STRUCTURAL CALCULATIONS

Location:

S.R. 618 Hillsborough County

Prepared for:

Tampa Hillsborough County Expressway Authority

Prepared by:

Kimley-Horn and Associates, Inc.
189 S. Orange Ave. Suite 1000
Orlando, FL 32801
Certificate of Authorization No. 696

Engineer of Record:

Jorge L. Perez P.E
Florida P.E # 42690

Jorge L Perez 2020.03.09 17:26:34-04'00'

MARCH 2020

This item has been digitally signed and sealed by Jorge L. Perez on the date indicated here. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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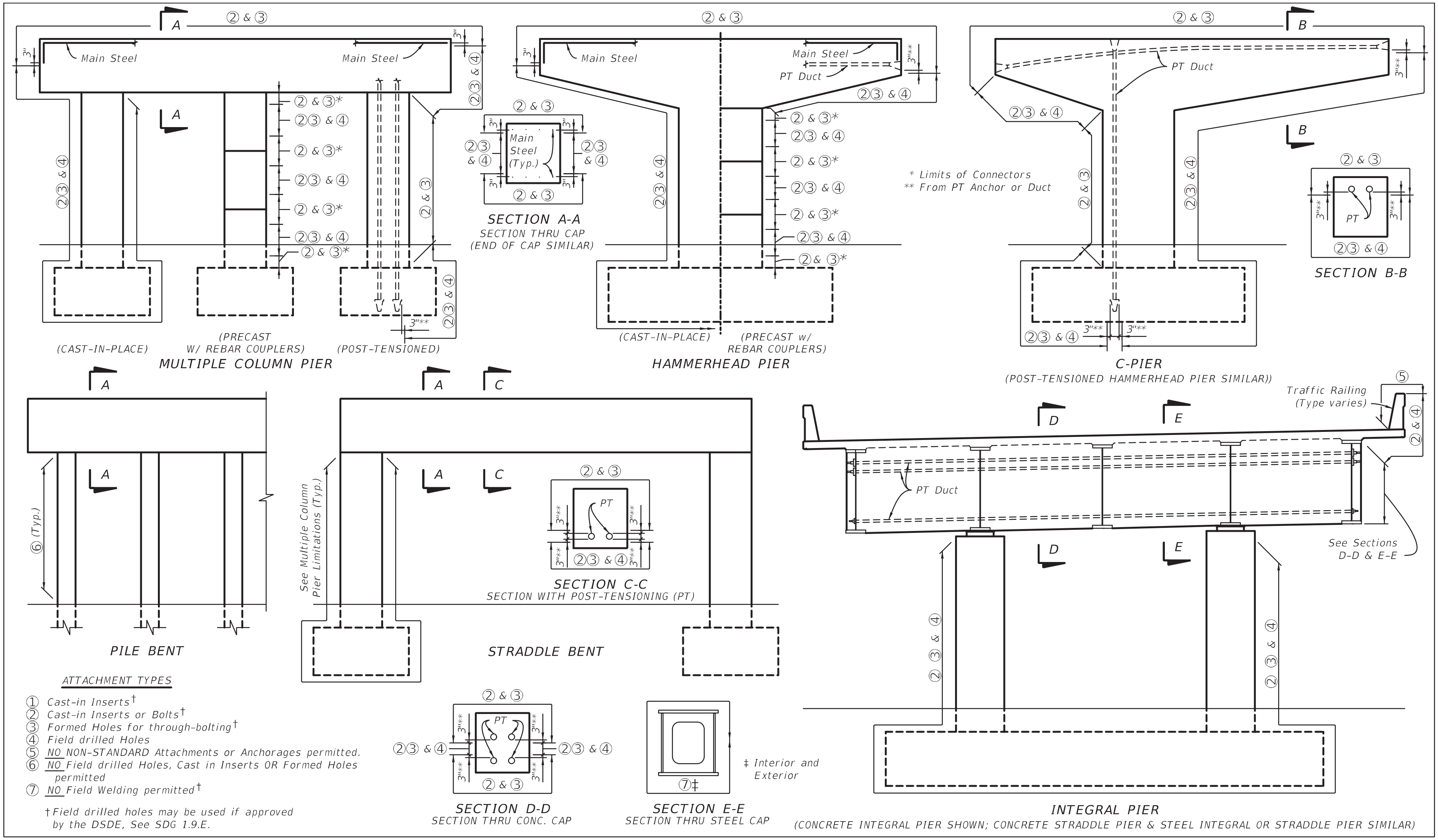
		Job No.	148872000	Sheet	1 of 1
Job	THEA Lighting Project	Design by	IERM	Date	7/19/18
Subject	Final Results	Checked by	JLP	Date	7/19/18

Summary :

The following structures for THEA have been analyzed through STAAD to ensure structural reliability and efficiency. Through the LTS 2017 Interim Revisions and the LTS 2015 1st edition the preceding wind loads and load combinations have been applied. Other programs utilized include Mathcad, HILTI, and Tedds for the connection assessment.

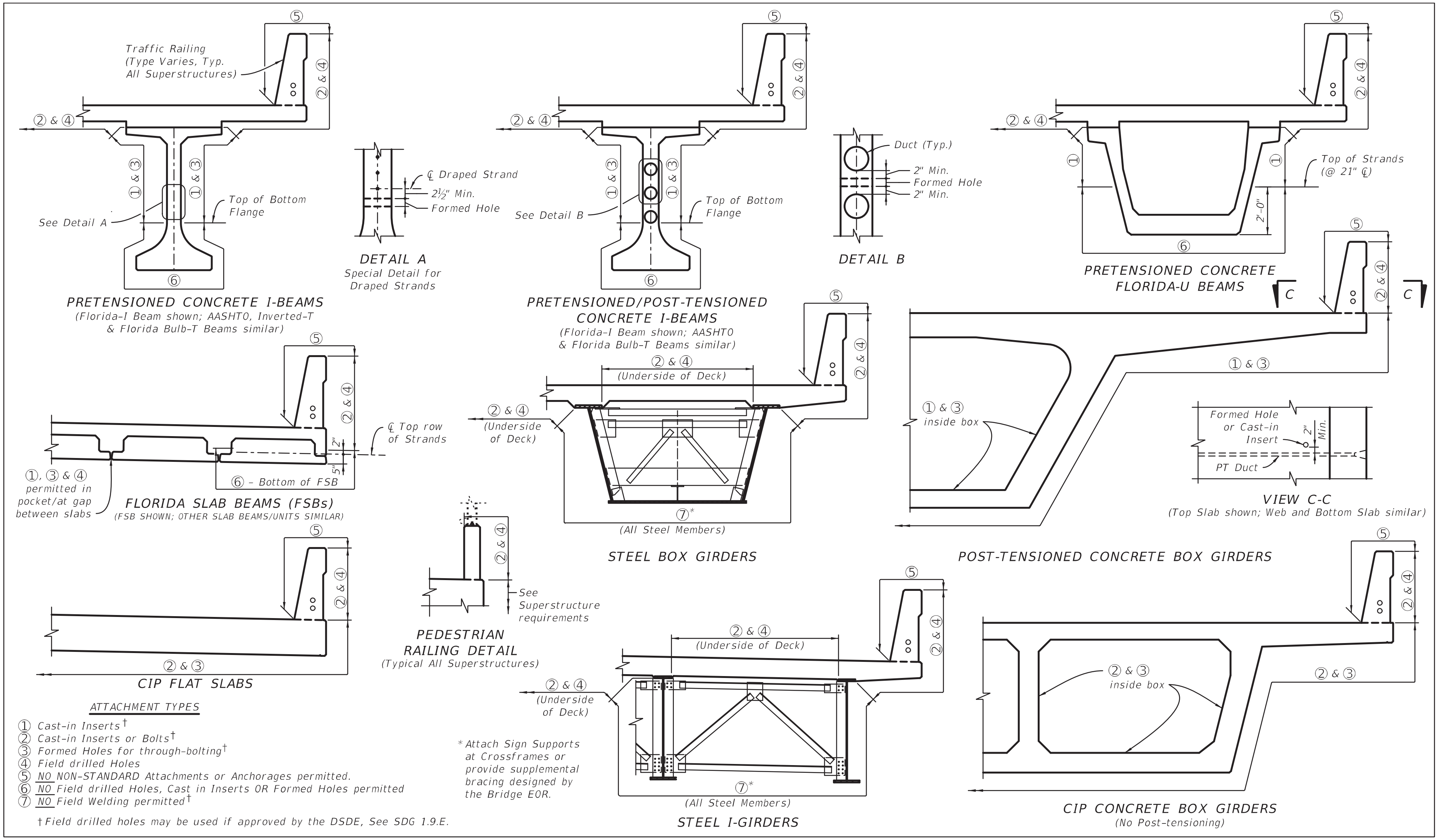
Design Standards & Cut Sheets

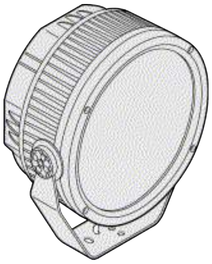
ALLOWABLE CONNECTION TYPES FOR MISCELLANEOUS ATTACHMENTS - SUBSTRUCTURES



1A-1

ALLOWABLE CONNECTION TYPES FOR MISCELLANEOUS ATTACHMENTS - SUPERSTRUCTURES





Client:	
Project:	
Type:	
Order Code:	
Quantity:	

Dyna Drum HO Color is a high output, outdoor rated, quad color LED floodlight. It features an internal 100-277VAC power supply, onboard DMX+RDM driver, and each unit carries Acclaim's Aria wireless DMX technology inside. The quad color chip provides superior color mixing and saturation over single source LED fixtures. It comes with a narrow 10º beam standard, with optional quick-change spread lenses for wider applications. It is ideal for facade lighting applications and as an area floodlight.

SPECIFICATIONS

Colors	**QW:** RGBW (W=6000K), **QS:** RGBW (W=3000K)
Beam Angles	10º standard, 20º, 40º, 60º, 10º x 60º spread lens options
Photometrics	7660 lumens, 161,203 cd, see page 4 for details
Effective Projected Area	1.75 ft^2
Control	DMX+RDM, Manual color setting in menu, photocell included, Aria wireless direct connect
Max Fixtures in Series	32 via DMX, power local to each fixture
Power Consumption	250W
Operating Voltage	100-277VAC, 50/60 Hz
Lumen Maintenance	L70 @ 150,000 hours (25º C)
Mounting	Surface mount bracket included, optional tenon mount and pipe clamp available
Finish	Gray standard (RAL 7047), black, white, and custom colors optional
Material	Die cast aluminum, glass top lens, optional marine coating available
Ambient Operating Temperature	-40º F to 125º F (-40º C to 51º C)
IP Rating	IP66, wet location
IK Rating	IK07, protection against 2 joule impact
Fixture Connectors	Attached 5' (1.5m) IP66 hybrid cable, AC power +DMX/RDM
Warranty	5 Years, limited
Weight	30 lbs. (13.6 kg)
Dimensions	**L:** 14.8" x **W:** 15.4" x **D:** 8.2" (378mm x 393mm x 209mm)
Certifications	ETL Intertek, CE

ORDER CODES

* indicates special order

DDJ - 2 # 1 - A C # N

Version:
DDJ = Dyna Drum HO Color (Gen 2)

Control:
2 = DMX+RDM

Housing Finish:
1 = Black* (RAL 9005)
2 = White* (RAL 9003)
4 = Gray (RAL 7047)
7 = Custom* (Provide RAL #)

Lens Cover:
1 = Clear

Size:
A = Standard

Beam:
C = 10º

LED Color:
H = QW RGBW (W=6000K)
L = QS RGBW (W=3000K)

Input Voltage:
N = 100-277VAC

RELATED COMPONENTS

Optional Beam Accessories

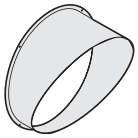
DDHSL20
20º Spread lens for Dyna Drum HO Color

DDHSL40
40º Spread lens for Dyna Drum HO Color

DDHSL60
60º Spread lens for Dyna Drum HO Color

DDHSL1060
10º x 60º Spread lens for Dyna Drum HO Color

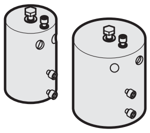
DDH2FSG
Full snoot for Dyna Drum HO Color, Gray



DDH2HSG
Half snoot for Dyna Drum HO Color, Gray

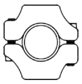
RELATED COMPONENTS

Optional Mounting Accessories



TM2
2" pipe, schedule 40 tenon mount
(2.51", 56mm inner dia.)

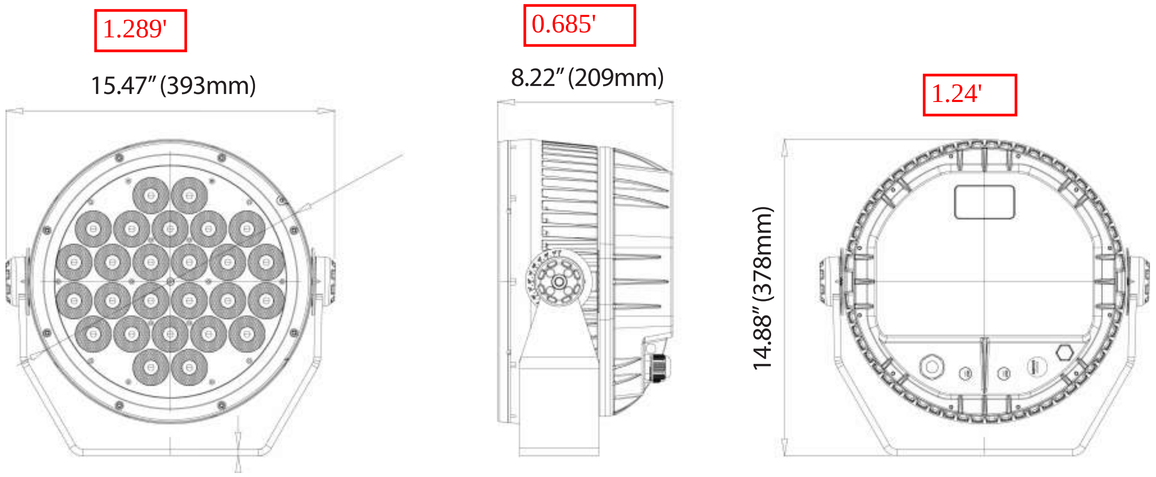
TM4
3.5" pipe, schedule 40 tenon mount
(4.13", 105mm inner dia.)



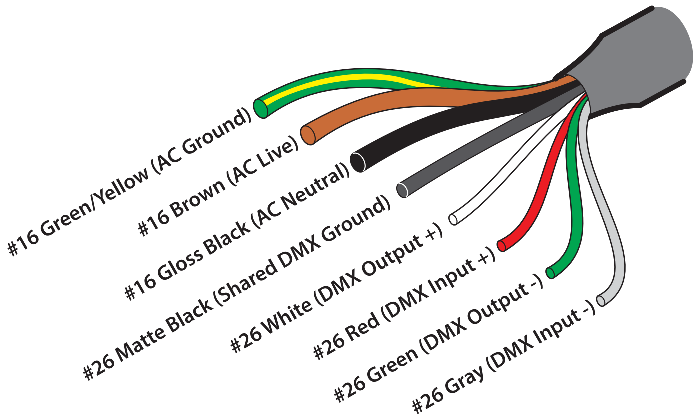
PC2
2" pipe, schedule 40 pipe clamp
mounts 1 or 2 fixtures

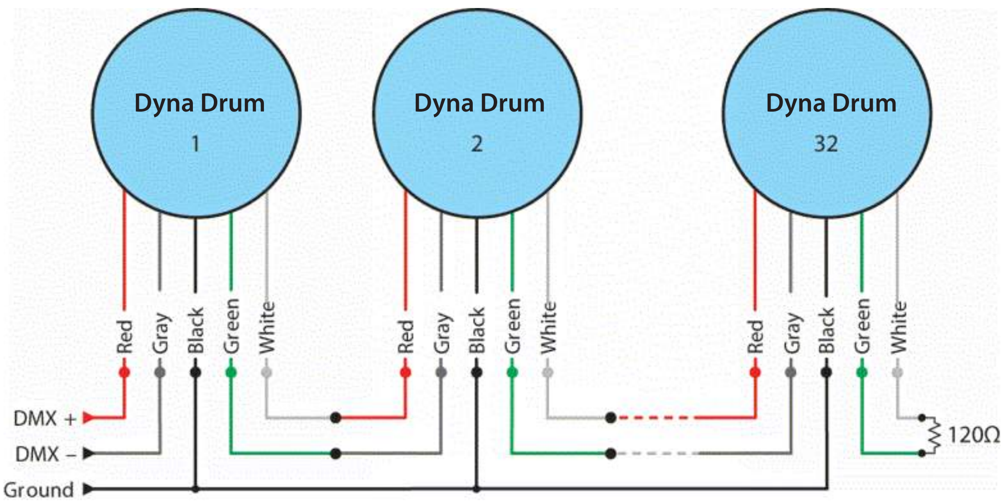
PC4
4" pipe, schedule 40 pipe clamp
mounts 1 or 2 fixtures

DIMENSIONS



WIRING





PHOTOMETRICS

Color Temp / Beam	Lumens	Center Candela	Efficacy (l/pw)	CRI (Ra)	CRI (r9)
QW RGBW, 10º	7660	161,203	31	-	-
QS RGBW, 10º	7741	183,376	31	-	-
					-

Dyna Drum SO™

ACCLAIM LIGHTING

aria™ WIRELESS DMX

Client:	
Project:	
Type:	
Order Code:	
Quantity:	

The **Dyna Drum SO** is a high output, outdoor rated, LED flood fixture. It features an adjustable yoke, on-board digital display, a 100-277VAC internal power supply, and a built in receiver for the Aria wireless DMX system. It is ideal for facade lighting applications, and as an area flood light.

Specifications

Color Temperature	RGBW, RGBA, 2700K, 3000K, 3500K, 4000K, 5500K, DW (2400K-5500K)
Beam Angle	6º (standard), 20º, 40º, 60º, 10º x 60º spread lens options
Total Lumens	7,769 at 5500K, 6º / 4656 at RGBW, 6º
Center Beam Candela	344,366 at 5500K, 6º / 148,001 at RGBW, 6º
Control	DMX-512, 4 channels (color), 3 Channels (DW), or 1 Channel (white)
Max Fixtures in Series	32, via DMX-512
Effective Projected Area	Front: 0.72, Side 0.74 (includes drag coefficient)
Power Consumption	157W at steady state
Operating Voltage	100-277VAC, 50/60Hz
Lumen Maintenance	L70 @ 120,000 Hours (25º C)
Finish	Gray (Standard), White or Black (Optional)
Housing Material	Die Cast Aluminum, Optional Marine Environment Coating Available
Operating Temperature	-40º F to 122º F (-40º C to 50º C)
IP Rating	IP66, Wet Location
Fixture Connectors	Attached 5' (1.5m) IP 66 AC Power + Signal Cable
Warranty	5 Year Limited Warranty
Weight	26.4 lbs (12 kg)
Dimensions	9.13" ø x W 8.39" x H 14.13" (232mm ø x W 213mm x H 359mm)
Certifications	ETL, CE, 3G LUMINAIRE VIBRATION

Dyna Drum SO™

ACCLAIM LIGHTING

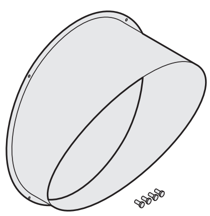
Order Codes

* Indicates Special Order

DDE - 2 # 1 - A A # N

- **Version:** E = SO Single Chip
- **Control:** 2 = DMX
- **Housing Color:** 1 = Black*, 2 = White*, 4 = Gray, 7 = Custom*
- **Lens Cover:** 1 = Clear
- **Size:** A = Standard
- **Beam:** A = 6°
- **Color:** A = 2700K*, C = 3000K, D = 3500K*, E = 4000K, F = 5500K*, L = RGBW *(W=6000K)*, J = RGBA*, M = DW *(2400K-5500K)*
- **Input Voltage:** N = Normal (100-277VAC)

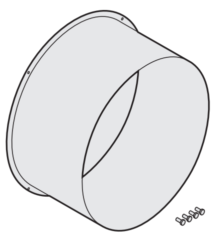
Related Components



Half Snoot

Gray: DDSOHSG
Black: DDSOHSB
White: DDSOHSW

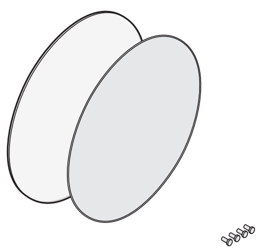
Includes four M4 mounting screws



Full Snoot

Gray: DDSOFSG
Black: DDSOFSB
White: DDSOFSW

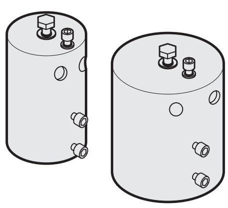
Includes four M4 mounting screws



Spread Lens Kits

20º Beam: DDSSL20
40º Beam: DDSSL40
60º Beam: DDSSL60
10º x 60º Beam: DDSSL1060

Includes four M4 mounting screws



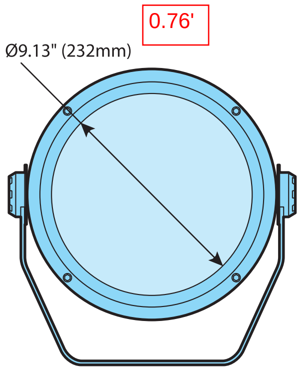
Tenon Mount

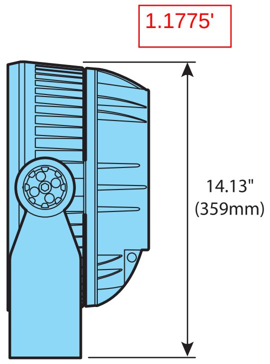
For 2" pipe: TM2
For 4" pipe: TM4

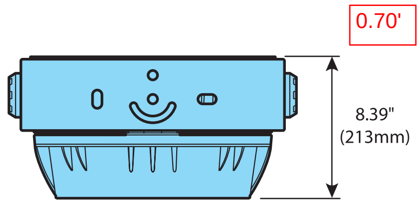
Dyna Drum SO™

ACCLAIM LIGHTING

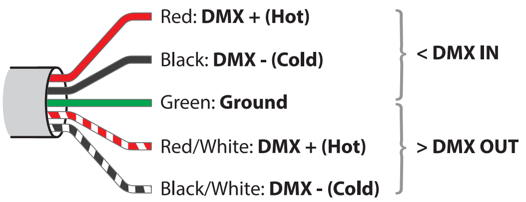
Dimensions

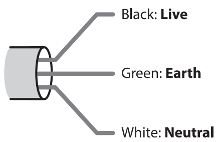




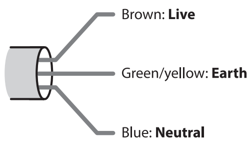


Wiring





Power cord colors
US version



Power cord colors
European version

Photometrics

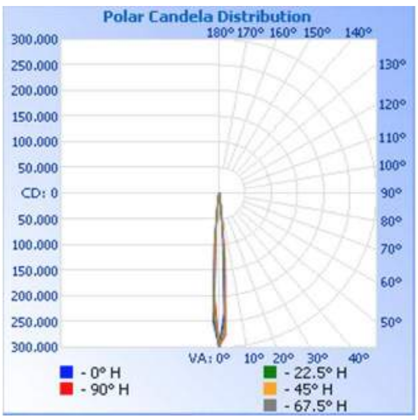
For IES & Revit files, please visit acclaimlighting.com

5500K, 6º

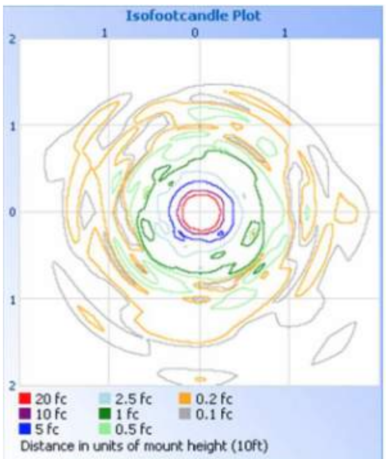
Zonal Lumen Summary

Zone	Lumens	%
0-60	7634	98.3
60-90	131.8	1.7
90-180	2.8	0.0
Total	**7769**	**100**

Polar Candela Distribution



Isofootcandle Plot



Specification Sheet 2.2.3

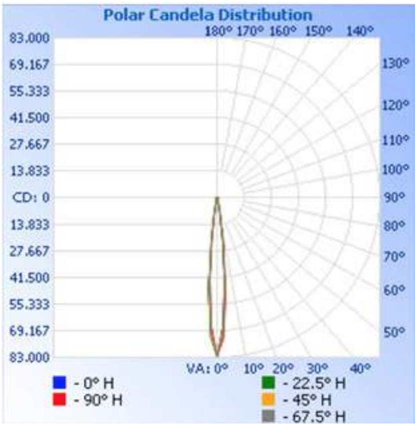
Photometrics (Con't)

RGBW, 6º

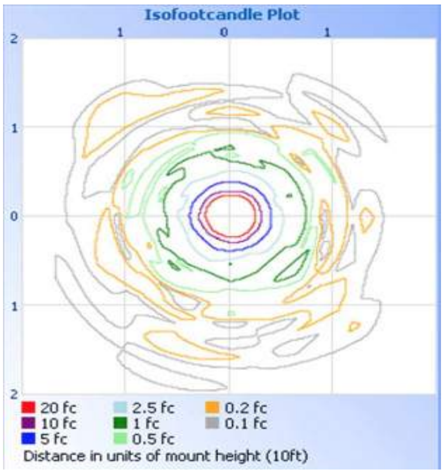
Zonal Lumen Summary

Zone	Lumens	%
0-60	4556	97.9
60-90	96.3	2.1
90-180	3.7	0.1
Total	**4656**	**100**

Polar Candela Distribution



Isofootcandle Plot



Wind Calculation

The following wind calculations are based on:

1. LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (1st Edition 2015)

2. 2017 Interim Revisions to the LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (1st Edition 2015)

3. FDOT Structures Design Guidelines (January 2018)

$G= 1.14$ (LRFD Spec. 2017 Revisions, 3.8.6)

$C_d= 0.5$ (LRFD Spec. 2017 Revisions, Table 3.8.7)

-From elevations worst case (70')

$K_z= 1.17$ (LRFD Spec. 2015, Table C3.8.4-1)

$K_d= 0.85$ (LRFD Spec. 2015, Table C3.8.5-1)

V= 150 mph (FDOT SDG, Table 2.4.1-1,Hillsborough County)

$P_z= 0.00256*V^2*K_z*K_d*G*C_d$ (LRFD Spec. 2015, 3.8.1-1)

$P_z=0.00256*(150\ mph)^2*(1.17)*(0.85)*(1.14)*(0.5)$

$P_z= 32.65$ psf

<u>Luminaires (Dyna Drum HO QW Color):</u>

$F_z= 32.65*(1.289'*1.24')$

$F_z= 52.2$ lbs

$M_z= (52.2\ lb*1.24'/2)$

$M_z= 32.4$ lb*ft

$F_x= 32.65*(0.685'*1.24')$

$F_x= 27.7$ lbs

$M_x= (27.7\ lb*1.24'/2)$

$M_x= 17.0$ lb*ft

<u>Luminaires (Dyna Drum SO):</u>

$F_z= 32.65*(0.76'*1.18')$

$F_z= 29.3$ lbs

$M_z= (29.3\ lb*1.18'/2)$

$M_z= 17.3$ lb*ft

$F_x= 32.65*(0.70'*1.18')$

$F_x= 27$ lbs

$M_x= (27\ lb*1.18'/2)$

$M_x= 15.9$ lb*ft

Wind Pressure on HSS:

Pz = 0.00256*V^2*Kz*Kd*G*Cd

Cd = 2 - 6*rs

rs = Cover Radius/ d

rs = 2*t/ 3"

rs = 2* (3"/16)/3" = 0.125

Cd = 1.25

Pz = 0.00256*(150 mph)^2*(1.17)*(0.85)*(1.14)*(1.25)

Pz = 81.62 psf

2.4 WIND LOADS

2.4.1 Wind Loads on Completed Structures: WL and WS [3.8] (Rev. 01/18)

A. Design Wind Speed

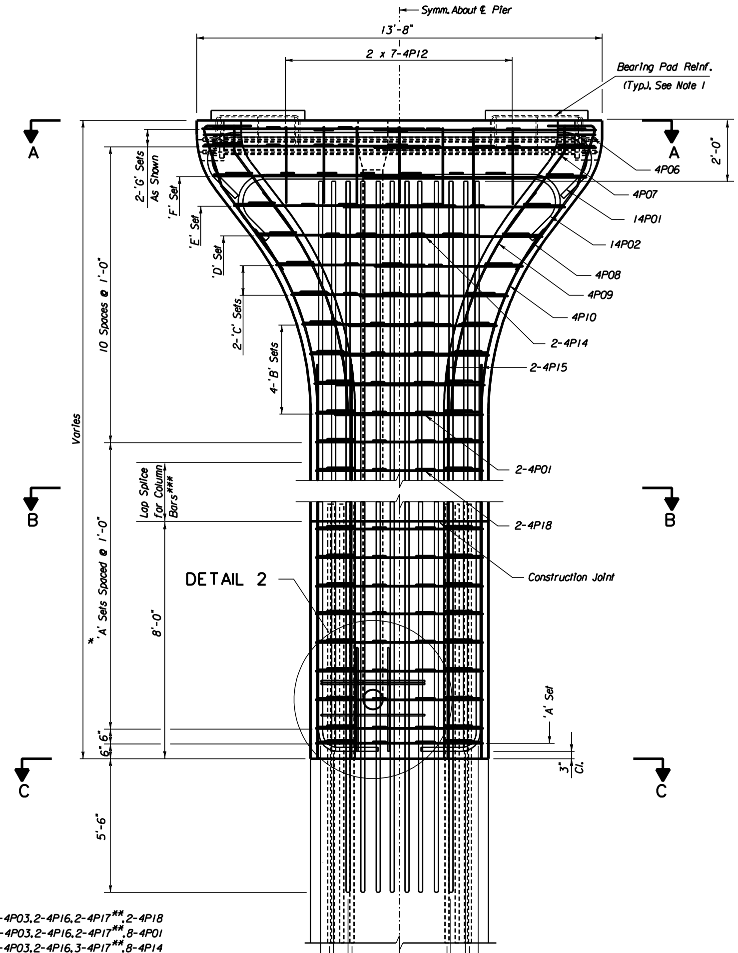
Use the design 3-second gust wind speed, V, from Table 2.4.1-1 in lieu of ***LRFD*** [Figure 3.8.1.1.2-1].

