4	-784.068	4	-0.054	4	0.000	0.098	0.010		2.643	
5	M1	24in Dia. CS Duct	Sec 3 - max	0.077	6	-0.384	1	0.154	6	-0.181	7	0.046	1	2.143	9	2.143	6	833.704	5	0.057	5	0.004	0.024	0.079		2.143	
6	M1	24in Dia. CS Duct	Sec 3 - min	-0.077	8	-0.384	5	-0.154	7	-0.046	1	0.181	7	-2.143	8	-2.143	9	-833.704	4	-0.057	4	0.004	0.024	0.079		2.143	
395	M53	24in Dia. CS Duct	Sec 3 - max	0.124	7	0.523	7	0.205	9	0.001	1	0.571	8	2.125	6	2.125	9	833.704	5	0.057	5	0.007	0.021	0.079		2.125	
396	M53	24in Dia. CS Duct	Sec 3 - min	-0.124	8	0.051	1	-0.205	6	-0.571	8	-0.001	1	-2.125	9	-2.125	6	-833.704	4	-0.057	4	0.007	0.021	0.079		2.125	
3	M1	24in Dia. CS Duct	Sec 2 - max	0.076	6	-0.380	1	0.152	6	-0.003	7	0.466	1	2.214	9	2.214	6	833.704	5	0.057	5	0.004	0.017	0.082		2.214	
4	M1	24in Dia. CS Duct	Sec 2 - min	-0.076	8	-0.360	5	-0.152	7	-0.466	1	0.003	7	-2.214	6	-2.214	9	-833.704	4	-0.057	4	0.004	0.017	0.082		2.214	
21	M4	24in Dia. CS Duct	Sec 1 - max	0.130	7	0.496	7	0.194	9	1.085	7	-0.122	1	1.487	6	1.487	9	833.704	5	0.057	5	0.008	0.040	0.055		1.487	
22	M4	24in Dia. CS Duct	Sec 1 - min	-0.130	8	0.024	1	-0.194	6	0.122	1	-1.085	7	-1.487	9	-1.487	6	-833.704	4	-0.057	4	0.008	0.040	0.055		1.487	
399	M53	24in Dia. CS Duct	Sec 5 - max	0.130	7	0.498	7	0.194	9	1.085	7	-0.122	1	1.487	6	1.487	9	833.704	5	0.057	5	0.008	0.040	0.055		1.487	
400	M53	24in Dia. CS Duct	Sec 5 - min	-0.130	8	0.024	1	-0.194	6	0.122	1	-1.085	7	-1.487	9	-1.487	6	-833.704	4	-0.057	4	0.008	0.040	0.055		1.487	
655	M79	24in Dia. CS Duct	Sec 3 - max	0.296	2	2.020	8	0.089	4	2.045	3	-0.050	1	0.250	4	0.250	5	784.068	5	0.054	5	0.017	0.076	0.009		2.045	
1	M1	24in Dia. CS Duct	Sec 1 - max	0.075	8	-0.376	1	0.150	6	0.173	7	0.292	1	2.285	9	2.285	6	833.704	5	0.057	5	0.004	0.011	0.085		2.285	
2	M1	24in Dia. CS Duct	Sec 1 - min	-0.075	8	-0.376	5	-0.150	7	-0.292	1	-0.173	7	-2.285	6	-2.285	9	-833.704	4	-0.057	4	0.004	0.011	0.085		2.285	
481	M62	24in Dia. CS Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.846	6	-0.617	1	1.529	9	1.529	6	3060.703	7	0.209	7	0.000	0.031	0.057		1.529	
482	M62	24in Dia. CS Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.617	1	-0.846	6	-1.529	6	-1.529	9	1769.815	1	0.121	1	0.000	0.031	0.057		1.529	
511	M65	24in Dia. CS Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.846	7	-0.617	1	1.529	7	1.529	8	-1769.815	1	-0.121	1	0.000	0.031	0.057		1.529	
512	M65	24in Dia. CS Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.617	1	-0.846	7	-1.529	8	-1.529	7	-3060.703	6	-0.209	6	0.000	0.031	0.057		1.529	
483	M62	24in Dia. CS Duct	Sec 2 - max	0.004	7	-0.015	1	0.008	6	0.834	6	-0.604	1	1.522	9	1.522	6	3060.703	7	0.209	7	0.000	0.031	0.056		1.522	
484	M62	24in Dia. CS Duct	Sec 2 - min	-0.004	8	-0.015	1	-0.008	9	0.604	1	-0.834	6	-1.522	6	-1.522	9	1769.815	1	0.121	1	0.000	0.031	0.056		1.522	
513	M65	24in Dia. CS Duct	Sec 2 - max	0.004	6	-0.015	1	0.008	8	0.834	7	-0.604	1	1.522	7	1.522	8	-1769.815	1	-0.121	1	0.000	0.031	0.056		1.522	
514	M65	24in Dia. CS Duct	Sec 2 - min	-0.004	9	-0.015	1	-0.008	7	0.604	1	-0.834	7	-1.522	8	-1.522	7	-3060.703	6	-0.209	6	0.000	0.031	0.056		1.522	
485	M62	24in Dia. CS Duct	Sec 3 - max	0.008	7	-0.029	1	0.016	6	0.796	6	-0.568	1	1.500	9	1.500	8	3060.703	7	0.209	7	0.000	0.029	0.056		1.500	
486	M62	24in Dia. CS Duct	Sec 3 - min	-0.008	8	-0.029	1	-0.016	9	0.568	1	-0.796	6	-1.500	8	-1.500	9	1769.815	1	0.121	1	0.000	0.029	0.056		1.500	
515	M65	24in Dia. CS Duct	Sec 3 - max	0.008	6	-0.029	1	0.016	8	0.796	7	-0.568	1	1.500	7	1.500	8	-1769.815	1	-0.121	1	0.000	0.029	0.056		1.500	
516	M65	24in Dia. CS Duct	Sec 3 - min	-0.008	9	-0.029	1	-0.016	7	0.568	1	-0.796	7	-1.500	8	-1.500	7	-3060.703	6	-0.209	6	0.000	0.029	0.056		1.500	
658	M79	24in Dia. CS Duct	Sec 3 - min	0.001	1	-0.025	1	-0.089	5	0.050	1	-2.045	3	-0.250	5	-0.250	4	-784.068	4	-0.054	4	0.000	0.076	0.009		2.045	
397	M53	24in Dia. CS Duct	Sec 4 - max	0.127	7	0.510	7	0.200	9	0.281	7	-0.072	1	1.802	6	1.802	9	833.704	5	0.057	5	0.007	0.010	0.067		1.802	
398	M53	24in Dia. CS Duct	Sec 4 - min	-0.127	8	0.038	1	-0.200	6	0.072	1	-0.281	7	-1.802	9	-1.802	6	-833.704	4	-0.057	4	0.007	0.010	0.067		1.802	
487	M62	24in Dia. CS Duct	Sec 4 - max	0.012	7	-0.044	1	0.025	6	0.733	6	-0.503	1	1.465	9	1.465	6	3060.703	7	0.209	7	0.001	0.027	0.054		1.465	
488	M62	24in Dia. CS Duct	Sec 4 - min	-0.012	8	-0.044	1	-0.025	9	0.503	1	-0.733	6	-1.465	6	-1.465	9	1769.815	1	0.121	1	0.001	0.027	0.054		1.465	
517	M65	24in Dia. CS Duct	Sec 4 - max	0.012	6	-0.044	1	0.025	8	0.733	7	-0.503	1	1.465	7	1.465	8	-1769.815	1	-0.121	1	0.001	0.027	0.054		1.465	
518	M65	24in Dia. CS Duct	Sec 4 - min	-0.012	9	-0.044	1	-0.025	7	0.503	1	-0.733	7	-1.465	8	-1.465	7	-3060.703	6	-0.209	6	0.001	0.027	0.054		1.465	
647	M78	24in Dia. CS Duct	Sec 4 - max	0.482	2	1.893	6	0.082	4	0.080	1	1.294	2	0.127	4	0.127	5	548.338	9	0.038	9	0.028	0.048	0.005		1.294	
653	M79	24in Dia. CS Duct	Sec 2 - max	0.295	2	2.023	8	0.088	4	1.446	3	-0.058	1	0.223	4	0.223	5	784.068	5	0.054	5	0.017	0.054	0.008		1.446	
491	M63	24in Dia. CS Duct	Sec 1 - max	0.028	7	-0.099	4	0.056	6	0.645	8	-0.415	1	1.415	9	1.415	6	3060.703	7	0.209	7	0.002	0.024	0.052		1.415	
492	M63	24in Dia. CS Duct	Sec 1 - min	-0.028	8	-0.090	2	-0.056	9	0.415	1	-0.645	6	-1.415	6	-1.415	9	1769.815	1	0.121	1	0.002	0.024	0.052		1.415	
521	M66	24in Dia. CS Duct	Sec 1 - max	0.028	6	-0.099	6	0.056	8	0.645	7	-0.415	1	1.415	7	1.415	8	-1769.815	1	-0.121	1	0.002	0.024	0.052		1.415	
522	M68	24in Dia. CS Duct	Sec 1 - min	-0.028	9	-0.099	2	-0.056	7	0.415	1	-0.645	7	-1.415	8	-1.415	7	-3060.703	8	-0.209	6	0.002	0.024	0.052		1.415	
34	M5	24in Dia. CS Duct	Sec 2 - min	0.077	1	-0.981	8	-0.006	4	-0.061	1	-1.590	8	-0.390	6	-0.390	9	-2141.320	4	-0.146	4	0.004	0.059	0.014		1.590	
489	M62	24in Dia. CS Duct	Sec 5 - max	0.016	7	-0.058	1	0.033	6	0.645	6	-0.415	1	1.415	9	1.415	6	3060.703	7	0.209	7	0.001	0.024	0.052		1.415	
490	M62	24in Dia. CS Duct	Sec 6 - min	-0.016	8	-0.058	1	-0.033	9	0.415	1	-0.645	6	-1.415	6	-1.415	9	1769.815	1	0.121	1	0.001	0.024	0.052		1.415	
519	M65	24in Dia. CS Duct	Sec 5 - max	0.016	6	-0.058	1	0.033	8	0.645	7	-0.415	1	1.415	7	1.415	8	-1769.815	1	-0.121	1	0.001	0.024	0.052		1.415	
520	M65	24in Dia. CS Duct	Sec 5 - min	-0.016	9	-0.058	1	-0.033	7	0.415	1	-0.645	7	-1.415	8	-1.415	7	-3060.703	8	-0.209	6	0.001	0.024	0.052		1.415	
493	M63	24in Dia. CS Duct	Sec 2 - max	0.029	7	-0.103	4	0.058	6	0.590	6	-0.361	1	1.384	9	1.384	6	3060.703	7	0.209	7	0.002	0.022	0.051		1.384	
494	M63	24in Dia. CS Duct	Sec 2 - min	-0.029	8	-0.103	2	-0.058	9	0.361	1	-0.590	6	-1.384	6	-1.384	9	1769.815	1	0.121	1	0.002	0.022	0.051		1.384	
523	M66	24in Dia. CS Duct	Sec 2 - max	0.029	6	-0.103	6	0.058	6	0.590	7	-0.361	1	1.384	7	1.384	8	-1769.815	1	-0.121	1	0.002	0.022	0.051		1.384	
524	M68	24in Dia. CS Duct	Sec 2 - min	-0.029	9	-0.103	2	-0.058	7	0.361	1	-0.590	7	-1.384	8	-1.384	7	-3060.703	6	-0.209	6	0.002	0.022	0.051		1.384	
495	M63	24in Dia. CS Duct	Sec 3 - max	0.031	7	-0.108	4	0.061	6	0.533	6	-0.303	1	1.358	7	1.358	8	3060.703	7	0.209	7	0.002	0.020	0.050		1.358	
496	M63	24in Dia. CS Duct	Sec 3 - min	-0.031	8	-0.108	2	-0.061	9	0.303	1	-0.533	6	-1.358	8	-1.358	7	1769.815	1	0.121	1	0.002	0.020	0.050		1.358	

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_b/σ_c	f_v/σ_c	[illegible]	f_c (ksi)	[illegible]
																						C-2250						
525	M66	24in Dia. CS Duct	Sec 3 - max	0.031	6	-0.108	6	0.061	8	0.533	7	-0.303	1	1.358	9	1.358	6	-1769.815	1	-0.121	1	0.002	0.020	0.050	[illegible]	1.358	[illegible]
526	M66	24in Dia. CS Duct	Sec 3 - min	-0.031	9	-0.108	2	-0.061	7	0.303	1	-0.533	7	-1.358	6	-1.358	9	-3060.703	6	-0.209	6	0.002	0.020	0.050	[illegible]	1.358	[illegible]
169	M18	16in Dia. Duct	Sec 5 - max	0.091	7	-0.090	1	0.052	2	-0.505	1	1.258	9	0.182	2	0.194	3	741.516	2	0.147	2	0.007	0.056	0.009	[illegible]	1.258	[illegible]
170	M18	16in Dia. Duct	Sec 5 - min	-0.088	6	-0.147	9	-0.053	3	-1.258	9	0.505	1	-0.194	3	-0.182	2	-667.887	3	-0.132	3	0.006	0.056	0.009	[illegible]	1.258	[illegible]
509	M64	24in Dia. CS Duct	Sec 5 - max	0.053	7	-0.188	1	0.106	6	-0.219	6	0.448	1	1.358	7	1.358	8	3060.703	7	0.209	7	0.003	0.017	0.050	[illegible]	1.358	[illegible]
510	M84	24in Dia. CS Duct	Sec 5 - min	-0.053	8	-0.188	4	-0.106	9	-0.448	1	0.219	6	-1.358	8	-1.358	7	1769.815	1	0.121	1	0.003	0.017	0.050	[illegible]	1.358	[illegible]
539	M67	24in Dia. CS Duct	Sec 5 - max	0.053	8	-0.188	1	0.106	8	-0.219	7	0.448	1	1.358	9	1.358	6	-1769.815	1	-0.121	1	0.003	0.017	0.050	[illegible]	1.358	[illegible]
540	M67	24in Dia. CS Duct	Sec 5 - min	-0.053	9	-0.188	3	-0.106	7	-0.448	1	0.219	7	-1.358	6	-1.358	9	-3060.703	6	-0.209	6	0.003	0.017	0.050	[illegible]	1.358	[illegible]
497	M63	24in Dia. CS Duct	Sec 4 - max	0.032	7	-0.112	4	0.064	6	0.473	6	-0.243	1	1.358	7	1.358	8	3060.703	7	0.209	7	0.002	0.018	0.050	[illegible]	1.358	[illegible]
498	M63	24in Dia. CS Duct	Sec 4 - min	-0.032	8	-0.112	2	-0.064	9	0.243	1	-0.473	6	-1.358	8	-1.358	7	1769.815	1	0.121	1	0.002	0.018	0.050	[illegible]	1.358	[illegible]
527	M66	24in Dia. CS Duct	Sec 4 - max	0.032	6	-0.112	6	0.064	8	0.473	7	-0.243	1	1.358	9	1.358	6	-1769.815	1	-0.121	1	0.002	0.018	0.050	[illegible]	1.358	[illegible]
528	M66	24in Dia. CS Duct	Sec 4 - min	-0.032	9	-0.112	2	-0.064	7	0.243	1	-0.473	7	-1.358	6	-1.358	9	-3060.703	6	-0.209	6	0.002	0.018	0.050	[illegible]	1.358	[illegible]
501	M64	24in Dia. CS Duct	Sec 1 - max	0.045	7	-0.158	1	0.089	6	0.411	6	-0.181	1	1.358	7	1.358	8	3060.703	7	0.209	7	0.003	0.015	0.050	[illegible]	1.358	[illegible]
502	M64	24in Dia. CS Duct	Sec 1 - min	-0.045	8	-0.158	4	-0.089	9	0.181	1	-0.411	6	-1.358	8	-1.358	7	1769.815	1	0.121	1	0.003	0.015	0.050	[illegible]	1.358	[illegible]
531	M67	24in Dia. CS Duct	Sec 1 - max	0.045	6	-0.158	1	0.089	8	0.411	7	-0.181	1	1.358	9	1.358	6	-1769.815	1	-0.121	1	0.003	0.015	0.050	[illegible]	1.358	[illegible]
532	M67	24in Dia. CS Duct	Sec 1 - min	-0.045	9	-0.158	3	-0.089	7	0.181	1	-0.411	7	-1.358	6	-1.358	9	-3060.703	6	-0.209	6	0.003	0.015	0.050	[illegible]	1.358	[illegible]
499	M63	24in Dia. CS Duct	Sec 5 - max	0.033	7	-0.117	4	0.066	6	0.411	6	-0.181	1	1.358	7	1.358	8	3060.703	7	0.209	7	0.002	0.015	0.050	[illegible]	1.358	[illegible]
500	M63	24in Dia. CS Duct	Sec 5 - min	-0.033	8	-0.117	2	-0.066	9	0.181	1	-0.411	6	-1.358	8	-1.358	7	1769.815	1	0.121	1	0.002	0.015	0.050	[illegible]	1.358	[illegible]
529	M66	24in Dia. CS Duct	Sec 5 - max	0.033	6	-0.117	6	0.066	8	0.411	7	-0.181	1	1.358	9	1.358	6	-1769.815	1	-0.121	1	0.002	0.015	0.050	[illegible]	1.358	[illegible]
530	M66	24in Dia. CS Duct	Sec 5 - min	-0.033	9	-0.117	2	-0.066	7	0.181	1	-0.411	7	-1.358	6	-1.358	9	-3060.703	6	-0.209	6	0.002	0.015	0.050	[illegible]	1.358	[illegible]
849	M78	24in Dia. CS Duct	Sec 5 - max	0.482	2	1.884	8	0.087	4	0.846	3	-0.064	1	0.215	4	0.215	5	548.338	9	0.038	9	0.028	0.031	0.008	[illegible]	0.846	[illegible]