Table 2.4.1-1 Design Wind Speed, V

County (Dist)	Design Wind Speed (mph)	County (Dist)	Design Wind Speed (mph)	County (Dist)	Design Wind Speed (mph)
Alachua (2)	130	Hardee (1)	150	Nassau (2)	130
Baker (2)	130	Hendry (1)	150	Okaloosa (3)	150
Bay (3)	150	Hernando (7)	150	Okeechobee (1)	150
Bradford (2)	130	Highlands (1)	150	Orange (5)	150
Brevard (5)	170	Hillsborough (7)	150	Osceola (5)	150
Broward (4)	170	Holmes (3)	150	Palm Beach (4)	170
Calhoun (3)	130	Indian River (4)	170	Pasco (7)	150
Charlotte (1)	170	Jackson (3)	130	Pinellas (7)	150
Citrus (7)	150	Jefferson (3)	130	Polk (1)	150
Clay (2)	130	Lafayette (2)	130	Putnam (2)	130
Collier (1)	170	Lake (5)	150	St. Johns (2)	150
Columbia (2)	130	Lee (1)	170	St. Lucie (4)	170
DeSoto (1)	150	Leon (3)	130	Santa Rosa (3)	150
Dixie (2)	130	Levy (2)	150	Sarasota (1)	170
Duval (2)	130	Liberty (3)	130	Seminole (5)	150
Escambia (3)	170	Madison (2)	130	Sumter (5)	150
Flagler (5)	150	Manatee (1)	150	Suwannee (2)	130
Franklin (3)	150	Marion (5)	150	Taylor (2)	130
Gadsden (3)	130	Martin (4)	170	Union (2)	130
Gilchrist (2)	130	Miami-Dade (6)	170	Volusia (5)	150
Glades (1)	150	Miami-Dade Islands (6)	180	Wakulla (3)	130
Gulf (3)	150	Monroe (6)	170	Walton (3)	150
Hamilton (2)	130	Monroe Islands (6)	180	Washington (3)	150

Pier

Existing Structural Plans



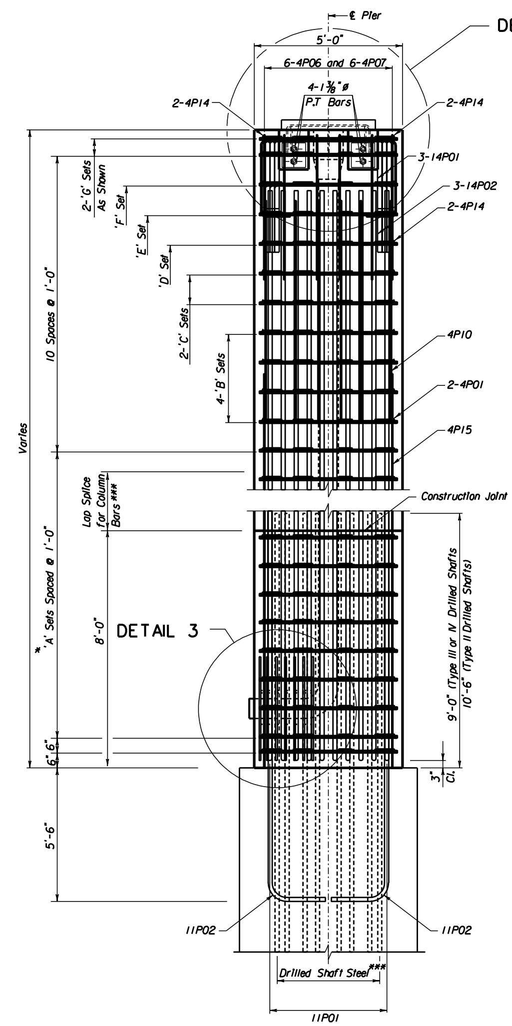
HALF-ELEVATION TYPICAL PIER

HALF-ELEVATION EXPANSION PIER

***(11S01, 11S02 & 11S03 Bars Terminating at Top of Drilled Shaft Not Shown)

Pier Types I, II, III and IV:
'A' Sets Contain 2-4P02, 2-4P03, 2-4P16, 2-4P17**, 2-4P18
'B' Sets Contain 2-4P02, 2-4P03, 2-4P16, 2-4P17**, 8-4P01
'C' Sets Contain 2-4P02, 2-4P03, 2-4P16, 3-4P17**, 8-4P14
'D' Sets Contain 2-4P02, 2-4P03, 2-4P16, 4-4P17**, 8-4P14
'E' Sets Contain 2-4P02, 2-4P03, 2-4P16, 5-4P17**, 8-4P14
'F' Sets Contain 2-4P02, 2-4P03, 2-4P16, 6-4P17**, 8-4P14
'G' Sets Contain 2-4P02, 2-4P03, 2-4P16, 7-4P17**, 8-4P14

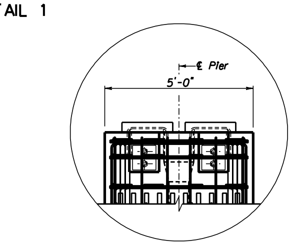
** Each set 'A' through 'G' contains an additional 2-4P17 for Pier Types II and III and an additional 4-4P17 for Pier Type IV.



SIDE VIEW

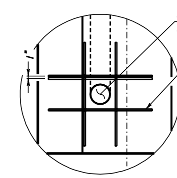
(Interior Pier Shown)

***(11S01, 11S02 & 11S03 Bars Terminating at Top of Drilled Shaft Not Shown)



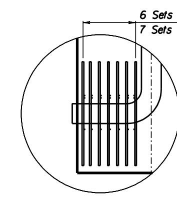
DETAIL 1

EXPANSION PIER



DETAIL 2

Typical Steel Omitted for Clarity



DETAIL 3 ••

Typical Steel Omitted for Clarity

NOTE:

1. For Bearing Details, See Bearing Details Sheets.
2. For Post-Tensioning Blockout Pour Back Details, See Drawing XXX
3. For Drainage Details, See Drainage Details Sheets.
4. E.F. Denotes Each Face
   O.F. Denotes Outside Face
   I.F. Denotes Inside Face
5. Minimum Concrete Cover = 2", Unless Otherwise Noted
6. For Drilled Shaft Details, See Drilled Shaft Dimensions and Reinforcement Sheets.
* 7. For The Total Quantity of 'A' Sets, See Sheet T-170.
8. For Placement of Drilled Shaft Reinforcement, See Sheets T-156 and T-157. 11P01 Bars Extend into Drilled Shaft Types V and VI.
** 9. Contractor may Field Cut No More than 2-11P02 Bars for 8"ø and 10"ø Pipes and No More than 3-11P02 Bars for 12"ø and 16"ø Pipes.
*** 10. Lap Splices at 8' Construction Joint Shall be a Minimum of 7'-2"

STRUCTURE NOS. 100800, 100806 & 100812

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JMF	12-13-02
Checked by	AKK	12-13-02
Designed by	WDP	12-13-02
Checked by	JMR	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: PIER REINFORCEMENT 1

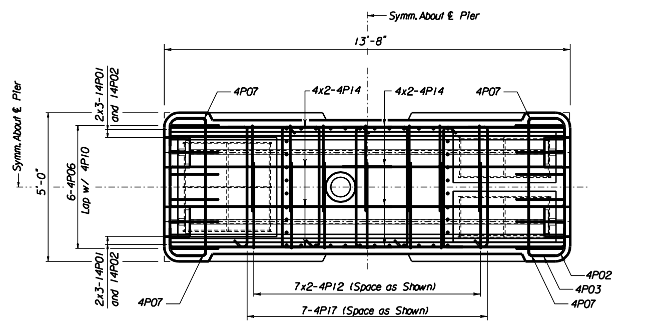
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-169

Index No.

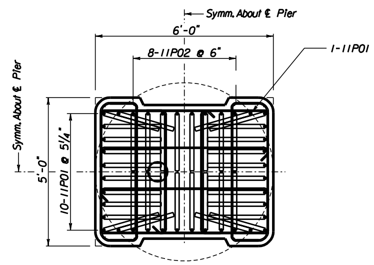
13 DEC 2002 16:59:17

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		



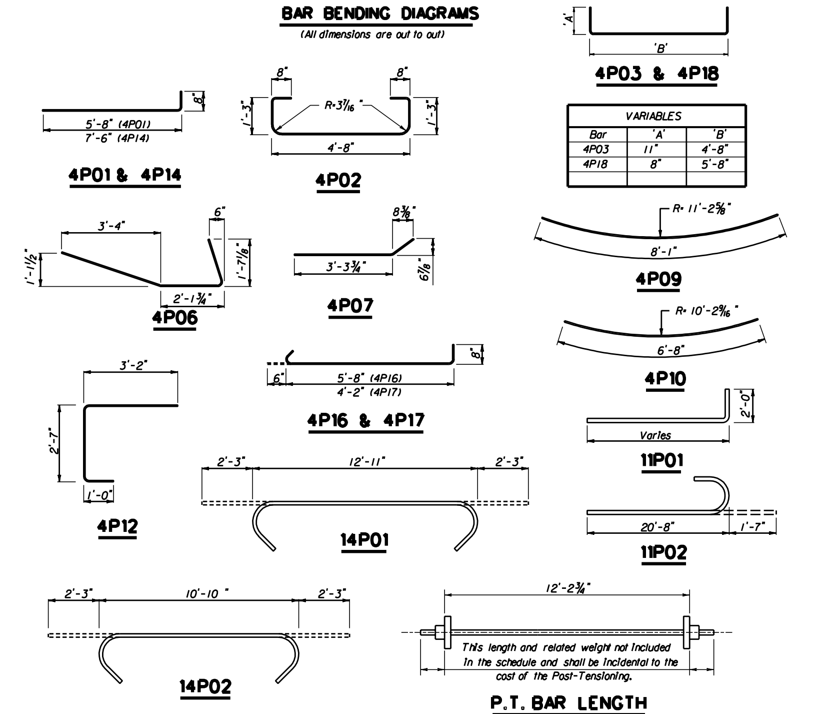
HALF-VIEW A-A TYPICAL PIER
(Type I Shown)

HALF-VIEW A-A EXPANSION PIER
(Type I Shown)



SECTION C-C
(Type I shown)
(Drilled Shaft Reinforcing Not Shown)

BAR BENDING DIAGRAMS
(All dimensions are out to out)

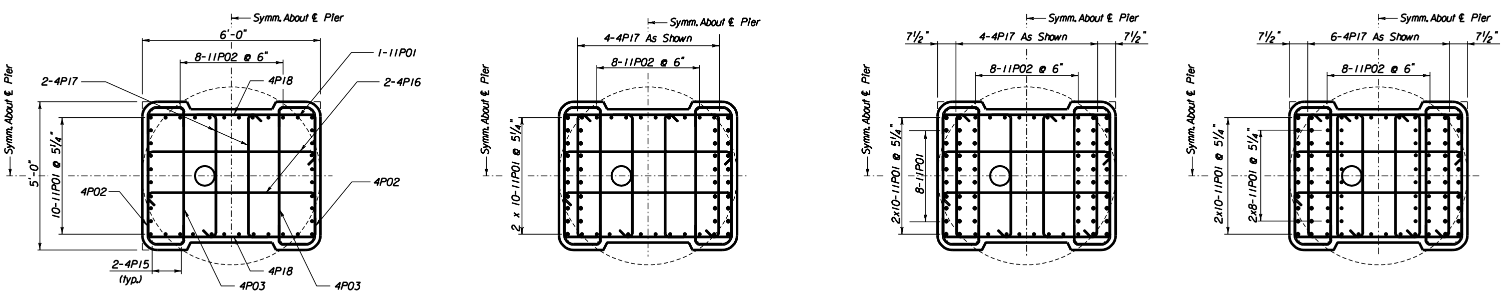


VARIABLES		
Bar	'A'	'B'
4P03	11"	4'-8"
4P18	8"	5'-8"

BAR LIST / PIER

* Bar	No.	Length	Bent	Str.
4P01	32	6'-4"	•	
4P02	Varies	8'-6"	•	
4P03	Varies	6'-6"	•	
4P06	12	7'-4"	•	
4P07	4	4'-3"	•	
4P09	4	8'-1"	•	
4P10	12	6'-8"	•	
4P12	14	6'-9"	•	
4P14	56	8'-2"	•	
4P15	8	Varies		•
4P16	Varies	6'-10"	•	
4P17	Varies	5'-4"	•	
4P18	Varies	7'-0"	•	
11P01	Varies	Varies	•	
11P01A	Varies	Varies		•
11P02	16	22'-3"	•	
11P02A	16	Varies		•
14P01	6	17'-5"	•	
14P02	6	15'-4"	•	

*Number preceding letter denotes Bar size.
All Bar Bends shall be in accordance with A.C.I. Standards.



SECTION B-B
(Type I)

SECTION B-B
(Type II)
(See Section B-B (Type I) for dimensions and callouts of #4 bars, excluding 4P17 bars.)

SECTION B-B
(Type III)
(See Section B-B (Type I) for dimensions and callouts of #4 bars, excluding 4P17 bars)

SECTION B-B
(Type IV)
(See Section B-B (Type I) for dimensions and callouts of #4 bars, excluding 4P17 bars)

DRAIN PIPE REINFORCEMENT - 5P01 **

Pipe Size	No.	Length	Bent	Str.
8"	30	3'-6"		•
10"	30	3'-6"		•
12"	30	3'-6"		•
16"	35	3'-6"		•
18"	35	3'-6"		•

Note:
1. For Bearing Details, See Bearing Details sheets.
2. For Drainage Details, See Drainage Details sheets.
3. Minimum Concrete Cover = 2", Unless Otherwise Noted
4. For Drilled Shaft Details, See Drilled Shaft Dimensions and Reinforcement sheets.
** 5. The Cost of the 5P01 Bars shall be incidental to the Cost of the Drain Pipe.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JMF	12-13-02
Checked by	CF	12-13-02
Designed by	CF	12-13-02
Checked by	MWN	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: PIER REINFORCEMENT 3

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

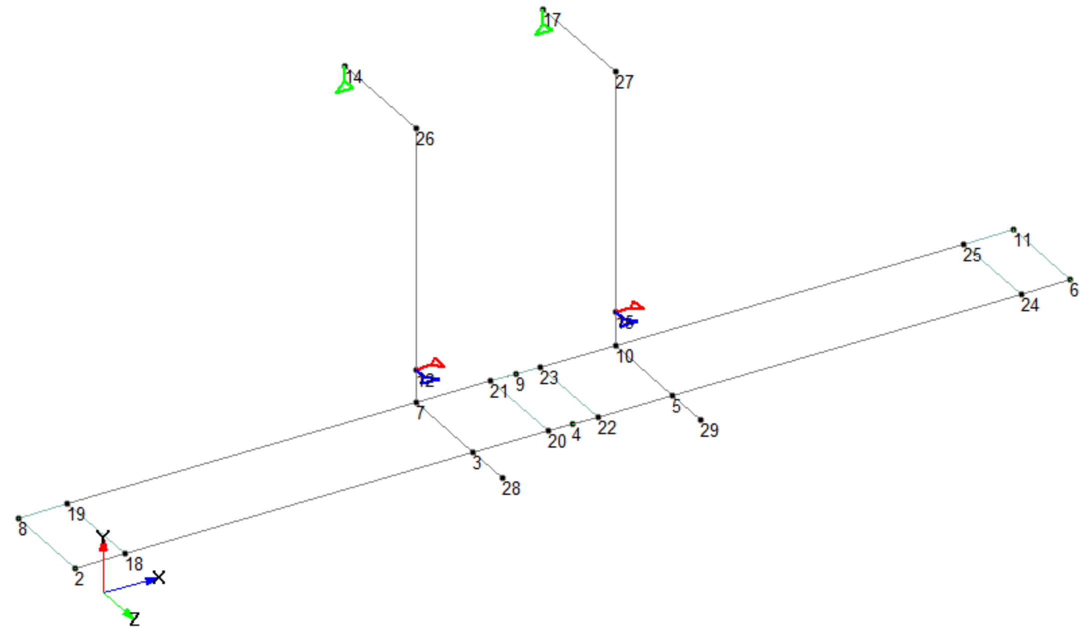
Drawing No. T-171

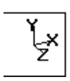
Index No.

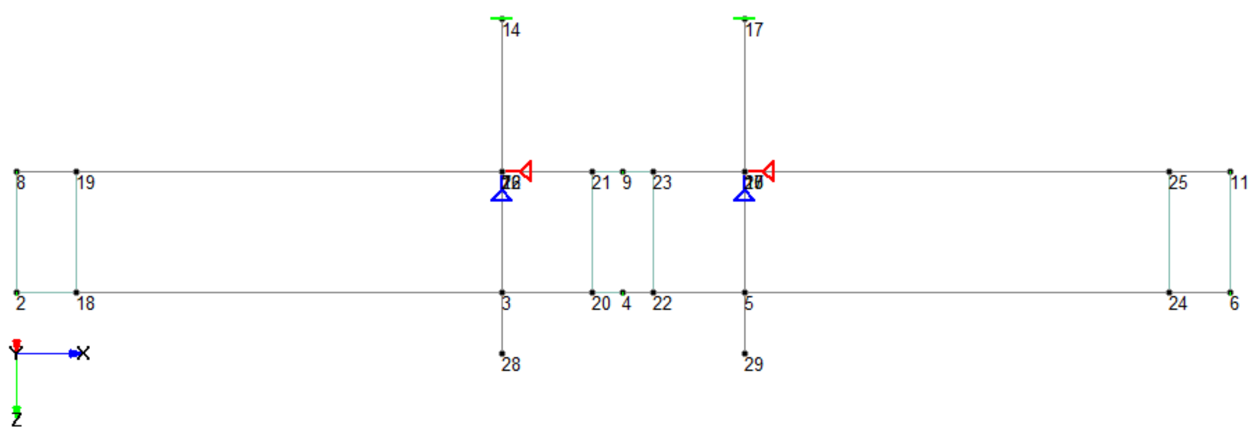
13 DEC 2002 16:59:18

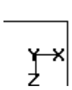
STAAD Analysis

Stadd Model Nodes

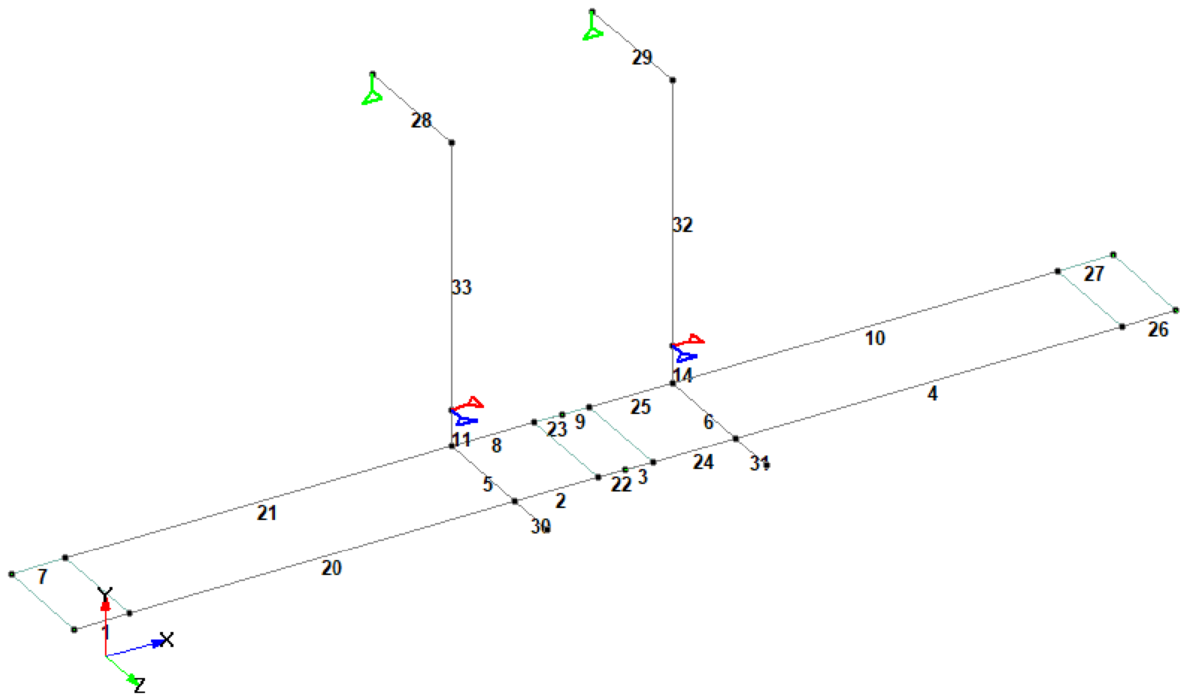


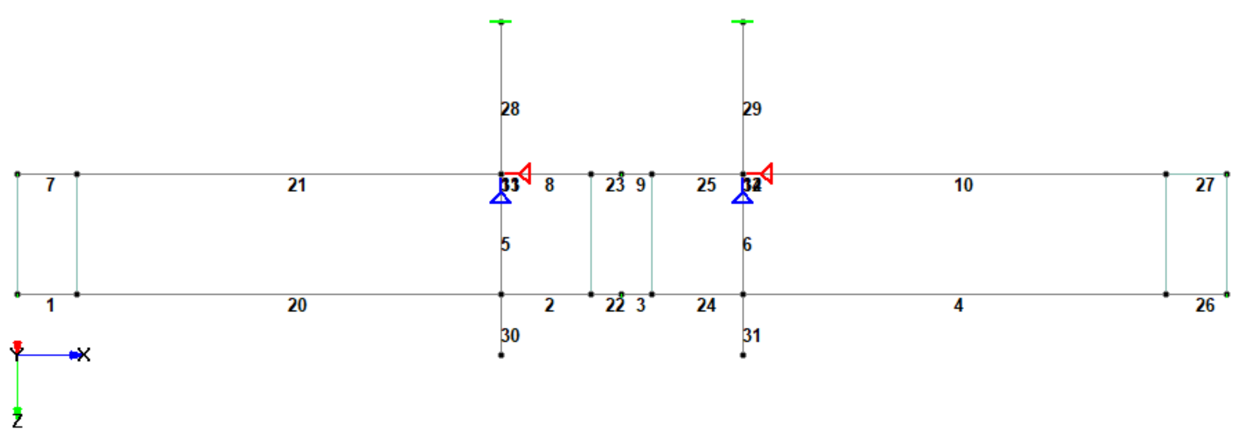






Stadd Model
Members





Job Information

	Engineer	Checked	Approved
Name:	IERM		
Date:	2/12/2020		

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	26	Highest Node	29
Number of Elements	26	Highest Beam	33
Number of Plates	3	Highest Plate	19

Number of Basic Load Cases	7
Number of Combination Load Cases	9

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

Type	L/C	Name
Primary	2	DYNO DRUM HO: LIGHT WIND LOAD (Z)
Primary	1	WEIGHT
Primary	10	WIND LOAD ON STRUCTURE (X) DIREC
Primary	11	WIND LOAD ON STRUCTURE (Y) DIREC
Primary	12	DYNO DRUM HO: LIGHT WIND LOAD (X)
Primary	16	WIND RESULTANT
Primary	9	COMPRESSION FORCE
Combination	3	1.1DL+1.0WR
Combination	4	1.25DL
Combination	5	1.1DL+1.0WX
Combination	6	CASE I: VX
Combination	7	1.1DL+1.0WZ
Combination	8	CASE I: VY
Combination	13	CASE III: VY
Combination	14	CASE III: VZ
Combination	15	CASE III:VX

Nodes

Node	X (ft)	Y (ft)	Z (ft)
2	0	0	-1.000
3	8.000	0	-1.000
4	10.000	0	-1.000
5	12.000	0	-1.000
6	20.000	0	-1.000
7	8.000	0	-3.000
8	0	0	-3.000
9	10.000	0	-3.000
10	12.000	0	-3.000
11	20.000	0	-3.000
12	8.000	0.670	-3.000
14	8.000	5.500	-5.500
15	12.000	0.670	-3.000
17	12.000	5.500	-5.500
18	1.000	0	-1.000
19	1.000	0	-3.000
20	9.500	0	-1.000
21	9.500	0	-3.000
22	10.500	0	-1.000
23	10.500	0	-3.000
24	19.000	0	-1.000
25	19.000	0	-3.000
26	8.000	5.500	-3.000
27	12.000	5.500	-3.000
28	8.000	0	0
29	12.000	0	0

Beams

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	2	18	1.000	2	0
2	3	20	1.500	2	0
3	4	22	0.500	2	0
4	5	24	7.000	2	0
5	3	7	2.000	3	0
6	5	10	2.000	3	0
7	8	19	1.000	2	0
8	7	21	1.500	2	0
9	9	23	0.500	2	0
10	10	25	7.000	2	0
11	7	12	0.670	3	0
14	10	15	0.670	3	0
20	18	3	7.000	2	0

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
21	19	7	7.000	2	0
22	20	4	0.500	2	0
23	21	9	0.500	2	0
24	22	5	1.500	2	0
25	23	10	1.500	2	0
26	24	6	1.000	2	0
27	25	11	1.000	2	0
28	26	14	2.500	3	0
29	27	17	2.500	3	0
30	3	28	1.000	3	0
31	5	29	1.000	3	0
32	15	27	4.830	3	0
33	12	26	4.830	3	0

Plates

Plate	Node A	Node B	Node C	Node D	Property
17	18	19	8	2	1
18	22	23	21	20	1
19	6	11	25	24	1

Section Properties

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
2	HSST3X3X0.188	1.890	2.460	2.460	3.927	STEEL
3	HSST3.5X3.5X0.25	2.910	5.040	5.040	8.125	STEEL

Plate Thickness

Prop	Node A (in)	Node B (in)	Node C (in)	Node D (in)	Material
1	0.250	0.250	0.250	0.250	STEEL_36_KS

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	CONCRETE	3.15E+3	0.170	8.68e-05	5.5E -6
2	ALUMINUM	10E+3	0.330	9.8e-05	12.8E -6
3	STEEL_50_KSI	29E+3	0.300	0.000283	6.5E -6
4	STAINLESSSTEEL	28E+3	0.300	0.000283	9.9E -6
5	A500-GR.B	29E+3	0.300	0.000	6E -6
6	STEEL_36_KSI	29E+3	0.300	0.000283	6.5E -6
7	STEEL_275_NMM2	29.7E+3	0.300	0.000	6.67E -6
8	STEEL	29E+3	0.300	0.000283	6E -6
9	STEEL_355_NMM2	29.7E+3	0.300	0.000	6.67E -6

Releases

There is no data of this type.

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip˙ft/deg)	rY (kip˙ft/deg)	rZ (kip˙ft/deg)
12	Fixed	-	Fixed	-	-	-
14	-	Fixed	-	-	-	-
15	Fixed	-	Fixed	-	-	-
17	-	Fixed	-	-	-	-

Primary Load Cases

Number	Name	Type
2	DYNO DRUM HO: LIGHT WIND LOAD (Z)	Wind
1	WEIGHT	Dead
10	WIND LOAD ON STRUCTURE (X) DIREC	Wind
11	WIND LOAD ON STRUCTURE (Y) DIREC	Wind
12	DYNO DRUM HO: LIGHT WIND LOAD (X)	Wind
16	WIND RESULTANT	Wind
9	COMPRESSION FORCE	Dead

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
3	1.1DL+1.0WR	1	WEIGHT	1.10
		16	WIND RESULTANT	1.00
4	1.25DL	1	WEIGHT	1.25
5	1.1DL+1.0WX	1	WEIGHT	1.10
		12	DYNO DRUM HO: LIGHT WIND LOAD (X)	1.00
		10	WIND LOAD ON STRUCTURE (X) DIREC	1.00
6	CASE I: VX	10	WIND LOAD ON STRUCTURE (X) DIREC	1.00
7	1.1DL+1.0WZ	2	DYNO DRUM HO: LIGHT WIND LOAD (Z)	1.00
		3	1.1DL+1.0WR	1.00
		1	WEIGHT	1.10
8	CASE I: VY	1	WEIGHT	1.00
13	CASE III: VY	1	WEIGHT	0.75
14	CASE III: VZ	3	1.1DL+1.0WR	0.75
		2	DYNO DRUM HO: LIGHT WIND LOAD (Z)	0.75
15	CASE III:VX	12	DYNO DRUM HO: LIGHT WIND LOAD (X)	0.75

1 WEIGHT : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
2	-	-0.0261	-	-	-	-
4	-	-0.0261	-	-	-	-
6	-	-0.0261	-	-	-	-
8	-	-0.0261	-	-	-	-
9	-	-0.0261	-	-	-	-
11	-	-0.0261	-	-	-	-

1 WEIGHT : Selfweight

Direction	Factor	Assigned Geometry
Y	-1.000	ALL

2 DYNO DRUM HO: LIGHT WIND LOAD (Z) DIRECTION : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
2	-	-	-0.0522	-	-	-
4	-	-	-0.0522	-	-	-
6	-	-	-0.0522	-	-	-
8	-	-	-0.0522	-	-	-
9	-	-	-0.0522	-	-	-
11	-	-	-0.0522	-	-	-

9 COMPRESSION FORCE : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip`in)	MY (kip`in)	MZ (kip`in)
14	-	-	3.000	-	-	-
17	-	-	3.000	-	-	-
26	-	-	-3.000	-	-	-
27	-	-	-3.000	-	-	-

10 WIND LOAD ON STRUCTURE (X) DIRECTION : Beam Loads

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
5	UNI	lbf/ft	GX	20.000	0	-	2.000	-
6	UNI	lbf/ft	GX	20.000	0	-	2.000	-
11	UNI	lbf/ft	GX	20.000	0	-	0.670	-
14	UNI	lbf/ft	GX	20.000	0	-	0.670	-
30	UNI	lbf/ft	GX	20.000	0	-	1.000	-
31	UNI	lbf/ft	GX	20.000	0	-	1.000	-
32	UNI	lbf/ft	GX	20.000	0	-	4.830	-
33	UNI	lbf/ft	GX	20.000	0	-	4.830	-

11 WIND LOAD ON STRUCTURE (Y) DIRECTION : Beam Loads

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
1	UNI	lbf/ft	GY	20.000	0	-	1.000	-
2	UNI	lbf/ft	GY	20.000	0	-	1.500	-
3	UNI	lbf/ft	GY	20.000	0	-	0.500	-
4	UNI	lbf/ft	GY	20.000	0	-	7.000	-
5	UNI	lbf/ft	GY	20.000	0	-	2.000	-
6	UNI	lbf/ft	GY	20.000	0	-	2.000	-
7	UNI	lbf/ft	GY	20.000	0	-	1.000	-
8	UNI	lbf/ft	GY	20.000	0	-	1.500	-
9	UNI	lbf/ft	GY	20.000	0	-	0.500	-
10	UNI	lbf/ft	GY	20.000	0	-	7.000	-
20	UNI	lbf/ft	GY	20.000	0	-	7.000	-
21	UNI	lbf/ft	GY	20.000	0	-	7.000	-
22	UNI	lbf/ft	GY	20.000	0	-	0.500	-
23	UNI	lbf/ft	GY	20.000	0	-	0.500	-
24	UNI	lbf/ft	GY	20.000	0	-	1.500	-
25	UNI	lbf/ft	GY	20.000	0	-	1.500	-
26	UNI	lbf/ft	GY	20.000	0	-	1.000	-
27	UNI	lbf/ft	GY	20.000	0	-	1.000	-
30	UNI	lbf/ft	GY	20.000	0	-	1.000	-
31	UNI	lbf/ft	GY	20.000	0	-	1.000	-

12 DYNO DRUM HO: LIGHT WIND LOAD (X) DIRECTION : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
2	0.02777	-	-	-	-	-
4	0.02777	-	-	-	-	-
8	0.02777	-	-	-	-	-
9	0.02777	-	-	-	-	-
24	0.02777	-	-	-	-	-
25	0.02777	-	-	-	-	-

16 WIND RESULTANT : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
2	0.0295	-	-	-	-	-
3	0.042	-	-	-	-	-
5	0.042	-	-	-	-	-
8	0.0295	-	-	-	-	-
12	0.155	-	-	-	-	-
15	0.155	-	-	-	-	-
20	0.0295	-	-	-	-	-
21	0.0295	-	-	-	-	-
24	0.0295	-	-	-	-	-
25	0.0295	-	-	-	-	-
26	0.053	-	-	-	-	-
27	0.053	-	-	-	-	-
28	0.021	-	-	-	-	-
29	0.021	-	-	-	-	-

Node Displacement Summary

	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Max X	26	11:WIND LOAI	**1.131**	653E+3	-1.26E+6	1.42E+6	-21.8E+3	0.002	-0.020
Min X	26	7:1.1DL+1.0W	**-1.702**	-1.06E+6	2.05E+6	2.31E+6	35.4E+3	-0.002	0.029
Max Y	28	11:WIND LOAI	-0.102	**1.44E+6**	175E+3	1.45E+6	-21.8E+3	0.002	-0.022
Min Y	28	7:1.1DL+1.0W	0.157	**-2.34E+6**	-285E+3	2.36E+6	35.4E+3	-0.002	0.034
Max Z	14	7:1.1DL+1.0W	-1.632	0	**2.05E+6**	2.05E+6	35.4E+3	-0.002	0.029
Min Z	14	11:WIND LOAI	1.085	0	**-1.26E+6**	1.26E+6	-21.8E+3	0.002	-0.020
Max rX	14	7:1.1DL+1.0W	-1.632	0	2.05E+6	2.05E+6	**35.4E+3**	-0.002	0.029
Min rX	14	11:WIND LOAI	1.085	0	-1.26E+6	1.26E+6	**-21.8E+3**	0.002	-0.020
Max rY	3	11:WIND LOAI	-0.120	1.18E+6	175E+3	1.19E+6	-21.8E+3	**0.002**	-0.022
Min rY	18	7:1.1DL+1.0W	0.184	-1.91E+6	-285E+3	1.93E+6	35.4E+3	**-0.002**	0.039
Max rZ	8	7:1.1DL+1.0W	0.239	-1.06E+6	-285E+3	1.1E+6	35.4E+3	-0.002	**0.040**
Min rZ	8	11:WIND LOAI	-0.157	653E+3	175E+3	676E+3	-21.8E+3	0.002	**-0.025**
Max Rst	28	7:1.1DL+1.0W	0.157	-2.34E+6	-285E+3	**2.36E+6**	35.4E+3	-0.002	0.034

Beam End Displacement Summary

Displacements shown in italic indicate the presence of an offset

	Beam	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	28	26	11:WIND LOAD	**1.131**	653E+3	-1.26E+6	1.42E+6
Min X	28	26	7:1.1DL+1.0W	**-1.702**	-1.06E+6	2.05E+6	2.31E+6
Max Y	30	28	11:WIND LOAD	-0.102	**1.44E+6**	175E+3	1.45E+6
Min Y	30	28	7:1.1DL+1.0W	0.157	**-2.34E+6**	-285E+3	2.36E+6
Max Z	28	26	7:1.1DL+1.0W	-1.702	-1.06E+6	**2.05E+6**	2.31E+6
Min Z	28	26	11:WIND LOAD	1.131	653E+3	**-1.26E+6**	1.42E+6
Max Rst	30	28	7:1.1DL+1.0W	0.157	-2.34E+6	-285E+3	**2.36E+6**

Beam End Force Summary

The signs of the forces at end B of each beam have been reversed. For example: this means that the Min Fx entry gives the largest tension value for an beam.

				Axial	Shear		Torsion	Bending	
	Beam	Node	L/C	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip¯in)	My (kip¯in)	Mz (kip¯in)
Max Fx	28	26	9:COMPRESS	**3.000**	0.000	0.000	-0.000	-0.000	0.000
Min Fx	8	7	11:WIND LOAD	**-1.284**	-0.340	-0.014	-7.549	0.126	-8.507
Max Fy	11	7	7:1.1DL+1.0W	-0.533	**2.034**	0.049	-0.000	22.152	18.528
Min Fy	14	10	7:1.1DL+1.0W	-0.642	**-2.249**	-0.148	0.000	-37.026	-15.906
Max Fz	11	7	16:WIND RESU	0.055	-0.104	**0.206**	-0.000	-1.123	1.339
Min Fz	27	25	2:DYNO DRUM	0.084	-0.001	**-0.179**	0.006	1.395	-0.005
Max Mx	8	7	7:1.1DL+1.0W	2.303	0.472	-0.009	**11.258**	-0.072	12.081
Min Mx	5	3	7:1.1DL+1.0W	-0.072	0.215	0.109	**-14.139**	-1.336	-6.696
Max My	14	15	11:WIND LOAD	0.460	1.290	0.000	-0.000	**25.560**	-0.000
Min My	32	27	7:1.1DL+1.0W	-0.761	0.037	-0.037	0.000	**-40.391**	0.000
Max Mz	29	17	7:1.1DL+1.0W	-0.000	-0.816	-0.000	-0.000	0.000	**64.046**
Min Mz	29	17	11:WIND LOAD	-0	0.460	0.000	-0.000	-0.000	**-39.360**

Beam Force Detail Summary

Sign convention as diagrams:- positive above line, negative below line except Fx where positive is compression. Distance d is given from beam end A.

				Axial	Shear		Torsion	Bending	
	Beam	L/C	d (ft)	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip¯in)	My (kip¯in)	Mz (kip¯in)
Max Fx	28	9:COMPRESS	0	**3.000**	0.000	0.000	-0.000	-0.000	0.000
Min Fx	8	11:WIND LOAD	0	**-1.284**	-0.340	-0.014	-7.549	0.126	-8.507
Max Fy	11	7:1.1DL+1.0W	0	-0.533	**2.034**	0.049	-0.000	22.152	18.528
Min Fy	14	7:1.1DL+1.0W	0	-0.642	**-2.249**	-0.148	0.000	-37.026	-15.906
Max Fz	11	16:WIND RESU	0	0.055	-0.104	**0.206**	-0.000	-1.123	1.339
Min Fz	27	2:DYNO DRUM	0	0.084	-0.001	**-0.179**	0.006	1.395	-0.005
Max Mx	8	7:1.1DL+1.0W	0	2.303	0.472	-0.009	**11.258**	-0.072	12.081
Min Mx	5	7:1.1DL+1.0W	0	-0.072	0.215	0.109	**-14.139**	-1.336	-6.696
Max My	14	11:WIND LOAD	0.670	0.460	1.290	0.000	-0.000	**25.560**	-0.000

Beam Force Detail Summary Cont...

	Beam	L/C	d	Axial Fx	Shear Fy	Shear Fz	Torsion Mx	Bending My	Bending Mz
			(ft)	(kip)	(kip)	(kip)	(kip¯in)	(kip¯in)	(kip¯in)
Min My	32	7:1.1DL+1.0W;	4.830	-0.761	0.037	-0.037	0.000	**-40.391**	0.000
Max Mz	29	7:1.1DL+1.0W;	2.500	-0.000	-0.816	-0.000	-0.000	0.000	**64.046**
Min Mz	29	11:WIND LOAI	2.500	-0	0.460	0.000	-0.000	-0.000	**-39.360**

Beam Combined Axial and Bending Stresses Summary

Beam	L/C	Length	Max Comp Stress	Max Comp d	Max Comp Corner	Max Tens Stress	Max Tens d	Max Tens Corner
		(ft)	(psi)	(ft)		(psi)	(ft)	
1	2:DYNO DRUN	1.000	808.023	1.000	2	-896.777	1.000	1
	1:WEIGHT	1.000	213.567	1.000	3	-214.042	1.000	1
	10:WIND LOAI	1.000	4.584	1.000	3	-4.826	1.000	1
	11:WIND LOAI	1.000	35.503	0	1	-34.876	0	3
	12:DYNO DRU	1.000	20.377	1.000	2			
	16:WIND RESI	1.000	360.562	1.000	1	-304.328	1.000	2
	9:COMPRESS	1.000	0.000	1.000	3	-0.000	1.000	1
	3:1.1DL+1.0WI	1.000	595.486	1.000	4	-539.774	1.000	2
	4:1.25DL	1.000	266.959	1.000	3	-267.552	1.000	1
	5:1.1DL+1.0W)	1.000	257.192	1.000	3	-231.068	1.000	1
	6:CASE I: VX	1.000	4.584	1.000	3	-4.826	1.000	1
	7:1.1DL+1.0W;	1.000	966.864	1.000	3	-1E+3	1.000	1
	8:CASE I: VY	1.000	213.567	1.000	3	-214.042	1.000	1
	13:CASE III: V	1.000	160.175	1.000	3	-160.531	1.000	1
	14:CASE III: V;	1.000	550.598	1.000	3	-575.379	1.000	1
	15:CASE III:VX	1.000	15.283	1.000	2			
2	2:DYNO DRUN	1.500	372.927	0	1	-770.020	0	2
	1:WEIGHT	1.500	1.25E+3	0	1	-1.24E+3	0	3
	10:WIND LOAI	1.500	639.564	0	3	-611.547	0	1
	11:WIND LOAI	1.500	2.15E+3	0	3	-2.16E+3	0	1
	12:DYNO DRU	1.500	175.047	0	2	-163.347	0	1
	16:WIND RESI	1.500	649.102	0	2	-455.636	0	1
	9:COMPRESS	1.500	0.000	0	3	-0.000	0	1
	3:1.1DL+1.0WI	1.500	1.77E+3	0	1	-1.57E+3	0	3
	4:1.25DL	1.500	1.56E+3	0	1	-1.55E+3	0	3
	5:1.1DL+1.0W)	1.500	1.26E+3	1.500	4	-1.22E+3	1.500	2
	6:CASE I: VX	1.500	639.564	0	3	-611.547	0	1
	7:1.1DL+1.0W;	1.500	2.89E+3	0	1	-3.08E+3	0	3
	8:CASE I: VY	1.500	1.25E+3	0	1	-1.24E+3	0	3
	13:CASE III: V	1.500	934.913	0	1	-931.373	0	3
	14:CASE III: V;	1.500	1.15E+3	0	1	-1.3E+3	0	3
	15:CASE III:VX	1.500	131.285	0	2	-122.511	0	1
3	2:DYNO DRUN	0.500				-258.921	0.500	2
	1:WEIGHT	0.500	2.29E+3	0.500	3	-2.19E+3	0.500	1

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
	10:WIND LOAI	0.500	232.567	0.500	2	-232.567	0.500	4
	11:WIND LOAI	0.500	3.05E+3	0.500	1	-3.19E+3	0.500	3
	12:DYNO DRU	0.500	125.081	0.500	3	-110.417	0.500	1
	16:WIND RESI	0.500	343.758	0.500	2	-235.072	0.500	4
	9:COMPRESS	0.500	0.000	0.500	1	-0.000	0.500	3
	3:1.1DL+1.0WI	0.500	2.79E+3	0.500	3	-2.57E+3	0.500	1
	4:1.25DL	0.500	2.87E+3	0.500	3	-2.74E+3	0.500	1
	5:1.1DL+1.0W	0.500	2.64E+3	0.500	3	-2.51E+3	0.500	1
	6:CASE I: VX	0.500	232.567	0.500	2	-232.567	0.500	4
	7:1.1DL+1.0W	0.500	5.23E+3	0.500	3	-5.16E+3	0.500	1
	8:CASE I: VY	0.500	2.29E+3	0.500	3	-2.19E+3	0.500	1
	13:CASE III: V	0.500	1.72E+3	0.500	3	-1.64E+3	0.500	1
	14:CASE III: V	0.500	2.03E+3	0.500	3	-2.06E+3	0.500	1
	15:CASE III:VX	0.500	93.811	0.500	3	-82.813	0.500	1
4	2:DYNO DRUN	7.000	1.3E+3	0	1	-1.55E+3	0	2
	1:WEIGHT	7.000	3.82E+3	0	3	-3.82E+3	0	1
	10:WIND LOAI	7.000	101.440	0	1	-101.076	0	3
	11:WIND LOAI	7.000	5.07E+3	0	1	-5.07E+3	0	3
	12:DYNO DRU	7.000				-26.640	0	1
	16:WIND RESI	7.000	597.088	0	2	-542.405	0	1
	9:COMPRESS	7.000	0.000	0	1	-0.000	0	3
	3:1.1DL+1.0WI	7.000	4.74E+3	0	3	-4.69E+3	0	1
	4:1.25DL	7.000	4.77E+3	0	3	-4.77E+3	0	1
	5:1.1DL+1.0W	7.000	4.09E+3	0	3	-4.12E+3	0	1
	6:CASE I: VX	7.000	101.440	0	1	-101.076	0	3
	7:1.1DL+1.0W	7.000	9.13E+3	0	3	-9.32E+3	0	1
	8:CASE I: VY	7.000	3.82E+3	0	3	-3.82E+3	0	1
	13:CASE III: V	7.000	2.86E+3	0	3	-2.86E+3	0	1
	14:CASE III: V	7.000	3.71E+3	0	3	-3.85E+3	0	1
	15:CASE III:VX	7.000				-19.980	0	1
5	2:DYNO DRUN	2.000	899.971	2.000	2	-846.659	2.000	4
	1:WEIGHT	2.000	1.78E+3	2.000	1	-1.79E+3	2.000	3
	10:WIND LOAI	2.000	700.758	2.000	3	-715.738	2.000	1
	11:WIND LOAI	2.000	2.31E+3	2.000	3	-2.3E+3	2.000	1
	12:DYNO DRU	2.000	151.032	2.000	2	-165.282	2.000	4
	16:WIND RESI	2.000	254.507	2.000	4	-341.616	2.000	2
	9:COMPRESS	2.000	0.000	2.000	3	-0.000	2.000	1
	3:1.1DL+1.0WI	2.000	1.81E+3	2.000	1	-1.9E+3	2.000	3
	4:1.25DL	2.000	2.23E+3	2.000	1	-2.24E+3	2.000	3
	5:1.1DL+1.0W	2.000	1.49E+3	2.000	2	-1.53E+3	2.000	4
	6:CASE I: VX	2.000	700.758	2.000	3	-715.738	2.000	1
	7:1.1DL+1.0W	2.000	4.35E+3	2.000	2	-4.4E+3	2.000	4
	8:CASE I: VY	2.000	1.78E+3	2.000	1	-1.79E+3	2.000	3
	13:CASE III: V	2.000	1.34E+3	2.000	1	-1.34E+3	2.000	3

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
	14:CASE III: V/	2.000	1.84E+3	2.000	2	-1.87E+3	2.000	4
	15:CASE III:VX	2.000	113.274	2.000	2	-123.962	2.000	4
6	2:DYNO DRUN	2.000	900.192	2.000	4	-846.880	2.000	2
	1:WEIGHT	2.000	4.09E+3	2.000	3	-4.1E+3	2.000	1
	10:WIND LOAI	2.000	715.738	2.000	2	-700.758	2.000	4
	11:WIND LOAI	2.000	6.34E+3	2.000	1	-6.33E+3	2.000	3
	12:DYNO DRU	2.000	165.089	2.000	3	-150.891	2.000	1
	16:WIND RESI	2.000	585.376	2.000	2	-601.798	2.000	4
	9:COMPRESS	2.000	0.000	2.000	1	-0.000	2.000	3
	3:1.1DL+1.0WI	2.000	4.68E+3	2.000	3	-4.7E+3	2.000	1
	4:1.25DL	2.000	5.12E+3	2.000	3	-5.13E+3	2.000	1
	5:1.1DL+1.0W)	2.000	4.13E+3	2.000	3	-4.11E+3	2.000	1
	6:CASE I: VX	2.000	715.738	2.000	2	-700.758	2.000	4
	7:1.1DL+1.0W/	2.000	9.17E+3	2.000	3	-9.15E+3	2.000	1
	8:CASE I: VY	2.000	4.09E+3	2.000	3	-4.1E+3	2.000	1
	13:CASE III: V	2.000	3.07E+3	2.000	3	-3.08E+3	2.000	1
	14:CASE III: V/	2.000	3.55E+3	2.000	4	-3.53E+3	2.000	2
	15:CASE III:VX	2.000	123.817	2.000	3	-113.168	2.000	1
7	2:DYNO DRUN	1.000	897.537	1.000	2	-809.062	1.000	1
	1:WEIGHT	1.000	290.880	1.000	3	-291.444	1.000	1
	10:WIND LOAI	1.000	6.556	1.000	2	-6.526	1.000	4
	11:WIND LOAI	1.000	131.822	1.000	1	-131.077	1.000	3
	12:DYNO DRU	1.000	19.731	0	1			
	16:WIND RESI	1.000	334.522	1.000	1	-348.459	1.000	2
	9:COMPRESS	1.000	0.000	1.000	1	-0.000	1.000	3
	3:1.1DL+1.0WI	1.000	652.020	1.000	4	-666.576	1.000	2
	4:1.25DL	1.000	363.601	1.000	3	-364.305	1.000	1
	5:1.1DL+1.0W)	1.000	330.205	1.000	3	-303.573	1.000	1
	6:CASE I: VX	1.000	6.556	1.000	2	-6.526	1.000	4
	7:1.1DL+1.0W/	1.000	1.19E+3	1.000	3	-1.12E+3	1.000	1
	8:CASE I: VY	1.000	290.880	1.000	3	-291.444	1.000	1
	13:CASE III: V	1.000	218.160	1.000	3	-218.583	1.000	1
	14:CASE III: V/	1.000	651.653	1.000	3	-596.214	1.000	1
	15:CASE III:VX	1.000	14.798	0	1			
8	2:DYNO DRUN	1.500	819.536	0	1	-432.734	0	2
	1:WEIGHT	1.500	4.2E+3	0	3	-3.18E+3	0	1
	10:WIND LOAI	1.500	2E+3	0	1	-2.03E+3	0	3
	11:WIND LOAI	1.500	4.59E+3	0	1	-5.94E+3	0	3
	12:DYNO DRU	1.500	558.154	0	3	-599.239	0	1
	16:WIND RESI	1.500	1.23E+3	0	1	-1.44E+3	0	3
	9:COMPRESS	1.500	0.000	0	1	-0.000	0	3
	3:1.1DL+1.0WI	1.500	3.85E+3	0	3	-2.93E+3	0	1
	4:1.25DL	1.500	5.25E+3	0	3	-3.97E+3	0	1
	5:1.1DL+1.0W)	1.500	3.31E+3	0	3	-2.24E+3	0	1

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	6:CASE I: VX	1.500	2E+3	0	1	-2.03E+3	0	3
	7:1.1DL+1.0W	1.500	8.63E+3	0	3	-6.19E+3	0	1
	8:CASE I: VY	1.500	4.2E+3	0	3	-3.18E+3	0	1
	13:CASE III: V	1.500	3.15E+3	0	3	-2.38E+3	0	1
	14:CASE III: V	1.500	3.03E+3	0	3	-2.05E+3	0	1
	15:CASE III:VX	1.500	418.615	0	3	-449.429	0	1
9	2:DYNO DRUM	0.500	212.591	0	1			
	1:WEIGHT	0.500	866.667	0.500	1	-92.067	0.500	3
	10:WIND LOAD	0.500	581.498	0.500	3	-581.498	0.500	1
	11:WIND LOAD	0.500	192.594	0.500	3	-1.22E+3	0.500	1
	12:DYNO DRU	0.500	227.558	0.500	2	-212.894	0.500	4
	16:WIND RES	0.500	425.346	0.500	3	-507.547	0.500	1
	9:COMPRESS	0.500	0.000	0.500	3	-0.000	0.500	1
	3:1.1DL+1.0WI	0.500	810.237	0	1	-40.378	0	2
	4:1.25DL	0.500	1.08E+3	0.500	1	-115.083	0.500	3
	5:1.1DL+1.0W	0.500	868.021	0	1	-1.297	0	2
	6:CASE I: VX	0.500	581.498	0.500	3	-581.498	0.500	1
	7:1.1DL+1.0W	0.500	1.77E+3	0	1			
	8:CASE I: VY	0.500	866.667	0.500	1	-92.067	0.500	3
	13:CASE III: V	0.500	650.000	0.500	1	-69.050	0.500	3
	14:CASE III: V	0.500	679.124	0	1			
	15:CASE III:VX	0.500	170.668	0.500	2	-159.671	0.500	4
10	2:DYNO DRUM	7.000	1.55E+3	0	1	-1.3E+3	0	2
	1:WEIGHT	7.000	3.37E+3	0	3	-3.37E+3	0	1
	10:WIND LOAD	7.000	98.654	0	3	-99.018	0	1
	11:WIND LOAD	7.000	4.31E+3	0	1	-4.31E+3	0	3
	12:DYNO DRU	7.000				-27.613	0	1
	16:WIND RES	7.000	507.675	0	2	-606.505	0	1
	9:COMPRESS	7.000	0.000	0	3	-0.000	0	1
	3:1.1DL+1.0WI	7.000	4.21E+3	0	3	-4.3E+3	0	1
	4:1.25DL	7.000	4.22E+3	0	3	-4.22E+3	0	1
	5:1.1DL+1.0W	7.000	3.79E+3	0	3	-3.82E+3	0	1
	6:CASE I: VX	7.000	98.654	0	3	-99.018	0	1
	7:1.1DL+1.0W	7.000	8.3E+3	0	3	-8.15E+3	0	1
	8:CASE I: VY	7.000	3.37E+3	0	3	-3.37E+3	0	1
	13:CASE III: V	7.000	2.53E+3	0	3	-2.53E+3	0	1
	14:CASE III: V	7.000	3.44E+3	0	3	-3.33E+3	0	1
	15:CASE III:VX	7.000				-20.710	0	1
11	2:DYNO DRUM	0.670	464.323	0	2	-464.323	0	1
	1:WEIGHT	0.670	6.11E+3	0	2	-6.29E+3	0	1
	10:WIND LOAD	0.670	1.99E+3	0.670	4	-1.92E+3	0.670	2
	11:WIND LOAD	0.670	8.55E+3	0	1	-8.23E+3	0	2
	12:DYNO DRU	0.670	397.413	0	1	-416.594	0	3
	16:WIND RES	0.670	958.260	0.670	3	-920.721	0.670	1

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	9:COMPRESS	0.670	0.000	0.670	1	-0.000	0.670	3
	3:1.1DL+1.0WI	0.670	6.81E+3	0	3	-6.98E+3	0	1
	4:1.25DL	0.670	7.64E+3	0	2	-7.86E+3	0	1
	5:1.1DL+1.0W	0.670	6.36E+3	0	3	-6.52E+3	0	1
	6:CASE I: VX	0.670	1.99E+3	0.670	4	-1.92E+3	0.670	2
	7:1.1DL+1.0W	0.670	13.9E+3	0	2	-14.3E+3	0	1
	8:CASE I: VY	0.670	6.11E+3	0	2	-6.29E+3	0	1
	13:CASE III: V	0.670	4.58E+3	0	2	-4.72E+3	0	1
	14:CASE III: V	0.670	5.42E+3	0	2	-5.54E+3	0	1
	15:CASE III:V)	0.670	298.060	0	1	-312.446	0	3
14	2:DYNO DRUN	0.670	874.350	0.670	1	-874.350	0.670	2
	1:WEIGHT	0.670	8.46E+3	0	1	-8.64E+3	0	2
	10:WIND LOAI	0.670	1.92E+3	0.670	3	-1.99E+3	0.670	1
	11:WIND LOAI	0.670	12.6E+3	0	2	-12.3E+3	0	1
	12:DYNO DRU	0.670	416.595	0	1	-397.414	0	3
	16:WIND RESI	0.670	1.15E+3	0.670	3	-1.19E+3	0.670	1
	9:COMPRESS	0.670	0.000	0.670	2	-0.000	0.670	4
	3:1.1DL+1.0WI	0.670	8.45E+3	0	1	-8.69E+3	0	2
	4:1.25DL	0.670	10.6E+3	0	1	-10.8E+3	0	2
	5:1.1DL+1.0W	0.670	7.79E+3	0	1	-8.04E+3	0	2
	6:CASE I: VX	0.670	1.92E+3	0.670	3	-1.99E+3	0.670	1
	7:1.1DL+1.0W	0.670	18.2E+3	0	1	-18.6E+3	0	2
	8:CASE I: VY	0.670	8.46E+3	0	1	-8.64E+3	0	2
	13:CASE III: V	0.670	6.34E+3	0	1	-6.48E+3	0	2
	14:CASE III: V	0.670	6.64E+3	0	1	-6.82E+3	0	2
	15:CASE III:V)	0.670	312.446	0	1	-298.060	0	3
20	2:DYNO DRUN	7.000	1.29E+3	7.000	1	-1.54E+3	7.000	2
	1:WEIGHT	7.000	2.63E+3	7.000	3	-2.63E+3	7.000	1
	10:WIND LOAI	7.000	101.076	7.000	3	-101.440	7.000	1
	11:WIND LOAI	7.000	3.33E+3	7.000	1	-3.33E+3	7.000	3
	12:DYNO DRU	7.000	27.241	7.000	2			
	16:WIND RESI	7.000	626.343	7.000	2	-507.442	7.000	1
	9:COMPRESS	7.000	0.000	7.000	3	-0.000	7.000	1
	3:1.1DL+1.0WI	7.000	3.52E+3	7.000	3	-3.4E+3	7.000	1
	4:1.25DL	7.000	3.29E+3	7.000	3	-3.29E+3	7.000	1
	5:1.1DL+1.0W	7.000	3.01E+3	7.000	3	-2.98E+3	7.000	1
	6:CASE I: VX	7.000	101.076	7.000	3	-101.440	7.000	1
	7:1.1DL+1.0W	7.000	6.5E+3	7.000	4	-6.63E+3	7.000	2
	8:CASE I: VY	7.000	2.63E+3	7.000	3	-2.63E+3	7.000	1
	13:CASE III: V	7.000	1.97E+3	7.000	3	-1.97E+3	7.000	1
	14:CASE III: V	7.000	2.71E+3	7.000	4	-2.8E+3	7.000	2
	15:CASE III:V)	7.000	20.431	7.000	2			
21	2:DYNO DRUN	7.000	1.54E+3	7.000	1	-1.3E+3	7.000	2
	1:WEIGHT	7.000	4.56E+3	7.000	3	-4.56E+3	7.000	1

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	10:WIND LOAI	7.000	99.018	7.000	1	-98.654	7.000	3
	11:WIND LOAI	7.000	6.05E+3	7.000	1	-6.05E+3	7.000	3
	12:DYNO DRU	7.000	27.013	7.000	3			
	16:WIND RESI	7.000	545.005	7.000	2	-619.758	7.000	1
	9:COMPRESS	7.000	0.000	7.000	1	-0.000	7.000	3
	3:1.1DL+1.0WI	7.000	5.5E+3	7.000	3	-5.57E+3	7.000	1
	4:1.25DL	7.000	5.7E+3	7.000	3	-5.7E+3	7.000	1
	5:1.1DL+1.0W)	7.000	4.94E+3	7.000	3	-4.91E+3	7.000	1
	6:CASE I: VX	7.000	99.018	7.000	1	-98.654	7.000	3
	7:1.1DL+1.0W	7.000	10.9E+3	7.000	4	-10.8E+3	7.000	2
	8:CASE I: VY	7.000	4.56E+3	7.000	3	-4.56E+3	7.000	1
	13:CASE III: V	7.000	3.42E+3	7.000	3	-3.42E+3	7.000	1
	14:CASE III: V	7.000	4.45E+3	7.000	4	-4.32E+3	7.000	2
	15:CASE III:VX	7.000	20.260	7.000	3			
22	2:DYNO DRUM	0.500				-222.179	0	1
	1:WEIGHT	0.500	1.5E+3	0.500	3	-1.4E+3	0.500	1
	10:WIND LOAI	0.500	232.567	0	3	-232.567	0	1
	11:WIND LOAI	0.500	1.95E+3	0.500	1	-2.09E+3	0.500	3
	12:DYNO DRU	0.500	110.404	0	1	-125.127	0	2
	16:WIND RESI	0.500	322.844	0	1	-214.157	0	2
	9:COMPRESS	0.500	0.000	0	3	-0.000	0	1
	3:1.1DL+1.0WI	0.500	1.71E+3	0.500	3	-1.48E+3	0.500	1
	4:1.25DL	0.500	1.88E+3	0.500	3	-1.75E+3	0.500	1
	5:1.1DL+1.0W)	0.500	1.65E+3	0.500	3	-1.55E+3	0.500	1
	6:CASE I: VX	0.500	232.567	0	3	-232.567	0	1
	7:1.1DL+1.0W	0.500	3.3E+3	0.500	3	-3.22E+3	0.500	1
	8:CASE I: VY	0.500	1.5E+3	0.500	3	-1.4E+3	0.500	1
	13:CASE III: V	0.500	1.13E+3	0.500	3	-1.05E+3	0.500	1
	14:CASE III: V	0.500	1.24E+3	0.500	3	-1.27E+3	0.500	1
	15:CASE III:VX	0.500	82.803	0	1	-93.845	0	2
23	2:DYNO DRUM	0.500	262.766	0	1	-12.859	0	2
	1:WEIGHT	0.500	1.6E+3	0	3	-827.225	0	1
	10:WIND LOAI	0.500	581.498	0	1	-581.498	0	3
	11:WIND LOAI	0.500	1.25E+3	0	1	-2.27E+3	0	3
	12:DYNO DRU	0.500	212.848	0	4	-227.571	0	1
	16:WIND RESI	0.500	448.937	0	1	-531.138	0	2
	9:COMPRESS	0.500	0.000	0	1	-0.000	0	3
	3:1.1DL+1.0WI	0.500	1.73E+3	0	3	-958.821	0	1
	4:1.25DL	0.500	2E+3	0	3	-1.03E+3	0	1
	5:1.1DL+1.0W)	0.500	1.62E+3	0	3	-779.673	0	1
	6:CASE I: VX	0.500	581.498	0	1	-581.498	0	3
	7:1.1DL+1.0W	0.500	3.75E+3	0	3	-1.88E+3	0	1
	8:CASE I: VY	0.500	1.6E+3	0	3	-827.225	0	1
	13:CASE III: V	0.500	1.2E+3	0	3	-620.419	0	1

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
	14:CASE III: V	0.500	1.49E+3	0	3	-728.760	0	1
	15:CASE III:VX	0.500	159.636	0	4	-170.678	0	1
24	2:DYNO DRUM	1.500	409.001	1.500	4	-806.095	1.500	2
	1:WEIGHT	1.500	4.79E+3	1.500	3	-4.79E+3	1.500	1
	10:WIND LOAD	1.500	611.547	1.500	1	-639.564	1.500	3
	11:WIND LOAD	1.500	6.71E+3	1.500	1	-6.72E+3	1.500	3
	12:DYNO DRU	1.500	163.040	1.500	4	-174.739	1.500	2
	16:WIND RESI	1.500	379.521	1.500	1	-277.027	1.500	3
	9:COMPRESS	1.500	0.000	1.500	1	-0.000	1.500	3
	3:1.1DL+1.0WI	1.500	5.39E+3	1.500	4	-5.28E+3	1.500	2
	4:1.25DL	1.500	5.99E+3	1.500	3	-5.99E+3	1.500	1
	5:1.1DL+1.0W	1.500	5.06E+3	1.500	4	-5.09E+3	1.500	2
	6:CASE I: VX	1.500	611.547	1.500	1	-639.564	1.500	3
	7:1.1DL+1.0W	1.500	11.1E+3	1.500	4	-11.4E+3	1.500	2
	8:CASE I: VY	1.500	4.79E+3	1.500	3	-4.79E+3	1.500	1
	13:CASE III: V	1.500	3.6E+3	1.500	3	-3.59E+3	1.500	1
	14:CASE III: V	1.500	4.35E+3	1.500	4	-4.57E+3	1.500	2
	15:CASE III:VX	1.500	122.280	1.500	4	-131.054	1.500	2
25	2:DYNO DRUM	1.500	760.263	1.500	1	-373.460	1.500	3
	1:WEIGHT	1.500	2.96E+3	1.500	1	-1.93E+3	1.500	3
	10:WIND LOAD	1.500	2.03E+3	1.500	4	-2E+3	1.500	2
	11:WIND LOAD	1.500	3.06E+3	1.500	3	-4.42E+3	1.500	1
	12:DYNO DRU	1.500	599.547	1.500	1	-558.461	1.500	3
	16:WIND RESI	1.500	1.02E+3	1.500	4	-1.1E+3	1.500	2
	9:COMPRESS	1.500	0.000	1.500	3	-0.000	1.500	1
	3:1.1DL+1.0WI	1.500	2.46E+3	1.500	1	-1.4E+3	1.500	3
	4:1.25DL	1.500	3.7E+3	1.500	1	-2.42E+3	1.500	3
	5:1.1DL+1.0W	1.500	2.14E+3	1.500	1	-938.302	1.500	3
	6:CASE I: VX	1.500	2.03E+3	1.500	4	-2E+3	1.500	2
	7:1.1DL+1.0W	1.500	6.48E+3	1.500	1	-3.9E+3	1.500	3
	8:CASE I: VY	1.500	2.96E+3	1.500	1	-1.93E+3	1.500	3
	13:CASE III: V	1.500	2.22E+3	1.500	1	-1.45E+3	1.500	3
	14:CASE III: V	1.500	2.41E+3	1.500	1	-1.33E+3	1.500	3
	15:CASE III:VX	1.500	449.660	1.500	1	-418.846	1.500	3
26	2:DYNO DRUM	1.000	808.316	0	2	-897.070	0	1
	1:WEIGHT	1.000	255.049	0	3	-255.524	0	1
	10:WIND LOAD	1.000	4.826	0	1	-4.584	0	3
	11:WIND LOAD	1.000	83.151	0	1	-82.524	0	3
	12:DYNO DRU	1.000	2.370	0	1	-2.238	0	2
	16:WIND RESI	1.000	360.260	0	1	-332.245	0	2
	9:COMPRESS	1.000	0.000	0	1	-0.000	0	3
	3:1.1DL+1.0WI	1.000	639.291	0	1	-611.797	0	2
	4:1.25DL	1.000	318.812	0	3	-319.405	0	1
	5:1.1DL+1.0W	1.000	281.424	0	3	-281.572	0	1