507	M84	24in Dia. CS Duct	Sec 4 - max	0.051	7	-0.180	1	0.102	6	-0.051	6	0.281	1	1.358	7	1.358	8	3060.703	7	0.209	7	0.003	0.010	0.050	[illegible]	1.358	[illegible]
508	M84	24in Dia. CS Duct	Sec 4 - min	-0.051	8	-0.180	4	-0.102	9	-0.281	1	0.051	6	-1.358	8	-1.358	7	1769.815	1	0.121	1	0.003	0.010	0.050	[illegible]	1.358	[illegible]
537	M67	24in Dia. CS Duct	Sec 4 - max	0.051	6	-0.180	1	0.102	8	-0.051	7	0.281	1	1.358	9	1.358	6	-1769.815	1	-0.121	1	0.003	0.010	0.050	[illegible]	1.358	[illegible]
538	M67	24in Dia. CS Duct	Sec 4 - min	-0.051	9	-0.180	3	-0.102	7	-0.281	1	0.051	7	-1.358	6	-1.358	9	-3060.703	6	-0.209	6	0.003	0.010	0.050	[illegible]	1.358	[illegible]
503	M84	24in Dia. CS Duct	Sec 2 - max	0.047	7	-0.165	1	0.093	6	0.264	6	-0.034	1	1.358	7	1.358	8	3060.703	7	0.209	7	0.003	0.010	0.050	[illegible]	1.358	[illegible]
504	M64	24in Dia. CS Duct	Sec 2 - min	-0.047	8	-0.165	4	-0.093	9	0.034	1	-0.264	6	-1.358	8	-1.358	7	1769.815	1	0.121	1	0.003	0.010	0.050	[illegible]	1.358	[illegible]
533	M67	24in Dia. CS Duct	Sec 2 - max	0.047	6	-0.165	1	0.093	8	0.264	7	-0.034	1	1.358	9	1.358	6	-1769.815	1	-0.121	1	0.003	0.010	0.050	[illegible]	1.358	[illegible]
534	M67	24in Dia. CS Duct	Sec 2 - min	-0.047	9	-0.165	3	-0.093	7	0.034	1	-0.264	7	-1.358	6	-1.358	9	-3060.703	6	-0.209	6	0.003	0.010	0.050	[illegible]	1.358	[illegible]
654	M79	24in Dia. CS Duct	Sec 2 - min	0.000	1	-0.022	1	-0.088	5	0.058	1	-1.446	3	-0.223	5	-0.223	4	-784.068	4	-0.054	4	0.000	0.054	0.008	[illegible]	1.446	[illegible]
13	M2	24in Dia. CS Duct	Sec 2 - max	0.089	7	0.084	1	0.177	8	-0.343	1	0.508	7	0.985	9	0.985	6	833.704	5	0.057	5	0.005	0.019	0.036	[illegible]	0.985	[illegible]
14	M2	24in Dia. CS Duct	Sec 2 - min	-0.089	8	-0.020	7	-0.177	9	-0.508	7	0.343	1	-0.985	6	-0.985	9	-833.704	4	-0.057	4	0.005	0.019	0.036	[illegible]	0.985	[illegible]
505	M64	24in Dia. CS Duct	Sec 3 - max	0.049	7	-0.173	1	0.098	6	0.110	6	0.120	1	1.358	7	1.358	8	3060.703	7	0.209	7	0.003	0.004	0.050	[illegible]	1.358	[illegible]
506	M64	24in Dia. CS Duct	Sec 3 - min	-0.049	8	-0.173	4	-0.098	9	-0.120	1	-0.110	6	-1.358	8	-1.358	7	1769.815	1	0.121	1	0.003	0.004	0.050	[illegible]	1.358	[illegible]
535	M67	24in Dia. CS Duct	Sec 3 - max	0.049	6	-0.173	1	0.098	8	0.110	7	0.120	1	1.358	9	1.358	6	-1769.815	1	-0.121	1	0.003	0.004	0.050	[illegible]	1.358	[illegible]
536	M67	24in Dia. CS Duct	Sec 3 - min	-0.049	9	-0.173	3	-0.098	7	-0.120	1	-0.110	7	-1.358	6	-1.358	9	-3060.703	6	-0.209	6	0.003	0.004	0.050	[illegible]	1.358	[illegible]
851	M79	24in Dia. CS Duct	Sec 1 - max	0.294	2	2.028	8	0.087	4	0.848	3	-0.064	1	0.197	4	0.197	5	784.068	5	0.054	5	0.017	0.031	0.007	[illegible]	0.846	[illegible]
648	M78	24in Dia. CS Duct	Sec 4 - min	-0.003	1	-0.011	1	-0.062	5	-1.294	2	-0.050	1	-0.127	5	-0.127	4	-548.338	6	-0.038	6	0.000	0.048	0.005	[illegible]	1.294	[illegible]
111	M13	16in Dia. Duct	Sec 1 - max	0.079	8	0.085	3	0.070	9	0.657	2	0.543	3	0.067	4	0.277	1	340.435	3	0.067	3	0.006	0.029	0.012	[illegible]	0.657	[illegible]
112	M13	16in Dia. Duct	Sec 1 - min	0.079	1	-0.085	2	-0.060	8	-0.543	3	-0.657	2	-0.277	1	-0.067	4	-338.027	2	-0.067	2	0.006	0.029	0.012	[illegible]	0.657	[illegible]
113	M13	16in Dia. Duct	Sec 2 - max	0.080	8	0.087	3	0.071	9	0.625	2	0.511	3	0.054	4	0.275	1	340.435	3	0.067	3	0.006	0.028	0.012	[illegible]	0.625	[illegible]
114	M13	16in Dia. Duct	Sec 2 - min	0.080	1	-0.087	2	-0.061	8	-0.511	3	-0.625	2	-0.275	1	-0.054	4	-338.027	2	-0.067	2	0.006	0.028	0.012	[illegible]	0.625	[illegible]
115	M13	16in Dia. Duct	Sec 3 - max	0.081	8	0.086	3	0.072	9	0.592	2	0.479	3	0.041	4	0.273	1	340.435	3	0.067	3	0.006	0.026	0.012	[illegible]	0.592	[illegible]
116	M13	16in Dia. Duct	Sec 3 - min	0.081	1	-0.086	2	-0.062	8	-0.479	3	-0.592	2	-0.273	1	-0.041	4	-338.027	2	-0.067	2	0.006	0.026	0.012	[illegible]	0.592	[illegible]
117	M13	16in Dia. Duct	Sec 4 - max	0.082	8	0.090	3	0.072	9	0.559	2	0.446	3	0.027	4	0.271	1	340.435	3	0.067	3	0.006	0.025	0.012	[illegible]	0.559	[illegible]
118	M13	16in Dia. Duct	Sec 4 - min	0.082	1	-0.090	2	-0.063	8	-0.446	3	-0.559	2	-0.271	1	-0.027	4	-338.027	2	-0.067	2	0.006	0.025	0.012	[illegible]	0.559	[illegible]
119	M13	16in Dia. Duct	Sec 5 - max	0.083	8	0.091	3	0.073	9	0.526	2	0.412	3	0.012	4	0.270	1	340.435	3	0.067	3	0.006	0.023	0.012	[illegible]	0.526	[illegible]
120	M13	16in Dia. Duct	Sec 5 - min	0.083	1	-0.091	2	-0.063	8	-0.412	3	-0.526	2	-0.270	1	-0.012	4	-338.027	2	-0.067	2	0.006	0.023	0.012	[illegible]	0.526	[illegible]
140	M15	16in Dia. Duct	Sec 5 - min	-0.069	6	0.026	4	-0.046	7	-0.256	6	-0.570	9	-0.228	3	-0.249	2	-453.283	3	-0.090	3	0.005	0.025	0.011	[illegible]	0.570	[illegible]
169	M32	16in Dia. Duct	Sec 5 - max	0.125	7	0.052	7	0.136	2	0.265	9	0.284	6	0.434	2	0.403	3	275.104	3	0.055	3	0.009	0.013	0.019	[illegible]	0.434	[illegible]
130	M14	16in Dia. Duct	Sec 5 - min	-0.071	6	-0.017	4	-0.051	2	-0.304	6	-0.429	9	-0.340	3	-0.369	2	-134.756	3	-0.027	3	0.005	0.019	0.016	[illegible]	0.429	[illegible]
138	M15	16in Dia. Duct	Sec 4 - min	-0.068	6	0.029	4	-0.047	2	-0.267	6	-0.536	9	-0.244	3	-0.268	2	-453.283	3	-0.090	3	0.005	0.024	0.012	[illegible]	0.536	[illegible]
15	M2	24in Dia. CS Duct	Sec 3 - max	0.099	7	0.033	1	0.197	6	0.012	1	0.783	7	0.153	6	0.153	9	833.704	5	0.057	5	0.006	0.029	0.006	[illegible]	0.783	[illegible]
16	M2	24in Dia. CS Duct	Sec 3 - min	-0.099	8	-0.071	7	-0.197	9	-0.783	7	-0.012	1	-0.153	9	-0.153	6	-833.704	4	-0.057	4	0.006	0.029	0.006	[illegible]	0.783	[illegible]
91	M11	20in Dia. Duct	Sec 1 - max	0.043	9	0.018	9	0.042	2	0.191	6	0.277	9	0.488	3	0.549	2	743.957	3	0.081	3	0.003	0.012	0.024	[illegible]	0.549	[illegible]
136	M15	16in Dia. Duct	Sec 3 - min	-0.068	6	0.031	4	-0.048	2	-0.278	6	-0.501	9	-0.260	3	-0.282	2	-453.283	3	-0.090	3	0.005	0.022	0.013	[illegible]	0.501	[illegible]
128	M14	16in Dia. Duct	Sec 4 - min	-0.072	6	-0.015	8	-0.052	2	-0.298	6	-0.388	9	-0.358	3	-0.387	2	-134.756	3	-0.027	3	0.005	0.017	0.017	[illegible]	0.388	[illegible]
190	M32	16in Dia. Duct	Sec 5 - min	0.107	6	-0.134	6	-0.136	3	-0.284	6	-0.265	9	-0.403	3	-0.434	2	-278.429	2	-0.055	2	0.008	0.013	0.019	[illegible]	0.434	[illegible]
650	M78	24in Dia. CS Duct	Sec 5 - min	-0.003	1	-0.020	1	-0.087	5	0.064	1	-0.846	3	-0.215	5	-0.215	4	-548.338	6	-0.038	6	0.000	0.031	0.008	[illegible]	0.846	[illegible]
92	M11	20in Dia. Duct	Sec 1 - min	0.036	8	-0.043	8	-0.042	3	-0.277	9	-0.191	6	-0.549	2	-0.488	3	-797.525	2	-0.087	2	0.003	0.012	0.024	[illegible]	0.549	[illegible]
93	M11	20in Dia. Duct	Sec 2 - max	0.044	9	0.018	9	0.043	2	0.178	6	0.271	9	0.475	3	0.537	2	743.957	3	0.081	3	0.003	0.012	0.024	[illegible]	0.537	[illegible]
134	M15	16in Dia. Duct	Sec 2 - min	-0.069	6	0.033	4	-0.049	2	-0.291	6	-0.465	9	-0.277	3	-0.299	2	-453.283	3	-0.090	3	0.005	0.021	0.013	[illegible]	0.465	[illegible]
652	M79	24in Dia. CS Duct	Sec 1 - min	0.000	1	-0.020	1	-0.087	5	0.064	1	-0.846	3	-0.197	5	-0.197	4	-784.068	4	-0.054	4	0.000	0.031	0.007	[illegible]	0.846	[illegible]
139	M15	16in Dia. Duct	Sec 5 - max	0.031	9	0.100	5	0.045	8	0.570	9	0.255	6	0.249	2	0.228	3	506.361	2	0.100	2	0.002	0.025	0.011	[illegible]	0.570	[illegible]
128	M14	16in Dia. Duct	Sec 3 - min	-0.072	6	-0.014	8	-0.053	2	-0.293	6	-0.348	9	-0.376	3	-0.405	2	-134.756	3	-0.027	3	0.005	0.015	0.018	[illegible]	0.405	[illegible]
94	M11	20in Dia. Duct	Sec 2 - min	0.037	8	-0.045	8	-0.043	3	-0.271	9	-0.178	6	-0.537	2	-0.475	3	-797.525	2	-0.087	2	0.003	0.012	0.024	[illegible]	0.537	[illegible]
95	M11	20in Dia. Duct	Sec 3 - max	0.045	9	0.020	9	0.044	2	0.165	6	0.266	9	0.462	3	0.524	2	743.957	3	0.081	3	0.003	0.012	0.023	[illegible]	0.524	[illegible]
132	M15	16in Dia. Duct	Sec 1 - min	-0.069	6	0.036	4	-0.051	2	-0.304	6	-0.429	9	-0.294	3	-0.316	2	-453.283	3	-0.090	3	0.005	0.019	0.014	[illegible]	0.429	[illegible]
137	M15	16in Dia. Duct	Sec 4 - max	0.030	9	0.104	5	0.046	3	0.536	9	0.267	6	0.266	2	0.244	3	506.361	2	0.100	2	0.002	0.024	0.012	[illegible]	0.536	[illegible]
96	M11	20in Dia. Duct	Sec 3 - min	0.038	8	-0.046	8	-0.044	3	-0.266	9	-0.165	6	-0.524	2	-0.462	3	-797.525	2	-0.087	2	0.003	0.012	0.023	[illegible]	0.524	[illegible]
124	M14	16in Dia. Duct	Sec 2 - min	-0.073	6	-0.012	8	-0.055	2	-0.288	6	-0.307	9	-0.395	3	-0.424	2	-134.756	3	-0.027	3	0.005	0.014	0.019	[illegible]	0.424	[illegible]
150	M16	16in Dia. Duct	Sec 5 - min	-0.058	4	0.061	9	-0.043	7	-0.150	6	-0.661	9	-0.083	3	-0.094	2	-639.140	3	-0.127	3	0.004	0.029	0.004	[illegible]	0.661	[illegible]
122	M14	16in Dia. Duct	Sec 1 - min	-0.073	6	-0.010	8	-0.058	2	-0.284	6	-0.265	9	-0.414	3	-0.443	2	-134.756	3	-0.027	3	0.005	0.013	0.020	[illegible]	0.443	[illegible]
97	M11	20in Dia. Duct	Sec 4 - max	0.046	9	0.020	9	0.045	2	0.151	6	0.260	9	0.449	3	0.511	2	743.957	3	0.081	3	0.003	0.012	0.023	[illegible]	0.511	[illegible]
187	M32	16in Dia. Duct	Sec 4 - max	0.124	7	0.052	7	0.135	2	0.247	9	0.257	1	0.387	2	0.355	3	275.104	3	0.055	3	0.009	0.011	0.017	[illegible]	0.387	[illegible]
101	M12	20in Dia. Duct	Sec 1 - max	0.043	2	0.047	3	0.039	7	0.521	2	0.459	3	0.136	6	0.253	9	340.435	3	0.037	3	0.003	0.023	0.011	[illegible]	0.521	[illegible]
102	M12	20in Dia. Duct	Sec 1 - min	0.043	1	-0.047	2	-0.032	6	-0.459	3	-0.521	2	-0.253	9	-0.136	6	-338.027	2	-0.037	2	0.003	0.023	0.011	[illegible]	0.521	[illegible]

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	f_{sy}/σ_a	f_{sz}/σ_a	D-2250	f_c (ksi)	D-2250
148	M16	16in Dia. Duct	Sec 4 - min	-0.058	6	0.063	9	-0.043	7	-0.175	6	-0.639	9	-0.097	3	-0.108	2	-639.140	3	-0.127	3	0.004	0.028	0.005		0.639	
161	M18	16in Dia. Duct	Sec 1 - max	0.064	7	0.039	1	0.037	3	0.685	9	0.091	6	0.049	9	0.045	6	741.516	2	0.147	2	0.005	0.030	0.002		0.685	
149	M16	16in Dia. Duct	Sec 5 - max	0.050	5	0.094	1	0.042	8	0.661	9	0.150	6	0.094	2	0.083	3	708.830	2	0.140	2	0.004	0.029	0.004		0.661	
162	M18	16in Dia. Duct	Sec 1 - min	-0.062	6	-0.015	9	-0.038	2	-0.091	6	-0.685	9	-0.045	6	-0.049	9	-667.887	3	-0.132	3	0.004	0.030	0.002		0.685	
98	M11	20in Dia. Duct	Sec 4 - min	0.039	8	-0.047	8	-0.045	3	-0.260	9	-0.151	6	-0.511	2	-0.449	3	-797.525	2	-0.087	2	0.003	0.012	0.023		0.511	
146	M16	16in Dia. Duct	Sec 3 - min	-0.057	6	0.065	9	-0.044	7	-0.201	6	-0.617	9	-0.112	3	-0.123	2	-639.140	3	-0.127	3	0.004	0.027	0.005		0.617	
135	M15	16in Dia. Duct	Sec 3 - max	0.029	9	0.105	5	0.047	3	0.501	9	0.278	6	0.282	2	0.260	3	506.361	2	0.100	2	0.002	0.022	0.013		0.501	
147	M16	16in Dia. Duct	Sec 4 - max	0.049	9	0.096	1	0.043	8	0.639	9	0.175	6	0.108	2	0.097	3	708.830	2	0.140	2	0.004	0.028	0.005		0.639	
99	M11	20in Dia. Duct	Sec 5 - max	0.047	9	0.021	9	0.047	2	0.136	6	0.253	9	0.435	3	0.497	2	743.957	3	0.081	3	0.003	0.011	0.022		0.497	
144	M16	16in Dia. Duct	Sec 2 - min	-0.057	6	0.066	9	-0.045	7	-0.228	6	-0.594	9	-0.127	3	-0.138	2	-639.140	3	-0.127	3	0.004	0.026	0.006		0.594	