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	6:CASE I: VX	1.000	4.826	0	1	-4.584	0	3
	7:1.1DL+1.0W2	1.000	1.03E+3	0	3	-1.09E+3	0	1
	8:CASE I: VY	1.000	255.049	0	3	-255.524	0	1
	13:CASE III: V	1.000	191.287	0	3	-191.643	0	1
	14:CASE III: V2	1.000	565.827	0	2	-611.772	0	1
	15:CASE III:VX	1.000	1.778	0	1	-1.678	0	2
27	2:DYNO DRUM	1.000	897.830	0	2	-809.355	0	1
	1:WEIGHT	1.000	235.561	0	3	-236.125	0	1
	10:WIND LOAD	1.000	6.526	0	3	-6.556	0	1
	11:WIND LOAD	1.000	50.503	0	1	-49.758	0	3
	12:DYNO DRU	1.000	2.399	0	1	-2.602	0	2
	16:WIND RESI	1.000	331.171	0	1	-360.384	0	2
	9:COMPRESS	1.000	0.000	0	3	-0.000	0	1
	3:1.1DL+1.0WI	1.000	590.288	0	1	-620.122	0	2
	4:1.25DL	1.000	294.451	0	3	-295.156	0	1
	5:1.1DL+1.0W)	1.000	267.020	0	3	-267.873	0	1
	6:CASE I: VX	1.000	6.526	0	3	-6.556	0	1
	7:1.1DL+1.0W2	1.000	1.05E+3	0	2	-994.497	0	1
	8:CASE I: VY	1.000	235.561	0	3	-236.125	0	1
	13:CASE III: V	1.000	176.671	0	3	-177.094	0	1
	14:CASE III: V2	1.000	595.183	0	2	-551.202	0	1
	15:CASE III:VX	1.000	1.799	0	1	-1.951	0	2
28	2:DYNO DRUM	2.500				-0.000	2.292	1
	1:WEIGHT	2.500	3.47E+3	0	1	-3.47E+3	0	3
	10:WIND LOAD	2.500	982.292	0	3	-982.292	0	1
	11:WIND LOAD	2.500	4.79E+3	0	3	-4.79E+3	0	1
	12:DYNO DRU	2.500	290.717	0	1	-290.717	0	3
	16:WIND RESI	2.500	568.945	0	3	-568.945	0	1
	9:COMPRESS	2.500	1.03E+3	0	1			
	3:1.1DL+1.0WI	2.500	3.25E+3	0	1	-3.25E+3	0	3
	4:1.25DL	2.500	4.34E+3	0	1	-4.34E+3	0	3
	5:1.1DL+1.0W)	2.500	3.13E+3	0	1	-3.13E+3	0	3
	6:CASE I: VX	2.500	982.292	0	3	-982.292	0	1
	7:1.1DL+1.0W2	2.500	7.08E+3	0	1	-7.08E+3	0	3
	8:CASE I: VY	2.500	3.47E+3	0	1	-3.47E+3	0	3
	13:CASE III: V	2.500	2.61E+3	0	1	-2.61E+3	0	3
	14:CASE III: V2	2.500	2.44E+3	0	1	-2.44E+3	0	3
	15:CASE III:VX	2.500	218.038	0	1	-218.038	0	3
29	2:DYNO DRUM	2.500	874.350	2.292	3	-874.350	2.292	1
	1:WEIGHT	2.500	9.3E+3	2.500	3	-9.3E+3	2.500	1
	10:WIND LOAD	2.500	982.292	0	1	-982.292	0	3
	11:WIND LOAD	2.500	13.7E+3	2.500	1	-13.7E+3	2.500	3
	12:DYNO DRU	2.500	290.717	0	3	-290.717	0	1
	16:WIND RESI	2.500	910.312	2.500	3	-910.312	2.500	1

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
	9:COMPRESS	2.500	1.03E+3	0	1			
	3:1.1DL+1.0WI	2.500	11.1E+3	2.500	3	-11.1E+3	2.500	1
	4:1.25DL	2.500	11.6E+3	2.500	3	-11.6E+3	2.500	1
	5:1.1DL+1.0W)	2.500	10.2E+3	2.500	3	-10.2E+3	2.500	1
	6:CASE I: VX	2.500	982.292	0	1	-982.292	0	3
	7:1.1DL+1.0W2	2.500	22.2E+3	2.500	3	-22.2E+3	2.500	1
	8:CASE I: VY	2.500	9.3E+3	2.500	3	-9.3E+3	2.500	1
	13:CASE III: V	2.500	6.97E+3	2.500	3	-6.97E+3	2.500	1
	14:CASE III: V2	2.500	9.01E+3	2.500	3	-9.01E+3	2.500	1
	15:CASE III:VX	2.500	218.038	0	3	-218.038	0	1
30	2:DYNO DRUM	1.000	0.000	1.000	1	-0.000	1.000	3
	1:WEIGHT	1.000	20.588	0	3	-20.588	0	1
	10:WIND LOAD	1.000	41.667	0	1	-41.667	0	2
	11:WIND LOAD	1.000	41.666	0	1	-41.666	0	3
	12:DYNO DRU	1.000	0.000	0	1	-0.000	0	3
	16:WIND RESI	1.000	56.769	0	1	-66.975	0	2
	9:COMPRESS	1.000	0.000	1.000	3	-0.000	1.000	1
	3:1.1DL+1.0WI	1.000	79.416	0	1	-89.621	0	2
	4:1.25DL	1.000	25.735	0	3	-25.735	0	1
	5:1.1DL+1.0W)	1.000	64.313	0	1	-64.313	0	2
	6:CASE I: VX	1.000	41.667	0	1	-41.667	0	2
	7:1.1DL+1.0W2	1.000	102.062	0	1	-112.268	0	2
	8:CASE I: VY	1.000	20.588	0	3	-20.588	0	1
	13:CASE III: V	1.000	15.441	0	3	-15.441	0	1
	14:CASE III: V2	1.000	59.562	0	1	-67.216	0	2
	15:CASE III:VX	1.000	0.000	0	1	-0.000	0	3
31	2:DYNO DRUM	1.000	0.000	0.917	1	-0.000	0.917	3
	1:WEIGHT	1.000	20.588	0	3	-20.588	0	1
	10:WIND LOAD	1.000	41.667	0	1	-41.667	0	2
	11:WIND LOAD	1.000	41.667	0	1	-41.667	0	3
	12:DYNO DRU	1.000	0.000	0	3	-0.000	0	1
	16:WIND RESI	1.000	56.769	0	1	-66.975	0	2
	9:COMPRESS	1.000	0.000	0	2	-0.000	0	1
	3:1.1DL+1.0WI	1.000	79.416	0	1	-89.622	0	2
	4:1.25DL	1.000	25.735	0	3	-25.735	0	1
	5:1.1DL+1.0W)	1.000	64.314	0	1	-64.314	0	2
	6:CASE I: VX	1.000	41.667	0	1	-41.667	0	2
	7:1.1DL+1.0W2	1.000	102.063	0	1	-112.269	0	2
	8:CASE I: VY	1.000	20.588	0	3	-20.588	0	1
	13:CASE III: V	1.000	15.441	0	3	-15.441	0	1
	14:CASE III: V2	1.000	59.562	0	1	-67.216	0	2
	15:CASE III:VX	1.000	0.000	0	3	-0.000	0	1
32	2:DYNO DRUM	4.830	874.350	0	1	-874.350	0	2
	1:WEIGHT	4.830	5.73E+3	0	1	-5.93E+3	4.830	2

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	10:WIND LOAI	4.830	1.92E+3	0	3	-1.99E+3	0	1
	11:WIND LOAI	4.830	9.03E+3	0	2	-8.72E+3	0	1
	12:DYNO DRU	4.830	300.308	0	1	-281.127	0	2
	16:WIND RESI	4.830	1.15E+3	0	3	-1.19E+3	0	1
	9:COMPRESS	4.830	0.000	4.830	2	-0.000	4.830	1
	3:1.1DL+1.0WI	4.830	6.62E+3	0	1	-6.89E+3	4.830	2
	4:1.25DL	4.830	7.16E+3	0	1	-7.42E+3	4.830	2
	5:1.1DL+1.0W)	4.830	6.56E+3	0	1	-6.81E+3	0	2
	6:CASE I: VX	4.830	1.92E+3	0	3	-1.99E+3	0	1
	7:1.1DL+1.0W.	4.830	13.8E+3	0	1	-14.3E+3	4.830	2
	8:CASE I: VY	4.830	5.73E+3	0	1	-5.93E+3	4.830	2
	13:CASE III: V'	4.830	4.3E+3	0	1	-4.45E+3	4.830	2
	14:CASE III: V.	4.830	5.62E+3	0	1	-5.82E+3	4.830	2
	15:CASE III:VX	4.830	225.231	0	1	-210.845	0	2
33	2:DYNO DRUN	4.830	0.000	0	1	-0.000	0	2
	1:WEIGHT	4.830	3.38E+3	0	2	-3.59E+3	4.830	1
	10:WIND LOAI	4.830	1.99E+3	0	1	-1.92E+3	0	2
	11:WIND LOAI	4.830	4.95E+3	4.830	1	-4.63E+3	4.830	2
	12:DYNO DRU	4.830	281.127	0	2	-300.308	0	1
	16:WIND RESI	4.830	958.260	0	3	-920.721	0	1
	9:COMPRESS	4.830	0.000	0	1	-0.000	0	2
	3:1.1DL+1.0WI	4.830	4.68E+3	0	2	-4.85E+3	0	1
	4:1.25DL	4.830	4.23E+3	0	2	-4.48E+3	4.830	1
	5:1.1DL+1.0W)	4.830	4.02E+3	0	2	-4.18E+3	0	1
	6:CASE I: VX	4.830	1.99E+3	0	1	-1.92E+3	0	2
	7:1.1DL+1.0W.	4.830	8.4E+3	0	2	-8.77E+3	0	1
	8:CASE I: VY	4.830	3.38E+3	0	2	-3.59E+3	4.830	1
	13:CASE III: V'	4.830	2.54E+3	0	2	-2.69E+3	4.830	1
	14:CASE III: V.	4.830	3.51E+3	0	2	-3.63E+3	0	1
	15:CASE III:VX	4.830	210.845	0	2	-225.231	0	1

Plate Center Stress Summary

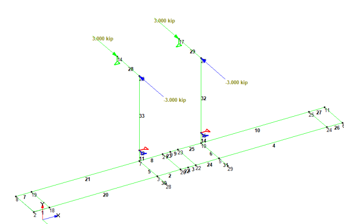
	Plate	L/C	Shear		Membrane			Bending		
			Qx (psi)	Qy (psi)	Sx (psi)	Sy (psi)	Sxy (psi)	Mx (lb-in/in)	My (lb-in/in)	Mxy (lb-in/in)
Max Qx	17	7:1.1DL+1.0W	**13.066**	-0.259	-0.054	-0.695	46.440	-2.318	-0.460	0.389
Min Qx	17	11:WIND LOAD	**-8.297**	0.024	0.068318	0.216	0.050	1.462	0.415	-0.250
Max Qy	18	11:WIND LOAD	2.482	**1.951**	9.159	31.689	-0.000	-1.165	-1.412	4.276
Min Qy	18	7:1.1DL+1.0W	-4.398	**-3.035**	-15.381	-53.154	35.615	1.584	2.158	-6.338
Max Sx	18	11:WIND LOAD	2.482	1.951	**9.159**	31.689	-0.000	-1.165	-1.412	4.276
Min Sx	18	7:1.1DL+1.0W	-4.398	-3.035	**-15.381**	-53.154	35.615	1.584	2.158	-6.338
Max Sy	18	11:WIND LOAD	2.482	1.951	9.159	**31.689**	-0.000	-1.165	-1.412	4.276
Min Sy	18	7:1.1DL+1.0W	-4.398	-3.035	-15.381	**-53.154**	35.615	1.584	2.158	-6.338
Max Sxy	17	2:DYNO DRUM	0.317	0.001	-0.011	-0.044	**77.028**	-0.143	-0.043	0.008
Min Sxy	19	2:DYNO DRUM	-0.361	0.001	-0.011	-0.044	**-77.028**	0.143	0.042553	0.010
Max Mx	19	7:1.1DL+1.0W	-3.175	0.319	-0.185	-0.592	-52.763	**4.392**	1.541	0.050
Min Mx	19	11:WIND LOAD	2.301	-0.064	0.068	0.216	-0.050	**-3.000**	-0.915	-0.037
Max My	18	7:1.1DL+1.0W	-4.398	-3.035	-15.381	-53.154	35.615	1.584	**2.158**	-6.338
Min My	18	11:WIND LOAD	2.482	1.951	9.159	31.689	-0.000	-1.165	**-1.412**	4.276
Max Mxy	18	11:WIND LOAD	2.482	1.951	9.159	31.689	-0.000	-1.165	-1.412	**4.276**
Min Mxy	18	7:1.1DL+1.0W	-4.398	-3.035	-15.381	-53.154	35.615	1.584	2.158	**-6.338**

Reaction Summary

	Node	L/C	Horizontal	Vertical	Horizontal	Moment		
			FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
Max FX	12	7:1.1DL+1.0W	**1.887**	0	-0.197	0	0	0
Min FX	15	7:1.1DL+1.0W	**-2.396**	0	0.001	0	0	0
Max FY	17	7:1.1DL+1.0W	0	**0.816**	0	0	0	0
Min FY	17	11:WIND LOAD	0	**-0.460**	0	0	0	0
Max FZ	15	2:DYNO DRUM	0.010	0	**0.157**	0	0	0
Min FZ	12	16:WIND RESI	-0.251	0	**-0.353**	0	0	0
Max MX	12	2:DYNO DRUM	-0.010	0	0.157	**0**	0	0
Min MX	12	2:DYNO DRUM	-0.010	0	0.157	**0**	0	0
Max MY	12	2:DYNO DRUM	-0.010	0	0.157	0	**0**	0
Min MY	12	2:DYNO DRUM	-0.010	0	0.157	0	**0**	0
Max MZ	12	2:DYNO DRUM	-0.010	0	0.157	0	0	**0**
Min MZ	12	2:DYNO DRUM	-0.010	0	0.157	0	0	**0**

2.396 kips = 3 kips , therefore 3 kips applied at nodes 26, 14 and 27, 17 for compression member check (28, and 29).

PL^3/3EI = (3.00 kips)* (5.5'/12)^3/(3 *(29000ksi)*(5.04)) = 1.96", OK



Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
1	HSST3X3X0	HSST3X3X0	0.026	1.000	0.026	HSS FLEX+A	7	1.890	2.460	2.460	4.030
2	HSST3X3X0	HSST3X3X0	0.137	1.000	0.137	HSS TORSIO	7	1.890	2.460	2.460	4.030
3	HSST3X3X0	HSST3X3X0	0.174	1.000	0.174	HSS T+SH+F	7	1.890	2.460	2.460	4.030
4	HSST3X3X0	HSST3X3X0	0.263	1.000	0.263	HSS T+SH+F	7	1.890	2.460	2.460	4.030
5	HSST3.5X3.	HSST3.5X3.	0.148	1.000	0.148	HSS TORSIO	7	2.910	5.040	5.040	8.350
6	HSST3.5X3.	HSST3.5X3.	0.282	1.000	0.282	HSS T+SH+F	7	2.910	5.040	5.040	8.350
7	HSST3X3X0	HSST3X3X0	0.030	1.000	0.030	HSS FLEX+A	7	1.890	2.460	2.460	4.030
8	HSST3X3X0	HSST3X3X0	0.320	1.000	0.320	HSS T+SH+F	7	1.890	2.460	2.460	4.030
9	HSST3X3X0	HSST3X3X0	0.206	1.000	0.206	HSS TORSIO	7	1.890	2.460	2.460	4.030
10	HSST3X3X0	HSST3X3X0	0.231	1.000	0.231	HSS T+SH+F	7	1.890	2.460	2.460	4.030
11	HSST3.5X3.	HSST3.5X3.	0.362	1.000	0.362	HSS FLEX+A	7	2.910	5.040	5.040	8.350
14	HSST3.5X3.	HSST3.5X3.	0.470	1.000	0.470	HSS FLEX+A	7	2.910	5.040	5.040	8.350
20	HSST3X3X0	HSST3X3X0	0.180	1.000	0.180	HSS T+SH+F	7	1.890	2.460	2.460	4.030
21	HSST3X3X0	HSST3X3X0	0.314	1.000	0.314	HSS T+SH+F	7	1.890	2.460	2.460	4.030
22	HSST3X3X0	HSST3X3X0	0.134	1.000	0.134	HSS TORSIO	7	1.890	2.460	2.460	4.030
23	HSST3X3X0	HSST3X3X0	0.206	1.000	0.206	HSS TORSIO	7	1.890	2.460	2.460	4.030
24	HSST3X3X0	HSST3X3X0	0.359	1.000	0.359	HSS T+SH+F	7	1.890	2.460	2.460	4.030
25	HSST3X3X0	HSST3X3X0	0.234	1.000	0.234	HSS T+SH+F	7	1.890	2.460	2.460	4.030
26	HSST3X3X0	HSST3X3X0	0.028	1.000	0.028	HSS FLEX+A	7	1.890	2.460	2.460	4.030
27	HSST3X3X0	HSST3X3X0	0.027	1.000	0.027	HSS FLEX+A	7	1.890	2.460	2.460	4.030
28	HSST3.5X3.	HSST3.5X3.	0.180	1.000	0.180	HSS BEND Z	7	2.910	5.040	5.040	8.350
29	HSST3.5X3.	HSST3.5X3.	0.565	1.000	0.565	HSS BEND Z	7	2.910	5.040	5.040	8.350
30	HSST3.5X3.	HSST3.5X3.	0.003	1.000	0.003	HSS FLEX+A	7	2.910	5.040	5.040	8.350
31	HSST3.5X3.	HSST3.5X3.	0.003	1.000	0.003	HSS FLEX+A	7	2.910	5.040	5.040	8.350
32	HSST3.5X3.	N/A						2.910	5.040	5.040	8.350
33	HSST3.5X3.	N/A						2.910	5.040	5.040	8.350

Statics Check Results

L/C		FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
2:DYNO DRUM H	Loads	0	0	-0.313	0	37.584	0
2:DYNO DRUM H	Reactions	-0.000	0.000	0.313	2.518	-37.584	0.000
	Difference	-0.000	0.000	0.000	2.518	-0.000	0.000
1:WEIGHT	Loads	0	-0.692	0	-18.888	0	-83.024
1:WEIGHT	Reactions	-0.000	0.692	0.000	45.663	-0.000	83.024
	Difference	-0.000	0.000	0.000	26.776	-0.000	0.000
10:WIND LOAD (	Loads	0.340	0	0	0	-10.080	-7.260
10:WIND LOAD (	Reactions	-0.340	-0.000	-0.000	-0.000	10.080	7.260
	Difference	0.000	-0.000	-0.000	-0.000	-0.000	-0.000
11:WIND LOAD (	Loads	0	0.920	0	21.360	0	110.400
11:WIND LOAD (	Reactions	0.000	-0.920	-0.000	-60.720	0.000	-110.400
	Difference	0.000	-0.000	-0.000	-39.360	0.000	-0.000

Statics Check Results Cont...

L/C		FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
12:DYNO DRUM	Loads	0.167	0	0	0	-3.999	0
12:DYNO DRUM	Reactions	-0.167	0.000	0.000	0.000	3.999	0.000
	Difference	-0.000	0.000	0.000	0.000	-0.000	0.000
16:WIND RESUL	Loads	0.508	0	0.508	6.709	-74.564	-6.709
16:WIND RESUL	Reactions	-0.508	0.000	-0.508	-4.088	74.564	6.709
	Difference	-0.000	0.000	0.000	2.622	-0.000	0.000
9:COMPRESSIO	Loads	0	0	0	0	0	0
9:COMPRESSIO	Reactions	0.000	-0.000	0.000	0.000	-0.000	-0.000
	Difference	0.000	-0.000	0.000	0.000	-0.000	-0.000

Base Pressure Summary

	Node	L/C	FX (psi)	FY (psi)	FZ (psi)
Max FX	12	2:DYNO DRUN	**0**	0	0
Min FX	12	2:DYNO DRUN	**0**	0	0
Max FY	12	2:DYNO DRUN	0	**0**	0
Min FY	12	2:DYNO DRUN	0	**0**	0
Max FZ	12	2:DYNO DRUN	0	0	**0**
Min FZ	12	2:DYNO DRUN	0	0	**0**

Job Information

	Engineer	**Checked**	**Approved**
Name:	IERM		
Date:	2/12/2020		

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	26	Highest Node	29
Number of Elements	26	Highest Beam	33
Number of Plates	3	Highest Plate	19

Number of Basic Load Cases	7
Number of Combination Load Cases	9

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

Type	L/C	Name
Primary	2	DYNO DRUM HO: LIGHT WIND LOAD (Z)
Primary	1	WEIGHT
Primary	10	WIND LOAD ON STRUCTURE (X) DIREC
Primary	11	WIND LOAD ON STRUCTURE (Y) DIREC
Primary	12	DYNO DRUM HO: LIGHT WIND LOAD (X)
Primary	16	WIND RESULTANT
Primary	9	COMPRESSION FORCE
Combination	3	1.1DL+1.0WR
Combination	4	1.25DL
Combination	5	1.1DL+1.0WX
Combination	6	CASE I: VX
Combination	7	1.1DL+1.0WZ
Combination	8	CASE I: VY
Combination	13	CASE III: VY
Combination	14	CASE III: VZ
Combination	15	CASE III:VX

Nodes

Node	X (ft)	Y (ft)	Z (ft)
2	0	0	-1.000
3	8.000	0	-1.000
4	10.000	0	-1.000
5	12.000	0	-1.000
6	20.000	0	-1.000
7	8.000	0	-3.000
8	0	0	-3.000
9	10.000	0	-3.000
10	12.000	0	-3.000
11	20.000	0	-3.000
12	8.000	0.670	-3.000
14	8.000	5.500	-5.500
15	12.000	0.670	-3.000
17	12.000	5.500	-5.500
18	1.000	0	-1.000
19	1.000	0	-3.000
20	9.500	0	-1.000
21	9.500	0	-3.000
22	10.500	0	-1.000
23	10.500	0	-3.000
24	19.000	0	-1.000
25	19.000	0	-3.000
26	8.000	5.500	-3.000
27	12.000	5.500	-3.000
28	8.000	0	0
29	12.000	0	0

Beams

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	2	18	1.000	2	0
2	3	20	1.500	2	0
3	4	22	0.500	2	0
4	5	24	7.000	2	0
5	3	7	2.000	3	0
6	5	10	2.000	3	0
7	8	19	1.000	2	0
8	7	21	1.500	2	0
9	9	23	0.500	2	0
10	10	25	7.000	2	0
11	7	12	0.670	3	0
14	10	15	0.670	3	0
20	18	3	7.000	2	0

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
21	19	7	7.000	2	0
22	20	4	0.500	2	0
23	21	9	0.500	2	0
24	22	5	1.500	2	0
25	23	10	1.500	2	0
26	24	6	1.000	2	0
27	25	11	1.000	2	0
28	26	14	2.500	3	0
29	27	17	2.500	3	0
30	3	28	1.000	3	0
31	5	29	1.000	3	0
32	15	27	4.830	3	0
33	12	26	4.830	3	0

Plates

Plate	Node A	Node B	Node C	Node D	Property
17	18	19	8	2	1
18	22	23	21	20	1
19	6	11	25	24	1

Section Properties

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
2	HSST3X3X0.188	1.890	2.460	2.460	3.927	STEEL
3	HSST3.5X3.5X0.25	2.910	5.040	5.040	8.125	STEEL

Plate Thickness

Prop	Node A (in)	Node B (in)	Node C (in)	Node D (in)	Material
1	0.250	0.250	0.250	0.250	STEEL_36_KS

Materials

Mat	Name	E (kip/in²)	ν	Density (kip/in³)	α (/°F)
1	CONCRETE	3.15E+3	0.170	8.68e-05	5.5E -6
2	ALUMINUM	10E+3	0.330	9.8e-05	12.8E -6
3	STEEL_50_KSI	29E+3	0.300	0.000283	6.5E -6
4	STAINLESSSTEEL	28E+3	0.300	0.000283	9.9E -6
5	A500-GR.B	29E+3	0.300	0.000	6E -6
6	STEEL_36_KSI	29E+3	0.300	0.000283	6.5E -6
7	STEEL_275_NMM2	29.7E+3	0.300	0.000	6.67E -6
8	STEEL	29E+3	0.300	0.000283	6E -6
9	STEEL_355_NMM2	29.7E+3	0.300	0.000	6.67E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip˙ft/deg)	rY (kip˙ft/deg)	rZ (kip˙ft/deg)
12	Fixed	-	Fixed	-	-	-
14	-	Fixed	-	-	-	-
15	Fixed	-	Fixed	-	-	-
17	-	Fixed	-	-	-	-

Releases

There is no data of this type.

Primary Load Cases

Number	Name	Type
2	DYNO DRUM HO: LIGHT WIND LOAD (Z)	Wind
1	WEIGHT	Dead
10	WIND LOAD ON STRUCTURE (X) DIREC	Wind
11	WIND LOAD ON STRUCTURE (Y) DIREC	Wind
12	DYNO DRUM HO: LIGHT WIND LOAD (X)	Wind
16	WIND RESULTANT	Wind
9	COMPRESSION FORCE	Dead

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
3	1.1DL+1.0WR	1	WEIGHT	1.10
		16	WIND RESULTANT	1.00
4	1.25DL	1	WEIGHT	1.25
5	1.1DL+1.0WX	1	WEIGHT	1.10
		12	DYNO DRUM HO: LIGHT WIND LOAD (X)	1.00
		10	WIND LOAD ON STRUCTURE (X) DIREC	1.00
6	CASE I: VX	10	WIND LOAD ON STRUCTURE (X) DIREC	1.00
7	1.1DL+1.0WZ	2	DYNO DRUM HO: LIGHT WIND LOAD (Z)	1.00
		1	WEIGHT	1.10
8	CASE I: VY	1	WEIGHT	1.00
13	CASE III: VY	1	WEIGHT	0.75
14	CASE III: VZ	2	DYNO DRUM HO: LIGHT WIND LOAD (Z)	0.75
15	CASE III:VX	12	DYNO DRUM HO: LIGHT WIND LOAD (X)	0.75
		10	WIND LOAD ON STRUCTURE (X) DIREC	0.75

Load Generators

There is no data of this type.

1 WEIGHT : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip·in)	MY (kip·in)	MZ (kip·in)
2	-	-0.0261	-	-	-	-
4	-	-0.0261	-	-	-	-
6	-	-0.0261	-	-	-	-
8	-	-0.0261	-	-	-	-
9	-	-0.0261	-	-	-	-
11	-	-0.0261	-	-	-	-

1 WEIGHT : Selfweight

Direction	Factor	Assigned Geometry
Y	-1.000	ALL

2 DYNO DRUM HO: LIGHT WIND LOAD (Z) DIRECTION : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip˙in)	MY (kip˙in)	MZ (kip˙in)
2	-	-	-0.0522	-	-	-
4	-	-	-0.0522	-	-	-
6	-	-	-0.0522	-	-	-
8	-	-	-0.0522	-	-	-
9	-	-	-0.0522	-	-	-
11	-	-	-0.0522	-	-	-

9 COMPRESSION FORCE : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip˙in)	MY (kip˙in)	MZ (kip˙in)
14	-	-	3.000	-	-	-
17	-	-	3.000	-	-	-
26	-	-	-3.000	-	-	-
27	-	-	-3.000	-	-	-

10 WIND LOAD ON STRUCTURE (X) DIRECTION : Beam Loads

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
5	UNI	lbf/ft	GX	20.000	0	-	2.000	-
6	UNI	lbf/ft	GX	20.000	0	-	2.000	-
11	UNI	lbf/ft	GX	20.000	0	-	0.670	-
14	UNI	lbf/ft	GX	20.000	0	-	0.670	-
30	UNI	lbf/ft	GX	20.000	0	-	1.000	-
31	UNI	lbf/ft	GX	20.000	0	-	1.000	-
32	UNI	lbf/ft	GX	20.000	0	-	4.830	-
33	UNI	lbf/ft	GX	20.000	0	-	4.830	-

11 WIND LOAD ON STRUCTURE (Y) DIRECTION : Beam Loads

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
1	UNI	lbf/ft	GY	20.000	0	-	1.000	-
2	UNI	lbf/ft	GY	20.000	0	-	1.500	-
3	UNI	lbf/ft	GY	20.000	0	-	0.500	-
4	UNI	lbf/ft	GY	20.000	0	-	7.000	-
5	UNI	lbf/ft	GY	20.000	0	-	2.000	-
6	UNI	lbf/ft	GY	20.000	0	-	2.000	-
7	UNI	lbf/ft	GY	20.000	0	-	1.000	-
8	UNI	lbf/ft	GY	20.000	0	-	1.500	-
9	UNI	lbf/ft	GY	20.000	0	-	0.500	-
10	UNI	lbf/ft	GY	20.000	0	-	7.000	-
20	UNI	lbf/ft	GY	20.000	0	-	7.000	-
21	UNI	lbf/ft	GY	20.000	0	-	7.000	-
22	UNI	lbf/ft	GY	20.000	0	-	0.500	-
23	UNI	lbf/ft	GY	20.000	0	-	0.500	-
24	UNI	lbf/ft	GY	20.000	0	-	1.500	-
25	UNI	lbf/ft	GY	20.000	0	-	1.500	-
26	UNI	lbf/ft	GY	20.000	0	-	1.000	-
27	UNI	lbf/ft	GY	20.000	0	-	1.000	-
30	UNI	lbf/ft	GY	20.000	0	-	1.000	-
31	UNI	lbf/ft	GY	20.000	0	-	1.000	-

12 DYNO DRUM HO: LIGHT WIND LOAD (X) DIRECTION : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip·in)	MY (kip·in)	MZ (kip·in)
2	0.02777	-	-	-	-	-
4	0.02777	-	-	-	-	-
8	0.02777	-	-	-	-	-
9	0.02777	-	-	-	-	-
24	0.02777	-	-	-	-	-
25	0.02777	-	-	-	-	-

16 WIND RESULTANT : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip`in)	MY (kip`in)	MZ (kip`in)
2	0.0295	-	-	-	-	-
3	0.042	-	-	-	-	-
5	0.042	-	-	-	-	-
8	0.0295	-	-	-	-	-
12	0.155	-	-	-	-	-
15	0.155	-	-	-	-	-
20	0.0295	-	-	-	-	-
21	0.0295	-	-	-	-	-
24	0.0295	-	-	-	-	-
25	0.0295	-	-	-	-	-
26	0.053	-	-	-	-	-
27	0.053	-	-	-	-	-
28	0.021	-	-	-	-	-
29	0.021	-	-	-	-	-

Node Displacement Summary

	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Max X	26	11:WIND LOAI	**1.131**	653E+3	-1.26E+6	1.42E+6	-21.8E+3	0.002	-0.020
Min X	26	4:1.25DL	**-0.962**	-556E+3	1.07E+6	1.21E+6	18.5E+3	-0.001	0.017
Max Y	28	11:WIND LOAI	-0.102	**1.44E+6**	175E+3	1.45E+6	-21.8E+3	0.002	-0.022
Min Y	28	4:1.25DL	0.086	**-1.22E+6**	-149E+3	1.23E+6	18.5E+3	-0.001	0.018909
Max Z	14	4:1.25DL	-0.923	0	**1.07E+6**	1.07E+6	18.5E+3	-0.001	0.017
Min Z	14	11:WIND LOAI	1.085	0	**-1.26E+6**	1.26E+6	-21.8E+3	0.002	-0.020
Max rX	14	4:1.25DL	-0.923	0	1.07E+6	1.07E+6	**18.5E+3**	-0.001	0.017
Min rX	14	11:WIND LOAI	1.085	0	-1.26E+6	1.26E+6	**-21.8E+3**	0.002	-0.020
Max rY	3	11:WIND LOAI	-0.120	1.18E+6	175E+3	1.19E+6	-21.8E+3	**0.002**	-0.022
Min rY	19	7:1.1DL+1.0W/	0.128	-531E+3	-142E+3	549E+3	17.7E+3	**-0.001**	0.021
Max rZ	8	4:1.25DL	0.134	-556E+3	-149E+3	575E+3	18.5E+3	-0.001	**0.022**
Min rZ	8	11:WIND LOAI	-0.157	653E+3	175E+3	676E+3	-21.8E+3	0.002	**-0.025**
Max Rst	28	11:WIND LOAI	-0.102	1.44E+6	175E+3	**1.45E+6**	-21.8E+3	0.002	-0.022

Beam Displacement Detail Summary

Displacements shown in italic indicate the presence of an offset

	Beam	L/C	d (ft)	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	28	11:WIND LOAI	0	**1.131**	653E+3	-1.26E+6	1.42E+6
Min X	28	4:1.25DL	0	**-0.962**	-556E+3	1.07E+6	1.21E+6
Max Y	30	11:WIND LOAI	1.000	-0.102	**1.44E+6**	175E+3	1.45E+6
Min Y	30	4:1.25DL	1.000	0.086	**-1.22E+6**	-149E+3	1.23E+6
Max Z	28	4:1.25DL	0	-0.962	-556E+3	**1.07E+6**	1.21E+6
Min Z	28	11:WIND LOAI	0	1.131	653E+3	**-1.26E+6**	1.42E+6
Max Rst	30	11:WIND LOAI	1.000	-0.102	1.44E+6	175E+3	**1.45E+6**

Beam Maximum Relative Displacements

Distances to maxima are given from beam end A.