159	M17	18in Dia. Duct	Sec 5 - max	0.054	7	0.091	1	0.041	8	0.685	9	0.091	6	0.049	9	0.045	6	741.516	2	0.147	2	0.004	0.030	0.002		0.685	
160	M17	16in Dia. Duct	Sec 5 - min	-0.052	6	0.037	9	-0.041	7	-0.091	6	-0.685	9	-0.045	6	-0.049	9	-667.887	3	-0.132	3	0.004	0.030	0.002		0.685	
145	M16	16in Dia. Duct	Sec 3 - max	0.048	9	0.098	1	0.043	8	0.617	9	0.201	6	0.123	2	0.112	3	708.830	2	0.140	2	0.003	0.027	0.005		0.617	
142	M16	16in Dia. Duct	Sec 1 - min	-0.057	6	0.068	9	-0.046	7	-0.256	6	-0.570	9	-0.142	3	-0.154	2	-639.140	3	-0.127	3	0.004	0.025	0.007		0.570	
81	M10	20in Dia. Duct	Sec 1 - max	0.038	7	-0.013	9	0.037	2	0.267	6	0.261	9	0.435	3	0.488	2	1542.956	3	0.168	3	0.003	0.012	0.022		0.488	
186	M32	16in Dia. Duct	Sec 4 - min	0.106	6	-0.133	6	-0.135	3	-0.257	1	-0.247	9	-0.355	3	-0.367	2	-278.429	2	-0.055	2	0.008	0.011	0.017		0.387	
100	M11	20in Dia. Duct	Sec 5 - min	0.040	8	-0.049	8	-0.047	3	-0.253	9	-0.136	6	-0.497	2	-0.435	3	-797.525	2	-0.087	2	0.003	0.011	0.022		0.497	
143	M16	16in Dia. Duct	Sec 2 - max	0.048	9	0.100	1	0.044	8	0.594	9	0.228	6	0.138	2	0.127	3	708.830	2	0.140	2	0.003	0.026	0.006		0.594	
133	M15	16in Dia. Duct	Sec 2 - max	0.028	9	0.106	5	0.049	3	0.465	9	0.291	6	0.299	2	0.277	3	506.361	2	0.100	2	0.002	0.021	0.013		0.465	
157	M17	16in Dia. Duct	Sec 4 - max	0.054	5	0.092	1	0.041	8	0.679	9	0.106	6	0.043	9	0.038	6	741.516	2	0.147	2	0.004	0.030	0.002		0.679	
129	M14	16in Dia. Duct	Sec 6 - max	0.005	9	0.117	5	0.050	3	0.429	9	0.304	6	0.369	2	0.340	3	162.198	2	0.032	2	0.000	0.019	0.016		0.429	
158	M17	16in Dia. Duct	Sec 4 - min	-0.052	4	0.038	9	-0.042	7	-0.106	6	-0.679	9	-0.038	6	-0.043	9	-667.887	3	-0.132	3	0.004	0.030	0.002		0.679	
83	M10	20in Dia. Duct	Sec 2 - max	0.039	7	-0.013	9	0.038	2	0.249	6	0.265	9	0.424	3	0.477	2	1542.956	3	0.168	3	0.003	0.012	0.021		0.477	
141	M16	16in Dia. Duct	Sec 1 - max	0.047	9	0.101	1	0.045	8	0.570	9	0.256	6	0.154	2	0.142	3	708.830	2	0.140	2	0.003	0.025	0.007		0.570	
85	M10	20in Dia. Duct	Sec 3 - max	0.041	7	-0.014	9	0.039	2	0.230	6	0.269	9	0.413	3	0.465	2	1542.956	3	0.168	3	0.003	0.012	0.021		0.465	
155	M17	16in Dia. Duct	Sec 3 - max	0.054	5	0.093	1	0.041	8	0.673	9	0.120	6	0.037	9	0.032	6	741.516	2	0.147	2	0.004	0.030	0.002		0.673	
156	M17	16in Dia. Duct	Sec 3 - min	-0.052	4	0.039	9	-0.042	7	-0.120	6	-0.673	9	-0.032	6	-0.037	9	-667.887	3	-0.132	3	0.004	0.030	0.002		0.673	
87	M10	20in Dia. Duct	Sec 4 - max	0.042	7	-0.014	9	0.041	2	0.211	6	0.273	9	0.401	3	0.453	2	1542.956	3	0.168	3	0.003	0.012	0.020		0.453	
171	M31	16in Dia. Duct	Sec 1 - max	0.101	6	0.115	3	0.087	9	0.306	2	0.336	5	0.292	4	0.241	5	376.360	3	0.075	3	0.007	0.015	0.013		0.336	
172	M31	16in Dia. Duct	Sec 1 - min	0.101	1	-0.115	2	-0.078	8	-0.336	3	-0.306	2	-0.241	5	-0.292	4	-395.194	2	-0.078	2	0.007	0.015	0.013		0.336	
82	M10	20in Dia. Duct	Sec 1 - min	0.022	8	-0.060	6	-0.037	3	-0.261	9	-0.267	6	-0.438	2	-0.435	3	-1700.239	2	-0.165	2	0.002	0.012	0.022		0.488	
131	M15	16in Dia. Duct	Sec 1 - max	0.027	9	0.107	5	0.050	3	0.429	9	0.304	6	0.316	2	0.294	3	506.361	2	0.100	2	0.002	0.019	0.014		0.429	
89	M10	20in Dia. Duct	Sec 5 - max	0.043	7	-0.015	9	0.042	2	0.191	6	0.277	9	0.389	3	0.441	2	1542.956	3	0.168	3	0.003	0.012	0.020		0.441	
151	M17	16in Dia. Duct	Sec 1 - max	0.054	5	0.095	1	0.042	8	0.661	9	0.150	6	0.037	2	0.032	3	741.516	2	0.147	2	0.004	0.029	0.002		0.661	
153	M17	16in Dia. Duct	Sec 2 - max	0.054	5	0.094	1	0.042	8	0.667	9	0.135	6	0.031	2	0.026	3	741.516	2	0.147	2	0.004	0.030	0.001		0.667	
152	M17	16in Dia. Duct	Sec 1 - min	-0.052	4	0.041	9	-0.043	7	-0.150	6	-0.661	9	-0.032	3	-0.037	2	-667.887	3	-0.132	3	0.004	0.029	0.002		0.661	
154	M17	16in Dia. Duct	Sec 2 - min	-0.052	4	0.040	9	-0.042	7	-0.135	6	-0.667	9	-0.026	3	-0.031	2	-667.887	3	-0.132	3	0.004	0.030	0.001		0.667	
127	M14	16in Dia. Duct	Sec 4 - max	0.004	9	0.117	7	0.051	3	0.386	9	0.298	6	0.387	2	0.358	3	162.198	2	0.032	2	0.000	0.017	0.017		0.388	
103	M12	20in Dia. Duct	Sec 2 - max	0.046	2	0.050	3	0.041	7	0.485	2	0.422	3	0.111	6	0.223	9	340.435	3	0.037	3	0.003	0.022	0.010		0.485	
104	M12	20in Dia. Duct	Sec 2 - min	0.046	1	-0.050	2	-0.034	6	-0.422	3	-0.485	2	-0.223	9	-0.111	6	-338.027	2	-0.037	2	0.003	0.022	0.010		0.485	
185	M32	16in Dia. Duct	Sec 3 - max	0.123	7	0.051	7	0.134	2	0.229	9	0.243	1	0.340	2	0.309	3	275.104	3	0.055	3	0.009	0.011	0.015		0.340	
84	M10	20in Dia. Duct	Sec 2 - min	0.023	8	-0.062	6	-0.038	3	-0.265	9	-0.249	8	-0.477	2	-0.424	3	-1700.239	2	-0.165	2	0.002	0.012	0.021		0.477	
86	M10	20in Dia. Duct	Sec 3 - min	0.024	8	-0.064	6	-0.039	3	-0.269	9	-0.230	6	-0.465	2	-0.413	3	-1700.239	2	-0.165	2	0.002	0.012	0.021		0.465	
88	M10	20in Dia. Duct	Sec 4 - min	0.025	8	-0.066	6	-0.041	3	-0.273	9	-0.211	6	-0.453	2	-0.401	3	-1700.239	2	-0.165	2	0.002	0.012	0.020		0.453	
125	M14	16in Dia. Duct	Sec 3 - max	0.003	9	0.118	7	0.053	3	0.348	9	0.293	6	0.405	2	0.376	3	162.198	2	0.032	2	0.000	0.015	0.018		0.405	
90	M10	20in Dia. Duct	Sec 5 - min	0.025	8	-0.068	6	-0.042	3	-0.277	9	-0.191	8	-0.441	2	-0.389	3	-1700.239	2	-0.165	2	0.002	0.012	0.020		0.441	
163	M18	16in Dia. Duct	Sec 2 - max	0.071	7	0.006	1	0.015	3	0.496	9	-0.034	6	0.147	3	0.147	2	741.516	2	0.147	2	0.005	0.022	0.007		0.496	
184	M18	16in Dia. Duct	Sec 2 - min	-0.069	6	-0.048	9	-0.015	2	0.034	6	-0.496	9	-0.147	2	-0.147	3	-667.887	3	-0.132	3	0.005	0.022	0.007		0.496	
188	M32	16in Dia. Duct	Sec 3 - min	0.105	6	-0.132	6	-0.134	3	-0.243	1	-0.229	9	-0.309	3	-0.340	2	-278.429	2	-0.055	2	0.008	0.011	0.015		0.340	
71	M9	20in Dia. Duct	Sec 1 - max	0.029	7	-0.036	7	0.032	2	0.347	6	0.215	9	0.315	3	0.350	2	2189.074	3	0.239	3	0.002	0.015	0.016		0.350	
123	M14	16in Dia. Duct	Sec 2 - max	0.002	9	0.118	7	0.054	3	0.307	9	0.288	6	0.424	2	0.395	3	162.198	2	0.032	2	0.000	0.014	0.019		0.424	
121	M14	16in Dia. Duct	Sec 1 - max	0.001	9	0.118	7	0.055	3	0.265	9	0.264	6	0.443	2	0.414	3	162.198	2	0.032	2	0.000	0.013	0.020		0.443	
183	M32	16in Dia. Duct	Sec 2 - max	0.122	7	0.051	7	0.132	2	0.212	9	0.229	1	0.294	2	0.262	3	275.104	3	0.055	3	0.009	0.010	0.013		0.294	
41	M8	20in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.595	6	-0.022	9	0.124	3	0.124	2	2652.532	3	0.289	3	0.000	0.026	0.006		0.595	
42	M8	20in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.022	9	-0.595	6	-0.124	2	-0.124	3	-2939.238	2	-0.320	2	0.000	0.026	0.006		0.595	
43	M6	20in Dia. Duct	Sec 2 - max	0.000	7	-0.002	1	0.001	2	0.595	6	-0.022	9	0.124	3	0.124	2	2652.532	3	0.289	3	0.000	0.026	0.006		0.595	
44	M6	20in Dia. Duct	Sec 2 - min	0.000	6	-0.002	1	-0.001	3	0.022	9	-0.595	6	-0.124	2	-0.124	3	-2939.238	2	-0.320	2	0.000	0.026	0.006		0.595	
45	M6	20in Dia. Duct	Sec 3 - max	0.000	7	-0.004	1	0.002	2	0.594	6	-0.021	9	0.123	3	0.124	2	2652.532	3	0.289	3	0.000	0.026	0.005		0.594	
46	M6	20in Dia. Duct	Sec 3 - min	0.000	6	-0.004	1	-0.002	3	0.021	9	-0.594	6	-0.124	2	-0.123	3	-2939.238	2	-0.320	2	0.000	0.026	0.005		0.594	
47	M6	20in Dia. Duct	Sec 4 - max	0.001	7	-0.006	1	0.003	2	0.592	6	-0.019	9	0.122	3	0.123	2	2652.532	3	0.289	3	0.000	0.026	0.005		0.592	
48	M6	20in Dia. Duct	Sec 4 - min	-0.001	6	-0.006	1	-0.003	3	0.019	9	-0.592	6	-0.123	2	-0.122	3	-2939.238	2	-0.320	2	0.000	0.026	0.005		0.592	
73	M9	20in Dia. Duct	Sec 2 - max	0.030	7	-0.037	7	0.033	2	0.328	6	0.226	9	0.305	3	0.340	2	2189.074	3	0.239	3	0.002	0.015	0.015		0.340	
49	M6	20in Dia. Duct	Sec 5 - max	0.002	7	-0.009	1	0.005	2	0.590	6	-0.017	9	0.121	3	0.122	2	2652.532	3	0.289	3	0.000	0.026	0.005		0.590	
50	M6	20in Dia. Duct	Sec 5 - min	-0.002	6	-0.009	1	-0.005	3	0.017	9	-0.590	6	-0.122	2	-0.121	3	-2939.238	2	-0.320	2	0.000	0.026	0.005		0.590	
51	M7	20in Dia. Duct	Sec 1 - max	0.002	7	-0.009	7	0.005	2	0.590	6	-0.017	9	0.121	3	0.122	2	2652.532	3	0.289	3	0.000	0.026	0.005		0.590	
52	M7	20in Dia. Duct	Sec 1 - min	-0.002	6	-0.009	8	-0.005	3	0.017	9	-0.590	6	-0.122	2	-0.121	3	-2939.238	2	-0.320	2	0.000	0.026	0.005		0.590	
105	M12	20in Dia. Duct	Sec 3 - max	0.049	2	0.053	3	0.044	7	0.446	2	0.381	3	0.084	6	0.191	9	340.435	3	0.037	3	0.003	0.020	0.008		0.446	
106	M12	20in Dia. Duct	Sec 3 - min	0.049	1	-0.053	2	-0.037	6	-0.384	3	-0.446	2	-0.191	9	-0.084	6	-338.027	2	-0.037	2	0.003	0.020	0.008		0.446	
72	M9	20in Dia. Duct	Sec 1 - min	0.008	8	-0.063	8	-0.032	3	-0.215	9	-0.347	6	-0.350	2	-0.315	3	-2426.123	2	-0.264	2	0.001	0.015	0.016		0.350	
301	M44	14in Dia. Duct	Sec 1 - max	0.037	4	0.081	5	0.047	3	0.098	4	0.401	5	0.243	2	0.243	3	342.156	3	0.089	3	0.003	0.018	0.011		0.401	
184	M32	18in Dia. Duct	Sec 2 - min	0.104	6	-0.131	6	-0.132	3	-0.229	1	-0.212	9	-0.262	3	-0.294	2	-278.429	2	-0.055	2	0.007	0.010	0.013		0.294	
75	M9	20in Dia. Duct	Sec 3 - max	0.031	7	-0.038	7	0.035	2	0.309	6	0.237	9	0.295	3	0.330	2	2189.074	3	0.239	3	0.002	0.014	0.015		0.330	
53	M7	20in Dia. Duct	Sec 2 - max	0.004	7	-0.020	7	0.010	2	0.570	6	0.003	9	0.111	3	0.111	2	2652.532	3	0.289	3	0.000	0.025	0.005		0.570	
54	M7	20in Dia. Duct	Sec 2 - min	-0.004	6	-0.020	8	-0.010	3	-0.003	9	-0.570	6	-0.111	2	-0.111	3	-2939.238	2	-0.320	2	0.000	0.025	0.005		0.570	
74	M9	20in Dia. Duct	Sec 2 - min	0.009	8	-0.065	8	-0.033	3	-0.226	9	-0.328	6	-0.340	2	-0.305	3	-2426.123	2	-0.264	2	0.001	0.015	0.015		0.340	
192	M33	14in Dia. Duct	Sec 1 - min	-0.024	2	0.000	2	-0.028	4	-0.289	2	-0.099	3	-0.122	7	-0.346	8	-56.085	9	-0.015	9	0.002	0.013	0.015		0.346	
187	M18	16in Dia. Duct	Sec 4 - max	0.084	7	-0.050	1	0.030	2	-0.046	1	0.476	9	0.054	3	0.062	2	741.516	2	0.147	2	0.006	0.021	0.003		0.476	

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_t/σ_c	f_{sy}/σ_s	f_{sz}/σ_s	D-2250	f_c (ksi)	D-2250
168	M18	16in Dia. Duct	Sec 4 - min	-0.082	6	-0.114	9	-0.030	3	-0.476	9	0.046	1	-0.062	2	-0.054	3	-667.887	3	-0.132	3	0.006	0.021	0.003		0.476	
303	M44	14in Dia. Duct	Sec 2 - max	0.036	4	0.079	5	0.046	3	0.108	4	0.377	5	0.229	2	0.229	3	342.156	3	0.089	3	0.003	0.017	0.010		0.377	
77	M9	20in Dia. Duct	Sec 4 - max	0.032	7	-0.040	7	0.036	2	0.288	6	0.249	9	0.284	3	0.319	2	2189.074	3	0.239	3	0.002	0.013	0.014		0.319	
161	M32	16in Dia. Duct	Sec 1 - max	0.121	7	0.051	7	0.131	2	0.194	9	0.215	1	0.248	2	0.218	3	275.104	3	0.055	3	0.009	0.010	0.011		0.248	
76	M9	20in Dia. Duct	Sec 3 - min	0.009	8	-0.068	8	-0.035	3	-0.237	9	-0.309	6	-0.330	2	-0.295	3	-2426.123	2	-0.264	2	0.001	0.014	0.015		0.330	
191	M33	14in Dia. Duct	Sec 1 - max	-0.009	3	0.045	3	0.028	5	0.099	3	0.289	2	0.346	8	0.122	7	369.464	6	0.096	6	0.001	0.013	0.015		0.346	
302	M44	14in Dia. Duct	Sec 1 - min	0.000	5	0.033	4	-0.047	2	-0.401	5	-0.098	4	-0.243	3	-0.243	2	-342.156	2	-0.089	2	0.000	0.018	0.011		0.401	
107	M12	20in Dia. Duct	Sec 4 - max	0.051	2	0.056	3	0.048	7	0.405	2	0.343	3	0.056	6	0.157	9	340.435	3	0.037	3	0.004	0.018	0.007		0.405	
108	M12	20in Dia. Duct	Sec 4 - min	0.051	1	-0.056	2	-0.039	6	-0.343	3	-0.405	2	-0.157	9	-0.056	6	-338.027	2	-0.037	2	0.004	0.018	0.007		0.405	
55	M7	20in Dia. Duct	Sec 3 - max	0.006	7	-0.030	7	0.018	2	0.535	6	0.038	9	0.092	3	0.093	2	2652.532	3	0.289	3	0.000	0.024	0.004		0.535	
56	M7	20in Dia. Duct	Sec 3 - min	-0.006	6	-0.030	8	-0.018	3	-0.038	9	-0.535	6	-0.093	2	-0.092	3	-2939.238	2	-0.320	2	0.000	0.024	0.004		0.535	
194	M33	14in Dia. Duct	Sec 2 - min	-0.018	2	0.000	2	-0.021	4	-0.290	2	-0.183	3	-0.092	7	-0.317	8	-56.085	9	-0.015	9	0.001	0.013	0.014		0.317	
182	M32	16in Dia. Duct	Sec 1 - min	0.103	6	-0.130	6	-0.131	3	-0.215	1	-0.194	9	-0.216	3	-0.248	2	-278.429	2	-0.055	2	0.007	0.010	0.011		0.248	
78	M9	20in Dia. Duct	Sec 5 - max	0.033	7	-0.041	7	0.037	2	0.267	6	0.261	9	0.273	3	0.309	2	2189.074	3	0.239	3	0.002	0.012	0.014		0.309	
300	M43	14in Dia. Duct	Sec 5 - min	-0.043	6	-0.096	7	-0.032	3	-0.401	5	-0.098	4	-0.157	3	-0.157	2	-495.111	2	-0.129	2	0.003	0.018	0.007		0.401	
209	M34	14in Dia. Duct	Sec 5 - max	0.004	2	0.000	2	0.005	4	0.219	3	0.320	2	0.301	8	0.095	7	420.267	8	0.109	8	0.000	0.014	0.013		0.320	
207	M34	14in Dia. Duct	Sec 4 - max	0.003	2	0.000	2	0.003	4	0.221	3	0.320	2	0.301	8	0.094	7	420.267	8	0.109	8	0.000	0.014	0.013		0.320	
305	M44	14in Dia. Duct	Sec 3 - max	0.035	4	0.077	5	0.045	3	0.117	4	0.353	5	0.216	2	0.216	3	342.156	3	0.089	3	0.003	0.016	0.010		0.353	
210	M34	14in Dia. Duct	Sec 5 - min	0.002	3	-0.008	3	-0.005	5	-0.320	2	-0.219	3	-0.095	7	-0.301	8	-113.722	7	-0.030	7	0.000	0.014	0.013		0.320	
208	M34	14in Dia. Duct	Sec 4 - min	0.001	3	-0.006	3	-0.003	5	-0.320	2	-0.221	3	-0.094	7	-0.301	8	-113.722	7	-0.030	7	0.000	0.014	0.013		0.320	
205	M34	14in Dia. Duct	Sec 3 - max	0.002	2	0.000	2	0.002	4	0.223	3	0.319	2	0.300	8	0.094	7	420.267	8	0.109	8	0.000	0.014	0.013		0.319	
78	M9	20in Dia. Duct	Sec 4 - min	0.009	8	-0.070	8	-0.036	3	-0.249	9	-0.288	6	-0.319	2	-0.284	3	-2426.123	2	-0.264	2	0.001	0.013	0.014		0.319	
203	M34	14in Dia. Duct	Sec 2 - max	0.001	2	0.000	2	0.001	4	0.224	3	0.319	2	0.300	8	0.093	7	420.267	8	0.109	8	0.000	0.014	0.013		0.319	
201	M34	14in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.225	3	0.319	2	0.300	8	0.093	7	420.267	8	0.109	8	0.000	0.014	0.013		0.319	
202	M34	14in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	-0.318	2	-0.225	3	-0.093	7	-0.300	8	-113.722	7	-0.030	7	0.000	0.014	0.013		0.319	
204	M34	14in Dia. Duct	Sec 2 - min	0.000	3	-0.002	3	-0.001	5	-0.319	2	-0.224	3	-0.093	7	-0.300	8	-113.722	7	-0.030	7	0.000	0.014	0.013		0.319	
206	M34	14in Dia. Duct	Sec 3 - min	0.000	3	-0.004	3	-0.002	5	-0.319	2	-0.223	3	-0.094	7	-0.300	8	-113.722	7	-0.030	7	0.000	0.014	0.013		0.319	
193	M33	14in Dia. Duct	Sec 2 - max	-0.007	3	0.034	3	0.021	5	0.163	3	0.290	2	0.317	8	0.092	7	369.464	6	0.096	6	0.001	0.013	0.014		0.317	
179	M31	16in Dia. Duct	Sec 6 - max	0.112	6	0.131	3	0.097	9	0.191	3	0.222	2	0.194	9	0.215	1	376.380	3	0.075	3	0.008	0.010	0.010		0.222	
180	M31	16in Dia. Duct	Sec 6 - min	0.112	1	-0.131	2	-0.087	8	-0.222	2	-0.191	3	-0.215	1	-0.194	9	-395.194	2	-0.078	2	0.008	0.010	0.010		0.222	
219	M35	14in Dia. Duct	Sec 5 - max	0.008	7	-0.005	7	0.008	6	0.134	9	0.377	6	0.227	8	0.115	7	470.213	8	0.122	8	0.001	0.017	0.010		0.377	
217	M35	14in Dia. Duct	Sec 4 - max	0.007	7	-0.004	7	0.007	6	0.138	9	0.373	6	0.227	8	0.115	7	470.213	8	0.122	8	0.001	0.017	0.010		0.373	
311	M45	14in Dia. Duct	Sec 1 - max	0.037	4	0.067	5	0.043	3	0.136	4	0.308	5	0.243	2	0.243	3	176.771	3	0.046	3	0.003	0.014	0.011		0.308	
173	M31	16in Dia. Duct	Sec 2 - max	0.104	6	0.119	3	0.090	9	0.180	2	0.211	3	0.222	4	0.231	1	376.380	3	0.075	3	0.007	0.009	0.010		0.231	
174	M31	16in Dia. Duct	Sec 2 - min	0.104	1	-0.119	2	-0.080	8	-0.211	3	-0.180	2	-0.231	1	-0.222	4	-395.194	2	-0.078	2	0.007	0.009	0.010		0.231	
299	M43	14in Dia. Duct	Sec 5 - max	0.031	9	-0.019	8	0.033	2	0.098	4	0.401	5	0.157	2	0.157	3	495.111	3	0.129	3	0.002	0.016	0.007		0.401	
215	M35	14in Dia. Duct	Sec 3 - max	0.006	7	-0.004	7	0.006	6	0.141	9	0.370	6	0.228	8	0.116	7	470.213	8	0.122	8	0.000	0.016	0.010		0.370	
220	M35	14in Dia. Duct	Sec 5 - min	0.002	8	-0.016	8	-0.006	9	-0.377	8	-0.134	9	-0.115	7	-0.227	8	-215.224	7	-0.056	7	0.000	0.017	0.010		0.377	
304	M44	14in Dia. Duct	Sec 2 - min	0.000	5	0.032	4	-0.046	2	-0.377	5	-0.108	4	-0.229	3	-0.229	2	-342.156	2	-0.089	2	0.000	0.017	0.010		0.377	
196	M33	14in Dia. Duct	Sec 3 - min	-0.012	2	0.000	2	-0.014	4	-0.290	2	-0.243	3	-0.071	7	-0.295	8	-56.085	9	-0.015	9	0.001	0.013	0.013		0.295	
218	M35	14in Dia. Duct	Sec 4 - min	0.002	8	-0.014	8	-0.007	9	-0.373	6	-0.138	9	-0.115	7	-0.227	8	-215.224	7	-0.056	7	0.000	0.017	0.010		0.373	
213	M35	14in Dia. Duct	Sec 2 - max	0.005	7	-0.003	7	0.005	6	0.143	9	0.367	6	0.228	8	0.116	7	470.213	8	0.122	8	0.000	0.016	0.010		0.367	
218	M35	14in Dia. Duct	Sec 3 - min	0.002	8	-0.012	8	-0.006	9	-0.370	6	-0.141	9	-0.116	7	-0.228	8	-215.224	7	-0.056	7	0.000	0.016	0.010		0.370	
61	M8	20in Dia. Duct	Sec 1 - max	0.017	9	-0.047	7	0.027	2	0.418	6	0.155	9	0.143	3	0.156	2	2574.005	3	0.281	3	0.001	0.019	0.007		0.418	
109	M12	20in Dia. Duct	Sec 5 - max	0.054	2	0.059	3	0.048	7	0.362	2	0.290	3	0.037	4	0.153	1	340.435	3	0.037	3	0.004	0.016	0.007		0.362	
110	M12	20in Dia. Duct	Sec 5 - min	0.054	1	-0.059	2	-0.041	6	-0.259	3	-0.362	2	-0.153	1	-0.037	4	-338.027	2	-0.037	2	0.004	0.016	0.007		0.362	
211	M35	14in Dia. Duct	Sec 1 - max	0.004	7	-0.002	7	0.004	6	0.145	9	0.365	6	0.228	3	0.116	2	470.213	8	0.122	8	0.000	0.016	0.010		0.365	
214	M35	14in Dia. Duct	Sec 2 - min	0.001	8	-0.010	8	-0.005	9	-0.387	6	-0.143	9	-0.116	7	-0.228	8	-215.224	7	-0.056	7	0.000	0.016	0.010		0.387	
212	M35	14in Dia. Duct	Sec 1 - min	0.001	8	-0.008	8	-0.004	9	-0.365	6	-0.145	9	-0.118	2	-0.228	3	-215.224	7	-0.056	7	0.000	0.016	0.010		0.365	
195	M33	14in Dia. Duct	Sec 3 - max	-0.005	3	0.023	3	0.014	5	0.243	3	0.290	2	0.205	8	0.071	7	369.464	6	0.096	6	0.000	0.013	0.013		0.295	
60	M9	20in Dia. Duct	Sec 5 - min	0.009	8	-0.072	8	-0.037	3	-0.261	9	-0.267	6	-0.309	2	-0.273	3	-2426.123	2	-0.264	2	0.001	0.012	0.014		0.309	
298	M43	14in Dia. Duct	Sec 4 - min	-0.042	6	-0.095	7	-0.031	3	-0.375	5	-0.107	4	-0.147	3	-0.147	2	-495.111	2	-0.129	2	0.003	0.017	0.007		0.375	
307	M44	14in Dia. Duct	Sec 4 - max	0.035	4	0.076	5	0.044	3	0.127	4	0.330	5	0.202	2	0.202	3	342.156	3	0.089	3	0.003	0.015	0.009		0.330	
198	M33	14in Dia. Duct	Sec 4 - min	-0.006	2	0.000	2	-0.007	4	-0.291	2	-0.278	3	-0.058	7	-0.283	8	-56.085	9	-0.015	9	0.000	0.013	0.013		0.291	
62	M8	20in Dia. Duct	Sec 1 - min	-0.003	8	-0.055	6	-0.027	3	-0.155	9	-0.418	6	-0.156	2	-0.143	3	-2854.732	2	-0.311	2	0.000	0.019	0.007		0.418	
63	M8	20in Dia. Duct	Sec 2 - max	0.018	9	-0.049	7	0.029	2	0.401	6	0.169	9	0.135	3	0.148	2	2574.005	3	0.281	3	0.001	0.018	0.007		0.401	
197	M33	14in Dia. Duct	Sec 4 - max	-0.002	3	0.011	3	0.007	5	0.278	3	0.291	2	0.283	8	0.058	7	369.464	6	0.096	6	0.000	0.013	0.013		0.291	
312	M45	14in Dia. Duct	Sec 1 - min	0.016	5	0.002	4	-0.043	2	-0.308	5	-0.136	4	-0.243	3	-0.243	2	-176.771	2	-0.046	2	0.001	0.014	0.011		0.308	
313	M45	14in Dia. Duct	Sec 2 - max	0.038	4	0.066	5	0.042	3	0.136	4	0.287	5	0.230	2	0.230	3	176.771	3	0.046	3	0.003	0.013	0.010		0.287	
297	M43	14in Dia. Duct	Sec 4 - max	0.031	9	-0.018	8	0.032	2	0.107	4	0.375	5	0.147	2	0.147	3	495.111	3	0.129	3	0.002	0.017	0.007		0.375	
199	M33	14in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.290	3	0.291	2	0.278	8	0.053	7	369.464	6	0.096	6	0.000	0.013	0.012		0.291	
200	M33	14in Dia. Duct	Sec 6 - min	0.000	1	0.000	1	0.000	1	-0.291	2	-0.290	3	-0.053	7	-0.278	8	-56.085	9	-0.015	9	0.000	0.013	0.012		0.291	
308	M44	14in Dia. Duct	Sec 3 - min	0.000	5	0.031	4	-0.045	2	-0.353	5	-0.117	4	-0.218	3	-0.218	2	-342.156	2	-0.089	2	0.000	0.016	0.010		0.353	
229	M36	14in Dia. Duct	Sec 5 - max	0.011	5	-0.013	5	0.014	2	0.080	9	0.413	6	0.135	3	0.106	2	510.983	3	0.133	3	0.001	0.018	0.006		0.413	
57	M7	20in Dia. Duct	Sec 4 - max	0.008	7	-0.041	7	0.022	2	0.484	6	0.069	9	0.066	3	0.066	2	2652.532	3	0.289	3	0.001	0.022	0.003		0.484	
58	M7	20in Dia. Duct	Sec 4 - min	-0.008	6	-0.041	6	-0.022	3	-0.069	9	-0.484	6	-0.066	2	-0.066	3	-2939.238	2	-0.320	2	0.001	0.022	0.003		0.484	
227	M36	14in Dia. Duct	Sec 4 - max	0.010	5	-0.012	6	0.013	2	0.086	9	0.405	6	0.140	3	0.111	2	510.983	3	0.133	3	0.001	0.018	0.006		0.405	
225	M36	14in Dia. Duct	Sec 3 - max	0.009	5	-0.011	5	0.011	2	0.091	9	0.398	6	0.144	3	0.116	2	510.983	3	0.133	3	0.001	0.018	0.006		0.398	
296	M43	14in Dia. Duct	Sec 3 - min	-0.042	6	-0.093	7	-0.030	3	-0.350	5	-0.115	4	-0.138	3	-0.137	2	-495.111	2	-0.129	2	0.003	0.016	0.006		0.350	
64	M8	20in Dia. Duct	Sec 2 - min	-0.004	6	-0.057	6	-0.029	3	-0.169	9	-0.401	6	-0.148	2	-0.135	3	-2854.732	2	-0.311	2	0.000	0.018	0.007		0.401	
223	M36	14in Dia. Duct	Sec 2 - max	0.008	5	-0.009	5	0.010	2	0.096	9	0.392	6	0.148	3	0.120	2	510.983	3	0.133	3	0.001	0.017	0.007		0.392	
309	M44	14in Dia. Duct	Sec 5 - max	0.034	4	0.074	5	0.043	3	0.136	4	0.308	5	0.189	2	0.189	3	342.156	3	0.089	3	0.002	0.014	0.008		0.308	
65	M8	20in Dia. Duct	Sec 3 - max	0.018	9	-0.051	7	0.030	2	0.384	6	0.184	9	0.126	3	0.139	2	2574.005	3	0.281	3	0.001	0.017	0.006		0.384	
221	M36	14in Dia. Duct	Sec 1 - max	0.007	5	-0.008	5	0.009	2	0.100	9	0.387	6	0.152	3	0.123	2	510.983	3	0.133	3	0.001	0.017	0.007		0.387	
230	M36	14in Dia. Duct	Sec 5 - min	-0.001	4	-0.025	4	-0.014	3	-0.413	6	-0.080	9	-0.106	2	-0.135	3	-359.432	2	-0.093	2	0.000	0.018	0.006		0.413	
228	M36	14in Dia. Duct	Sec 4 - min	-0.001	4	-0.023	4	-0.013	3	-0.405	6	-0.086	9	-0.111	2	-0.140	3	-359.432	2	-0.093	2	0.000	0.018	0.006		0.405	
315	M45	14in Dia. Duct	Sec 3 - max	0.035	4	0.064	5	0.041	3	0.137	4	0.268	5	0.218	2	0.218	3	176.771	3	0.046	3	0.003	0.012	0.010		0.268	

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	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_b/σ_a	f_{sh}/σ_a		f_c (ksi)	
226	M38	14in Dia. Duct	Sec 3 - min	0.000	4	-0.021	4	-0.011	3	-0.398	6	-0.091	9	-0.116	2	-0.144	3	-359.432	2	-0.093	2	0.000	0.018	0.006		0.398	
314	M45	14in Dia. Duct	Sec 2 - min	0.015	5	0.002	4	-0.042	2	-0.287	5	-0.136	4	-0.230	3	-0.230	2	-176.771	2	-0.046	2	0.001	0.013	0.010		0.287	
224	M36	14in Dia. Duct	Sec 2 - min	0.000	4	-0.019	4	-0.010	3	-0.392	8	-0.096	9	-0.120	2	-0.148	3	-359.432	2	-0.093	2	0.000	0.017	0.007		0.392	
222	M36	14in Dia. Duct	Sec 1 - min	0.000	4	-0.017	4	-0.009	3	-0.387	6	-0.100	9	-0.123	2	-0.152	3	-359.432	2	-0.093	2	0.000	0.017	0.007		0.387	
295	M43	14in Dia. Duct	Sec 3 - max	0.031	9	-0.017	8	0.031	2	0.115	4	0.350	5	0.137	2	0.138	3	495.111	3	0.129	3	0.002	0.016	0.006		0.350	
308	M44	14in Dia. Duct	Sec 4 - min	0.000	5	0.031	4	-0.044	2	-0.330	5	-0.127	4	-0.202	3	-0.202	2	-342.156	2	-0.089	2	0.000	0.015	0.009		0.330	
68	M8	20in Dia. Duct	Sec 3 - min	-0.004	8	-0.059	6	-0.030	3	-0.184	9	-0.394	6	-0.139	2	-0.126	3	-2854.732	2	-0.311	2	0.000	0.017	0.000		0.384	