Beam	Node A	Length (ft)	L/C	y (in)	d (ft)	z (in)	d (ft)	Resultant (in)	d (ft)	Span Max z
1	2	1.000	2:DYNO DRUM	0.004	0.250	0.000	0.500	0.004	0.250	3072
			1:WEIGHT	-0.03125	0.167	0.004	0.250	0.031	0.167	384
			10:WIND LOAI	0.000	0.833	-0.000	0.500	0.000	0.500	> 10000
			11:WIND LOAI	0.0625	0.250	0.008	0.500	0.062622	0.250	192
			12:DYNO DRU	0.000	0.167	-0.000	0.667	0.000	0.667	> 10000
			16:WIND RESI	0.004	0.500	-0.000	0.250	0.004	0.500	3072
			9:COMPRESS	0	0	0	0	0.000	0.917	
			3:1.1DL+1.0WI	-0.03125	0.167	0.008	0.500	0.032	0.500	384
			4:1.25DL	-0.021	0.083	0.008	0.500	0.022	0.417	576
			5:1.1DL+1.0W	0.03125	0.167	-0.004	0.500	0.031	0.500	384
			6:CASE I: VX	0.000	0.833	-0.000	0.500	0.000	0.500	> 10000
			7:1.1DL+1.0W	-0.021	0.083	0	0	0.021	0.083	576
			8:CASE I: VY	-0.03125	0.167	0.004	0.250	0.031	0.167	384
			13:CASE III: V	-0.03125	0.250	0.004	0.500	0.031311	0.250	384
			14:CASE III: V	-0.002	0.167	0.000	0.500	0.002	0.500	6144
			15:CASE III:VX	0.000	0.750	-0.000	0.417	0.000	0.417	> 10000
2	3	1.500	2:DYNO DRUM	-0.004	0.250	-0.000	0.250	0.004	1.250	4608
			1:WEIGHT	-0.021	0.125	-0.004	0.250	0.021	0.250	864
			10:WIND LOAI	0.000	0.625	-0.000	0.375	0.000	0.625	> 10000
			11:WIND LOAI	0.0625	0.250	-0.008	0.375	0.063	0.250	288
			12:DYNO DRU	-0.000	0.625	-0.000	0.375	0.000	0.500	> 10000
			16:WIND RESI	-0.004	0.375	0.000	0.375	0.004	0.375	4608
			9:COMPRESS	0	0	0	0	0.000	1.375	
			3:1.1DL+1.0WI	-0.021	0.125	-0.008	0.750	0.022	0.625	864
			4:1.25DL	-0.03125	0.125	0.008	0.375	0.032	0.375	576
			5:1.1DL+1.0W	-0.021	0.125	-0.004	0.250	0.021	0.250	864
			6:CASE I: VX	0.000	0.625	-0.000	0.375	0.000	0.625	> 10000
			7:1.1DL+1.0W	0.03125	0.750	0.008	0.375	0.03125	0.750	576
			8:CASE I: VY	-0.021	0.125	-0.004	0.250	0.021	0.250	864
			13:CASE III: V	-0.021	0.125	-0.004	0.375	0.021	0.250	864
			14:CASE III: V	-0.002	0.750	0.000	0.750	0.002	0.750	9216

Beam Maximum Relative Displacements Cont...

Beam	Node A	Length (ft)	L/C	y (in)	d (ft)	z (in)	d (ft)	Resultant (in)	d (ft)	Span Max z
			15:CASE III:VX	0.000	0.625	-0.000	0.375	0.000	0.625	> 10000
3	4	0.500	2:DYNO DRUM	-0.004	0.250	0.000	0.250	0.004	0.250	1536
			1:WEIGHT	0.03125	0.125	0	0	0.03125	0.125	192
			10:WIND LOAI	-0.000	0.292	-0.000	0.250	0.000	0.250	> 10000
			11:WIND LOAI	0.0625	0.250	0	0	0.0625	0.250	96
			12:DYNO DRU	0.000	0.292	-0.000	0.250	0.000	0.375	> 10000
			16:WIND RESI	0	0	0	0	0.000	0.208	
			9:COMPRESS	0	0	0	0	0.000	0.458	
			3:1.1DL+1.0WI	0.03125	0.250	0	0	0.03125	0.250	192
			4:1.25DL	0.03125	0.125	0.008	0.250	0.031	0.125	192
			5:1.1DL+1.0W)	0.03125	0.125	0.004	0.250	0.031311	0.125	192
			6:CASE I: VX	-0.000	0.292	-0.000	0.250	0.000	0.250	> 10000
			7:1.1DL+1.0WZ	-0.03125	0.250	0.008	0.250	0.032	0.250	192
			8:CASE I: VY	0.03125	0.125	0	0	0.03125	0.125	192
			13:CASE III: V	-0.03125	0.250	0	0	0.03125	0.250	192
			14:CASE III: V	0.002	0.125	0	0	0.002	0.125	3072
			15:CASE III:VX	-0.000	0.292	-0.000	0.333	0.000	0.333	> 10000
4	5	7.000	2:DYNO DRUM	0.004	1.750	0.004	1.750	0.006	1.750	> 10000
			1:WEIGHT	0.094	3.500	-0.004	3.500	0.094	3.500	896
			10:WIND LOAI	-0.001	2.917	0.000	3.500	0.001	2.917	> 10000
			11:WIND LOAI	0	0	-0.005	0.583	0.005	4.667	
			12:DYNO DRU	0.000	2.917	0.000	3.500	0.000	2.917	> 10000
			16:WIND RESI	-0.003	0.583	-0.001	2.333	0.003	2.333	> 10000
			9:COMPRESS	0	0	0	0	0.000	6.417	
			3:1.1DL+1.0WI	0.094	3.500	-0.008	3.500	0.094	3.500	896
			4:1.25DL	0.083	4.667	-0.008	3.500	0.083	4.667	1008
			5:1.1DL+1.0W)	0.0625	1.750	0.003	0.583	0.063	2.333	1344
			6:CASE I: VX	-0.001	2.917	0.000	3.500	0.001	2.917	> 10000
			7:1.1DL+1.0WZ	0.094	1.750	-0.005	0.583	0.094	2.917	896
			8:CASE I: VY	0.094	3.500	-0.004	3.500	0.094	3.500	896
			13:CASE III: V	0.03125	3.500	0.003	0.583	0.03125	3.500	2688
			14:CASE III: V	-0.002	1.167	0.003	1.750	0.003	1.167	> 10000
			15:CASE III:VX	-0.001	2.917	0.000	3.500	0.001	2.917	> 10000
5	3	2.000	2:DYNO DRUM	0.003	0.167	0.000	0.333	0.003	0.167	8192
			1:WEIGHT	-0.03125	0.500	0.000	0.833	0.03125	1.500	768
			10:WIND LOAI	0.001	1.000	0.000	0.500	0.001	1.000	> 10000
			11:WIND LOAI	0.052	0.333	-0.000	1.500	0.052	0.333	461
			12:DYNO DRU	-0.000	1.000	0.000	0.333	0.000	1.000	> 10000
			16:WIND RESI	0.004	1.167	-0.000	0.500	0.004	1.167	6703
			9:COMPRESS	0	0	0	0	0.000	1.833	
			3:1.1DL+1.0WI	-0.03125	0.167	-0.000	0.500	0.03125	0.500	768
			4:1.25DL	-0.03125	1.000	0.000	1.000	0.03125	1.000	768
			5:1.1DL+1.0W)	0.046875	1.167	0.000	0.667	0.046875	1.167	512
			6:CASE I: VX	0.001	1.000	0.000	0.500	0.001	1.000	> 10000
			7:1.1DL+1.0WZ	0.052	1.833	0.000	0.500	0.052	1.833	461

Beam Maximum Relative Displacements Cont...

Beam	Node A	Length (ft)	L/C	y (in)	d (ft)	z (in)	d (ft)	Resultant (in)	d (ft)	Span Max z
			8:CASE I: VY	-0.03125	0.500	0.000	0.833	0.03125	1.500	768
			13:CASE III: V	0.021	0.167	0.000	1.167	0.021	1.167	1152
			14:CASE III: V	0.003	1.167	0.000	0.500	0.003	1.167	8674
			15:CASE III:VX	0.000	1.000	0.000	0.333	0.000	1.000	> 10000
6	5	2.000	2:DYNO DRUM	0.003	0.167	-0.000	0.500	0.003	0.167	7373
			1:WEIGHT	-0.03125	0.333	-0.000	1.667	0.03125	1.000	768
			10:WIND LOAD	-0.001	1.000	0.000	1.000	0.001	1.000	> 10000
			11:WIND LOAD	-0.047	0.833	0.000	0.667	0.046875	0.833	512
			12:DYNO DRU	0.000	1.000	0.000	0.167	0.000	1.000	> 10000
			16:WIND RESI	0.003	0.667	-0.000	1.667	0.003	0.667	9216
			9:COMPRESS	0	0	0	0	0.000	1.833	
			3:1.1DL+1.0WI	-0.021	0.167	-0.000	1.667	0.021	1.667	1152
			4:1.25DL	0.052	1.667	-0.000	1.333	0.052	1.667	461
			5:1.1DL+1.0W	-0.03125	0.167	-0.000	1.667	0.03125	1.500	768
			6:CASE I: VX	-0.001	1.000	0.000	1.000	0.001	1.000	> 10000
			7:1.1DL+1.0W	0.046875	1.833	-0.000	0.500	0.046875	1.833	512
			8:CASE I: VY	-0.03125	0.333	-0.000	1.667	0.03125	1.000	768
			13:CASE III: V	0.029	0.167	-0.000	1.500	0.029	0.167	838
			14:CASE III: V	0.003	1.167	0.000	1.667	0.003	1.167	7022
			15:CASE III:VX	-0.000	1.000	-0.000	1.667	0.000	1.000	> 10000
7	8	1.000	2:DYNO DRUM	-0.001	0.083	0.000	0.500	0.001	0.417	9216
			1:WEIGHT	-0.016	0.083	0.004	0.250	0.016	0.250	768
			10:WIND LOAD	-0.000	0.667	-0.000	0.167	0.000	0.500	> 10000
			11:WIND LOAD	-0.03125	0.500	0.008	0.500	0.032	0.500	384
			12:DYNO DRU	0.000	0.583	-0.000	0.250	0.000	0.750	> 10000
			16:WIND RESI	-0.002	0.250	-0.000	0.250	0.002	0.750	6144
			9:COMPRESS	0	0	0	0	0.000	0.917	
			3:1.1DL+1.0WI	-0.03125	0.167	0.008	0.500	0.032	0.500	384
			4:1.25DL	0.03125	0.500	0.008	0.500	0.032	0.500	384
			5:1.1DL+1.0W	-0.016	0.500	-0.004	0.500	0.016	0.500	768
			6:CASE I: VX	-0.000	0.667	-0.000	0.167	0.000	0.500	> 10000
			7:1.1DL+1.0W	-0.021	0.083	0	0	0.021	0.083	576
			8:CASE I: VY	-0.016	0.083	0.004	0.250	0.016	0.250	768
			13:CASE III: V	-0.016	0.500	0.004	0.500	0.016	0.500	768
			14:CASE III: V	0.001	0.083	0.000	0.500	0.001	0.417	> 10000
			15:CASE III:VX	-0.000	0.583	0.000	0.750	0.000	0.750	> 10000
8	7	1.500	2:DYNO DRUM	0.002	0.125	-0.000	0.250	0.002	0.625	9216
			1:WEIGHT	0.010	0.125	-0.004	0.250	0.011125	0.250	1728
			10:WIND LOAD	-0.001	0.625	-0.000	0.250	0.001	0.625	> 10000
			11:WIND LOAD	-0.03125	0.750	-0.008	0.375	0.03125	0.750	576
			12:DYNO DRU	0.000	0.625	-0.000	0.250	0.000	0.625	> 10000
			16:WIND RESI	-0.002	0.250	0.000	0.375	0.002	1.250	9216
			9:COMPRESS	0	0	0	0	0.000	1.375	
			3:1.1DL+1.0WI	-0.021	0.125	-0.008	0.750	0.022	0.625	864
			4:1.25DL	0.03125	0.750	0.008	0.375	0.03125	0.750	576

Beam Maximum Relative Displacements Cont...

Beam	Node A	Length (ft)	L/C	y (in)	d (ft)	z (in)	d (ft)	Resultant (in)	d (ft)	Span Max z
			5:1.1DL+1.0W)	0.015625	0.750	-0.004	0.250	0.016	0.750	1152
			6:CASE I: VX	-0.001	0.625	-0.000	0.250	0.001	0.625	> 10000
			7:1.1DL+1.0W.	0.03125	0.750	0.008	0.375	0.03125	0.750	576
			8:CASE I: VY	0.010	0.125	-0.004	0.250	0.011125	0.250	1728
			13:CASE III: V'	-0.016	0.125	-0.004	0.375	0.016	1.125	1152
			14:CASE III: V.	0.001	0.125	0.000	0.750	0.001	0.625	> 10000
			15:CASE III:VX	-0.001	0.625	-0.000	0.375	0.001	0.625	> 10000
9	9	0.500	2:DYNO DRUM	0.002	0.250	0.000	0.250	0.002	0.250	3072
			1:WEIGHT	-0.016	0.083	0	0	0.015625	0.083	384
			10:WIND LOAI	0.000	0.292	-0.000	0.250	0.000	0.292	> 10000
			11:WIND LOAI	0.03125	0.125	0	0	0.03125	0.125	192
			12:DYNO DRU	-0.000	0.292	-0.000	0.167	0.000	0.250	> 10000
			16:WIND RESI	0	0	0	0	0.000	0.250	
			9:COMPRESS	0	0	0	0	0.000	0.458	
			3:1.1DL+1.0WI	-0.03125	0.250	0	0	0.03125	0.250	192
			4:1.25DL	0.03125	0.125	0.008	0.250	0.031	0.125	192
			5:1.1DL+1.0W)	0.015625	0.083	0.004	0.250	0.016	0.250	384
			6:CASE I: VX	0.000	0.292	-0.000	0.250	0.000	0.292	> 10000
			7:1.1DL+1.0W.	0.03125	0.250	0.008	0.250	0.032	0.250	192
			8:CASE I: VY	-0.016	0.083	0	0	0.015625	0.083	384
			13:CASE III: V'	-0.016	0.250	0	0	0.015625	0.250	384
			14:CASE III: V.	-0.001	0.083	0	0	0.001	0.083	6144
			15:CASE III:VX	0.000	0.292	-0.000	0.208	0.000	0.208	> 10000
10	10	7.000	2:DYNO DRUM	-0.002	1.167	0.004	1.750	0.005	1.167	> 10000
			1:WEIGHT	0.046875	3.500	-0.004	3.500	0.047	3.500	1792
			10:WIND LOAI	0.001	2.917	0.000	3.500	0.001	2.917	> 10000
			11:WIND LOAI	0.03125	3.500	-0.005	0.583	0.03125	3.500	2688
			12:DYNO DRU	-0.000	2.917	0.000	3.500	0.000	3.500	> 10000
			16:WIND RESI	0.001	0.583	-0.001	2.333	0.002	4.667	> 10000
			9:COMPRESS	0	0	0	0	0.000	6.417	
			3:1.1DL+1.0WI	0.094	3.500	-0.008	3.500	0.094	3.500	896
			4:1.25DL	0.094	3.500	-0.008	3.500	0.094	3.500	896
			5:1.1DL+1.0W)	0.046875	1.750	0.003	0.583	0.046875	1.750	1792
			6:CASE I: VX	0.001	2.917	0.000	3.500	0.001	2.917	> 10000
			7:1.1DL+1.0W.	0.094	2.917	-0.005	0.583	0.094	2.917	896
			8:CASE I: VY	0.046875	3.500	-0.004	3.500	0.047	3.500	1792
			13:CASE III: V'	0.046875	1.750	0.003	0.583	0.046875	1.750	1792
			14:CASE III: V.	0.001	3.500	0.003	1.750	0.003	1.750	> 10000
			15:CASE III:VX	0.001	2.917	0.000	3.500	0.001	2.917	> 10000
11	7	0.670	2:DYNO DRUM	0	0	0.001	0.391	0.004	0.502	
			1:WEIGHT	0.000	0.279	0.005	0.112	0.032	0.447	> 10000
			10:WIND LOAI	0.000	0.279	0.000	0.335	0.000	0.335	> 10000
			11:WIND LOAI	-0.000	0.279	-0.007	0.391	0.063	0.502	> 10000
			12:DYNO DRU	-0.000	0.167	-0.000	0.391	0.000	0.391	> 10000
			16:WIND RESI	0.000	0.391	0.000	0.391	0.004	0.502	> 10000

Beam Maximum Relative Displacements Cont...

Beam	Node A	Length (ft)	L/C	y (in)	d (ft)	z (in)	d (ft)	Resultant (in)	d (ft)	Span Max z
			9:COMPRESS	0	0	0	0	0.000	0.502	
			3:1.1DL+1.0WI	0.000	0.279	0.005	0.112	0.063	0.558	> 10000
			4:1.25DL	0.000	0.279	0.009	0.391	0.063	0.558	> 10000
			5:1.1DL+1.0W)	0.000	0.335	0.008	0.279	0.031	0.335	> 10000
			6:CASE I: VX	0.000	0.279	0.000	0.335	0.000	0.335	> 10000
			7:1.1DL+1.0W.	0.000	0.279	0.008	0.558	0.063	0.558	> 10000
			8:CASE I: VY	0.000	0.279	0.005	0.112	0.032	0.447	> 10000
			13:CASE III: V'	0.000	0.279	-0.004	0.056	0.031	0.335	> 10000
			14:CASE III: V.	-0.000	0.112	0.000	0.391	0.000	0.391	> 10000
			15:CASE III:VX	0.000	0.335	0.000	0.391	0.000	0.335	> 10000
14	10	0.670	2:DYNO DRUN	-0.000	0.335	0.001	0.558	0.004	0.614	> 10000
			1:WEIGHT	-0.000	0.279	0.005	0.223	0.031	0.447	> 10000
			10:WIND LOAI	0.000	0.279	-0.000	0.335	0.000	0.335	> 10000
			11:WIND LOAI	0.000	0.335	-0.010	0.614	0.063	0.558	> 10000
			12:DYNO DRU	-0.000	0.112	0.000	0.335	0.000	0.335	> 10000
			16:WIND RESI	0.000	0.279	0.001	0.558	0.004	0.614	> 10000
			9:COMPRESS	0	0	0	0	0.000	0.502	
			3:1.1DL+1.0WI	-0.000	0.279	0.007	0.391	0.062622	0.502	> 10000
			4:1.25DL	-0.000	0.223	0.007	0.391	0.063	0.502	> 10000
			5:1.1DL+1.0W)	-0.000	0.223	0.008	0.391	0.032	0.447	> 10000
			6:CASE I: VX	0.000	0.279	-0.000	0.335	0.000	0.335	> 10000
			7:1.1DL+1.0W.	-0.000	0.279	0.009	0.391	0.063	0.558	> 10000
			8:CASE I: VY	-0.000	0.279	0.005	0.223	0.031	0.447	> 10000
			13:CASE III: V'	-0.000	0.223	0.003	0.391	0.031	0.447	> 10000
			14:CASE III: V.	0.000	0.335	0.000	0.112	0.000	0.614	> 10000
			15:CASE III:VX	0.000	0.391	-0.000	0.391	0.000	0.391	> 10000
20	18	7.000	2:DYNO DRUN	0.004	1.167	0.004	5.833	0.006	5.833	> 10000
			1:WEIGHT	-0.03125	3.500	-0.004	3.500	0.031	3.500	2688
			10:WIND LOAI	0.001	4.083	-0.000	3.500	0.001	4.083	> 10000
			11:WIND LOAI	0.042	0.583	-0.005	0.583	0.042	0.583	2016
			12:DYNO DRU	-0.000	4.083	-0.000	3.500	0.000	4.083	> 10000
			16:WIND RESI	-0.003	0.583	-0.002	5.250	0.003	5.833	> 10000
			9:COMPRESS	0	0	0	0	0.000	4.083	
			3:1.1DL+1.0WI	0	0	-0.005	0.583	0.005	4.083	
			4:1.25DL	-0.021	0.583	0.008	3.500	0.022	0.583	4032
			5:1.1DL+1.0W)	0.03125	1.167	-0.004	1.167	0.031	1.167	2688
			6:CASE I: VX	0.001	4.083	-0.000	3.500	0.001	4.083	> 10000
			7:1.1DL+1.0W.	-0.03125	1.167	0.008	1.750	0.032	1.167	2688
			8:CASE I: VY	-0.03125	3.500	-0.004	3.500	0.031	3.500	2688
			13:CASE III: V'	-0.03125	3.500	0.003	0.583	0.03125	3.500	2688
			14:CASE III: V.	-0.002	1.167	0.003	5.250	0.003	5.833	> 10000
			15:CASE III:VX	0.001	4.083	-0.000	3.500	0.001	4.083	> 10000
21	19	7.000	2:DYNO DRUN	-0.001	0.583	0.004	5.833	0.004	5.833	> 10000
			1:WEIGHT	0.042	2.333	-0.004	3.500	0.042	4.083	2016
			10:WIND LOAI	-0.001	4.083	-0.000	3.500	0.001	4.083	> 10000

Beam Maximum Relative Displacements Cont...

Beam	Node A	Length (ft)	L/C	y (in)	d (ft)	z (in)	d (ft)	Resultant (in)	d (ft)	Span Max z
			11:WIND LOAD	-0.083	4.667	-0.005	0.583	0.083	4.667	1008
			12:DYNO DRU	0.000	4.083	-0.000	3.500	0.000	3.500	> 10000
			16:WIND RESI	0.001	0.583	-0.002	5.250	0.002	5.833	> 10000
			9:COMPRESS	0	0	0	0	0.000	4.083	
			3:1.1DL+1.0WI	0.0625	2.333	-0.005	0.583	0.063	2.333	1344
			4:1.25DL	0.094	5.833	0.008	3.500	0.094	5.833	896
			5:1.1DL+1.0W)	0.078125	4.083	-0.004	1.167	0.078	4.083	1075
			6:CASE I: VX	-0.001	4.083	-0.000	3.500	0.001	4.083	> 10000
			7:1.1DL+1.0W:	0.083	2.333	0.008	1.750	0.083	2.333	1008
			8:CASE I: VY	0.042	2.333	-0.004	3.500	0.042	4.083	2016
			13:CASE III: V	0.046875	5.833	0.003	0.583	0.047	5.833	1792
			14:CASE III: V:	-0.001	0.583	0.003	5.250	0.003	5.250	> 10000
			15:CASE III:VX	-0.001	4.083	-0.000	3.500	0.001	4.083	> 10000
22	20	0.500	2:DYNO DRUM	0.004	0.250	0	0	0.004	0.250	1536
			1:WEIGHT	-0.03125	0.250	0.004	0.250	0.031	0.250	192
			10:WIND LOAD	0.000	0.208	0.000	0.208	0.000	0.208	> 10000
			11:WIND LOAD	-0.0625	0.250	-0.008	0.250	0.063	0.250	96
			12:DYNO DRU	-0.000	0.208	0.000	0.208	0.000	0.333	> 10000
			16:WIND RESI	-0.004	0.250	0.000	0.250	0.004	0.250	1536
			9:COMPRESS	0	0	0	0	0.000	0.458	
			3:1.1DL+1.0WI	0.03125	0.125	0.008	0.250	0.031	0.125	192
			4:1.25DL	-0.03125	0.250	0	0	0.03125	0.250	192
			5:1.1DL+1.0W)	0.03125	0.125	0	0	0.03125	0.125	192
			6:CASE I: VX	0.000	0.208	0.000	0.208	0.000	0.208	> 10000
			7:1.1DL+1.0W:	-0.03125	0.125	0	0	0.03125	0.125	192
			8:CASE I: VY	-0.03125	0.250	0.004	0.250	0.031	0.250	192
			13:CASE III: V	0.03125	0.250	-0.004	0.250	0.031	0.250	192
			14:CASE III: V:	0.002	0.125	-0.000	0.250	0.002	0.125	3072
			15:CASE III:VX	0.000	0.208	0.000	0.167	0.000	0.167	> 10000
23	21	0.500	2:DYNO DRUM	0.002	0.125	0	0	0.002	0.125	3072
			1:WEIGHT	-0.016	0.125	0.004	0.250	0.016	0.125	384
			10:WIND LOAD	-0.000	0.208	0.000	0.208	0.000	0.208	> 10000
			11:WIND LOAD	0.03125	0.125	-0.008	0.250	0.031	0.125	192
			12:DYNO DRU	0.000	0.208	0.000	0.417	0.000	0.125	> 10000
			16:WIND RESI	0.002	0.250	0.000	0.250	0.002	0.250	3072
			9:COMPRESS	0	0	0	0	0.000	0.458	
			3:1.1DL+1.0WI	0.03125	0.250	0.008	0.250	0.032	0.250	192
			4:1.25DL	-0.03125	0.250	0	0	0.03125	0.250	192
			5:1.1DL+1.0W)	0.015625	0.125	0	0	0.015625	0.125	384
			6:CASE I: VX	-0.000	0.208	0.000	0.208	0.000	0.208	> 10000
			7:1.1DL+1.0W:	-0.03125	0.250	0	0	0.03125	0.250	192
			8:CASE I: VY	-0.016	0.125	0.004	0.250	0.016	0.125	384
			13:CASE III: V	-0.016	0.125	-0.004	0.250	0.016	0.125	384
			14:CASE III: V:	0.001	0.083	-0.000	0.250	0.001	0.250	6144
			15:CASE III:VX	-0.000	0.208	0.000	0.250	0.000	0.250	> 10000

Beam Maximum Relative Displacements Cont...

Beam	Node A	Length (ft)	L/C	y (in)	d (ft)	z (in)	d (ft)	Resultant (in)	d (ft)	Span Max z
24	22	1.500	2:DYNO DRUM	0.004	0.250	-0.000	0.750	0.004	0.750	4608
			1:WEIGHT	-0.021	0.125	-0.004	0.250	0.021	0.250	864
			10:WIND LOAI	-0.000	0.875	0.000	1.125	0.000	0.875	> 10000
			11:WIND LOAI	-0.0625	0.250	0.008	0.375	0.063	0.250	288
			12:DYNO DRU	0.000	0.875	0.000	1.125	0.000	1.000	> 10000
			16:WIND RESI	0.004	0.375	-0.000	0.375	0.004	1.125	4608
			9:COMPRESS	0	0	0	0	0.000	1.375	
			3:1.1DL+1.0WI	-0.03125	0.750	-0.008	0.750	0.032	0.750	576
			4:1.25DL	0.03125	0.750	-0.008	0.750	0.032	0.750	576
			5:1.1DL+1.0W)	-0.021	0.125	-0.004	0.250	0.021	0.250	864
			6:CASE I: VX	-0.000	0.875	0.000	1.125	0.000	0.875	> 10000
			7:1.1DL+1.0W:	0.03125	0.750	-0.008	0.750	0.032	0.750	576
			8:CASE I: VY	-0.021	0.125	-0.004	0.250	0.021	0.250	864
			13:CASE III: V'	0.03125	0.250	0.004	0.375	0.031	0.250	576
			14:CASE III: V:	-0.001	0.125	0.000	0.750	0.001	0.625	> 10000
			15:CASE III:VX	-0.000	0.875	0.000	1.125	0.000	0.875	> 10000
25	23	1.500	2:DYNO DRUM	-0.002	0.125	-0.000	0.750	0.002	0.625	9216
			1:WEIGHT	-0.016	0.750	-0.004	0.250	0.016	0.750	1152
			10:WIND LOAI	0.001	0.875	0.000	1.000	0.001	0.875	> 10000
			11:WIND LOAI	0.03125	0.750	0.008	0.375	0.03125	0.750	576
			12:DYNO DRU	-0.000	0.875	0.000	1.250	0.000	0.875	> 10000
			16:WIND RESI	-0.002	0.250	-0.000	0.375	0.002	0.250	9216
			9:COMPRESS	0	0	0	0	0.000	1.375	
			3:1.1DL+1.0WI	-0.021	0.125	-0.008	0.750	0.022	0.625	864
			4:1.25DL	-0.021	0.125	-0.008	0.750	0.022	0.625	864
			5:1.1DL+1.0W)	-0.016	0.125	-0.004	0.250	0.016	0.125	1152
			6:CASE I: VX	0.001	0.875	0.000	1.000	0.001	0.875	> 10000
			7:1.1DL+1.0W:	-0.03125	0.750	-0.008	0.750	0.032	0.750	576
			8:CASE I: VY	-0.016	0.750	-0.004	0.250	0.016	0.750	1152
			13:CASE III: V'	0.015625	0.125	0.004	0.375	0.016	0.375	1152
			14:CASE III: V:	0.001	0.125	0.000	0.750	0.001	0.625	> 10000
			15:CASE III:VX	0.001	0.875	0.000	1.125	0.001	0.875	> 10000
26	24	1.000	2:DYNO DRUM	-0.004	0.250	-0.000	0.500	0.004	0.750	3072
			1:WEIGHT	-0.03125	0.250	-0.004	0.500	0.031311	0.250	384
			10:WIND LOAI	-0.000	0.167	-0.000	0.500	0.000	0.500	> 10000
			11:WIND LOAI	0.0625	0.500	0.008	0.500	0.063	0.500	192
			12:DYNO DRU	-0.000	0.667	0.000	0.500	0.000	0.917	> 10000
			16:WIND RESI	0.004	0.500	0.000	0.250	0.004	0.500	3072
			9:COMPRESS	0	0	0	0	0.000	0.917	
			3:1.1DL+1.0WI	-0.03125	0.250	-0.008	0.500	0.031	0.250	384
			4:1.25DL	0.03125	0.250	-0.008	0.500	0.031	0.250	384
			5:1.1DL+1.0W)	0.03125	0.250	0.004	0.250	0.031	0.250	384
			6:CASE I: VX	-0.000	0.167	-0.000	0.500	0.000	0.500	> 10000
			7:1.1DL+1.0W:	-0.03125	0.167	0.008	0.500	0.032	0.500	384
			8:CASE I: VY	-0.03125	0.250	-0.004	0.500	0.031311	0.250	384

Beam Maximum Relative Displacements Cont...

Beam	Node A	Length (ft)	L/C	y (in)	d (ft)	z (in)	d (ft)	Resultant (in)	d (ft)	Span Max z
			13:CASE III: V	0.03125	0.500	0.004	0.500	0.031	0.500	384
			14:CASE III: V	-0.002	0.167	-0.000	0.500	0.002	0.500	6144
			15:CASE III:VX	-0.000	0.167	0.000	0.417	0.000	0.417	> 10000
27	25	1.000	2:DYNO DRUM	-0.001	0.083	-0.000	0.500	0.001	0.417	9216
			1:WEIGHT	-0.010	0.083	-0.004	0.500	0.011	0.417	1152
			10:WIND LOAD	0.000	0.417	-0.000	0.167	0.000	0.500	> 10000
			11:WIND LOAD	0.03125	0.167	0.008	0.500	0.032	0.500	384
			12:DYNO DRU	-0.000	0.417	0.000	0.917	0.000	0.917	> 10000
			16:WIND RESI	0.002	0.250	0.000	0.250	0.002	0.750	6144
			9:COMPRESS	0	0	0	0	0.000	0.917	
			3:1.1DL+1.0WI	-0.03125	0.250	-0.008	0.500	0.031	0.250	384
			4:1.25DL	-0.03125	0.250	-0.008	0.500	0.031	0.250	384
			5:1.1DL+1.0W	-0.016	0.167	0.004	0.250	0.016	0.167	768
			6:CASE I: VX	0.000	0.417	-0.000	0.167	0.000	0.500	> 10000
			7:1.1DL+1.0W	0.03125	0.250	0.008	0.500	0.031	0.250	384
			8:CASE I: VY	-0.010	0.083	-0.004	0.500	0.011	0.417	1152
			13:CASE III: V	0.015625	0.167	0.004	0.500	0.016	0.500	768
			14:CASE III: V	-0.001	0.083	-0.000	0.500	0.001	0.583	> 10000
			15:CASE III:VX	0.000	0.417	0.000	0.750	0.000	0.750	> 10000
28	26	2.500	2:DYNO DRUM	-0.002	0.417	0.000	1.875	0.002	0.417	> 10000
			1:WEIGHT	0.021	0.417	0	0	0.021	0.417	1440
			10:WIND LOAD	0.001	1.042	0.000	2.083	0.001	1.042	> 10000
			11:WIND LOAD	-0.03125	0.417	-0.000	2.292	0.03125	0.417	960
			12:DYNO DRU	-0.000	1.042	-0.000	0.208	0.000	1.042	> 10000
			16:WIND RESI	0.002	2.083	-0.000	1.458	0.002	2.083	> 10000
			9:COMPRESS	0	0	0	0	0.000	1.458	
			3:1.1DL+1.0WI	0.026	1.458	-0.000	1.458	0.026	1.458	1152
			4:1.25DL	0.036	1.458	-0.000	0.417	0.036	1.458	823
			5:1.1DL+1.0W	0.021	0.417	-0.000	0.417	0.021	0.417	1440
			6:CASE I: VX	0.001	1.042	0.000	2.083	0.001	1.042	> 10000
			7:1.1DL+1.0W	0.026	1.458	0.000	2.292	0.026	1.458	1152
			8:CASE I: VY	0.021	0.417	0	0	0.021	0.417	1440
			13:CASE III: V	0.015625	0.208	-0.000	0.417	0.015625	0.208	1920
			14:CASE III: V	0.002	1.458	0.000	2.083	0.002	1.458	> 10000
			15:CASE III:VX	0.001	1.042	-0.000	2.292	0.001	1.042	> 10000
29	27	2.500	2:DYNO DRUM	0.002	2.292	0.000	1.250	0.002	2.292	> 10000
			1:WEIGHT	0.046875	1.042	-0.000	2.083	0.046875	1.042	640
			10:WIND LOAD	-0.001	1.042	-0.000	0.417	0.001	1.042	> 10000
			11:WIND LOAD	-0.03125	1.875	-0.000	1.875	0.03125	1.875	960
			12:DYNO DRU	0.000	1.042	-0.000	0.417	0.000	1.042	> 10000
			16:WIND RESI	0.004	2.083	-0.000	1.250	0.004	2.083	8378
			9:COMPRESS	0	0	0	0	0.000	1.458	
			3:1.1DL+1.0WI	0.039	2.083	0	0	0.039	2.083	768
			4:1.25DL	0.036	1.458	-0.000	1.667	0.036	1.458	823
			5:1.1DL+1.0W	0.057	1.458	0.000	2.292	0.057	1.458	524

Beam Maximum Relative Displacements Cont...