67	M8	20in Dia. Duct	Sec 4 - max	0.019	9	-0.053	7	0.031	2	0.366	6	0.199	9	0.117	3	0.130	2	2574.005	3	0.281	3	0.001	0.016	0.006		0.366	
294	M43	14in Dia. Duct	Sec 2 - min	-0.042	9	-0.092	7	-0.029	3	-0.325	5	-0.123	4	-0.129	3	-0.128	2	-495.111	2	-0.129	2	0.003	0.014	0.006		0.325	
165	M18	16in Dia. Duct	Sec 3 - max	0.077	7	-0.027	1	0.007	6	0.215	1	0.039	6	0.168	3	0.172	2	741.516	2	0.147	2	0.006	0.010	0.008		0.215	
316	M45	14in Dia. Duct	Sec 3 - min	0.014	5	0.002	4	-0.041	2	-0.288	5	-0.137	4	-0.218	3	-0.218	2	-176.771	2	-0.046	2	0.001	0.012	0.010		0.288	
317	M45	14in Dia. Duct	Sec 4 - max	0.034	4	0.063	5	0.040	3	0.138	4	0.248	5	0.205	2	0.205	3	176.771	3	0.046	3	0.002	0.011	0.009		0.240	
166	M18	16in Dia. Duct	Sec 3 - min	-0.075	6	-0.081	9	-0.008	9	-0.039	6	-0.215	1	-0.172	2	-0.168	3	-667.887	3	-0.132	3	0.005	0.010	0.008		0.215	
293	M43	14in Dia. Duct	Sec 2 - max	0.031	9	-0.015	8	0.030	2	0.123	4	0.325	5	0.128	2	0.129	3	495.111	3	0.129	3	0.002	0.014	0.006		0.325	
68	M8	20in Dia. Duct	Sec 4 - min	-0.004	6	-0.062	6	-0.031	3	-0.199	9	-0.366	6	-0.130	2	-0.117	3	-2854.732	2	-0.311	2	0.000	0.016	0.006		0.360	
69	M8	20in Dia. Duct	Sec 5 - max	0.020	9	-0.055	7	0.032	2	0.347	6	0.215	9	0.108	3	0.121	2	2574.005	3	0.281	3	0.001	0.015	0.005		0.347	
310	M44	14in Dia. Duct	Sec 5 - min	0.000	5	0.030	4	-0.043	2	-0.308	5	-0.136	4	-0.189	3	-0.189	2	-342.156	2	-0.089	2	0.000	0.014	0.008		0.308	
321	M46	14in Dia. Duct	Sec 1 - max	0.031	4	0.046	5	0.039	3	0.138	4	0.230	5	0.214	2	0.214	3	20.738	3	0.005	3	0.002	0.010	0.010		0.230	
261	M40	14in Dia. Duct	Sec 1 - max	0.030	7	0.019	4	0.007	7	0.309	7	-0.068	8	0.123	8	0.130	7	530.767	3	0.138	3	0.002	0.014	0.005		0.309	
262	M40	14in Dia. Duct	Sec 1 - min	-0.030	8	-0.032	5	-0.006	8	0.098	8	-0.309	7	-0.130	7	-0.123	8	-530.444	2	-0.138	2	0.002	0.014	0.006		0.309	
292	M43	14in Dia. Duct	Sec 1 - min	-0.041	6	-0.090	7	-0.028	3	-0.300	5	-0.130	4	-0.120	3	-0.119	2	-495.111	2	-0.129	2	0.003	0.013	0.005		0.300	
322	M46	14in Dia. Duct	Sec 1 - min	0.024	5	-0.024	4	-0.039	2	-0.230	5	-0.138	4	-0.214	3	-0.214	2	-20.738	2	-0.005	2	0.002	0.010	0.010		0.230	
177	M31	18in Dia. Duct	Sec 4 - max	0.109	6	0.127	3	0.094	9	0.053	8	0.083	7	0.092	9	0.221	1	376.380	3	0.075	3	0.008	0.004	0.010		0.221	
178	M31	16in Dia. Duct	Sec 4 - min	0.109	1	-0.127	2	-0.085	8	-0.083	7	-0.053	8	-0.221	1	-0.092	9	-395.194	2	-0.078	2	0.008	0.004	0.010		0.221	
319	M45	14in Dia. Duct	Sec 5 - max	0.033	4	0.061	5	0.039	3	0.138	4	0.230	5	0.194	2	0.194	3	176.771	3	0.046	3	0.002	0.010	0.009		0.230	
175	M31	16in Dia. Duct	Sec 3 - max	0.106	6	0.123	3	0.092	9	0.051	2	0.081	3	0.147	4	0.226	1	376.380	3	0.075	3	0.008	0.004	0.010		0.226	
176	M31	16in Dia. Duct	Sec 3 - min	0.106	1	-0.123	2	-0.082	8	-0.081	3	-0.051	2	-0.226	1	-0.147	4	-395.194	2	-0.078	2	0.008	0.004	0.010		0.226	
232	M37	14in Dia. Duct	Sec 1 - min	-0.019	4	0.096	5	-0.044	7	-0.393	6	-0.050	9	-0.052	2	-0.041	3	-511.230	2	-0.133	2	0.001	0.017	0.002		0.393	
318	M45	14in Dia. Duct	Sec 4 - min	0.014	5	0.002	4	-0.040	2	-0.248	5	-0.138	4	-0.205	3	-0.205	2	-176.771	2	-0.046	2	0.001	0.011	0.009		0.248	
70	M8	20in Dia. Duct	Sec 5 - min	-0.004	8	-0.064	6	-0.032	3	-0.215	9	-0.347	6	-0.121	2	-0.108	3	-2854.732	2	-0.311	2	0.000	0.015	0.005		0.347	
291	M43	14in Dia. Duct	Sec 1 - max	0.031	9	-0.014	8	0.029	2	0.130	4	0.300	5	0.119	2	0.120	3	495.111	3	0.129	3	0.002	0.013	0.005		0.300	
259	M39	14in Dia. Duct	Sec 5 - max	0.019	7	0.071	4	0.015	9	0.309	7	-0.098	8	0.123	8	0.130	7	530.767	3	0.138	3	0.001	0.014	0.006		0.309	
260	M39	14in Dia. Duct	Sec 5 - min	-0.019	6	0.020	5	-0.015	6	0.098	8	-0.309	7	-0.130	7	-0.123	8	-530.444	2	-0.138	2	0.001	0.014	0.006		0.309	
323	M46	14in Dia. Duct	Sec 2 - max	0.030	4	0.045	5	0.038	3	0.131	4	0.216	5	0.203	2	0.203	3	20.738	3	0.005	3	0.002	0.010	0.009		0.216	
59	M7	20in Dia. Duct	Sec 5 - max	0.010	7	-0.052	7	0.027	2	0.418	6	0.155	9	0.031	3	0.031	2	2652.532	3	0.289	3	0.001	0.019	0.001		0.418	
60	M7	20in Dia. Duct	Sec 5 - min	-0.010	8	-0.052	8	-0.027	3	-0.155	9	-0.418	6	-0.031	2	-0.031	3	-2939.238	2	-0.320	2	0.001	0.019	0.001		0.418	
324	M46	14in Dia. Duct	Sec 2 - min	0.024	5	-0.023	4	-0.038	2	-0.216	5	-0.131	4	-0.203	3	-0.203	2	-20.738	2	-0.005	2	0.002	0.010	0.009		0.216	
263	M40	14in Dia. Duct	Sec 2 - max	0.030	7	0.015	4	0.009	7	0.282	7	-0.110	8	0.117	8	0.124	7	530.767	3	0.138	3	0.002	0.013	0.006		0.282	
264	M40	14in Dia. Duct	Sec 2 - min	-0.030	8	-0.036	5	-0.008	8	0.110	8	-0.282	7	-0.124	7	-0.117	8	-530.444	2	-0.138	2	0.002	0.013	0.006		0.282	
320	M45	14in Dia. Duct	Sec 5 - min	0.014	5	0.002	4	-0.039	2	-0.230	5	-0.138	4	-0.194	3	-0.194	2	-176.771	2	-0.046	2	0.001	0.010	0.009		0.230	
257	M39	14in Dia. Duct	Sec 4 - max	0.019	7	0.074	4	0.017	9	0.294	7	-0.054	8	0.113	8	0.121	7	530.767	3	0.138	3	0.001	0.013	0.005		0.294	
258	M39	14in Dia. Duct	Sec 4 - min	-0.019	6	0.023	5	-0.016	6	0.054	8	-0.294	7	-0.121	7	-0.113	8	-530.444	2	-0.138	2	0.001	0.013	0.005		0.294	
231	M37	14in Dia. Duct	Sec 1 - max	0.000	5	0.142	4	0.045	8	0.050	9	0.393	6	0.041	3	0.052	2	514.798	3	0.134	3	0.000	0.017	0.002		0.393	
325	M46	14in Dia. Duct	Sec 3 - max	0.030	4	0.043	5	-0.037	3	0.124	4	0.203	5	0.191	2	0.191	3	20.738	3	0.005	3	0.002	0.009	0.008		0.203	
326	M46	14in Dia. Dict	Sec 3 - min	0.023	5	-0.022	4	-0.037	2	-0.203	5	-0.124	4	-0.191	3	-0.191	2	-20.738	2	-0.005	2	0.002	0.009	0.008		0.203	
269	M42	14in Dia. Duct	Sec 5 - max	0.039	7	-0.027	4	0.029	2	0.130	4	0.300	5	0.067	2	0.068	3	530.767	3	0.138	3	0.003	0.013	0.003		0.300	
290	M42	14in Dia. Duct	Sec 5 - min	-0.039	8	-0.079	5	-0.028	3	-0.300	5	-0.130	4	-0.068	3	-0.067	2	-530.444	2	-0.138	2	0.003	0.013	0.003		0.300	
234	M37	14in Dia. Duct	Sec 2 - min	-0.019	4	0.094	5	-0.044	7	-0.342	6	-0.086	9	-0.058	2	-0.048	3	-511.230	2	-0.133	2	0.001	0.015	0.003		0.342	
265	M40	14in Dia. Duct	Sec 3 - max	0.031	7	0.011	4	0.010	7	0.253	7	-0.119	6	0.109	8	0.116	7	530.767	3	0.138	3	0.002	0.011	0.005		0.253	
266	M40	14in Dia. Duct	Sec 3 - min	-0.031	8	-0.040	5	-0.010	8	0.119	8	-0.253	7	-0.116	7	-0.109	8	-530.444	2	-0.138	2	0.002	0.011	0.005		0.253	
327	M46	14in Dia. Duct	Sec 4 - max	0.029	4	0.042	5	0.036	3	0.118	4	0.190	5	0.180	2	0.180	3	20.738	3	0.005	3	0.002	0.008	0.008		0.190	
255	M39	14in Dia. Duct	Sec 3 - max	0.018	7	0.077	4	0.018	9	0.276	7	-0.008	8	0.103	8	0.111	7	530.767	3	0.138	3	0.001	0.012	0.005		0.276	
256	M39	14in Dia. Duct	Sec 3 - min	-0.018	8	0.026	5	-0.017	6	0.008	8	-0.276	7	-0.111	7	-0.103	8	-530.444	2	-0.138	2	0.001	0.012	0.005		0.276	
328	M46	14in Dia. Duct	Sec 4 - min	0.022	5	-0.022	4	-0.036	2	-0.190	5	-0.118	4	-0.180	3	-0.180	2	-20.738	2	-0.005	2	0.002	0.008	0.008		0.190	
233	M37	14in Dia. Duct	Sec 2 - max	0.000	5	0.140	4	0.044	8	0.086	9	0.342	6	0.048	3	0.058	2	514.798	3	0.134	3	0.000	0.015	0.003		0.342	
329	M46	14in Dia. Duct	Sec 5 - max	0.028	4	0.041	5	0.035	3	0.111	4	0.177	5	0.170	2	0.170	3	20.738	3	0.005	3	0.002	0.008	0.008		0.177	
253	M39	14in Dia. Duct	Sec 2 - max	0.017	7	0.090	4	0.019	9	0.258	7	0.041	8	0.092	8	0.101	7	530.767	3	0.138	3	0.001	0.011	0.004		0.258	
254	M39	14in Dia. Duct	Sec 2 - min	-0.017	6	0.029	5	-0.018	6	-0.041	8	-0.258	7	-0.101	7	-0.092	8	-530.444	2	-0.138	2	0.001	0.011	0.004		0.258	
331	M47	14in Dia. Duct	Sec 1 - max	0.025	4	0.035	2	0.032	5	0.169	3	0.169	2	0.111	4	0.177	5	43.397	2	0.011	2	0.002	0.008	0.008		0.177	
332	M47	14in Dia. Duct	Sec 1 - min	0.025	1	-0.035	3	-0.032	4	-0.169	2	-0.169	3	-0.177	5	-0.111	4	-43.397	3	-0.011	3	0.002	0.008	0.008		0.177	
236	M37	14in Dia. Duct	Sec 3 - min	-0.019	4	0.092	5	-0.043	7	-0.291	6	-0.122	9	-0.064	2	-0.054	3	-511.230	2	-0.133	2	0.001	0.013	0.003		0.291	
267	M40	14in Dia. Duct	Sec 4 - max	0.032	7	0.007	4	0.012	7	0.224	1	-0.125	8	0.101	8	0.107	7	530.767	3	0.138	3	0.002	0.010	0.005		0.224	
268	M40	14in Dia. Duct	Sec 4 - min	-0.032	6	-0.044	5	-0.011	8	0.125	8	-0.224	1	-0.107	7	-0.101	8	-530.444	2	-0.138	2	0.002	0.010	0.005		0.224	
330	M46	14in Dia. Duct	Sec 5 - min	0.022	5	-0.021	4	-0.035	2	-0.177	5	-0.111	4	-0.170	3	-0.170	2	-20.738	2	-0.005	2	0.002	0.008	0.008		0.177	
287	M42	14in Dia. Duct	Sec 4 - max	0.038	7	-0.024	4	0.026	2	0.147	4	0.248	5	0.048	2	0.050	3	530.767	3	0.138	3	0.003	0.011	0.002		0.248	
288	M42	14in Dia. Duct	Sec 4 - min	-0.038	8	-0.076	5	-0.026	3	-0.248	5	-0.147	4	-0.050	3	-0.046	2	-530.444	2	-0.138	2	0.003	0.011	0.002		0.248	
269	M40	14in Dia. Duct	Sec 5 - max	0.033	7	0.003	4	0.013	7	0.207	4	-0.104	5	0.091	8	0.096	7	530.767	3	0.138	3	0.002	0.009	0.004		0.207	
270	M40	14in Dia. Duct	Sec 5 - min	-0.033	8	-0.048	5	-0.013	8	0.104	5	-0.207	4	-0.096	7	-0.091	8	-530.444	2	-0.138	2	0.002	0.009	0.004		0.207	
235	M37	14in Dia. Duct	Sec 3 - max	0.000	5	0.138	4	0.044	8	0.122	9	0.291	6	0.054	3	0.064	2	514.798	3	0.134	3	0.000	0.013	0.003		0.291	
251	M39	14in Dia. Duct	Sec 1 - max	0.017	7	0.084	4	0.020	9	0.237	7	0.091	8	0.080	8	0.090	7	530.767	3	0.138	3	0.001	0.011	0.004		0.237	
252	M39	14in Dia. Duct	Sec 1 - min	-0.017	6	0.032	5	-0.020	6	-0.091	8	-0.237	7	-0.090	7	-0.080	8	-530.444	2	-0.138	2	0.001	0.011	0.004		0.237	
238	M37	14in Dia. Duct	Sec 4 - min	-0.019	6	0.000	5	-0.042	7	-0.241	6	-0.157	9	-0.076	7	-0.066	8	-511.230	2	-0.133	2	0.001	0.011	0.003		0.241	
249	M38	14in Dia. Duct	Sec 5 - max	0.007	5	0.136	4	0.041	9	0.237	7	0.091	8	0.080	8	0.090	7	530.767	3	0.138	3	0.001	0.011	0.004		0.237	
250	M38	14in Dia. Duct	Sec 5 - min	-0.007	4	0.084	5	-0.040	6	-0.091	8	-0.237	7	-0.090	7	-0.080	8	-530.444	2	-0.138	2	0.001	0.011	0.004		0.237	
237	M37	14in Dia. Duct	Sec 4 - max	0.000	9	0.136	4	0.043	8	0.157	9	0.241	6	0.066	8	0.076	7	514.798	3	0.134	3	0.000	0.011	0.003		0.241	
247	M38	14in Dia. Duct	Sec 4 - max	0.007	5	0.136	4	0.041	9	0.222	7	0.113	8	0.073	8	0.083	7	530.767	3	0.138	3	0.001	0.010	0.004		0.222	
248	M38	14in Dia. Duct	Sec 4 - min	-0.007	4	0.085	5	-0.041	6	-0.113	8	-0.222	7	-0.083	7	-0.073	6	-530.444	2	-0.138	2	0.001	0.010	0.004		0.222	

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_t/σ_t	f_{sy}/σ_s	f_{sz}/σ_s	D-2250	f_c (ksi)	D-2250
240	M37	14in Dia. Duct	Sec 5 - min	-0.019	6	0.089	5	-0.042	7	-0.192	6	-0.191	9	-0.091	7	-0.082	8	-511,230	2	-0.133	2	0.001	0.009	0.004		0.192	
245	M38	14in Dia. Duct	Sec 3 - max	0.007	5	0.137	4	0.042	9	0.208	7	0.135	8	0.067	8	0.076	7	530,767	3	0.138	3	0.001	0.009	0.003		0.208	
246	M38	14in Dia. Duct	Sec 3 - min	-0.007	4	0.086	5	-0.041	6	-0.135	8	-0.208	7	-0.076	7	-0.067	8	-530,444	2	-0.138	2	0.001	0.009	0.003		0.208	
333	M47	14in Dia. Duct	Sec 2 - max	0.022	4	0.030	2	0.027	5	0.122	3	0.122	2	0.069	4	0.135	5	43,397	2	0.011	2	0.002	0.005	0.006		0.135	
334	M47	14in Dia. Duct	Sec 2 - min	0.022	1	-0.030	3	-0.027	4	-0.122	2	-0.122	3	-0.135	5	-0.069	4	-43,397	3	-0.011	3	0.002	0.005	0.006		0.135	
285	M42	14in Dia. Duct	Sec 3 - max	0.038	7	-0.021	4	0.024	2	0.163	4	0.198	5	0.031	2	0.033	3	530,767	3	0.138	3	0.003	0.009	0.001		0.198	