Beam	Node A	Length (ft)	L/C	y (in)	d (ft)	z (in)	d (ft)	Resultant (in)	d (ft)	Span Max z
			6:CASE I: VX	-0.001	1.042	-0.000	0.417	0.001	1.042	> 10000
			7:1.1DL+1.0W	0.03125	1.875	-0.000	0.208	0.03125	1.875	960
			8:CASE I: VY	0.046875	1.042	-0.000	2.083	0.046875	1.042	640
			13:CASE III: V	0.023	2.083	-0.000	0.417	0.023	2.083	1280
			14:CASE III: V	0.003	1.458	0.000	1.667	0.003	1.458	8777
			15:CASE III:VX	-0.001	1.042	0.000	2.292	0.001	1.042	> 10000
30	3	1.000	2:DYNO DRUM	0.003	0.083	0.000	0.083	0.003	0.083	4608
			1:WEIGHT	0.03125	0.083	-0.000	0.500	0.03125	0.083	384
			10:WIND LOAD	-0.000	0.083	0.000	0.583	0.000	0.583	> 10000
			11:WIND LOAD	0.073	0.917	-0.000	0.333	0.073	0.917	165
			12:DYNO DRU	-0.000	0.083	-0.000	0.750	0.000	0.750	> 10000
			16:WIND RESI	-0.005	0.583	0.000	0.083	0.005	0.583	2633
			9:COMPRESS	0	0	0	0	0.000	0.917	
			3:1.1DL+1.0WI	0.0625	0.667	0.000	0.083	0.0625	0.667	192
			4:1.25DL	-0.0625	0.250	-0.000	0.750	0.0625	0.250	192
			5:1.1DL+1.0W	0.03125	0.167	0.000	0.250	0.03125	0.167	384
			6:CASE I: VX	-0.000	0.083	0.000	0.583	0.000	0.583	> 10000
			7:1.1DL+1.0W	0.03125	0.500	-0.000	0.750	0.03125	0.500	384
			8:CASE I: VY	0.03125	0.083	-0.000	0.500	0.03125	0.083	384
			13:CASE III: V	0.03125	0.250	0.000	0.500	0.03125	0.250	384
			14:CASE III: V	-0.004	0.833	-0.000	0.167	0.004	0.833	3072
			15:CASE III:VX	0.000	0.833	-0.000	0.083	0.000	0.583	> 10000
31	5	1.000	2:DYNO DRUM	0.004	0.167	0.000	0.500	0.004	0.500	3072
			1:WEIGHT	-0.03125	0.500	0.000	0.417	0.03125	0.500	384
			10:WIND LOAD	0.000	0.833	0	0	0.000	0.917	> 10000
			11:WIND LOAD	0.0625	0.083	0.000	0.917	0.0625	0.083	192
			12:DYNO DRU	0.000	0.917	0.000	0.917	0.000	0.917	> 10000
			16:WIND RESI	0	0	0.000	0.250	0.000	0.250	
			9:COMPRESS	0	0	0	0	0.000	0.917	
			3:1.1DL+1.0WI	0.0625	0.667	0.000	0.333	0.0625	0.667	192
			4:1.25DL	0.0625	0.250	-0.000	0.750	0.0625	0.250	192
			5:1.1DL+1.0W	0.03125	0.167	-0.000	0.917	0.03125	0.167	384
			6:CASE I: VX	0.000	0.833	0	0	0.000	0.917	> 10000
			7:1.1DL+1.0W	-0.073	0.583	0.000	0.750	0.073	0.583	165
			8:CASE I: VY	-0.03125	0.500	0.000	0.417	0.03125	0.500	384
			13:CASE III: V	-0.03125	0.250	0	0	0.03125	0.250	384
			14:CASE III: V	-0.003	0.833	0.000	0.667	0.003	0.833	3686
			15:CASE III:VX	0.000	0.833	-0.000	0.167	0.000	0.833	> 10000
32	15	4.830	2:DYNO DRUM	0.000	0.402	0.013	4.025	0.013	4.025	> 10000
			1:WEIGHT	0.000	2.012	0.083	3.220	0.083	3.220	> 10000
			10:WIND LOAD	0.003	1.610	-0.008	2.415	0.008	2.415	> 10000
			11:WIND LOAD	-0.000	3.622	-0.115	2.817	0.115	2.817	> 10000
			12:DYNO DRU	-0.000	2.415	0.002	2.415	0.002	2.415	> 10000
			16:WIND RESI	0.003	2.012	0.007	4.025	0.007	4.025	> 10000
			9:COMPRESS	0	0	0	0	0.000	4.025	

Beam Maximum Relative Displacements Cont...

Beam	Node A	Length (ft)	L/C	y (in)	d (ft)	z (in)	d (ft)	Resultant (in)	d (ft)	Span Max z
			3:1.1DL+1.0WI	0.003	2.012	0.125	2.817	0.125	2.817	> 10000
			4:1.25DL	-0.000	2.012	0.125	4.025	0.140	4.025	> 10000
			5:1.1DL+1.0W)	0.003	2.012	0.089	2.817	0.089	2.817	> 10000
			6:CASE I: VX	0.003	1.610	-0.008	2.415	0.008	2.415	> 10000
			7:1.1DL+1.0W;	0.000	4.025	0.104	3.220	0.104	4.025	> 10000
			8:CASE I: VY	0.000	2.012	0.083	3.220	0.083	3.220	> 10000
			13:CASE III: V'	-0.000	0.402	0.052	2.817	0.052	2.817	> 10000
			14:CASE III: V;	-0.000	4.427	0.007	2.012	0.007	2.012	> 10000
			15:CASE III:VX	0.002	1.610	-0.004	2.415	0.005	2.415	> 10000
33	12	4.830	2:DYNO DRUN	0.000	0.805	0.004	2.817	0.006	4.428	> 10000
			1:WEIGHT	0.000	2.415	0.036	4.427	0.044	2.415	> 10000
			10:WIND LOAI	0.003	1.610	0.008	2.415	0.008	2.415	> 10000
			11:WIND LOAI	-0.000	2.012	0.0625	2.415	0.088	2.415	> 10000
			12:DYNO DRU	-0.000	1.207	-0.002	2.415	0.002	2.415	> 10000
			16:WIND RESI	0.003	2.012	0.007	4.025	0.007	4.025	> 10000
			9:COMPRESS	0	0	0	0	0.000	4.025	
			3:1.1DL+1.0WI	0.003	2.012	-0.03125	2.415	0.070	2.415	> 10000
			4:1.25DL	-0.000	4.427	-0.0625	2.415	0.088	2.415	> 10000
			5:1.1DL+1.0W)	0.003	1.610	0.0625	2.817	0.063	2.817	> 10000
			6:CASE I: VX	0.003	1.610	0.008	2.415	0.008	2.415	> 10000
			7:1.1DL+1.0W;	0.000	2.817	0.046875	2.817	0.070	1.207	> 10000
			8:CASE I: VY	0.000	2.415	0.036	4.427	0.044	2.415	> 10000
			13:CASE III: V'	0.000	3.220	0.052	4.025	0.052	4.025	> 10000
			14:CASE III: V;	0.000	3.220	0.003	4.025	0.003	4.025	> 10000
			15:CASE III:VX	0.002	1.610	0.004	2.415	0.005	2.415	> 10000

Beam End Displacement Summary

Displacements shown in italic indicate the presence of an offset

	Beam	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	28	26	11:WIND LOAI	**1.131**	653E+3	-1.26E+6	1.42E+6
Min X	28	26	4:1.25DL	**-0.962**	-556E+3	1.07E+6	1.21E+6
Max Y	30	28	11:WIND LOAI	-0.102	**1.44E+6**	175E+3	1.45E+6
Min Y	30	28	4:1.25DL	0.086	**-1.22E+6**	-149E+3	1.23E+6
Max Z	28	26	4:1.25DL	-0.962	-556E+3	**1.07E+6**	1.21E+6
Min Z	28	26	11:WIND LOAI	1.131	653E+3	**-1.26E+6**	1.42E+6
Max Rst	30	28	11:WIND LOAI	-0.102	1.44E+6	175E+3	**1.45E+6**

Beam End Force Summary

The signs of the forces at end B of each beam have been reversed. For example: this means that the Min Fx entry gives the largest tension value for an beam.

	Beam	Node	L/C	Axial Fx (kip)	Shear Fy (kip)	Shear Fz (kip)	Torsion Mx (kip-in)	Bending My (kip-in)	Bending Mz (kip-in)
Max Fx	28	26	9:COMPRESS	**3.000**	0.000	0.000	-0.000	-0.000	0.000
Min Fx	8	7	11:WIND LOAD	**-1.284**	-0.340	-0.014	-7.549	0.126	-8.507
Max Fy	14	10	11:WIND LOAD	0.460	**1.290**	0.000	-0.000	25.560	10.370
Min Fy	11	7	11:WIND LOAD	0.460	**-1.290**	0.000	0.000	-13.800	-10.370
Max Fz	11	7	16:WIND RESI	0.055	-0.104	**0.206**	-0.000	-1.123	1.339
Min Fz	27	25	2:DYNO DRUM	0.084	-0.001	**-0.179**	0.006	1.395	-0.005
Max Mx	5	3	11:WIND LOAD	0.014	-0.105	0.006	**8.964**	-0.025	4.498
Min Mx	5	3	4:1.25DL	-0.013	0.116	-0.005	**-7.923**	0.024	-3.849
Max My	14	15	11:WIND LOAD	0.460	1.290	0.000	-0.000	**25.560**	-0.000
Min My	14	15	7:1.1DL+1.0W	-0.301	-1.064	-0.157	0.000	**-20.963**	-0.000
Max Mz	29	17	4:1.25DL	-0	-0.432	0.000	-0.000	0.000	**33.470**
Min Mz	29	17	11:WIND LOAD	-0	0.460	0.000	-0.000	-0.000	**-39.360**

Beam Force Detail Summary

Sign convention as diagrams:- positive above line, negative below line except Fx where positive is compression. Distance d is given from beam end A.

	Beam	L/C	d (ft)	Axial Fx (kip)	Shear Fy (kip)	Shear Fz (kip)	Torsion Mx (kip-in)	Bending My (kip-in)	Bending Mz (kip-in)
Max Fx	28	9:COMPRESS	0	**3.000**	0.000	0.000	-0.000	-0.000	0.000
Min Fx	8	11:WIND LOAD	0	**-1.284**	-0.340	-0.014	-7.549	0.126	-8.507
Max Fy	14	11:WIND LOAD	0	0.460	**1.290**	0.000	-0.000	25.560	10.370
Min Fy	11	11:WIND LOAD	0	0.460	**-1.290**	0.000	0.000	-13.800	-10.370
Max Fz	11	16:WIND RESI	0	0.055	-0.104	**0.206**	-0.000	-1.123	1.339
Min Fz	27	2:DYNO DRUM	0	0.084	-0.001	**-0.179**	0.006	1.395	-0.005
Max Mx	5	11:WIND LOAD	0	0.014	-0.105	0.006	**8.964**	-0.025	4.498
Min Mx	5	4:1.25DL	0	-0.013	0.116	-0.005	**-7.923**	0.024	-3.849
Max My	14	11:WIND LOAD	0.670	0.460	1.290	0.000	-0.000	**25.560**	-0.000
Min My	14	7:1.1DL+1.0W	0.670	-0.301	-1.064	-0.157	0.000	**-20.963**	-0.000
Max Mz	29	4:1.25DL	2.500	-0	-0.432	0.000	-0.000	0.000	**33.470**
Min Mz	29	11:WIND LOAD	2.500	-0	0.460	0.000	-0.000	-0.000	**-39.360**

Beam Maximum Shear Forces

Distances to maxima are given from beam end A.

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
1	2	1.000	2:DYNO DRUM	Max +ve	0	0.179	0	0.000
				Max -ve				
			1:WEIGHT	Max +ve				
				Max -ve	0	-0.000	1.000	-0.029
			10:WIND LOAD	Max +ve	0	0.000		
				Max -ve			0	-0.001
			11:WIND LOAD	Max +ve	0	0.000	1.000	0.008
				Max -ve			0	-0.012
			12:DYNO DRU	Max +ve	0	0.000	0	0.000
				Max -ve				
			16:WIND RESU	Max +ve				
				Max -ve	0	-0.071	0	-0.000
			9:COMPRESS	Max +ve				
				Max -ve	0	-0.000	0	-0.000
			3:1.1DL+1.0WI	Max +ve				
				Max -ve	0	-0.071	1.000	-0.032
			4:1.25DL	Max +ve				
				Max -ve	0	-0.000	1.000	-0.036
			5:1.1DL+1.0W)	Max +ve	0	0.000		
				Max -ve			1.000	-0.033
			6:CASE I: VX	Max +ve	0	0.000		
				Max -ve			0	-0.001
			7:1.1DL+1.0W2	Max +ve	0	0.179		
				Max -ve			1.000	-0.031
			8:CASE I: VY	Max +ve				
				Max -ve	0	-0.000	1.000	-0.029
			13:CASE III: V	Max +ve				
				Max -ve	0	-0.000	1.000	-0.022
			14:CASE III: V	Max +ve	0	0.134	0	0.000
				Max -ve				
			15:CASE III:VX	Max +ve	0	0.001		
				Max -ve			0	-0.001
2	3	1.500	2:DYNO DRUM	Max +ve	0	0.025403		
				Max -ve			0	-0.019
			1:WEIGHT	Max +ve				
				Max -ve	0	-0.010	1.500	-0.182
			10:WIND LOAD	Max +ve			0	0.034
				Max -ve	0	-0.022		
			11:WIND LOAD	Max +ve	0	0.014	1.500	0.290
				Max -ve				
			12:DYNO DRU	Max +ve				
				Max -ve	0	-0.021	0	-0.003
			16:WIND RESU	Max +ve			0	0.009
				Max -ve	0	-0.062		

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
			9:COMPRESS	Max +ve	0	0.000	0	0.000
				Max -ve				
			3:1.1DL+1.0WI	Max +ve				
				Max -ve	0	-0.073	1.500	-0.192
			4:1.25DL	Max +ve				
				Max -ve	0	-0.013	1.500	-0.228
			5:1.1DL+1.0W)	Max +ve				
				Max -ve	0	-0.054	1.500	-0.170
			6:CASE I: VX	Max +ve			0	0.034
				Max -ve	0	-0.022		
			7:1.1DL+1.0W	Max +ve	0	0.014		
				Max -ve			1.500	-0.220
			8:CASE I: VY	Max +ve				
				Max -ve	0	-0.010	1.500	-0.182
			13:CASE III: V	Max +ve				
				Max -ve	0	-0.008	1.500	-0.137
			14:CASE III: V	Max +ve	0	0.019		
				Max -ve			0	-0.015
			15:CASE III:VX	Max +ve			0	0.023
				Max -ve	0	-0.032		
3	4	0.500	2:DYNO DRUM	Max +ve				
				Max -ve	0	-0.0261	0	-0.019
			1:WEIGHT	Max +ve	0	0.000		
				Max -ve			0.500	-0.218
			10:WIND LOAD	Max +ve	0	0.030	0	0.033
				Max -ve				
			11:WIND LOAD	Max +ve			0.500	0.306
				Max -ve	0	-0.000		
			12:DYNO DRU	Max +ve	0	0.029		
				Max -ve			0	-0.003
			16:WIND RESI	Max +ve	0	0.068	0	0.008
				Max -ve				
			9:COMPRESS	Max +ve			0	0.000
				Max -ve	0	-0.000		
			3:1.1DL+1.0WI	Max +ve	0	0.068		
				Max -ve			0.500	-0.231
			4:1.25DL	Max +ve	0	0.000		
				Max -ve			0.500	-0.272
			5:1.1DL+1.0W)	Max +ve	0	0.059		
				Max -ve			0.500	-0.209
			6:CASE I: VX	Max +ve	0	0.030	0	0.033
				Max -ve				
			7:1.1DL+1.0W	Max +ve				
				Max -ve	0	-0.026	0.500	-0.258
			8:CASE I: VY	Max +ve	0	0.000		

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
				Max -ve			0.500	-0.218
			13:CASE III: V'	Max +ve	0	0.000		
				Max -ve			0.500	-0.163
			14:CASE III: V.	Max +ve				
				Max -ve	0	-0.020	0	-0.014
			15:CASE III:VX	Max +ve	0	0.045	0	0.023
				Max -ve				
4	5	7.000	2:DYNO DRUM	Max +ve	0	0.052	0	0.001
				Max -ve				
			1:WEIGHT	Max +ve			0	0.092
				Max -ve	0	-0.000		
			10:WIND LOAI	Max +ve	0	0.000		
				Max -ve			0	-0.002
			11:WIND LOAI	Max +ve	0	0.000		
				Max -ve			0	-0.167
			12:DYNO DRU	Max +ve			0	0.000
				Max -ve	0	-0.000		
			16:WIND RESI	Max +ve				
				Max -ve	0	-0.021	0	-0.000
			9:COMPRESS	Max +ve	0	0.000		
				Max -ve			0	-0.000
			3:1.1DL+1.0WI	Max +ve			0	0.100
				Max -ve	0	-0.021		
			4:1.25DL	Max +ve			0	0.115
				Max -ve	0	-0.000		
			5:1.1DL+1.0W)	Max +ve			0	0.099
				Max -ve	0	-0.000		
			6:CASE I: VX	Max +ve	0	0.000		
				Max -ve			0	-0.002
			7:1.1DL+1.0W.	Max +ve	0	0.052	0	0.102
				Max -ve				
			8:CASE I: VY	Max +ve			0	0.092
				Max -ve	0	-0.000		
			13:CASE III: V'	Max +ve			0	0.069
				Max -ve	0	-0.000		
			14:CASE III: V.	Max +ve	0	0.039	0	0.001
				Max -ve				
			15:CASE III:VX	Max +ve	0	0.000		
				Max -ve			0	-0.001
5	3	2.000	2:DYNO DRUM	Max +ve	0	0.144	0	0.020
				Max -ve				
			1:WEIGHT	Max +ve			0	0.093
				Max -ve	0	-0.004		
			10:WIND LOAI	Max +ve	2.000	0.033		
				Max -ve	0	-0.007	0	-0.036

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
			11:WIND LOAI	Max +ve	0	0.006		
				Max -ve			0	-0.105
			12:DYNO DRU	Max +ve	0	0.016	0	0.003
				Max -ve				
			16:WIND RESI	Max +ve				
				Max -ve	0	-0.026	0	-0.009
			9:COMPRESS	Max +ve				
				Max -ve	0	-0.000	0	-0.000
			3:1.1DL+1.0WI	Max +ve			0	0.093
				Max -ve	0	-0.031		
			4:1.25DL	Max +ve			0	0.116
				Max -ve	0	-0.005		
			5:1.1DL+1.0W)	Max +ve	2.000	0.045	0	0.069
				Max -ve				
			6:CASE I: VX	Max +ve	2.000	0.033		
				Max -ve	0	-0.007	0	-0.036
			7:1.1DL+1.0W2	Max +ve	0	0.139	0	0.122
				Max -ve				
			8:CASE I: VY	Max +ve			0	0.093
				Max -ve	0	-0.004		
			13:CASE III: V	Max +ve			0	0.069
				Max -ve	0	-0.003		
			14:CASE III: V2	Max +ve	0	0.108	0	0.015
				Max -ve				
			15:CASE III:VX	Max +ve	2.000	0.037		
				Max -ve			0	-0.024
6	5	2.000	2:DYNO DRUN	Max +ve				
				Max -ve	0	-0.144	0	-0.020
			1:WEIGHT	Max +ve	0	0.004		
				Max -ve			2.000	-0.362
			10:WIND LOAI	Max +ve	2.000	0.033	0	0.036
				Max -ve	0	-0.007		
			11:WIND LOAI	Max +ve			2.000	0.574
				Max -ve	0	-0.006		
			12:DYNO DRU	Max +ve	0	0.016		
				Max -ve			0	-0.003
			16:WIND RESI	Max +ve	0	0.090	0	0.009
				Max -ve				
			9:COMPRESS	Max +ve			0	0.000
				Max -ve	0	-0.000		
			3:1.1DL+1.0WI	Max +ve	0	0.095		
				Max -ve			2.000	-0.389
			4:1.25DL	Max +ve	0	0.005		
				Max -ve			2.000	-0.452
			5:1.1DL+1.0W)	Max +ve	2.000	0.054		

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
				Max -ve			2.000	-0.366
			6:CASE I: VX	Max +ve	2.000	0.033	0	0.036
				Max -ve	0	-0.007		
			7:1.1DL+1.0W:	Max +ve				
				Max -ve	0	-0.139	2.000	-0.418
			8:CASE I: VY	Max +ve	0	0.004		
				Max -ve			2.000	-0.362
			13:CASE III: V	Max +ve	0	0.003		
				Max -ve			2.000	-0.271
			14:CASE III: V:	Max +ve				
				Max -ve	0	-0.108	0	-0.015
			15:CASE III:VX	Max +ve	2.000	0.037	0	0.024
				Max -ve				
7	8	1.000	2:DYNO DRUM	Max +ve	0	0.179		
				Max -ve			0	-0.000
			1:WEIGHT	Max +ve				
				Max -ve	0	-0.000	1.000	-0.046
			10:WIND LOAI	Max +ve	0	0.000	0	0.001
				Max -ve				
			11:WIND LOAI	Max +ve	0	0.000	1.000	0.032
				Max -ve				
			12:DYNO DRU	Max +ve	0	0.000		
				Max -ve			0	-0.000
			16:WIND RESI	Max +ve			0	0.000
				Max -ve	0	-0.071		
			9:COMPRESS	Max +ve			0	0.000
				Max -ve	0	-0.000		
			3:1.1DL+1.0WI	Max +ve				
				Max -ve	0	-0.071	1.000	-0.050
			4:1.25DL	Max +ve				
				Max -ve	0	-0.000	1.000	-0.057
			5:1.1DL+1.0W)	Max +ve	0	0.001		
				Max -ve			1.000	-0.049
			6:CASE I: VX	Max +ve	0	0.000	0	0.001
				Max -ve				
			7:1.1DL+1.0W:	Max +ve	0	0.179		
				Max -ve			1.000	-0.051
			8:CASE I: VY	Max +ve				
				Max -ve	0	-0.000	1.000	-0.046
			13:CASE III: V	Max +ve				
				Max -ve	0	-0.000	1.000	-0.034
			14:CASE III: V:	Max +ve	0	0.134		
				Max -ve			0	-0.000
			15:CASE III:VX	Max +ve	0	0.001	0	0.001
				Max -ve				

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
8	7	1.500	2:DYNO DRUM	Max +ve	0	0.026797	0	0.019
				Max -ve				
			1:WEIGHT	Max +ve	0	0.010	0	0.234
				Max -ve				
			10:WIND LOAD	Max +ve				
				Max -ve	0	-0.023	0	-0.128
			11:WIND LOAD	Max +ve				
				Max -ve	0	-0.014	0	-0.340
			12:DYNO DRU	Max +ve			0	0.031
				Max -ve	0	-0.021		
			16:WIND RESU	Max +ve				
				Max -ve	0	-0.058	0	-0.063
			9:COMPRESS	Max +ve	0	0.000		
				Max -ve			0	-0.000
			3:1.1DL+1.0WI	Max +ve			0	0.195
				Max -ve	0	-0.047		
			4:1.25DL	Max +ve	0	0.013	0	0.293
				Max -ve				
			5:1.1DL+1.0W)	Max +ve			0	0.161
				Max -ve	0	-0.033		
			6:CASE I: VX	Max +ve				
				Max -ve	0	-0.023	0	-0.128
			7:1.1DL+1.0W2	Max +ve	0	0.038	0	0.277
				Max -ve				
			8:CASE I: VY	Max +ve	0	0.010	0	0.234
				Max -ve				
			13:CASE III: V	Max +ve	0	0.008	0	0.176
				Max -ve				
			14:CASE III: V2	Max +ve	0	0.020	0	0.015
				Max -ve				
			15:CASE III:VX	Max +ve				
				Max -ve	0	-0.033	0	-0.073
9	9	0.500	2:DYNO DRUM	Max +ve			0	0.020
				Max -ve	0	-0.0261		
			1:WEIGHT	Max +ve	0	0.000	0	0.196
				Max -ve				
			10:WIND LOAD	Max +ve	0	0.031		
				Max -ve			0	-0.128
			11:WIND LOAD	Max +ve				
				Max -ve	0	-0.000	0	-0.308
			12:DYNO DRU	Max +ve	0	0.029	0	0.031
				Max -ve				
			16:WIND RESU	Max +ve	0	0.068		
				Max -ve			0	-0.063
			9:COMPRESS	Max +ve				

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
				Max -ve	0	-0.000	0	-0.000
			3:1.1DL+1.0WI	Max +ve	0	0.068	0	0.153
				Max -ve				
			4:1.25DL	Max +ve	0	0.000	0	0.245
				Max -ve				
			5:1.1DL+1.0W)	Max +ve	0	0.060	0	0.119
				Max -ve				
			6:CASE I: VX	Max +ve	0	0.031		
				Max -ve			0	-0.128
			7:1.1DL+1.0W2	Max +ve			0	0.236
				Max -ve	0	-0.0261		
			8:CASE I: VY	Max +ve	0	0.000	0	0.196
				Max -ve				
			13:CASE III: V'	Max +ve	0	0.000	0	0.147
				Max -ve				
			14:CASE III: V2	Max +ve			0	0.015
				Max -ve	0	-0.020		
			15:CASE III:VX	Max +ve	0	0.045		
				Max -ve			0	-0.073
10	10	7.000	2:DYNO DRUM	Max +ve	0	0.052		
				Max -ve			0	-0.001
			1:WEIGHT	Max +ve	0	0.000	0	0.084
				Max -ve				
			10:WIND LOAI	Max +ve			0	0.002
				Max -ve	0	-0.000		
			11:WIND LOAI	Max +ve				
				Max -ve	0	-0.000	0	-0.153
			12:DYNO DRU	Max +ve	0	0.000		
				Max -ve			0	-0.000
			16:WIND RESI	Max +ve			0	0.000
				Max -ve	0	-0.021		
			9:COMPRESS	Max +ve			0	0.000
				Max -ve	0	-0.000		
			3:1.1DL+1.0WI	Max +ve			0	0.092
				Max -ve	0	-0.021		
			4:1.25DL	Max +ve	0	0.000	0	0.104
				Max -ve				
			5:1.1DL+1.0W)	Max +ve	0	0.000	0	0.094
				Max -ve				
			6:CASE I: VX	Max +ve			0	0.002
				Max -ve	0	-0.000		
			7:1.1DL+1.0W2	Max +ve	0	0.052	0	0.091
				Max -ve				
			8:CASE I: VY	Max +ve	0	0.000	0	0.084
				Max -ve				

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
			13:CASE III: V'	Max +ve	0	0.000	0	0.063
				Max -ve				
			14:CASE III: V.	Max +ve	0	0.039		
				Max -ve			0	-0.001
			15:CASE III:VX	Max +ve			0	0.001
				Max -ve	0	-0.000		
11	7	0.670	2:DYNO DRUM	Max +ve				
				Max -ve	0	-0.157	0	-0.010
			1:WEIGHT	Max +ve			0	0.976
				Max -ve	0	-0.000		
			10:WIND LOAI	Max +ve	0	0.045		
				Max -ve			0.670	-0.0734
			11:WIND LOAI	Max +ve	0	0.000		
				Max -ve			0	-1.290
			12:DYNO DRU	Max +ve	0	0.041655		
				Max -ve			0	-0.083
			16:WIND RESI	Max +ve	0	0.206		
				Max -ve			0	-0.104
			9:COMPRESS	Max +ve			0	0.000
				Max -ve	0	-0.000		
			3:1.1DL+1.0WI	Max +ve	0	0.206	0	0.970
				Max -ve				
			4:1.25DL	Max +ve			0	1.220
				Max -ve	0	-0.000		
			5:1.1DL+1.0W)	Max +ve	0	0.087	0	0.930
				Max -ve				
			6:CASE I: VX	Max +ve	0	0.045		
				Max -ve			0.670	-0.0734
			7:1.1DL+1.0W.	Max +ve			0	1.064
				Max -ve	0	-0.157		
			8:CASE I: VY	Max +ve			0	0.976
				Max -ve	0	-0.000		
			13:CASE III: V'	Max +ve			0	0.732
				Max -ve	0	-0.000		
			14:CASE III: V.	Max +ve				
				Max -ve	0	-0.117	0	-0.007
			15:CASE III:VX	Max +ve	0	0.065		
				Max -ve			0.670	-0.118
14	10	0.670	2:DYNO DRUM	Max +ve			0	0.010
				Max -ve	0	-0.157		
			1:WEIGHT	Max +ve				
				Max -ve	0	-0.000	0	-0.976
			10:WIND LOAI	Max +ve				
				Max -ve	0	-0.045	0.670	-0.0734
			11:WIND LOAI	Max +ve	0	0.000	0	1.290

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
				Max -ve				
			12:DYNO DRU	Max +ve				
				Max -ve	0	-0.042	0	-0.083
			16:WIND RESI	Max +ve	0	0.008		
				Max -ve			0	-0.111
			9:COMPRESS	Max +ve	0	0.000	0	0.000
				Max -ve				
			3:1.1DL+1.0WI	Max +ve	0	0.008		
				Max -ve			0	-1.184
			4:1.25DL	Max +ve				
				Max -ve	0	-0.000	0	-1.220
			5:1.1DL+1.0W)	Max +ve				
				Max -ve	0	-0.087	0.670	-1.231
			6:CASE I: VX	Max +ve				
				Max -ve	0	-0.045	0.670	-0.0734
			7:1.1DL+1.0W	Max +ve				
				Max -ve	0	-0.157	0	-1.064
			8:CASE I: VY	Max +ve				
				Max -ve	0	-0.000	0	-0.976
			13:CASE III: V	Max +ve				
				Max -ve	0	-0.000	0	-0.732
			14:CASE III: V	Max +ve			0	0.007
				Max -ve	0	-0.117		
			15:CASE III:VX	Max +ve				
				Max -ve	0	-0.065	0.670	-0.118
20	18	7.000	2:DYNO DRUM	Max +ve			0	0.001
				Max -ve	0	-0.052		
			1:WEIGHT	Max +ve	0	0.000		
				Max -ve			7.000	-0.070
			10:WIND LOAI	Max +ve	0	0.000		
				Max -ve			0	-0.002
			11:WIND LOAI	Max +ve			7.000	0.135
				Max -ve	0	-0.000	0	-0.005
			12:DYNO DRU	Max +ve	0	0.000	0	0.000
				Max -ve				
			16:WIND RESI	Max +ve	0	0.021		
				Max -ve			0	-0.000
			9:COMPRESS	Max +ve	0	0.000		
				Max -ve			0	-0.000
			3:1.1DL+1.0WI	Max +ve	0	0.020817		
				Max -ve			7.000	-0.077
			4:1.25DL	Max +ve	0	0.000		
				Max -ve			7.000	-0.088
			5:1.1DL+1.0W)	Max +ve	0	0.000		
				Max -ve			7.000	-0.079

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
			6:CASE I: VX	Max +ve	0	0.000		
				Max -ve			0	-0.002
			7:1.1DL+1.0W:	Max +ve				
				Max -ve	0	-0.052	7.000	-0.076
			8:CASE I: VY	Max +ve	0	0.000		
				Max -ve			7.000	-0.070
			13:CASE III: V	Max +ve	0	0.000		
				Max -ve			7.000	-0.053
			14:CASE III: V:	Max +ve			0	0.001
				Max -ve	0	-0.039		
			15:CASE III:VX	Max +ve	0	0.000		
				Max -ve			0	-0.001
21	19	7.000	2:DYNO DRUM	Max +ve				
				Max -ve	0	-0.052	0	-0.001
			1:WEIGHT	Max +ve				
				Max -ve	0	-0.000	7.000	-0.105
			10:WIND LOAI	Max +ve			0	0.002
				Max -ve	0	-0.000		
			11:WIND LOAI	Max +ve	0	0.000	7.000	0.185
				Max -ve				
			12:DYNO DRU	Max +ve				
				Max -ve	0	-0.000	0	-0.000
			16:WIND RESI	Max +ve	0	0.021	0	0.000
				Max -ve				
			9:COMPRESS	Max +ve			0	0.000
				Max -ve	0	-0.000		
			3:1.1DL+1.0WI	Max +ve	0	0.020902		
				Max -ve			7.000	-0.115
			4:1.25DL	Max +ve				
				Max -ve	0	-0.000	7.000	-0.132
			5:1.1DL+1.0W)	Max +ve				
				Max -ve	0	-0.000	7.000	-0.114
			6:CASE I: VX	Max +ve			0	0.002
				Max -ve	0	-0.000		
			7:1.1DL+1.0W:	Max +ve				
				Max -ve	0	-0.052	7.000	-0.117
			8:CASE I: VY	Max +ve				
				Max -ve	0	-0.000	7.000	-0.105
			13:CASE III: V	Max +ve				
				Max -ve	0	-0.000	7.000	-0.079
			14:CASE III: V:	Max +ve				
				Max -ve	0	-0.039	0	-0.001
			15:CASE III:VX	Max +ve			0	0.001
				Max -ve	0	-0.000		
22	20	0.500	2:DYNO DRUM	Max +ve	0	0.0261		

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
				Max -ve			0	-0.019
			1:WEIGHT	Max +ve	0	0.000		
				Max -ve			0.500	-0.188
			10:WIND LOAI	Max +ve	0	0.030	0	0.033
				Max -ve				
			11:WIND LOAI	Max +ve			0.500	0.296
				Max -ve	0	-0.000		
			12:DYNO DRU	Max +ve	0	0.029		
				Max -ve			0	-0.003
			16:WIND RESI	Max +ve	0	0.068	0	0.008
				Max -ve				
			9:COMPRESS	Max +ve			0	0.000
				Max -ve	0	-0.000		
			3:1.1DL+1.0WI	Max +ve	0	0.068		
				Max -ve			0.500	-0.199
			4:1.25DL	Max +ve	0	0.000		
				Max -ve			0.500	-0.235
			5:1.1DL+1.0W)	Max +ve	0	0.059		
				Max -ve			0.500	-0.177
			6:CASE I: VX	Max +ve	0	0.030	0	0.033
				Max -ve				
			7:1.1DL+1.0W2	Max +ve	0	0.026		
				Max -ve			0.500	-0.226
			8:CASE I: VY	Max +ve	0	0.000		
				Max -ve			0.500	-0.188
			13:CASE III: V	Max +ve	0	0.000		
				Max -ve			0.500	-0.141
			14:CASE III: V2	Max +ve	0	0.019575		
				Max -ve			0	-0.014
			15:CASE III:VX	Max +ve	0	0.045	0	0.023
				Max -ve				
23	21	0.500	2:DYNO DRUN	Max +ve	0	0.0261	0	0.020
				Max -ve				
			1:WEIGHT	Max +ve	0	0.000	0	0.226
				Max -ve				
			10:WIND LOAI	Max +ve	0	0.031		
				Max -ve			0	-0.128
			11:WIND LOAI	Max +ve				
				Max -ve	0	-0.000	0	-0.318
			12:DYNO DRU	Max +ve	0	0.029	0	0.031
				Max -ve				
			16:WIND RESI	Max +ve	0	0.068		
				Max -ve			0	-0.063
			9:COMPRESS	Max +ve				
				Max -ve	0	-0.000	0	-0.000

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
			3:1.1DL+1.0WI	Max +ve	0	0.068	0	0.185
				Max -ve				
			4:1.25DL	Max +ve	0	0.000	0	0.282
				Max -ve				
			5:1.1DL+1.0W)	Max +ve	0	0.060	0	0.151
				Max -ve				
			6:CASE I: VX	Max +ve	0	0.031		
				Max -ve			0	-0.128
			7:1.1DL+1.0W;	Max +ve	0	0.026	0	0.268
				Max -ve				
			8:CASE I: VY	Max +ve	0	0.000	0	0.226
				Max -ve				
			13:CASE III: V'	Max +ve	0	0.000	0	0.169
				Max -ve				
			14:CASE III: V;	Max +ve	0	0.019575	0	0.015
				Max -ve				
			15:CASE III:VX	Max +ve	0	0.045		
				Max -ve			0	-0.073
24	22	1.500	2:DYNO DRUM	Max +ve				
				Max -ve	0	-0.025	0	-0.019
			1:WEIGHT	Max +ve	0	0.010396		
				Max -ve			1.500	-0.241
			10:WIND LOAI	Max +ve			0	0.034
				Max -ve	0	-0.022		
			11:WIND LOAI	Max +ve			1.500	0.347
				Max -ve	0	-0.014		
			12:DYNO DRU	Max +ve				
				Max -ve	0	-0.021	0	-0.003
			16:WIND RESI	Max +ve			0	0.009
				Max -ve	0	-0.042		
			9:COMPRESS	Max +ve	0	0.000	0	0.000
				Max -ve				
			3:1.1DL+1.0WI	Max +ve				
				Max -ve	0	-0.030	1.500	-0.256
			4:1.25DL	Max +ve	0	0.013		
				Max -ve			1.500	-0.301
			5:1.1DL+1.0W)	Max +ve				
				Max -ve	0	-0.031	1.500	-0.234
			6:CASE I: VX	Max +ve			0	0.034
				Max -ve	0	-0.022		
			7:1.1DL+1.0W;	Max +ve				
				Max -ve	0	-0.014	1.500	-0.284
			8:CASE I: VY	Max +ve	0	0.010396		
				Max -ve			1.500	-0.241
			13:CASE III: V'	Max +ve	0	0.008		

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
				Max -ve			1.500	-0.180
			14:CASE III: V.	Max +ve				
				Max -ve	0	-0.019	0	-0.015
			15:CASE III:VX	Max +ve			0	0.023
				Max -ve	0	-0.032		
25	23	1.500	2:DYNO DRUM	Max +ve			0	0.019
				Max -ve	0	-0.027		
			1:WEIGHT	Max +ve			0	0.188
				Max -ve	0	-0.010		
			10:WIND LOAD	Max +ve				
				Max -ve	0	-0.023	0	-0.128
			11:WIND LOAD	Max +ve	0	0.014		
				Max -ve			0	-0.297
			12:DYNO DRU	Max +ve			0	0.031
				Max -ve	0	-0.021		
			16:WIND RESI	Max +ve				
				Max -ve	0	-0.036	0	-0.063
			9:COMPRESS	Max +ve				
				Max -ve	0	-0.000	0	-0.000
			3:1.1DL+1.0WI	Max +ve			0	0.144
				Max -ve	0	-0.048		
			4:1.25DL	Max +ve			0	0.235
				Max -ve	0	-0.013		
			5:1.1DL+1.0W)	Max +ve			0	0.110
				Max -ve	0	-0.056		
			6:CASE I: VX	Max +ve				
				Max -ve	0	-0.023	0	-0.128
			7:1.1DL+1.0W.	Max +ve			0	0.226
				Max -ve	0	-0.038		
			8:CASE I: VY	Max +ve			0	0.188
				Max -ve	0	-0.010		
			13:CASE III: V	Max +ve			0	0.141
				Max -ve	0	-0.008		
			14:CASE III: V.	Max +ve			0	0.015
				Max -ve	0	-0.020		
			15:CASE III:VX	Max +ve				
				Max -ve	0	-0.033	0	-0.073
26	24	1.000	2:DYNO DRUM	Max +ve			0	0.001
				Max -ve	0	-0.179		
			1:WEIGHT	Max +ve	0	0.000	0	0.039
				Max -ve				
			10:WIND LOAD	Max +ve	0	0.000		
				Max -ve			0	-0.001
			11:WIND LOAD	Max +ve				
				Max -ve	0	-0.000	0	-0.023

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
			12:DYNO DRU	Max +ve	0	0.000	0	0.000
				Max -ve				
			16:WIND RESI	Max +ve	0	0.073		
				Max -ve			0	-0.000
			9:COMPRESS	Max +ve				
				Max -ve	0	-0.000	0	-0.000
			3:1.1DL+1.0WI	Max +ve	0	0.073	0	0.043
				Max -ve				
			4:1.25DL	Max +ve	0	0.000	0	0.049
				Max -ve				
			5:1.1DL+1.0W)	Max +ve	0	0.001	0	0.042
				Max -ve				
			6:CASE I: VX	Max +ve	0	0.000		
				Max -ve			0	-0.001
			7:1.1DL+1.0W2	Max +ve			0	0.044
				Max -ve	0	-0.179		
			8:CASE I: VY	Max +ve	0	0.000	0	0.039
				Max -ve				
			13:CASE III: V	Max +ve	0	0.000	0	0.029
				Max -ve				
			14:CASE III: V2	Max +ve			0	0.000
				Max -ve	0	-0.134		
			15:CASE III:VX	Max +ve	0	0.001		
				Max -ve			0	-0.001
27	25	1.000	2:DYNO DRUM	Max +ve				
				Max -ve	0	-0.179	0	-0.001
			1:WEIGHT	Max +ve	0	0.000	0	0.035
				Max -ve				
			10:WIND LOAD	Max +ve	0	0.000	0	0.001
				Max -ve				
			11:WIND LOAD	Max +ve			1.000	0.004
				Max -ve	0	-0.000	0	-0.016
			12:DYNO DRU	Max +ve	0	0.000		
				Max -ve			0	-0.000
			16:WIND RESI	Max +ve	0	0.072	0	0.000
				Max -ve				
			9:COMPRESS	Max +ve	0	0.000	0	0.000
				Max -ve				
			3:1.1DL+1.0WI	Max +ve	0	0.072	0	0.039
				Max -ve				
			4:1.25DL	Max +ve	0	0.000	0	0.044
				Max -ve				
			5:1.1DL+1.0W)	Max +ve	0	0.001	0	0.040
				Max -ve				
			6:CASE I: VX	Max +ve	0	0.000	0	0.001

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
				Max -ve				
			7:1.1DL+1.0W2	Max +ve			0	0.038
				Max -ve	0	-0.179		
			8:CASE I: VY	Max +ve	0	0.000	0	0.035
				Max -ve				
			13:CASE III: V	Max +ve	0	0.000	0	0.026
				Max -ve				
			14:CASE III: V2	Max +ve				
				Max -ve	0	-0.134	0	-0.000
			15:CASE III:VX	Max +ve	0	0.001	0	0.001
				Max -ve				
28	26	2.500	2:DYNO DRUM	Max +ve	0	0.000		
				Max -ve			0	-0.000
			1:WEIGHT	Max +ve	0	0.000		
				Max -ve			2.500	-0.346
			10:WIND LOAD	Max +ve			0	0.094
				Max -ve	0	-0.000		
			11:WIND LOAD	Max +ve			0	0.460
				Max -ve	0	-0.000		
			12:DYNO DRU	Max +ve	0	0.000		
				Max -ve			0	-0.028
			16:WIND RESU	Max +ve	0	0.000	0	0.055
				Max -ve				
			9:COMPRESS	Max +ve	0	0.000	0	0.000
				Max -ve				
			3:1.1DL+1.0WI	Max +ve	0	0.000		
				Max -ve			2.500	-0.326
			4:1.25DL	Max +ve	0	0.000		
				Max -ve			2.500	-0.432
			5:1.1DL+1.0W)	Max +ve	0	0.000		
				Max -ve			2.500	-0.314
			6:CASE I: VX	Max +ve			0	0.094
				Max -ve	0	-0.000		
			7:1.1DL+1.0W2	Max +ve	0	0.000		
				Max -ve			2.500	-0.381
			8:CASE I: VY	Max +ve	0	0.000		
				Max -ve			2.500	-0.346
			13:CASE III: V	Max +ve	0	0.000		
				Max -ve			2.500	-0.259
			14:CASE III: V2	Max +ve	0	0.000		
				Max -ve			0	-0.000
			15:CASE III:VX	Max +ve			0	0.050
				Max -ve	0	-0.000		
29	27	2.500	2:DYNO DRUM	Max +ve				
				Max -ve	0	-0.000	0	-0.000

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
			1:WEIGHT	Max +ve	0	0.000		
				Max -ve			2.500	-0.346
			10:WIND LOAI	Max +ve	0	0.000		
				Max -ve			0	-0.094
			11:WIND LOAI	Max +ve	0	0.000	0	0.460
				Max -ve				
			12:DYNO DRU	Max +ve	0	0.000	0	0.028
				Max -ve				
			16:WIND RESI	Max +ve				
				Max -ve	0	-0.000	0	-0.055
			9:COMPRESS	Max +ve			0	0.000
				Max -ve	0	-0.000		
			3:1.1DL+1.0WI	Max +ve				
				Max -ve	0	-0.000	2.500	-0.435
			4:1.25DL	Max +ve	0	0.000		
				Max -ve			2.500	-0.432
			5:1.1DL+1.0W)	Max +ve	0	0.000		
				Max -ve			2.500	-0.447
			6:CASE I: VX	Max +ve	0	0.000		
				Max -ve			0	-0.094
			7:1.1DL+1.0W.	Max +ve				
				Max -ve	0	-0.000	2.500	-0.381
			8:CASE I: VY	Max +ve	0	0.000		
				Max -ve			2.500	-0.346
			13:CASE III: V'	Max +ve	0	0.000		
				Max -ve			2.500	-0.259
			14:CASE III: V.	Max +ve				
				Max -ve	0	-0.000	0	-0.000
			15:CASE III:VX	Max +ve	0	0.000		
				Max -ve			0	-0.050
30	3	1.000	2:DYNO DRUN	Max +ve				
				Max -ve	0	-0.000	0	-0.000
			1:WEIGHT	Max +ve	0	0.000	0	0.010
				Max -ve			1.000	-0.000
			10:WIND LOAI	Max +ve	0	0.02		
				Max -ve			0	-0.000
			11:WIND LOAI	Max +ve	0	0.000		
				Max -ve			0	-0.020
			12:DYNO DRU	Max +ve				
				Max -ve	0	-0.000	0	-0.000
			16:WIND RESI	Max +ve	0	0.015	0	0.000
				Max -ve				
			9:COMPRESS	Max +ve	0	0.000		
				Max -ve			0	-0.000
			3:1.1DL+1.0WI	Max +ve	0	0.015	0	0.011

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
				Max -ve			1.000	-0.000
			4:1.25DL	Max +ve	0	0.000	0	0.012
				Max -ve			1.000	-0.000
			5:1.1DL+1.0W)	Max +ve	0	0.02	0	0.011
				Max -ve			1.000	-0.000
			6:CASE I: VX	Max +ve	0	0.02		
				Max -ve			0	-0.000
			7:1.1DL+1.0W2	Max +ve	0	0.000	0	0.011
				Max -ve			1.000	-0.000
			8:CASE I: VY	Max +ve	0	0.000	0	0.010
				Max -ve			1.000	-0.000
			13:CASE III: V\	Max +ve	0	0.000	0	0.007
				Max -ve			1.000	-0.000
			14:CASE III: V2	Max +ve				
				Max -ve	0	-0.000	0	-0.000
			15:CASE III:VX	Max +ve	0	0.015		
				Max -ve			0	-0.000
31	5	1.000	2:DYNO DRUM	Max +ve			0	0.000
				Max -ve	0	-0.000		
			1:WEIGHT	Max +ve			0	0.010
				Max -ve	0	-0.000		
			10:WIND LOAI	Max +ve	0	0.02		
				Max -ve	1.000	-0.000	0	-0.000
			11:WIND LOAI	Max +ve	0	0.000		
				Max -ve			0	-0.020
			12:DYNO DRU	Max +ve	0	0.000	0	0.000
				Max -ve				
			16:WIND RESI	Max +ve	0	0.015		
				Max -ve			0	-0.000
			9:COMPRESS	Max +ve				
				Max -ve	0	-0.000	0	-0.000
			3:1.1DL+1.0WI	Max +ve	0	0.015	0	0.011
				Max -ve				
			4:1.25DL	Max +ve			0	0.012353
				Max -ve	0	-0.000		
			5:1.1DL+1.0W)	Max +ve	0	0.02	0	0.011
				Max -ve	1.000	-0.000		
			6:CASE I: VX	Max +ve	0	0.02		
				Max -ve	1.000	-0.000	0	-0.000
			7:1.1DL+1.0W2	Max +ve			0	0.011
				Max -ve	0	-0.000		
			8:CASE I: VY	Max +ve			0	0.010
				Max -ve	0	-0.000		
			13:CASE III: V\	Max +ve			0	0.007
				Max -ve	0	-0.000		

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
			14:CASE III: V:	Max +ve			0	0.000
				Max -ve	0	-0.000		
			15:CASE III:VX	Max +ve	0	0.015	0	0.000
				Max -ve	1.000	-0.000		
32	15	4.830	2:DYNO DRUM	Max +ve	0	0.000	0	0.000
				Max -ve				
			1:WEIGHT	Max +ve	0	0.000		
				Max -ve			0	-0.000
			10:WIND LOAD	Max +ve			0	0.097
				Max -ve	0	-0.000		
			11:WIND LOAD	Max +ve				
				Max -ve	0	-0.000	0	-0.000
			12:DYNO DRU	Max +ve	0	0.000		
				Max -ve			0	-0.000
			16:WIND RESI	Max +ve			0	0.037
				Max -ve	0	-0.037		
			9:COMPRESS	Max +ve	0	0.000	0	0.000
				Max -ve				
			3:1.1DL+1.0WI	Max +ve			0	0.037
				Max -ve	0	-0.037		
			4:1.25DL	Max +ve	0	0.000		
				Max -ve			0	-0.000
			5:1.1DL+1.0W)	Max +ve	0	0.000	0	0.097
				Max -ve			4.830	-0.000
			6:CASE I: VX	Max +ve			0	0.097
				Max -ve	0	-0.000		
			7:1.1DL+1.0W:	Max +ve	0	0.000		
				Max -ve			0	-0.000
			8:CASE I: VY	Max +ve	0	0.000		
				Max -ve			0	-0.000
			13:CASE III: V'	Max +ve	0	0.000		
				Max -ve			0	-0.000
			14:CASE III: V:	Max +ve	0	0.000	0	0.000
				Max -ve				
			15:CASE III:VX	Max +ve			0	0.07245
				Max -ve	0	-0.000		
33	12	4.830	2:DYNO DRUM	Max +ve	0	0.000	0	0.000
				Max -ve				
			1:WEIGHT	Max +ve	0	0.000	0	0.000
				Max -ve				
			10:WIND LOAD	Max +ve			0	0.097
				Max -ve	0	-0.000	4.830	-0.000
			11:WIND LOAD	Max +ve				
				Max -ve	0	-0.000	0	-0.000
			12:DYNO DRU	Max +ve	0	0.000	0	0

Beam Maximum Shear Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fz (kip)	d (ft)	Max Fy (kip)
				Max -ve			0	0
			16:WIND RESU	Max +ve			0	0.037
				Max -ve	0	-0.037		
			9:COMPRESS	Max +ve	0	0.000		
				Max -ve			0	-0.000
			3:1.1DL+1.0WI	Max +ve			0	0.037
				Max -ve	0	-0.037		
			4:1.25DL	Max +ve	0	0.000	0	0.000
				Max -ve				
			5:1.1DL+1.0W)	Max +ve	0	0.000	0	0.097
				Max -ve				
			6:CASE I: VX	Max +ve			0	0.097
				Max -ve	0	-0.000	4.830	-0.000
			7:1.1DL+1.0W2	Max +ve	0	0.000	0	0.000
				Max -ve				
			8:CASE I: VY	Max +ve	0	0.000	0	0.000
				Max -ve				
			13:CASE III: V	Max +ve	0	0.000	0	0.000
				Max -ve				
			14:CASE III: V2	Max +ve	0	0.000	0	0.000
				Max -ve				
			15:CASE III:VX	Max +ve			0	0.07245
				Max -ve	0	-0.000	4.830	-0.000

Beam Maximum Axial Forces

Distances to maxima are given from beam end A.

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
1	2	1.000	2:DYNO DRUM	Max +ve		
				Max -ve	0	-0.084
			1:WEIGHT	Max +ve		
				Max -ve	0	-0.000
			10:WIND LOAD	Max +ve		
				Max -ve	0	-0.000
			11:WIND LOAD	Max +ve	0	0.001
				Max -ve		
			12:DYNO DRU	Max +ve	0	0.025
				Max -ve		
			16:WIND RESU	Max +ve	0	0.053
				Max -ve		
			9:COMPRESS	Max +ve		
				Max -ve	0	-0.000
			3:1.1DL+1.0WI	Max +ve	0	0.053

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
				Max -ve		
			4:1.25DL	Max +ve		
				Max -ve	0	-0.001
			5:1.1DL+1.0W)	Max +ve	0	0.025
				Max -ve		
			6:CASE I: VX	Max +ve		
				Max -ve	0	-0.000
			7:1.1DL+1.0W:	Max +ve		
				Max -ve	0	-0.084
			8:CASE I: VY	Max +ve		
				Max -ve	0	-0.000
			13:CASE III: V'	Max +ve		
				Max -ve	0	-0.000
			14:CASE III: V:	Max +ve		
				Max -ve	0	-0.063
			15:CASE III:VX	Max +ve	0	0.019
				Max -ve		
2	3	1.500	2:DYNO DRUN	Max +ve		
				Max -ve	0	-0.375
			1:WEIGHT	Max +ve	0	0.004
				Max -ve		
			10:WIND LOAI	Max +ve	0	0.026
				Max -ve		
			11:WIND LOAI	Max +ve		
				Max -ve	0	-0.006
			12:DYNO DRU	Max +ve	0	0.011
				Max -ve		
			16:WIND RESI	Max +ve	0	0.183
				Max -ve		
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve	0	0.188
				Max -ve		
			4:1.25DL	Max +ve	0	0.006
				Max -ve		
			5:1.1DL+1.0W)	Max +ve	0	0.042439
				Max -ve		
			6:CASE I: VX	Max +ve	0	0.026
				Max -ve		
			7:1.1DL+1.0W:	Max +ve		
				Max -ve	0	-0.370
			8:CASE I: VY	Max +ve	0	0.004
				Max -ve		
			13:CASE III: V'	Max +ve	0	0.003
				Max -ve		

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
			14:CASE III: V	Max +ve		
				Max -ve	0	-0.281
			15:CASE III:VX	Max +ve	0	0.028
				Max -ve		
3	4	0.500	2:DYNO DRUM	Max +ve		
				Max -ve	0	-0.249
			1:WEIGHT	Max +ve	0	0.100
				Max -ve		
			10:WIND LOAD	Max +ve	0	0
				Max -ve	0	0
			11:WIND LOAD	Max +ve		
				Max -ve	0	-0.133
			12:DYNO DRU	Max +ve	0	0.014
				Max -ve		
			16:WIND RESU	Max +ve	0	0.103
				Max -ve		
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve	0	0.213
				Max -ve		
			4:1.25DL	Max +ve	0	0.125
				Max -ve		
			5:1.1DL+1.0W)	Max +ve	0	0.124
				Max -ve		
			6:CASE I: VX	Max +ve	0	0
				Max -ve	0	0
			7:1.1DL+1.0W	Max +ve		
				Max -ve	0	-0.139
			8:CASE I: VY	Max +ve	0	0.100
				Max -ve		
			13:CASE III: V	Max +ve	0	0.075235
				Max -ve		
			14:CASE III: V	Max +ve		
				Max -ve	0	-0.187
			15:CASE III:VX	Max +ve	0	0.010
				Max -ve		
4	5	7.000	2:DYNO DRUM	Max +ve		
				Max -ve	0	-0.231
			1:WEIGHT	Max +ve	0	0.000
				Max -ve		
			10:WIND LOAD	Max +ve	0	0.000
				Max -ve		
			11:WIND LOAD	Max +ve		
				Max -ve	0	-0.000
			12:DYNO DRU	Max +ve		

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
				Max -ve	0	-0.027
			16:WIND RESU	Max +ve	0	0.052
				Max -ve		
			9:COMPRESS	Max +ve		
				Max -ve	0	-0.000
			3:1.1DL+1.0WI	Max +ve	0	0.052
				Max -ve		
			4:1.25DL	Max +ve	0	0.000
				Max -ve		
			5:1.1DL+1.0W)	Max +ve		
				Max -ve	0	-0.027
			6:CASE I: VX	Max +ve	0	0.000
				Max -ve		
			7:1.1DL+1.0W	Max +ve		
				Max -ve	0	-0.231
			8:CASE I: VY	Max +ve	0	0.000
				Max -ve		
			13:CASE III: V	Max +ve	0	0.000
				Max -ve		
			14:CASE III: V	Max +ve		
				Max -ve	0	-0.173
			15:CASE III:VX	Max +ve		
				Max -ve	0	-0.020
5	3	2.000	2:DYNO DRUM	Max +ve	0	0.078
				Max -ve		
			1:WEIGHT	Max +ve		
				Max -ve	0	-0.011
			10:WIND LOAD	Max +ve		
				Max -ve	0	-0.022
			11:WIND LOAD	Max +ve	0	0.014
				Max -ve		
			12:DYNO DRU	Max +ve		
				Max -ve	0	-0.021
			16:WIND RESU	Max +ve		
				Max -ve	0	-0.127
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve		
				Max -ve	0	-0.138
			4:1.25DL	Max +ve		
				Max -ve	0	-0.013
			5:1.1DL+1.0W)	Max +ve		
				Max -ve	0	-0.054
			6:CASE I: VX	Max +ve		
				Max -ve	0	-0.022

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
			7:1.1DL+1.0W.	Max +ve	0	0.065963
				Max -ve		
			8:CASE I: VY	Max +ve		
				Max -ve	0	-0.011
			13:CASE III: V	Max +ve		
				Max -ve	0	-0.008
			14:CASE III: V.	Max +ve	0	0.058
				Max -ve		
			15:CASE III:VX	Max +ve		
				Max -ve	0	-0.032
6	5	2.000	2:DYNO DRUN	Max +ve	0	0.078
				Max -ve		
			1:WEIGHT	Max +ve		
				Max -ve	0	-0.011
			10:WIND LOAI	Max +ve	0	0.022
				Max -ve		
			11:WIND LOAI	Max +ve	0	0.014
				Max -ve		
			12:DYNO DRU	Max +ve	0	0.021
				Max -ve		
			16:WIND RESI	Max +ve		
				Max -ve	0	-0.024
			9:COMPRESS	Max +ve		
				Max -ve	0	-0.000
			3:1.1DL+1.0WI	Max +ve		
				Max -ve	0	-0.036
			4:1.25DL	Max +ve		
				Max -ve	0	-0.013
			5:1.1DL+1.0W)	Max +ve	0	0.031
				Max -ve		
			6:CASE I: VX	Max +ve	0	0.022
				Max -ve		
			7:1.1DL+1.0W.	Max +ve	0	0.066
				Max -ve		
			8:CASE I: VY	Max +ve		
				Max -ve	0	-0.011
			13:CASE III: V	Max +ve		
				Max -ve	0	-0.008
			14:CASE III: V.	Max +ve	0	0.058
				Max -ve		
			15:CASE III:VX	Max +ve	0	0.032
				Max -ve		
7	8	1.000	2:DYNO DRUN	Max +ve	0	0.084
				Max -ve		
			1:WEIGHT	Max +ve		

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
				Max -ve	0	-0.001
			10:WIND LOAI	Max +ve	0	0.000
				Max -ve		
			11:WIND LOAI	Max +ve	0	0.001
				Max -ve		
			12:DYNO DRU	Max +ve	0	0.026
				Max -ve		
			16:WIND RESI	Max +ve		
				Max -ve	0	-0.013
			9:COMPRESS	Max +ve		
				Max -ve	0	-0.000
			3:1.1DL+1.0WI	Max +ve		
				Max -ve	0	-0.014
			4:1.25DL	Max +ve		
				Max -ve	0	-0.001
			5:1.1DL+1.0W	Max +ve	0	0.025
				Max -ve		
			6:CASE I: VX	Max +ve	0	0.000
				Max -ve		
			7:1.1DL+1.0W	Max +ve	0	0.083023
				Max -ve		
			8:CASE I: VY	Max +ve		
				Max -ve	0	-0.001
			13:CASE III: V	Max +ve		
				Max -ve	0	-0.000
			14:CASE III: V	Max +ve	0	0.063
				Max -ve		
			15:CASE III:VX	Max +ve	0	0.019315
				Max -ve		
8	7	1.500	2:DYNO DRUM	Max +ve	0	0.366
				Max -ve		
			1:WEIGHT	Max +ve	0	0.972
				Max -ve		
			10:WIND LOAI	Max +ve		
				Max -ve	0	-0.026
			11:WIND LOAI	Max +ve		
				Max -ve	0	-1.284
			12:DYNO DRU	Max +ve		
				Max -ve	0	-0.039
			16:WIND RESI	Max +ve		
				Max -ve	0	-0.200
			9:COMPRESS	Max +ve		
				Max -ve	0	-0.000
			3:1.1DL+1.0WI	Max +ve	0	0.869
				Max -ve		

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
			4:1.25DL	Max +ve	0	1.215
				Max -ve		
			5:1.1DL+1.0W)	Max +ve	0	1.004
				Max -ve		
			6:CASE I: VX	Max +ve		
				Max -ve	0	-0.026
			7:1.1DL+1.0W2	Max +ve	0	1.434
				Max -ve		
			8:CASE I: VY	Max +ve	0	0.972
				Max -ve		
			13:CASE III: V'	Max +ve	0	0.729
				Max -ve		
			14:CASE III: V2	Max +ve	0	0.274
				Max -ve		
			15:CASE III:VX	Max +ve		
				Max -ve	0	-0.049
9	9	0.500	2:DYNO DRUN	Max +ve	0	0.236
				Max -ve		
			1:WEIGHT	Max +ve	0	0.732
				Max -ve		
			10:WIND LOAI	Max +ve	0	0.000
				Max -ve		
			11:WIND LOAI	Max +ve		
				Max -ve	0	-0.967
			12:DYNO DRU	Max +ve	0	0.014
				Max -ve		
			16:WIND RESI	Max +ve		
				Max -ve	0	-0.078
			9:COMPRESS	Max +ve		
				Max -ve	0	-0.000
			3:1.1DL+1.0WI	Max +ve	0	0.728
				Max -ve		
			4:1.25DL	Max +ve	0	0.915
				Max -ve		
			5:1.1DL+1.0W)	Max +ve	0	0.819
				Max -ve		
			6:CASE I: VX	Max +ve	0	0.000
				Max -ve		
			7:1.1DL+1.0W2	Max +ve	0	1.041
				Max -ve		
			8:CASE I: VY	Max +ve	0	0.732
				Max -ve		
			13:CASE III: V'	Max +ve	0	0.549
				Max -ve		
			14:CASE III: V2	Max +ve	0	0.177