286	M42	14in Dia. Duct	Sec 3 - min	-0.038	6	-0.072	5	-0.024	3	-0.198	5	-0.163	4	-0.033	3	-0.031	2	-530,444	2	-0.138	2	0.003	0.009	0.001		0.198	
239	M37	14in Dia. Duct	Sec 5 - max	0.000	9	0.135	4	0.042	8	0.191	9	0.192	6	0.082	8	0.091	7	514,706	3	0.134	3	0.000	0.009	0.004		0.192	
281	M42	14in Dia. Duct	Sec 1 - max	0.036	7	-0.014	4	0.021	7	0.186	4	0.105	5	0.031	8	0.034	7	530,767	3	0.138	3	0.003	0.008	0.002		0.186	
282	M42	14in Dia. Duct	Sec 1 - min	-0.036	6	-0.066	5	-0.020	8	-0.105	5	-0.186	4	-0.034	7	-0.031	8	-530,444	2	-0.138	2	0.003	0.008	0.002		0.186	
243	M38	14in Dia. Duct	Sec 2 - max	0.007	5	0.138	4	0.042	9	0.193	7	0.157	8	0.060	8	0.070	7	530,767	3	0.138	3	0.001	0.009	0.003		0.193	
244	M38	14in Dia. Duct	Sec 2 - min	-0.007	4	0.087	5	-0.041	6	-0.157	8	-0.193	7	-0.070	7	-0.060	8	-530,444	2	-0.138	2	0.001	0.009	0.003		0.193	
542	M68	20in Dia. CS Duct	Sec 1 - min	-0.062	7	0.026	7	-0.048	6	-0.144	8	0.040	7	-0.073	9	-0.073	6	0.001	7	0.000	7	0.004	0.005	0.003		0.144	
552	M69	20in Dia. CS Duct	Sec 1 - min	-0.062	6	0.026	6	-0.048	8	-0.144	9	0.040	6	-0.073	7	-0.073	8	-0.003	7	0.000	7	0.004	0.005	0.003		0.144	
283	M42	14in Dia. Duct	Sec 2 - max	0.037	7	-0.018	4	0.022	2	0.175	4	0.150	5	0.017	8	0.019	7	530,767	3	0.138	3	0.003	0.008	0.001		0.175	
284	M42	14in Dia. Duct	Sec 2 - min	-0.037	6	-0.069	5	-0.021	3	-0.150	5	-0.175	4	-0.019	7	-0.017	8	-530,444	2	-0.138	2	0.003	0.008	0.001		0.175	
241	M38	14in Dia. Duct	Sec 1 - max	0.007	5	0.139	4	0.042	9	0.179	7	0.179	8	0.053	8	0.063	7	530,767	3	0.138	3	0.001	0.008	0.003		0.179	
242	M38	14in Dia. Duct	Sec 1 - min	-0.007	4	0.087	5	-0.042	6	-0.179	8	-0.179	7	-0.063	7	-0.053	8	-530,444	2	-0.138	2	0.001	0.008	0.003		0.179	
335	M47	14in Dia. Duct	Sec 3 - max	0.018	4	0.025	2	0.022	5	0.082	3	0.082	2	0.034	4	0.100	5	43,397	2	0.011	2	0.001	0.004	0.004		0.100	
336	M47	14in Dia. Duct	Sec 3 - min	0.018	1	-0.025	3	-0.022	4	-0.082	2	-0.082	3	-0.100	5	-0.034	4	-43,397	3	-0.011	3	0.001	0.004	0.004		0.100	
541	M68	20in Dia. CS Duct	Sec 1 - max	-0.017	8	0.094	8	0.048	9	-0.040	7	0.144	8	0.073	8	0.073	9	0.004	8	0.000	8	0.001	0.005	0.003		0.144	
551	M69	20in Dia. CS Duct	Sec 1 - max	-0.017	9	0.094	9	0.048	7	-0.040	6	0.144	9	0.073	8	0.073	7	0.003	8	0.000	8	0.001	0.005	0.003		0.144	
544	M68	20in Dia. CS Duct	Sec 2 - min	-0.060	7	0.025	7	-0.046	6	-0.095	8	0.027	7	-0.048	9	-0.048	6	0.001	7	0.000	7	0.004	0.004	0.002		0.095	
554	M69	20in Dia. CS Duct	Sec 2 - min	-0.060	6	0.025	6	-0.046	8	-0.095	9	0.027	6	-0.048	7	-0.048	8	-0.003	7	0.000	7	0.004	0.004	0.002		0.095	
439	M57	20in Dia. CS Duct	Sec 5 - max	0.016	6	-0.017	6	0.031	8	-0.031	6	0.113	9	0.058	8	0.058	7	0.002	7	0.000	7	0.001	0.004	0.002		0.113	
479	M81	20in Dia. CS Duct	Sec 5 - max	0.015	7	-0.017	7	0.031	6	-0.031	7	0.113	8	0.058	6	0.058	9	-0.001	7	0.000	7	0.001	0.004	0.002		0.113	
440	M57	20in Dia. CS Duct	Sec 5 - min	0.004	9	-0.061	9	-0.031	7	-0.113	9	0.031	6	-0.058	7	-0.058	8	-0.002	8	0.000	8	0.000	0.004	0.002		0.113	
480	M81	20in Dia. CS Duct	Sec 5 - min	0.004	8	-0.061	8	-0.031	9	-0.113	8	0.031	7	-0.058	9	-0.058	6	-0.004	8	0.000	8	0.000	0.004	0.002		0.113	
337	M47	14in Dia. Duct	Sec 4 - max	0.015	4	0.020	2	0.017	5	0.049	3	0.049	2	0.005	4	0.071	5	43,397	2	0.011	2	0.001	0.002	0.003		0.071	
338	M47	14in Dia. Duct	Sec 4 - min	0.015	1	-0.020	3	-0.017	4	-0.049	2	-0.049	3	-0.071	5	-0.005	4	-43,397	3	-0.011	3	0.001	0.002	0.003		0.071	
543	M68	20in Dia. CS Duct	Sec 2 - max	-0.017	8	0.090	8	0.046	9	-0.027	7	0.095	8	0.048	6	0.048	9	0.004	8	0.000	8	0.001	0.004	0.002		0.095	
553	M69	20in Dia. CS Duct	Sec 2 - max	-0.017	9	0.090	9	0.046	7	-0.027	6	0.095	9	0.048	8	0.046	7	0.003	8	0.000	8	0.001	0.004	0.002		0.095	
548	M68	20in Dia. CS Duct	Sec 3 - min	-0.058	7	0.024	7	-0.044	6	-0.049	8	0.014	7	-0.025	9	-0.025	6	0.001	7	0.000	7	0.003	0.002	0.001		0.058	
558	M69	20in Dia. CS Duct	Sec 3 - min	-0.058	6	0.024	6	-0.044	8	-0.049	9	0.014	6	-0.025	7	-0.025	8	-0.003	7	0.000	7	0.003	0.002	0.001		0.058	
410	M54	20in Dia. CS Duct	Sec 5 - min	-0.024	6	0.005	6	-0.009	8	0.023	6	-0.083	9	-0.043	8	-0.043	7	-0.003	7	0.000	7	0.001	0.003	0.002		0.083	
450	M58	20in Dia. CS Duct	Sec 5 - min	-0.024	7	0.005	7	-0.009	6	0.023	7	-0.083	8	-0.043	6	-0.043	9	0.001	7	0.000	7	0.001	0.003	0.002		0.083	
408	M54	20in Dia. CS Duct	Sec 4 - min	-0.026	6	0.006	6	-0.011	8	0.020	6	-0.074	9	-0.038	8	-0.038	7	-0.003	7	0.000	7	0.002	0.003	0.001		0.074	
448	M58	20in Dia. CS Duct	Sec 4 - min	-0.026	7	0.006	7	-0.011	6	0.020	7	-0.074	8	-0.038	6	-0.038	9	0.001	7	0.000	7	0.002	0.003	0.001		0.074	
550	M68	20in Dia. CS Duct	Sec 5 - min	-0.054	7	0.022	7	-0.039	6	0.010	7	-0.037	8	-0.019	6	-0.019	9	0.001	7	0.000	7	0.003	0.001	0.001		0.054	
560	M69	20in Dia. CS Duct	Sec 5 - min	-0.054	6	0.022	6	-0.039	8	0.010	6	-0.037	9	-0.019	8	-0.019	7	-0.003	7	0.000	7	0.003	0.001	0.001		0.054	
406	M54	20in Dia. CS Duct	Sec 3 - min	-0.028	6	0.007	6	-0.013	8	0.017	6	-0.063	9	-0.033	8	-0.033	7	-0.003	7	0.000	7	0.002	0.002	0.001		0.063	
446	M58	20in Dia. CS Duct	Sec 3 - min	-0.028	7	0.007	7	-0.013	6	0.017	7	-0.063	8	-0.033	6	-0.033	9	0.001	7	0.000	7	0.002	0.002	0.001		0.063	
409	M54	20in Dia. CS Duct	Sec 5 - max	-0.007	9	0.018	9	0.009	7	0.083	9	-0.023	6	0.043	7	0.043	8	0.003	8	0.000	8	0.000	0.003	0.002		0.083	
449	M58	20in Dia. CS Duct	Sec 5 - max	-0.007	8	0.016	8	0.009	9	0.083	8	-0.023	7	0.043	9	0.043	6	0.004	8	0.000	8	0.000	0.003	0.002		0.083	
437	M57	20in Dia. CS Duct	Sec 4 - max	0.013	6	-0.016	6	0.029	8	-0.020	6	0.076	9	0.039	8	0.039	7	0.002	7	0.000	7	0.001	0.003	0.001		0.076	
477	M81	20in Dia. CS Duct	Sec 4 - max	0.013	7	-0.016	7	0.029	6	-0.020	7	0.076	8	0.039	6	0.039	9	-0.001	7	0.000	7	0.001	0.003	0.001		0.076	
412	M55	20in Dia. CS Duct	Sec 1 - min	-0.002	6	-0.027	9	-0.014	7	0.023	6	-0.083	9	-0.043	8	-0.043	7	-0.035	8	0.000	8	0.000	0.003	0.002		0.083	
452	M59	20in Dia. CS Duct	Sec 1 - min	-0.002	7	-0.027	8	-0.014	9	0.023	7	-0.083	8	-0.043	6	-0.043	9	-0.001	8	0.000	8	0.000	0.003	0.002		0.083	
411	M55	20in Dia. CS Duct	Sec 1 - max	0.000	9	-0.007	6	0.014	8	0.083	9	-0.023	6	0.043	7	0.043	8	0.035	7	0.000	7	0.000	0.003	0.002		0.083	
451	M59	20in Dia. CS Duct	Sec 1 - max	0.000	8	-0.007	7	0.014	6	0.083	8	-0.023	7	0.043	9	0.043	6	-0.017	7	0.000	7	0.000	0.003	0.002		0.083	
404	M54	20in Dia. CS Duct	Sec 2 - min	-0.030	6	0.008	6	-0.015	8	0.014	6	-0.051	9	-0.026	8	-0.026	7	-0.003	7	0.000	7	0.002	0.002	0.001		0.051	
444	M58	20in Dia. CS Duct	Sec 2 - min	-0.030	7	0.008	7	-0.015	6	0.014	7	-0.051	8	-0.026	6	-0.026	9	0.001	7	0.000	7	0.002	0.002	0.001		0.051	
407	M54	20in Dia. CS Duct	Sec 4 - max	-0.007	9	0.022	9	0.011	7	0.074	9	-0.020	6	0.038	7	0.038	8	0.003	8	0.000	8	0.000	0.003	0.001		0.074	
447	M68	20in Dia. CS Duct	Sec 4 - max	-0.007	8	0.022	8	0.011	9	0.074	8	-0.020	7	0.038	9	0.038	6	0.004	8	0.000	8	0.000	0.003	0.001		0.074	
414	M55	20in Dia. CS Duct	Sec 2 - min	-0.001	6	-0.028	9	-0.014	7	0.022	6	-0.080	9	-0.041	8	-0.041	7	-0.035	8	0.000	8	0.000	0.003	0.002		0.080	
454	M59	20in Dia. CS Duct	Sec 2 - min	-0.001	7	-0.028	8	-0.014	9	0.022	7	-0.080	8	-0.041	6	-0.041	9	-0.061	8	0.000	8	0.000	0.003	0.002		0.080	
438	M57	20in Dia. CS Duct	Sec 4 - min	0.004	9	-0.056	9	-0.029	7	-0.076	9	0.020	6	-0.039	7	-0.039	8	-0.002	8	0.000	8	0.000	0.003	0.001		0.076	
478	M61	20in Dia. CS Duct	Sec 4 - min	0.004	8	-0.056	8	-0.029	9	-0.076	8	0.020	7	-0.039	9	-0.039	6	-0.004	8	0.000	8	0.000	0.003	0.001		0.076	
413	M55	20in Dia. CS Duct	Sec 2 - max	0.000	9	-0.008	6	0.014	8	0.080	9	-0.022	6	0.041	7	0.041	8	0.035	7	0.000	7	0.000	0.003	0.002		0.080	
453	M59	20in Dia. CS Duct	Sec 2 - max	0.000	8	-0.008	7	0.014	6	0.080	8	-0.022	7	0.041	9	0.041	6	-0.017	7	0.000	7	0.000	0.003	0.002		0.080	
341	M48	14in Dia. Duct	Sec 1 - max	0.013	4	0.016	5	0.016	3	-0.017	4	0.050	5	0.027	2	0.027	3	31,986	2	0.008	2	0.001	0.002	0.001		0.050	
415	M55	20in Dia. CS Duct	Sec 3 - max	0.000	9	-0.008	6	0.015	8	0.077	9	-0.021	6	0.039	7	0.039	8	0.035	7	0.000	7	0.000	0.003	0.001		0.077	
416	M55	20in Dia. CS Duct	Sec 3 - min	0.000	6	-0.029	9	-0.015	7	0.021	6	-0.077	9	-0.039	8	-0.039	7	-0.035	8	0.000	8	0.000	0.003	0.001		0.077	
455	M59	20in Dia. CS Duct	Sec 3 - max	0.000	8	-0.008	7	0.015	6	0.077	8	-0.021	7	0.039	9	0.039	6	-0.017	7	0.000	7	0.000	0.003	0.001		0.077	
456	M59	20in Dia. CS Duct	Sec 3 - min	0.000	7	-0.029	8	-0.015	9	0.021	7	-0.077	8	-0.039	6	-0.039	9	-0.061	8	0.000	8	0.000	0.003	0.001		0.077	
342	M48	14in Dia. Duct	Sec 1 - min	0.010	5	-0.007	4	-0.016	2	-0.050	5	0.017	4	-0.027	3	-0.027	2	-31,986	3	-0.008	3	0.001	0.002	0.001		0.050	
457	M59	20in Dia. CS Duct	Sec 4 - max	0.000	8	-0.008	7	0.015	6	0.073	8	-0.020	7	0.037	9	0.038	6	-0.017	7	0.000	7	0.000	0.003	0.001		0.073	
458	M59	20in Dia. CS Duct	Sec 4 - min	0.000	7	-0.030	8	-0.015	9	0.020	7	-0.073	8	-0.036	6	-0.037	9	-0.061	8	0.000	8	0.000	0.003	0.001		0.073	
417	M55	20in Dia. CS Duct	Sec 4 - max	0.000	9	-0.008	8	0.015	8	0.073	9	-0.020	6	0.037	7	0.037	8	0.035	7	0.000	7	0.000	0.003	0.001		0.073	
418	M55	20in Dia. CS Duct	Sec 4 - min	0.000	6	-0.030	9	-0.015	7	0.020	6	-0.073	9	-0.037	8	-0.037	7	-0.035	8	0.000	8	0.000	0.003	0.001		0.073	
339	M47	14in Dia. Duct	Sec 5 - max	0.011	4	0.018	2	0.013	5	0.023	3	0.023	2	-0.017	4	0.050	5	43,397	2	0.011	2	0.001	0.001	0.002		0.050	
340	M47	14in Dia. Duct	Sec 5 - min	0.011	1	-0.016	3	-0.013	4	-0.023	2	-0.023	3	-0.050	5	0.017	4	-43,397	3	-0.011	3	0.001	0.001	0.002		0.050	
405	M54	20in Dia. CS Duct	Sec 3 - max	-0.008	8	0.025	9	0.013	7	0.063	9	-0.017	6	0.033	7	0.033	8	0.003	8	0.000	8	0.000	0.002	0.001		0.063	
445	M58	20in Dia. CS Duct	Sec 3 - max	-0.008	8	0.025	8	0.013	9	0.063	8	-0.017	7	0.033	9	0.033	6	0.004	8	0.000	8	0.000	0.002	0.001		0.063	
343	M48	14in Dia. Duct	Sec 2 - max	0.012	4	0.016	5	0.015	3	-0.018	4	0.046	5	0.024	2	0.024	3	31,986	2	0.008	2	0.001	0.002	0.001		0.046	
402	M54	20in Dia. CS Duct	Sec 1 - min	-0.032	6	0.009	6	-0.016	8	0.010	6	-0.037	9	-0.019	8	-0.019	7	-0.003	7	0.000	7	0.002	0.001	0.001		0.037	
442	M58	20in Dia. CS Duct	Sec 1 - min	-0.032	7	0.009	7	-0.016	6	0.010	7	-0.037	8	-0.019	6	-0.019	9	0.001	7	0.000	7	0.002	0.001	0.001		0.037	

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_c	f_{sy}/σ_a	f_{sz}/σ_a	D-2250		f_c (ksi)	D-2270
419	M55	20in Dia. CS Duct	Sec 5 - max	0.000	6	-0.008	6	0.016	8	0.070	9	-0.019	6	0.036	7	0.036	8	0.035	7	0.000	7	0.000	0.003	0.001			0.070	
420	M55	20in Dia. CS Duct	Sec 5 - min	0.000	9	-0.031	9	-0.016	7	0.019	6	-0.070	9	-0.036	8	-0.036	7	-0.035	8	0.000	8	0.000	0.003	0.001			0.070	
421	M56	20in Dia. CS Duct	Sec 1 - max	0.000	1	-0.008	6	0.016	8	0.070	9	-0.019	6	0.036	7	0.036	8	0.001	7	0.000	7	0.000	0.003	0.001			0.070	
422	M56	20in Dia. CS Duct	Sec 1- min	0.000	1	-0.031	9	-0.016	7	0.019	6	-0.070	9	-0.036	8	-0.036	7	-0.001	8	0.000	8	0.000	0.003	0.001			0.070	
459	M59	20in Dia. CS Duct	Sec 5 - max	0.000	6	-0.008	7	0.016	6	0.070	8	-0.019	7	0.036	9	0.036	6	-0.017	7	0.000	7	0.000	0.003	0.001			0.070	
460	M59	20in Dia. CS Duct	Sec 5 - min	0.000	9	-0.031	8	-0.016	9	0.019	7	-0.070	8	-0.036	6	-0.036	8	-0.061	8	0.000	8	0.000	0.003	0.001			0.070	
461	M60	20in Dia. CS Duct	Sec 1 - max	0.000	1	-0.008	7	0.016	6	0.070	8	-0.019	7	0.036	9	0.036	6	-0.002	7	0.000	7	0.000	0.003	0.001			0.070	
462	M60	20in Dia. CS Duct	Sec 1- min	0.000	1	-0.031	8	-0.016	9	0.019	7	-0.070	8	-0.036	6	-0.036	9	-0.007	8	0.000	8	0.000	0.003	0.001			0.070	
344	M48	14in Dia. Duct	Sec 2 - min	0.009	5	-0.006	4	-0.015	2	-0.046	5	0.018	4	-0.024	3	-0.024	2	-31.986	3	-0.008	3	0.001	0.002	0.001			0.046	
545	M68	20in Dia. CS Duct	Sec 3 - max	-0.016	8	0.086	8	0.044	9	-0.014	7	0.049	6	0.025	6	0.025	9	0.004	8	0.000	8	0.001	0.002	0.001			0.049	
555	M69	20in Dia. CS Duct	Sec 3 - max	-0.016	8	0.086	9	0.044	7	-0.014	8	0.049	9	0.025	8	0.025	7	0.003	8	0.000	8	0.001	0.002	0.001			0.049	
759	M90	16in Dia. Duct	Sec 5 - max	0.005	7	-0.027	1	0.018	2	-0.043	1	0.043	1	0.029	2	0.029	3	0.000	1	0.000	1	0.000	0.002	0.001			0.043	
780	M90	16in Dia. Duct	Sec 5 - min	-0.005	8	-0.027	1	-0.018	3	-0.043	1	0.043	1	-0.029	3	-0.029	2	0.000	1	0.000	1	0.000	0.002	0.001			0.043	
548	M68	20in Dia. CS Duct	Sec 4 - min	-0.056	7	0.023	7	-0.042	6	-0.005	8	0.002	7	-0.002	9	-0.002	6	0.001	7	0.000	7	0.003	0.000	0.000			0.058	
558	M69	20in Dia. CS Duct	Sec 4 - min	-0.056	6	0.023	6	-0.042	8	-0.005	9	0.002	6	-0.002	7	-0.002	8	-0.003	7	0.000	7	0.003	0.000	0.000			0.056	
345	M48	14in Dia. Duct	Sec 3 - max	0.011	4	0.015	5	0.014	3	-0.020	4	0.042	5	0.020	2	0.020	3	31.986	2	0.008	2	0.001	0.002	0.001			0.042	
346	M48	14in Dia. Duct	Sec 3 - min	0.009	5	-0.006	4	-0.014	2	-0.042	5	0.020	4	-0.020	3	-0.020	2	-31.986	3	-0.008	3	0.001	0.002	0.001			0.042	
403	M54	20in Dia. CS Duct	Sec 2 - max	-0.008	9	0.029	9	0.015	7	0.051	9	-0.014	6	0.026	7	0.026	8	0.003	8	0.000	8	0.000	0.002	0.001			0.051	
443	M58	20in Dia. CS Duct	Sec 2 - max	-0.008	8	0.029	8	0.015	9	0.051	8	-0.014	7	0.026	9	0.026	6	0.004	8	0.000	8	0.000	0.002	0.001			0.051	
423	M56	20in Dia. CS Duct	Sec 2 - max	0.001	6	-0.009	6	0.017	8	0.058	9	-0.016	6	0.030	7	0.030	8	0.001	7	0.000	7	0.000	0.002	0.001			0.058	
463	M60	20in Dia. CS Duct	Sec 2 - max	0.001	7	-0.009	7	0.017	6	0.058	8	-0.016	7	0.030	9	0.030	6	-0.002	7	0.000	7	0.000	0.002	0.001			0.058	
424	M56	20in Dia. CS Duct	Sec 2 - min	0.000	9	-0.033	9	-0.017	7	0.016	6	-0.058	9	-0.030	8	-0.030	7	-0.001	8	0.000	8	0.000	0.002	0.001			0.058	
464	M60	20in Dia. CS Duct	Sec 2 - min	0.000	8	-0.033	8	-0.017	9	0.016	7	-0.058	8	-0.030	6	-0.030	9	-0.007	8	0.000	8	0.000	0.002	0.001			0.058	
347	M48	14in Dia. Duct	Sec 4 - max	0.011	4	0.014	5	0.013	3	-0.021	4	0.038	5	0.017	2	0.017	3	31.986	2	0.008	2	0.001	0.002	0.001			0.038	
351	M49	14in Dia. Duct	Sec 1 - max	0.010	4	0.019	5	0.013	3	-0.022	4	0.035	5	0.020	2	0.020	3	16.326	2	0.004	2	0.001	0.002	0.001			0.035	
348	M48	14in Dia. Duct	Sec 4 - min	0.008	5	-0.005	4	-0.013	2	-0.036	5	0.021	4	-0.017	3	-0.017	2	-31.986	3	-0.008	3	0.001	0.002	0.001			0.038	
549	M68	20in Dia. CS Duct	Sec 5 - max	-0.015	6	0.077	8	0.039	9	0.037	8	-0.010	7	0.019	9	0.019	6	0.004	8	0.000	8	0.001	0.001	0.001			0.037	
559	M69	20in Dia. CS Duct	Sec 5 - max	-0.016	9	0.077	9	0.039	7	0.037	9	-0.010	6	0.019	7	0.019	8	0.003	8	0.000	8	0.001	0.001	0.001			0.037	
349	M48	14in Dia. Duct	Sec 5 - max	0.010	4	0.013	5	0.013	3	-0.022	4	0.035	5	0.014	2	0.014	3	31.986	2	0.008	2	0.001	0.002	0.001			0.035	
435	M57	20in Dia. CS Duct	Sec 3 - max	0.010	6	-0.014	6	0.028	8	-0.011	6	0.041	9	0.021	8	0.021	7	0.002	7	0.000	7	0.001	0.002	0.001			0.041	
475	M61	20in Dia. CS Duct	Sec 3 - max	0.010	7	-0.014	7	0.028	6	-0.011	7	0.041	8	0.021	6	0.021	9	-0.001	7	0.000	7	0.001	0.002	0.001			0.041	
350	M48	14in Dia. Duct	Sec 5 - min	0.008	5	-0.005	4	-0.013	2	-0.035	5	0.022	4	-0.014	3	-0.014	2	-31.986	3	-0.008	3	0.001	0.002	0.001			0.035	
353	M49	14in Dia. Duct	Sec 2 - max	0.009	4	0.018	5	0.012	3	-0.021	4	0.030	5	0.017	2	0.017	3	16.326	2	0.004	2	0.001	0.001	0.001			0.030	
352	M49	14in Dia. Duct	Sec 1- min	0.004	5	0.005	4	-0.013	2	-0.035	5	0.022	4	-0.020	3	-0.020	2	-16.326	3	-0.004	3	0.000	0.002	0.001			0.035	
425	M56	20in Dia. CS Duct	Sec 3 - max	0.003	6	-0.010	6	0.019	8	0.046	9	-0.013	6	0.023	7	0.023	8	0.001	7	0.000	7	0.000	0.002	0.001			0.046	
465	M60	20in Dia. CS Duct	Sec 3 - max	0.003	7	-0.010	7	0.019	6	0.046	8	-0.013	7	0.023	9	0.023	6	-0.002	7	0.000	7	0.000	0.002	0.001			0.046	
721	M87	16in Dia. Duct	Sec 1 - max	0.004	6	0.022	1	0.015	3	-0.033	1	0.033	1	0.022	2	0.022	3	0.000	1	0.000	1	0.000	0.001	0.001			0.033	
722	M87	16in Dia. Duct	Sec 1- min	-0.004	7	0.022	1	-0.015	2	-0.033	1	0.033	1	-0.022	3	-0.022	2	0.000	1	0.000	1	0.000	0.001	0.001			0.033	
731	M88	16in Dia. Duct	Sec 1 - max	0.004	6	0.022	1	0.015	3	-0.033	1	0.033	1	0.022	2	0.022	3	0.000	1	0.000	1	0.000	0.001	0.001			0.033	
732	M88	16in Dia. Duct	Sec 1- min	-0.004	7	0.022	1	-0.015	2	-0.033	1	0.033	1	-0.022	3	-0.022	2	0.000	1	0.000	1	0.000	0.001	0.001			0.033	
401	M54	20in Dia. CS Duct	Sec 1 - max	-0.009	9	0.032	9	0.016	7	0.037	9	-0.010	6	0.019	7	0.019	8	0.003	8	0.000	8	0.001	0.001	0.001			0.037	
441	M58	20in Dia. CS Duct	Sec 1 - max	-0.009	8	0.032	6	0.016	9	0.037	8	-0.010	7	0.019	9	0.019	6	0.004	8	0.000	8	0.001	0.001	0.001			0.037	
426	M56	20in Dia. CS Duct	Sec 3 - min	0.000	9	-0.036	9	-0.019	7	0.013	6	-0.046	9	-0.023	8	-0.023	7	-0.001	8	0.000	8	0.000	0.002	0.001			0.046	
466	M60	20in Dia. CS Duct	Sec 3 - min	0.000	8	-0.036	8	-0.019	9	0.013	7	-0.046	8	-0.023	6	-0.023	9	-0.007	8	0.000	8	0.000	0.002	0.001			0.046	
436	M57	20in Dia. CS Duct	Sec 3 - min	0.003	9	-0.052	9	-0.026	7	-0.041	9	0.011	8	-0.021	7	-0.021	8	-0.002	8	0.000	8	0.000	0.002	0.001			0.041	
476	M61	20in Dia. CS Duct	Sec 3 - min	0.003	8	-0.052	8	-0.026	9	-0.041	8	0.011	7	-0.021	9	-0.021	6	-0.004	8	0.000	8	0.000	0.002	0.001			0.041	
355	M49	14in Dia. Duct	Sec 3 - max	0.009	4	0.016	5	0.011	3	-0.020	4	0.026	5	0.014	2	0.014	3	16.326	2	0.004	2	0.001	0.001	0.001			0.026	
354	M49	14in Dia. Duct	Sec 2 - min	0.004	5	0.005	4	-0.012	2	-0.030	5	0.021	4	-0.017	3	-0.017	2	-16.326	3	-0.004	3	0.000	0.001	0.001			0.030	
357	M49	14in Dia. Duct	Sec 4 - max	0.008	4	0.015	5	0.010	3	-0.019	6	0.023	7	0.012	2	0.012	3	16.326	2	0.004	2	0.001	0.001	0.001			0.023	
356	M49	14in Dia. Duct	Sec 3 - min	0.004	6	0.004	4	-0.011	2	-0.026	5	0.020	4	-0.014	3	-0.014	2	-16.326	3	-0.004	3	0.000	0.001	0.001			0.026	
427	M56	20in Dia. CS Duct	Sec 4 - max	0.004	6	-0.011	6	0.020	8	0.032	9	-0.009	6	0.016	7	0.016	8	0.001	7	0.000	7	0.000	0.001	0.001			0.032	
467	M60	20in Dia. CS Duct	Sec 4 - max	0.004	7	-0.011	7	0.020	6	0.032	8	-0.009	7	0.016	9	0.016	6	-0.002	7	0.000	7	0.000	0.001	0.001			0.032	
757	M90	16in Dia. Duct	Sec 4 - max	0.004	7	-0.022	1	0.015	2	-0.021	1	0.021	1	0.015	2	0.015	3	0.000	1	0.000	1	0.000	0.001	0.001			0.021	
758	M90	16in Dia. Duct	Sec 4 - min	-0.004	6	-0.022	1	-0.015	3	-0.021	1	0.021	1	-0.015	3	-0.015	2	0.000	1	0.000	1	0.000	0.001	0.001			0.021	
361	M50	14in Dia. Duct	Sec 1 - max	0.006	4	0.015	5	0.009	3	-0.018	8	0.020	7	0.012	2	0.012	3	6.236	2	0.002	2	0.000	0.001	0.001			0.020	
359	M49	14in Dia. Duct	Sec 5 - max	0.007	4	0.014	5	0.009	3	-0.018	6	0.020	7	0.010	2	0.010	3	16.326	2	0.004	2	0.001	0.001	0.000			0.020	
428	M56	20in Dia. CS Duct	Sec 4 - min	0.001	9	-0.039	9	-0.020	7	0.009	6	-0.032	9	-0.016	8	-0.016	7	-0.001	8	0.000	8	0.000	0.001	0.001			0.032	
468	M60	20in Dia. CS Duct	Sec 4 - min	0.001	8	-0.039	8	-0.020	9	0.009	7	-0.032	8	-0.016	6	-0.016	9	-0.007	8	0.000	8	0.000	0.001	0.001			0.032	
358	M49	14in Dia. Duct	Sec 4 - min	0.003	5	0.004	4	-0.010	2	-0.023	7	0.019	6	-0.012	3	-0.012	2	-16.326	3	-0.004	3	0.000	0.001	0.001			0.023	
741	M89	16in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.022	1	-0.022	1	0.015	3	0.015	2	0.000	1	0.000	1	0.000	0.001	0.001			0.022	
742	M89	16in Dia. Duct	Sec 1- min	0.000	1	0.000	1	0.000	1	0.022	1	-0.022	1	-0.015	2	-0.015	3	0.000	1	0.000	1	0.000	0.001	0.001			0.022	
743	M89	16in Dia. Duct	Sec 2 - max	0.000	7	-0.002	1	0.001	2	0.021	1	-0.021	1	0.014	3	0.014	2	0.000	1	0.000	1	0.000	0.001	0.001			0.021	
744	M89	16in Dia. Duct	Sec 2 - min	0.000	6	-0.002	1	-0.001	3	0.021	1	-0.021	1	-0.014	2	-0.014	3	0.000	1	0.000	1	0.000	0.001	0.001			0.021	
360	M49	14in Dia. Duct	Sec 5 - min	0.003	5	0.004	4	-0.009	2	-0.020	7	0.018	6	-0.010	3	-0.010	2	-16.326	3	-0.004	3	0.000	0.001	0.000			0.020	
363	M50	14in Dia. Duct	Sec 2 - max	0.005	4	0.014	5	0.009	3	-0.015	8	0.016	7	0.010	2	0.010	3	6.236	2	0.002	2	0.000	0.001	0.000			0.016	
745	M89	16in Dia. Duct	Sec 3 - max	0.000	7	-0.004	1	0.002	2	0.020	1	-0.020	1	0.014	3	0.014	2	0.000	1	0.000	1	0.000	0.001	0.001			0.020	
746	M89	16in Dia. Duct	Sec 3 - min	0.000	6	-0.004	1	-0.002	3	0.020	1	-0.020	1	-0.014	2	-0.014	3	0.000	1	0.000	1	0.000	0.001	0.001			0.020	
747	M89	16in Dia. Duct	Sec 4 - max	0.001	7	-0.005	1	0.004	2	0.019	1	-0.019	1	0.013	3	0.013	2	0.000	1	0.000	1	0.000	0.001	0.001			0.019	
748	M89	16in Dia. Duct	Sec 4 - min	-0.001	6	-0.005	1	-0.004	3	0.019	1	-0.019	1	-0.013	2	-0.013	3	0.000	1	0.000	1	0.000	0.001	0.001			0.019	
362	M50	14in Dia. Duct	Sec 1 - min	0.000	5	0.010	4	-0.009	2	-0.020	7	0.018	8	-0.012	3	-0.012	2	-6.236	3	-0.002	3	0.000	0.001	0.001			0.020	
749	M89	16in Dia. Duct	Sec 5 - max	0.001	7	-0.007	1	0.005	2	0.017	1	-0.017	1	0.012	3	0.012	2	0.000	1	0.000	1	0.000	0.001	0.001			0.017	
750	M89	16in Dia. Duct	Sec 5 - min	-0.001	6	-0.007	1	-0.005	3	0.017	1	-0.017	1	-0.012	2	-0.012	3	0.000	1	0.000	1	0.000	0.001	0.001			0.017	
751	M90	16in Dia. Duct	Sec 1 - max	0.001	7	-0.007	1	0.005	2	0.017	1	-0.017	1	0.012	3	0.012	2	0.000	1	0.000	1	0.000	0.001	0.001			0.017	
752	M90	16in Dia. Duct	Sec 1 - min	-0.001	6	-0.007	1	-0.005	3	0.017	1	-0.017	1	-0.012	2	-0.012	3	0.000	1	0.000	1	0.000	0.001	0.001			0.017	
429	M56	20in Dia. CS Duct	Sec 5 - max	0.006	6	-0.011	6	0.021	8	0.018	9	-0.005	6	0.009	7	0.009	8	0.001	7	0.000	7	0.000	0.001	0.000			0.018	
431	M57	20in Dia. CS Duct	Sec 1 - max	0.006	6	-0.011	6	0.021	8	0.018	9	-0.005	6	0.009	7	0.009	8	0.002	7	0.000	7	0.000	0.001	0.000			0.018	
469	M60	20in Dia. CS Duct	Sec 5 - max	0.006	7	-0.011	7	0.021	6	0.018	8	-0.005	7	0.009	9	0.009	6	-0.002	7	0.000	7	0.000	0.001	0.000			0.018	

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	D-2250 f_{sy}/σ_a	f_{sz}/σ_a		f_s (ksi)	
471	M81	20in Dia. CS Duct	Sec 1 - max	0.006	7	-0.011	7	0.021	6	0.018	8	-0.005	7	0.009	9	0.009	6	-0.001	7	0.000	7	0.000	0.001	0.000		0.018	
365	M50	14in Dia. Duct	Sec 3 - max	0.004	4	0.012	5	0.008	3	-0.013	5	0.013	4	0.008	2	0.008	3	6.236	2	0.002	2	0.000	0.001	0.000		0.013	
547	M68	20in Dia. CS Duct	Sec 4 - max	-0.018	8	0.082	8	0.042	9	-0.002	7	0.005	8	0.002	6	0.002	9	0.004	8	0.000	8	0.001	0.000	0.000		0.016	
557	M69	20in Dia. CS Duct	Sec 4 - max	-0.016	9	0.082	9	0.042	7	-0.002	6	0.005	9	0.002	8	0.002	7	0.003	8	0.000	8	0.001	0.000	0.000		0.016	
723	M87	16in Dia. Duct	Sec 2 - max	0.003	6	0.017	1	0.011	3	-0.013	1	0.013	1	0.009	2	0.009	3	0.000	1	0.000	1	0.000	0.001	0.000		0.013	
724	M87	16in Dia. Duct	Sec 2 - min	-0.003	7	0.017	1	-0.011	2	-0.013	1	0.013	1	-0.009	3	-0.009	2	0.000	1	0.000	1	0.000	0.001	0.000		0.013	
733	M88	16in Dia. Duct	Sec 2 - max	0.003	6	0.017	1	0.011	3	-0.013	1	0.013	1	0.009	2	0.009	3	0.000	1	0.000	1	0.000	0.001	0.000		0.013	
734	M88	16in Dia. Duct	Sec 2 - min	-0.003	7	0.017	1	-0.011	2	-0.013	1	0.013	1	-0.009	3	-0.009	2	0.000	1	0.000	1	0.000	0.001	0.000		0.013	
364	M50	14in Dia. Duct	Sec 2 - min	0.000	5	0.010	4	-0.008	2	-0.016	7	0.015	8	-0.010	3	-0.010	2	-6.236	3	-0.002	3	0.000	0.001	0.000		0.016	
430	M56	20in Dia. CS Duct	Sec 5 - min	0.002	9	-0.042	9	-0.021	7	0.005	6	-0.018	9	-0.009	8	-0.009	7	-0.001	8	0.000	8	0.000	0.001	0.000		0.018	
432	M57	20in Dia. CS Duct	Sec 1 - min	0.002	9	-0.042	9	-0.021	7	0.005	8	-0.018	9	-0.009	8	-0.009	7	-0.002	8	0.000	8	0.000	0.001	0.000		0.018	
470	M60	20in Dia. CS Duct	Sec 5 - min	0.002	8	-0.042	8	-0.021	9	0.005	7	-0.018	8	-0.009	6	-0.009	9	-0.007	8	0.000	8	0.000	0.001	0.000		0.018	
472	M61	20in Dia. CS Duct	Sec 1 - min	0.002	8	-0.042	8	-0.021	9	0.005	7	-0.018	8	-0.009	6	-0.009	9	-0.004	8	0.000	8	0.000	0.001	0.000		0.018	
367	M50	14in Dia. Duct	Sec 4 - max	0.004	8	0.011	9	0.007	3	-0.010	5	0.011	4	0.006	2	0.006	3	6.236	2	0.002	2	0.000	0.000	0.000		0.011	
433	M57	20in Dia. CS Duct	Sec 2 - max	0.006	6	-0.013	6	0.024	8	-0.002	6	0.010	9	0.005	8	0.005	7	0.002	7	0.000	7	0.000	0.000	0.000		0.010	
473	M61	20in Dia. CS Duct	Sec 2 - max	0.008	7	-0.013	7	0.024	6	-0.002	7	0.010	8	0.005	6	0.005	9	-0.001	7	0.000	7	0.000	0.000	0.000		0.010	
368	M50	14in Dia. Duct	Sec 3 - min	0.000	5	0.009	4	-0.008	2	-0.013	4	0.013	5	-0.008	3	-0.008	2	-6.236	3	-0.002	3	0.000	0.001	0.000		0.013	
701	M84	16in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.011	1	-0.011	1	0.008	3	0.008	2	0.000	1	0.000	1	0.000	0.000	0.000		0.011	
702	M84	16in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.011	1	-0.011	1	-0.008	2	-0.008	3	0.000	1	0.000	1	0.000	0.000	0.000		0.011	
703	M84	16in Dia. Duct	Sec 2 - max	0.000	7	-0.002	1	0.001	2	0.011	1	-0.011	1	0.008	3	0.008	2	0.000	1	0.000	1	0.000	0.000	0.000		0.011	
704	M84	16in Dia. Duct	Sec 2 - min	0.000	6	-0.002	1	-0.001	3	0.011	1	-0.011	1	-0.008	2	-0.008	3	0.000	1	0.000	1	0.000	0.000	0.000		0.011	
711	M85	16in Dia. Duct	Sec 1 - max	0.000	1	0.000	1	0.000	1	0.011	1	-0.011	1	0.008	3	0.008	2	0.000	1	0.000	1	0.000	0.000	0.000		0.011	
712	M85	16in Dia. Duct	Sec 1 - min	0.000	1	0.000	1	0.000	1	0.011	1	-0.011	1	-0.008	2	-0.008	3	0.000	1	0.000	1	0.000	0.000	0.000		0.011	
713	M85	16in Dia. Duct	Sec 2 - max	0.000	7	-0.002	1	0.001	2	0.011	1	-0.011	1	0.008	3	0.008	2	0.000	1	0.000	1	0.000	0.000	0.000		0.011	
714	M85	16in Dia. Duct	Sec 2 - min	0.000	6	-0.002	1	-0.001	3	0.011	1	-0.011	1	-0.008	2	-0.008	3	0.000	1	0.000	1	0.000	0.000	0.000		0.011	
729	M87	16in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.011	1	-0.011	1	0.008	3	0.008	2	0.000	1	0.000	1	0.000	0.000	0.000		0.011	
730	M87	16in Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.011	1	-0.011	1	-0.008	2	-0.008	3	0.000	1	0.000	1	0.000	0.000	0.000		0.011	
739	M88	16in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.011	1	-0.011	1	0.008	3	0.008	2	0.000	1	0.000	1	0.000	0.000	0.000		0.011	
740	M88	16in Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.011	1	-0.011	1	-0.008	2	-0.008	3	0.000	1	0.000	1	0.000	0.000	0.000		0.011	
369	M50	14in Dia. Duct	Sec 5 - max	0.003	8	0.010	9	0.006	3	-0.007	5	0.009	4	0.005	2	0.005	3	6.236	2	0.002	2	0.000	0.000	0.000		0.009	
372	M51	14in Dia. Duct	Sec 1 - min	-0.002	9	0.009	7	-0.006	2	-0.009	4	0.007	5	-0.006	3	-0.006	2	-1.304	3	0.000	3	0.000	0.000	0.000		0.009	
753	M90	16in Dia. Duct	Sec 2 - max	0.002	7	-0.012	1	0.008	2	0.009	1	-0.009	1	0.006	3	0.006	2	0.000	1	0.000	1	0.000	0.000	0.000		0.009	
754	M90	16in Dia. Duct	Sec 2 - min	-0.002	6	-0.012	1	-0.008	3	0.009	1	-0.009	1	-0.006	2	-0.006	3	0.000	1	0.000	1	0.000	0.000	0.000		0.009	
368	M50	14in Dia. Duct	Sec 4 - min	0.000	9	0.008	6	-0.007	2	-0.011	4	0.010	5	-0.006	3	-0.006	2	-6.236	3	-0.002	3	0.000	0.000	0.000		0.011	
705	M84	16in Dia. Duct	Sec 3 - max	0.000	7	-0.004	1	0.002	2	0.010	1	-0.010	1	0.007	3	0.007	2	0.000	1	0.000	1	0.000	0.000	0.000		0.010	
706	M84	16in Dia. Duct	Sec 3 - min	0.000	6	-0.004	1	-0.002	3	0.010	1	-0.010	1	-0.007	2	-0.007	3	0.000	1	0.000	1	0.000	0.000	0.000		0.010	
716	M85	16in Dia. Duct	Sec 3 - max	0.000	7	-0.004	1	0.002	2	0.010	1	-0.010	1	0.007	3	0.007	2	0.000	1	0.000	1	0.000	0.000	0.000		0.010	
716	M85	16in Dia. Duct	Sec 3 - min	0.000	6	-0.004	1	-0.002	3	0.010	1	-0.010	1	-0.007	2	-0.007	3	0.000	1	0.000	1	0.000	0.000	0.000		0.010	
371	M51	14in Dia. Duct	Sec 1 - max	0.001	6	0.009	6	0.006	3	-0.007	5	0.009	4	0.006	2	0.006	3	1.304	2	0.000	2	0.000	0.000	0.000		0.009	
707	M84	16in Dia. Duct	Sec 4 - max	0.001	7	-0.005	1	0.004	2	0.009	1	-0.009	1	0.006	3	0.006	2	0.000	1	0.000	1	0.000	0.000	0.000		0.009	
708	M84	16in Dia. Duct	Sec 4 - min	-0.001	8	-0.005	1	-0.004	3	0.009	1	-0.009	1	-0.006	2	-0.006	3	0.000	1	0.000	1	0.000	0.000	0.000		0.009	
717	M85	16in Dia. Duct	Sec 4 - max	0.001	7	-0.005	1	0.004	2	0.009	1	-0.009	1	0.006	3	0.006	2	0.000	1	0.000	1	0.000	0.000	0.000		0.009	
718	M85	16in Dia. Duct	Sec 4 - min	-0.001	8	-0.005	1	-0.004	3	0.009	1	-0.009	1	-0.006	2	-0.006	3	0.000	1	0.000	1	0.000	0.000	0.000		0.009	
727	M87	16in Dia. Duct	Sec 4 - max	0.001	6	0.006	1	0.004	3	0.009	1	-0.009	1	0.006	3	0.006	2	0.000	1	0.000	1	0.000	0.000	0.000		0.009	
728	M87	16in Dia. Duct	Sec 4 - min	-0.001	7	0.006	1	-0.004	2	0.009	1	-0.009	1	-0.006	2	-0.006	3	0.000	1	0.000	1	0.000	0.000	0.000		0.009	
737	M88	16in Dia. Duct	Sec 4 - max	0.001	6	0.006	1	0.004	3	0.009	1	-0.009	1	0.006	3	0.006	2	0.000	1	0.000	1	0.000	0.000	0.000		0.009	
738	M88	16in Dia. Duct	Sec 4 - min	-0.001	7	0.006	1	-0.004	2	0.009	1	-0.009	1	-0.006	2	-0.006	3	0.000	1	0.000	1	0.000	0.000	0.000		0.009	
434	M57	20in Dia. CS Duct	Sec 2 - min	0.002	9	-0.047	9	-0.024	7	-0.010	9	0.002	6	-0.005	7	-0.005	8	-0.002	8	0.000	6	0.000	0.000	0.000		0.010	
474	M61	20in Dia. CS Duct	Sec 2 - min	0.002	8	-0.047	8	-0.024	9	-0.010	8	0.002	7	-0.005	9	-0.005	6	-0.004	8	0.000	8	0.000	0.000	0.000		0.010	
374	M61	14in Dia. Duct	Sec 2 - min	-0.002	9	0.008	7	-0.005	2	-0.007	4	0.005	5	-0.004	3	-0.004	2	-1.304	3	0.000	3	0.000	0.000	0.000		0.007	
370	M50	14in Dia. Duct	Sec 5 - min	0.000	9	0.007	6	-0.006	2	-0.009	4	0.007	5	-0.005	3	-0.005	2	-6.236	3	-0.002	3	0.000	0.000	0.000		0.009	
709	M84	16in Dia. Duct	Sec 5 - max	0.001	7	-0.007	1	0.005	2	0.007	1	-0.007	1	0.005	3	0.005	2	0.000	1	0.000	1	0.000	0.000	0.000		0.007	
710	M84	16in Dia. Duct	Sec 5 - min	-0.001	8	-0.007	1	-0.005	3	0.007	1	-0.007	1	-0.005	2	-0.005	3	0.000	1	0.000	1	0.000	0.000	0.000		0.007	
719	M85	16in Dia. Duct	Sec 5 - max	0.001	7	-0.007	1	0.005	2	0.007	1	-0.007	1	0.005	3	0.005	2	0.000	1	0.000	1	0.000	0.000	0.000		0.007	
720	M85	16in Dia. Duct	Sec 5 - min	-0.001	8	-0.007	1	-0.005	3	0.007	1	-0.007	1	-0.005	2	-0.005	3	0.000	1	0.000	1	0.000	0.000	0.000		0.007	
373	M51	14in Dia. Duct	Sec 2 - max	0.001	6	0.008	6	0.005	3	-0.005	5	0.007	4	0.004	2	0.004	3	1.304	2	0.000	2	0.000	0.000	0.000		0.007	
765	M90	16in Dia. Duct	Sec 3 - max	0.003	7	-0.017	1	0.011	2	-0.004	1	0.004	1	0.003	2	0.003	3	0.000	1	0.000	1	0.000	0.000	0.000		0.004	
766	M90	16in Dia. Duct	Sec 3 - min	-0.003	6	-0.017	1	-0.011	3	-0.004	1	0.004	1	-0.003	3	-0.003	2	0.000	1	0.000	1	0.000	0.000	0.000		0.004	
378	M51	14in Dia. Duct	Sec 3 - min	-0.002	5	0.007	5	-0.005	2	-0.005	4	0.004	5	-0.003	3	-0.003	2	-1.304	3	0.000	3	0.000	0.000	0.000		0.005	
375	M51	14in Dia. Duct	Sec 3 - max	0.001	4	0.007	4	0.005	3	-0.004	5	0.005	4	0.003	2	0.003	3	1.304	2	0.000	2	0.000	0.000	0.000		0.005	
376	M51	14in Dia. Duct	Sec 4 - min	-0.002	5	0.005	5	-0.004	2	-0.004	4	0.002	5	-0.002	3	-0.002	2	-1.304	3	0.000	3	0.000	0.000	0.000		0.004	
382	M52	14in Dia. Duct	Sec 1 - min	-0.003	5	0.002	5	-0.003	2	-0.003	4	0.001	5	-0.001	3	-0.001	2	0.000	1	0.000	1	0.000	0.000	0.000		0.003	
377	M51	14in Dia. Duct	Sec 4 - max	0.001	4	0.006	4	0.004	3	-0.002	5	0.004	4	0.002	2	0.002	3	1.304	2	0.000	2	0.000	0.000	0.000		0.004	
380	M51	14in Dia. Duct	Sec 5 - min	-0.002	5	0.004	5	-0.003	2	-0.003	4	0.001	5	-0.001	3	-0.001	2	-1.304	3	0.000	3	0.000	0.000	0.000		0.003	
379	M51	14in Dia. Duct	Sec 5 - max	0.001	4	0.005	4	0.003	3	-0.001	5	0.003	4	0.001	2	0.001	3	1.304	2	0.000	2	0.000	0.000	0.000		0.003	
384	M52	14in Dia. Duct	Sec 2 - min	-0.002	5	0.002	5	-0.002	2	-0.001	4	0.000	5	0.000	3	0.000	2	0.000	1	0.000	1	0.000	0.000	0.000		0.002	
381	M52	14in Dia. Duct	Sec 1 - max	0.000	4	0.006	4	0.003	3	-0.001	5	0.003	4	0.001	2	0.001	3	0.000	1	0.000	1	0.000	0.000	0.000		0.003	
725	M87	16in Dia. Duct	Sec 3 - max	0.002	6	0.011	1	0.007	3	0.000	1	0.000	1	0.000	3	0.000	2	0.000	1	0.000	1	0.000	0.000	0.000		0.002	
726	M87	16in Dia. Duct	Sec 3 - min	-0.002	7	0.011	1	-0.007	2	0.000	1	0.000	1	0.000	2	0.000	3	0.000	1	0.000	1	0.000	0.000	0.000		0.002	
735	M88	16in Dia. Duct	Sec 3 - max	0.002	8	0.011	1	0.007	3	0.000	1	0.000	1	0.000	3	0.000	2	0.000	1	0.000	1	0.000	0.000	0.000		0.002	
736	M88	16in Dia. Duct	Sec 3 - min	-0.002	7	0.011	1	-0.007	2	0.000	1	0.000	1	0.000	2	0.000	3	0.000	1	0.000	1	0.000	0.000	0.000		0.002	
386	M52	14in Dia. Duct	Sec 3 - min	-0.001	5	0.001	5	-0.002	2	0.000	4	0.000	5	0.000	3	0.000	2	0.000	1	0.000	1	0.000	0.000	0.000		0.001	
383	M52	14in Dia. Duct	Sec 2 - max	0.000	4	0.004	4	0.002	3	0.000	5	0.001	4	0.000	2	0.000	3	0.000	1	0.000	1	0.000	0.000	0.000		0.001	
385	M52	14in Dia. Duct	Sec 3 - max	0.000	4	0.003	4	0.002	3	0.000	5	0.000	4	0.000	2	0.000	3	0.000	1	0.000	1	0.000	0.000	0.000		0.000	
387	M52	14in Dia. Duct	Sec 4 - max	0.000	4	0.001	4	0.000	3	0.000	5	0.000	4	0.000	2	0.000	3	0.000	1	0.000	1	0.000	0.000	0.000		0.000	
388	M52	14in Dia. Duct	Sec 4 - min	0.000	5	0.000	5	0.000	2	0.000	4	0.000	5	0.000	3	0.000	2	0.000	1	0.000	1	0.000	0.000	0.000		0.000	
389	M52	14in Dia. Duct	Sec 5 - max	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000		0.000	

	Member	Duct Size		Axial (ksi)	Load Case	y Shear (ksi)	Load Case	z Shear (ksi)	Load Case	y top Bending (ksi)	Load Case	y bot Bending (ksi)	Load Case	z top Bending (ksi)	Load Case	z bot Bending (ksi)	Load Case	Torque (k-in)	Load Case	Torsional Shear (ksi)	Load Case	f_a/σ_a	D-2250 f_{sy}/σ_a	f_{sz}/σ_a	D-2250 Equation 11 Value	f_v (ksi)	D-2270 Equation 14 Value
390	M52	14in Dia. Duct	Sec 5 - min	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.000	0.000	0.000	0.000	0.000