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
				Max -ve		
			15:CASE III:VX	Max +ve	0	0.010
				Max -ve		
10	10	7.000	2:DYNO DRUM	Max +ve	0	0.231
				Max -ve		
			1:WEIGHT	Max +ve		
				Max -ve	0	-0.000
			10:WIND LOAD	Max +ve		
				Max -ve	0	-0.000
			11:WIND LOAD	Max +ve	0	0.000
				Max -ve		
			12:DYNO DRU	Max +ve		
				Max -ve	0	-0.028
			16:WIND RESU	Max +ve		
				Max -ve	0	-0.093
			9:COMPRESS	Max +ve		
				Max -ve	0	-0.000
			3:1.1DL+1.0WI	Max +ve		
				Max -ve	0	-0.094
			4:1.25DL	Max +ve		
				Max -ve	0	-0.000
			5:1.1DL+1.0W)	Max +ve		
				Max -ve	0	-0.029
			6:CASE I: VX	Max +ve		
				Max -ve	0	-0.000
			7:1.1DL+1.0W	Max +ve	0	0.231
				Max -ve		
			8:CASE I: VY	Max +ve		
				Max -ve	0	-0.000
			13:CASE III: V	Max +ve		
				Max -ve	0	-0.000
			14:CASE III: V	Max +ve	0	0.173
				Max -ve		
			15:CASE III:VX	Max +ve		
				Max -ve	0	-0.021
11	7	0.670	2:DYNO DRUM	Max +ve	0	0.000
				Max -ve		
			1:WEIGHT	Max +ve		
				Max -ve	0.670	-0.273
			10:WIND LOAD	Max +ve	0	0.094
				Max -ve		
			11:WIND LOAD	Max +ve	0	0.460
				Max -ve		
			12:DYNO DRU	Max +ve		
				Max -ve	0	-0.028

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
			16:WIND RESU	Max +ve	0	0.055
				Max -ve		
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve		
				Max -ve	0.670	-0.246
			4:1.25DL	Max +ve		
				Max -ve	0.670	-0.342
			5:1.1DL+1.0W)	Max +ve		
				Max -ve	0.670	-0.234
			6:CASE I: VX	Max +ve	0	0.094
				Max -ve		
			7:1.1DL+1.0W2	Max +ve		
				Max -ve	0.670	-0.301
			8:CASE I: VY	Max +ve		
				Max -ve	0.670	-0.273
			13:CASE III: V'	Max +ve		
				Max -ve	0.670	-0.205
			14:CASE III: V2	Max +ve	0	0.000
				Max -ve		
			15:CASE III:VX	Max +ve	0	0.050
				Max -ve		
14	10	0.670	2:DYNO DRUM	Max +ve	0	0
				Max -ve	0	0
			1:WEIGHT	Max +ve		
				Max -ve	0.670	-0.273
			10:WIND LOAD	Max +ve		
				Max -ve	0	-0.094
			11:WIND LOAD	Max +ve	0	0.460
				Max -ve		
			12:DYNO DRU	Max +ve	0	0.028
				Max -ve		
			16:WIND RESU	Max +ve		
				Max -ve	0	-0.055
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve		
				Max -ve	0.670	-0.355
			4:1.25DL	Max +ve		
				Max -ve	0.670	-0.342
			5:1.1DL+1.0W)	Max +ve		
				Max -ve	0.670	-0.367
			6:CASE I: VX	Max +ve		
				Max -ve	0	-0.094
			7:1.1DL+1.0W2	Max +ve		

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
				Max -ve	0.670	-0.301
			8:CASE I: VY	Max +ve		
				Max -ve	0.670	-0.273
			13:CASE III: V'	Max +ve		
				Max -ve	0.670	-0.205
			14:CASE III: V.	Max +ve	0	0
				Max -ve	0	0
			15:CASE III:VX	Max +ve		
				Max -ve	0	-0.050
20	18	7.000	2:DYNO DRUN	Max +ve		
				Max -ve	0	-0.231
			1:WEIGHT	Max +ve	0	0.000
				Max -ve		
			10:WIND LOAI	Max +ve		
				Max -ve	0	-0.000
			11:WIND LOAI	Max +ve		
				Max -ve	0	-0.000
			12:DYNO DRU	Max +ve	0	0.027
				Max -ve		
			16:WIND RESI	Max +ve	0	0.112
				Max -ve		
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve	0	0.112
				Max -ve		
			4:1.25DL	Max +ve	0	0.000
				Max -ve		
			5:1.1DL+1.0W)	Max +ve	0	0.027
				Max -ve		
			6:CASE I: VX	Max +ve		
				Max -ve	0	-0.000
			7:1.1DL+1.0W.	Max +ve		
				Max -ve	0	-0.231
			8:CASE I: VY	Max +ve	0	0.000
				Max -ve		
			13:CASE III: V'	Max +ve	0	0.000
				Max -ve		
			14:CASE III: V.	Max +ve		
				Max -ve	0	-0.173
			15:CASE III:VX	Max +ve	0	0.020
				Max -ve		
21	19	7.000	2:DYNO DRUN	Max +ve	0	0.231
				Max -ve		
			1:WEIGHT	Max +ve		
				Max -ve	0	-0.000

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
			10:WIND LOAI	Max +ve	0	0.000
				Max -ve		
			11:WIND LOAI	Max +ve	0	0.000
				Max -ve		
			12:DYNO DRU	Max +ve	0	0.028
				Max -ve		
			16:WIND RESI	Max +ve		
				Max -ve	0	-0.071
			9:COMPRESS	Max +ve		
				Max -ve	0	-0.000
			3:1.1DL+1.0WI	Max +ve		
				Max -ve	0	-0.071
			4:1.25DL	Max +ve		
				Max -ve	0	-0.000
			5:1.1DL+1.0W)	Max +ve	0	0.028
				Max -ve		
			6:CASE I: VX	Max +ve	0	0.000
				Max -ve		
			7:1.1DL+1.0W2	Max +ve	0	0.231
				Max -ve		
			8:CASE I: VY	Max +ve		
				Max -ve	0	-0.000
			13:CASE III: V'	Max +ve		
				Max -ve	0	-0.000
			14:CASE III: V2	Max +ve	0	0.173
				Max -ve		
			15:CASE III:VX	Max +ve	0	0.021
				Max -ve		
22	20	0.500	2:DYNO DRUM	Max +ve		
				Max -ve	0	-0.249
			1:WEIGHT	Max +ve	0	0.100
				Max -ve		
			10:WIND LOAI	Max +ve	0	0.000
				Max -ve		
			11:WIND LOAI	Max +ve		
				Max -ve	0	-0.133
			12:DYNO DRU	Max +ve		
				Max -ve	0	-0.014
			16:WIND RESI	Max +ve	0	0.103
				Max -ve		
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve	0	0.213
				Max -ve		
			4:1.25DL	Max +ve	0	0.125

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
				Max -ve		
			5:1.1DL+1.0W)	Max +ve	0	0.096
				Max -ve		
			6:CASE I: VX	Max +ve	0	0.000
				Max -ve		
			7:1.1DL+1.0W;	Max +ve		
				Max -ve	0	-0.139
			8:CASE I: VY	Max +ve	0	0.100
				Max -ve		
			13:CASE III: V'	Max +ve	0	0.075235
				Max -ve		
			14:CASE III: V;	Max +ve		
				Max -ve	0	-0.187
			15:CASE III:VX	Max +ve		
				Max -ve	0	-0.010
23	21	0.500	2:DYNO DRUM	Max +ve	0	0.236
				Max -ve		
			1:WEIGHT	Max +ve	0	0.732
				Max -ve		
			10:WIND LOAI	Max +ve	0	0.000
				Max -ve		
			11:WIND LOAI	Max +ve		
				Max -ve	0	-0.967
			12:DYNO DRU	Max +ve		
				Max -ve	0	-0.014
			16:WIND RESI	Max +ve		
				Max -ve	0	-0.078
			9:COMPRESS	Max +ve		
				Max -ve	0	-0.000
			3:1.1DL+1.0WI	Max +ve	0	0.728
				Max -ve		
			4:1.25DL	Max +ve	0	0.915
				Max -ve		
			5:1.1DL+1.0W)	Max +ve	0	0.791
				Max -ve		
			6:CASE I: VX	Max +ve	0	0.000
				Max -ve		
			7:1.1DL+1.0W;	Max +ve	0	1.041
				Max -ve		
			8:CASE I: VY	Max +ve	0	0.732
				Max -ve		
			13:CASE III: V'	Max +ve	0	0.549
				Max -ve		
			14:CASE III: V;	Max +ve	0	0.177
				Max -ve		

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
			15:CASE III:VX	Max +ve		
				Max -ve	0	-0.010
24	22	1.500	2:DYNO DRUM	Max +ve		
				Max -ve	0	-0.375
			1:WEIGHT	Max +ve	0	0.004
				Max -ve		
			10:WIND LOAD	Max +ve		
				Max -ve	0	-0.026
			11:WIND LOAD	Max +ve		
				Max -ve	0	-0.006
			12:DYNO DRU	Max +ve		
				Max -ve	0	-0.011
			16:WIND RESU	Max +ve	0	0.097
				Max -ve		
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve	0	0.102
				Max -ve		
			4:1.25DL	Max +ve	0	0.006
				Max -ve		
			5:1.1DL+1.0W	Max +ve		
				Max -ve	0	-0.033
			6:CASE I: VX	Max +ve		
				Max -ve	0	-0.026
			7:1.1DL+1.0W	Max +ve		
				Max -ve	0	-0.370
			8:CASE I: VY	Max +ve	0	0.004
				Max -ve		
			13:CASE III: V	Max +ve	0	0.003
				Max -ve		
			14:CASE III: V	Max +ve		
				Max -ve	0	-0.281
			15:CASE III:VX	Max +ve		
				Max -ve	0	-0.028
25	23	1.500	2:DYNO DRUM	Max +ve	0	0.366
				Max -ve		
			1:WEIGHT	Max +ve	0	0.972
				Max -ve		
			10:WIND LOAD	Max +ve	0	0.026
				Max -ve		
			11:WIND LOAD	Max +ve		
				Max -ve	0	-1.284
			12:DYNO DRU	Max +ve	0	0.039
				Max -ve		
			16:WIND RESU	Max +ve		

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
				Max -ve	0	-0.072
			9:COMPRESS	Max +ve		
				Max -ve	0	-0.000
			3:1.1DL+1.0WI	Max +ve	0	0.996
				Max -ve		
			4:1.25DL	Max +ve	0	1.215
				Max -ve		
			5:1.1DL+1.0W)	Max +ve	0	1.134
				Max -ve		
			6:CASE I: VX	Max +ve	0	0.026
				Max -ve		
			7:1.1DL+1.0W.	Max +ve	0	1.434
				Max -ve		
			8:CASE I: VY	Max +ve	0	0.972
				Max -ve		
			13:CASE III: V'	Max +ve	0	0.729
				Max -ve		
			14:CASE III: V.	Max +ve	0	0.274
				Max -ve		
			15:CASE III:VX	Max +ve	0	0.049
				Max -ve		
26	24	1.000	2:DYNO DRUM	Max +ve		
				Max -ve	0	-0.084
			1:WEIGHT	Max +ve		
				Max -ve	0	-0.000
			10:WIND LOAI	Max +ve	0	0.000
				Max -ve		
			11:WIND LOAI	Max +ve	0	0.001
				Max -ve		
			12:DYNO DRU	Max +ve	0	0.000
				Max -ve		
			16:WIND RESI	Max +ve	0	0.026
				Max -ve		
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve	0	0.026
				Max -ve		
			4:1.25DL	Max +ve		
				Max -ve	0	-0.001
			5:1.1DL+1.0W)	Max +ve		
				Max -ve	0	-0.000
			6:CASE I: VX	Max +ve	0	0.000
				Max -ve		
			7:1.1DL+1.0W.	Max +ve		
				Max -ve	0	-0.084

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
			8:CASE I: VY	Max +ve		
				Max -ve	0	-0.000
			13:CASE III: V\	Max +ve		
				Max -ve	0	-0.000
			14:CASE III: V:	Max +ve		
				Max -ve	0	-0.063
			15:CASE III:VX	Max +ve	0	0.000
				Max -ve		
27	25	1.000	2:DYNO DRUN	Max +ve	0	0.084
				Max -ve		
			1:WEIGHT	Max +ve		
				Max -ve	0	-0.001
			10:WIND LOAI	Max +ve		
				Max -ve	0	-0.000
			11:WIND LOAI	Max +ve	0	0.001
				Max -ve		
			12:DYNO DRU	Max +ve		
				Max -ve	0	-0.000
			16:WIND RESI	Max +ve		
				Max -ve	0	-0.028
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve		
				Max -ve	0	-0.028
			4:1.25DL	Max +ve		
				Max -ve	0	-0.001
			5:1.1DL+1.0W)	Max +ve		
				Max -ve	0	-0.001
			6:CASE I: VX	Max +ve		
				Max -ve	0	-0.000
			7:1.1DL+1.0W:	Max +ve	0	0.083023
				Max -ve		
			8:CASE I: VY	Max +ve		
				Max -ve	0	-0.001
			13:CASE III: V\	Max +ve		
				Max -ve	0	-0.000
			14:CASE III: V:	Max +ve	0	0.063
				Max -ve		
			15:CASE III:VX	Max +ve		
				Max -ve	0	-0.000
28	26	2.500	2:DYNO DRUN	Max +ve		
				Max -ve	0	-0.000
			1:WEIGHT	Max +ve	0	0
				Max -ve	0	0
			10:WIND LOAI	Max +ve	0	0

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
				Max -ve	0	0
			11:WIND LOAI	Max +ve		
				Max -ve	0	-0.000
			12:DYNO DRU	Max +ve	0	0.000
				Max -ve		
			16:WIND RESI	Max +ve	0	0.000
				Max -ve		
			9:COMPRESS	Max +ve	0	3.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve	0	0.000
				Max -ve		
			4:1.25DL	Max +ve	0	0
				Max -ve	0	0
			5:1.1DL+1.0W)	Max +ve	0	0.000
				Max -ve		
			6:CASE I: VX	Max +ve	0	0
				Max -ve	0	0
			7:1.1DL+1.0W	Max +ve		
				Max -ve	0	-0.000
			8:CASE I: VY	Max +ve	0	0
				Max -ve	0	0
			13:CASE III: V	Max +ve	0	0
				Max -ve	0	0
			14:CASE III: V	Max +ve		
				Max -ve	0	-0.000
			15:CASE III:VX	Max +ve	0	0.000
				Max -ve		
29	27	2.500	2:DYNO DRUM	Max +ve		
				Max -ve	0	-0.000
			1:WEIGHT	Max +ve	0	0
				Max -ve	0	0
			10:WIND LOAI	Max +ve	0	0
				Max -ve	0	0
			11:WIND LOAI	Max +ve	0	0
				Max -ve	0	0
			12:DYNO DRU	Max +ve	0	0
				Max -ve	0	0
			16:WIND RESI	Max +ve	0	0
				Max -ve	0	0
			9:COMPRESS	Max +ve	0	3.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve	0	0
				Max -ve	0	0
			4:1.25DL	Max +ve	0	0
				Max -ve	0	0

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
			5:1.1DL+1.0W)	Max +ve	0	0
				Max -ve	0	0
			6:CASE I: VX	Max +ve	0	0
				Max -ve	0	0
			7:1.1DL+1.0W	Max +ve		
				Max -ve	0	-0.000
			8:CASE I: VY	Max +ve	0	0
				Max -ve	0	0
			13:CASE III: V	Max +ve	0	0
				Max -ve	0	0
			14:CASE III: V	Max +ve		
				Max -ve	0	-0.000
			15:CASE III:VX	Max +ve	0	0
				Max -ve	0	0
30	3	1.000	2:DYNO DRUM	Max +ve	0	0
				Max -ve	0	0
			1:WEIGHT	Max +ve	0	0.000
				Max -ve		
			10:WIND LOAD	Max +ve		
				Max -ve	0	-0.000
			11:WIND LOAD	Max +ve	0	0.000
				Max -ve		
			12:DYNO DRU	Max +ve	0	0.000
				Max -ve		
			16:WIND RESU	Max +ve		
				Max -ve	0	-0.015
			9:COMPRESS	Max +ve	0	0
				Max -ve	0	0
			3:1.1DL+1.0WI	Max +ve		
				Max -ve	0	-0.015
			4:1.25DL	Max +ve	0	0.000
				Max -ve		
			5:1.1DL+1.0W)	Max +ve	0	0.000
				Max -ve		
			6:CASE I: VX	Max +ve		
				Max -ve	0	-0.000
			7:1.1DL+1.0W	Max +ve	0	0.000
				Max -ve		
			8:CASE I: VY	Max +ve	0	0.000
				Max -ve		
			13:CASE III: V	Max +ve	0	0.000
				Max -ve		
			14:CASE III: V	Max +ve	0	0
				Max -ve	0	0
			15:CASE III:VX	Max +ve		

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
				Max -ve	0	-0.000
31	5	1.000	2:DYNO DRUM	Max +ve		
				Max -ve	0	-0.000
			1:WEIGHT	Max +ve	0	0
				Max -ve	0	0
			10:WIND LOAD	Max +ve		
				Max -ve	0	-0.000
			11:WIND LOAD	Max +ve		
				Max -ve	0	-0.000
			12:DYNO DRU	Max +ve	0	0
				Max -ve	0	0
			16:WIND RESU	Max +ve		
				Max -ve	0	-0.015
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve		
				Max -ve	0	-0.015
			4:1.25DL	Max +ve	0	0
				Max -ve	0	0
			5:1.1DL+1.0WX	Max +ve		
				Max -ve	0	-0.000
			6:CASE I: VX	Max +ve		
				Max -ve	0	-0.000
			7:1.1DL+1.0WZ	Max +ve		
				Max -ve	0	-0.000
			8:CASE I: VY	Max +ve	0	0
				Max -ve	0	0
			13:CASE III: V'	Max +ve	0	0
				Max -ve	0	0
			14:CASE III: VZ	Max +ve		
				Max -ve	0	-0.000
			15:CASE III:VX	Max +ve		
				Max -ve	0	-0.000
32	15	4.830	2:DYNO DRUM	Max +ve		
				Max -ve	0	-0.000
			1:WEIGHT	Max +ve		
				Max -ve	4.830	-0.321
			10:WIND LOAD	Max +ve		
				Max -ve	0	-0.094
			11:WIND LOAD	Max +ve	0	0.460
				Max -ve		
			12:DYNO DRU	Max +ve	0	0.028
				Max -ve		
			16:WIND RESU	Max +ve		
				Max -ve	0	-0.055

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve		
				Max -ve	4.830	-0.408
			4:1.25DL	Max +ve		
				Max -ve	4.830	-0.402
			5:1.1DL+1.0W)	Max +ve		
				Max -ve	4.830	-0.420
			6:CASE I: VX	Max +ve		
				Max -ve	0	-0.094
			7:1.1DL+1.0W2	Max +ve		
				Max -ve	4.830	-0.353
			8:CASE I: VY	Max +ve		
				Max -ve	4.830	-0.321
			13:CASE III: V'	Max +ve		
				Max -ve	4.830	-0.241
			14:CASE III: V2	Max +ve		
				Max -ve	0	-0.000
			15:CASE III:VX	Max +ve		
				Max -ve	0	-0.050
33	12	4.830	2:DYNO DRUM	Max +ve	0	0
				Max -ve	0	0
			1:WEIGHT	Max +ve		
				Max -ve	4.830	-0.321
			10:WIND LOAI	Max +ve	0	0.094
				Max -ve		
			11:WIND LOAI	Max +ve	0	0.460
				Max -ve		
			12:DYNO DRU	Max +ve		
				Max -ve	0	-0.028
			16:WIND RESI	Max +ve	0	0.055
				Max -ve		
			9:COMPRESS	Max +ve	0	0.000
				Max -ve		
			3:1.1DL+1.0WI	Max +ve		
				Max -ve	4.830	-0.299
			4:1.25DL	Max +ve		
				Max -ve	4.830	-0.402
			5:1.1DL+1.0W)	Max +ve		
				Max -ve	4.830	-0.287
			6:CASE I: VX	Max +ve	0	0.094
				Max -ve		
			7:1.1DL+1.0W2	Max +ve		
				Max -ve	4.830	-0.353
			8:CASE I: VY	Max +ve		

Beam Maximum Axial Forces Cont...

Beam	Node A	Length (ft)	L/C		d (ft)	Max Fx (kip)
				Max -ve	4.830	-0.321
			13:CASE III: V\	Max +ve		
				Max -ve	4.830	-0.241
			14:CASE III: V/	Max +ve	0	0
				Max -ve	0	0
			15:CASE III:VX	Max +ve	0	0.050
				Max -ve		

Beam Maximum Forces by Section Property

		Axial	Shear		Torsion	Bending	
Section		Max Fx (kip)	Max Fy (kip)	Max Fz (kip)	Max Mx (kip-in)	Max My (kip-in)	Max Mz (kip-in)
HSST3X3X0.188	Max +ve	1.434	0.347	0.179	6.427	2.150	9.808
	Max -ve	-1.284	-0.340	-0.179	-7.549	-2.252	-10.999
HSST3.5X3.5X0.25	Max +ve	3.000	1.290	0.206	8.964	25.560	33.470
	Max -ve	-0.420	-1.290	-0.157	-7.923	-20.963	-39.360

Beam Combined Axial and Bending Stresses Summary

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
1	2:DYNO DRUN	1.000	808.023	1.000	2	-896.777	1.000	1
	1:WEIGHT	1.000	213.567	1.000	3	-214.042	1.000	1
	10:WIND LOAI	1.000	4.584	1.000	3	-4.826	1.000	1
	11:WIND LOAI	1.000	35.503	0	1	-34.876	0	3
	12:DYNO DRU	1.000	20.377	1.000	2			
	16:WIND RESI	1.000	360.562	1.000	1	-304.328	1.000	2
	9:COMPRESS	1.000	0.000	1.000	3	-0.000	1.000	1
	3:1.1DL+1.0WI	1.000	595.486	1.000	4	-539.774	1.000	2
	4:1.25DL	1.000	266.959	1.000	3	-267.552	1.000	1
	5:1.1DL+1.0W)	1.000	257.192	1.000	3	-231.068	1.000	1
	6:CASE I: VX	1.000	4.584	1.000	3	-4.826	1.000	1
	7:1.1DL+1.0W/	1.000	1.04E+3	1.000	3	-1.13E+3	1.000	1
	8:CASE I: VY	1.000	213.567	1.000	3	-214.042	1.000	1
	13:CASE III: V\	1.000	160.175	1.000	3	-160.531	1.000	1
	14:CASE III: V/	1.000	606.017	1.000	2	-672.582	1.000	1
	15:CASE III:VX	1.000	18.344	1.000	3			
2	2:DYNO DRUN	1.500	372.927	0	1	-770.020	0	2
	1:WEIGHT	1.500	1.25E+3	0	1	-1.24E+3	0	3
	10:WIND LOAI	1.500	639.564	0	3	-611.547	0	1
	11:WIND LOAI	1.500	2.15E+3	0	3	-2.16E+3	0	1
	12:DYNO DRU	1.500	175.047	0	2	-163.347	0	1

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	16:WIND RES	1.500	649.102	0	2	-455.636	0	1
	9:COMPRESS	1.500	0.000	0	3	-0.000	0	1
	3:1.1DL+1.0WI	1.500	1.77E+3	0	1	-1.57E+3	0	3
	4:1.25DL	1.500	1.56E+3	0	1	-1.55E+3	0	3
	5:1.1DL+1.0W	1.500	1.26E+3	1.500	4	-1.22E+3	1.500	2
	6:CASE I: VX	1.500	639.564	0	3	-611.547	0	1
	7:1.1DL+1.0W	1.500	1.74E+3	0	1	-2.14E+3	0	3
	8:CASE I: VY	1.500	1.25E+3	0	1	-1.24E+3	0	3
	13:CASE III: V	1.500	934.913	0	1	-931.373	0	3
	14:CASE III: V	1.500	279.695	0	1	-577.515	0	2
	15:CASE III:VX	1.500	539.802	0	3	-510.014	0	1
3	2:DYNO DRUM	0.500				-258.921	0.500	2
	1:WEIGHT	0.500	2.29E+3	0.500	3	-2.19E+3	0.500	1
	10:WIND LOAD	0.500	232.567	0.500	2	-232.567	0.500	4
	11:WIND LOAD	0.500	3.05E+3	0.500	1	-3.19E+3	0.500	3
	12:DYNO DRU	0.500	125.081	0.500	3	-110.417	0.500	1
	16:WIND RES	0.500	343.758	0.500	2	-235.072	0.500	4
	9:COMPRESS	0.500	0.000	0.500	1	-0.000	0.500	3
	3:1.1DL+1.0WI	0.500	2.79E+3	0.500	3	-2.57E+3	0.500	1
	4:1.25DL	0.500	2.87E+3	0.500	3	-2.74E+3	0.500	1
	5:1.1DL+1.0W	0.500	2.64E+3	0.500	3	-2.51E+3	0.500	1
	6:CASE I: VX	0.500	232.567	0.500	2	-232.567	0.500	4
	7:1.1DL+1.0W	0.500	2.44E+3	0.500	3	-2.59E+3	0.500	1
	8:CASE I: VY	0.500	2.29E+3	0.500	3	-2.19E+3	0.500	1
	13:CASE III: V	0.500	1.72E+3	0.500	3	-1.64E+3	0.500	1
	14:CASE III: V	0.500				-194.191	0.500	2
	15:CASE III:VX	0.500	250.746	0.500	2	-239.748	0.500	4
4	2:DYNO DRUM	7.000	1.3E+3	0	1	-1.55E+3	0	2
	1:WEIGHT	7.000	3.82E+3	0	3	-3.82E+3	0	1
	10:WIND LOAD	7.000	101.440	0	1	-101.076	0	3
	11:WIND LOAD	7.000	5.07E+3	0	1	-5.07E+3	0	3
	12:DYNO DRU	7.000				-26.640	0	1
	16:WIND RES	7.000	597.088	0	2	-542.405	0	1
	9:COMPRESS	7.000	0.000	0	1	-0.000	0	3
	3:1.1DL+1.0WI	7.000	4.74E+3	0	3	-4.69E+3	0	1
	4:1.25DL	7.000	4.77E+3	0	3	-4.77E+3	0	1
	5:1.1DL+1.0W	7.000	4.09E+3	0	3	-4.12E+3	0	1
	6:CASE I: VX	7.000	101.440	0	1	-101.076	0	3
	7:1.1DL+1.0W	7.000	5.49E+3	0	3	-5.73E+3	0	1
	8:CASE I: VY	7.000	3.82E+3	0	3	-3.82E+3	0	1
	13:CASE III: V	7.000	2.86E+3	0	3	-2.86E+3	0	1
	14:CASE III: V	7.000	975.742	0	1	-1.16E+3	0	2
	15:CASE III:VX	7.000	60.371	0	1	-81.801	0	3
5	2:DYNO DRUM	2.000	899.971	2.000	2	-846.659	2.000	4

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	1:WEIGHT	2.000	1.78E+3	2.000	1	-1.79E+3	2.000	3
	10:WIND LOAI	2.000	700.758	2.000	3	-715.738	2.000	1
	11:WIND LOAI	2.000	2.31E+3	2.000	3	-2.3E+3	2.000	1
	12:DYNO DRU	2.000	151.032	2.000	2	-165.282	2.000	4
	16:WIND RESI	2.000	254.507	2.000	4	-341.616	2.000	2
	9:COMPRESS	2.000	0.000	2.000	3	-0.000	2.000	1
	3:1.1DL+1.0WI	2.000	1.81E+3	2.000	1	-1.9E+3	2.000	3
	4:1.25DL	2.000	2.23E+3	2.000	1	-2.24E+3	2.000	3
	5:1.1DL+1.0W)	2.000	1.49E+3	2.000	2	-1.53E+3	2.000	4
	6:CASE I: VX	2.000	700.758	2.000	3	-715.738	2.000	1
	7:1.1DL+1.0W2	2.000	2.8E+3	2.000	2	-2.75E+3	2.000	4
	8:CASE I: VY	2.000	1.78E+3	2.000	1	-1.79E+3	2.000	3
	13:CASE III: V	2.000	1.34E+3	2.000	1	-1.34E+3	2.000	3
	14:CASE III: V2	2.000	674.978	2.000	2	-634.994	2.000	4
	15:CASE III:VX	2.000	504.164	2.000	3	-526.086	2.000	1
6	2:DYNO DRUM	2.000	900.192	2.000	4	-846.880	2.000	2
	1:WEIGHT	2.000	4.09E+3	2.000	3	-4.1E+3	2.000	1
	10:WIND LOAI	2.000	715.738	2.000	2	-700.758	2.000	4
	11:WIND LOAI	2.000	6.34E+3	2.000	1	-6.33E+3	2.000	3
	12:DYNO DRU	2.000	165.089	2.000	3	-150.891	2.000	1
	16:WIND RESI	2.000	585.376	2.000	2	-601.798	2.000	4
	9:COMPRESS	2.000	0.000	2.000	1	-0.000	2.000	3
	3:1.1DL+1.0WI	2.000	4.68E+3	2.000	3	-4.7E+3	2.000	1
	4:1.25DL	2.000	5.12E+3	2.000	3	-5.13E+3	2.000	1
	5:1.1DL+1.0W)	2.000	4.13E+3	2.000	3	-4.11E+3	2.000	1
	6:CASE I: VX	2.000	715.738	2.000	2	-700.758	2.000	4
	7:1.1DL+1.0W2	2.000	5.34E+3	2.000	4	-5.29E+3	2.000	2
	8:CASE I: VY	2.000	4.09E+3	2.000	3	-4.1E+3	2.000	1
	13:CASE III: V	2.000	3.07E+3	2.000	3	-3.08E+3	2.000	1
	14:CASE III: V2	2.000	675.144	2.000	4	-635.160	2.000	2
	15:CASE III:VX	2.000	525.942	2.000	2	-504.058	2.000	4
7	2:DYNO DRUM	1.000	897.537	1.000	2	-809.062	1.000	1
	1:WEIGHT	1.000	290.880	1.000	3	-291.444	1.000	1
	10:WIND LOAI	1.000	6.556	1.000	2	-6.526	1.000	4
	11:WIND LOAI	1.000	131.822	1.000	1	-131.077	1.000	3
	12:DYNO DRU	1.000	19.731	0	1			
	16:WIND RESI	1.000	334.522	1.000	1	-348.459	1.000	2
	9:COMPRESS	1.000	0.000	1.000	1	-0.000	1.000	3
	3:1.1DL+1.0WI	1.000	652.020	1.000	4	-666.576	1.000	2
	4:1.25DL	1.000	363.601	1.000	3	-364.305	1.000	1
	5:1.1DL+1.0W)	1.000	330.205	1.000	3	-303.573	1.000	1
	6:CASE I: VX	1.000	6.556	1.000	2	-6.526	1.000	4
	7:1.1DL+1.0W2	1.000	1.22E+3	1.000	3	-1.13E+3	1.000	1
	8:CASE I: VY	1.000	290.880	1.000	3	-291.444	1.000	1

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	13:CASE III: V'	1.000	218.160	1.000	3	-218.583	1.000	1
	14:CASE III: V.	1.000	673.153	1.000	2	-606.797	1.000	1
	15:CASE III:VX	1.000	16.464	0	1			
8	2:DYNO DRUM	1.500	819.536	0	1	-432.734	0	2
	1:WEIGHT	1.500	4.2E+3	0	3	-3.18E+3	0	1
	10:WIND LOAI	1.500	2E+3	0	1	-2.03E+3	0	3
	11:WIND LOAI	1.500	4.59E+3	0	1	-5.94E+3	0	3
	12:DYNO DRU	1.500	558.154	0	3	-599.239	0	1
	16:WIND RESI	1.500	1.23E+3	0	1	-1.44E+3	0	3
	9:COMPRESS	1.500	0.000	0	1	-0.000	0	3
	3:1.1DL+1.0WI	1.500	3.85E+3	0	3	-2.93E+3	0	1
	4:1.25DL	1.500	5.25E+3	0	3	-3.97E+3	0	1
	5:1.1DL+1.0W)	1.500	3.31E+3	0	3	-2.24E+3	0	1
	6:CASE I: VX	1.500	2E+3	0	1	-2.03E+3	0	3
	7:1.1DL+1.0W.	1.500	5.44E+3	0	3	-3.93E+3	0	1
	8:CASE I: VY	1.500	4.2E+3	0	3	-3.18E+3	0	1
	13:CASE III: V'	1.500	3.15E+3	0	3	-2.38E+3	0	1
	14:CASE III: V.	1.500	614.652	0	1	-324.550	0	2
	15:CASE III:VX	1.500	1.24E+3	0	1	-1.29E+3	0	3
9	2:DYNO DRUM	0.500	212.591	0	1			
	1:WEIGHT	0.500	866.667	0.500	1	-92.067	0.500	3
	10:WIND LOAI	0.500	581.498	0.500	3	-581.498	0.500	1
	11:WIND LOAI	0.500	192.594	0.500	3	-1.22E+3	0.500	1
	12:DYNO DRU	0.500	227.558	0.500	2	-212.894	0.500	4
	16:WIND RESI	0.500	425.346	0.500	3	-507.547	0.500	1
	9:COMPRESS	0.500	0.000	0.500	3	-0.000	0.500	1
	3:1.1DL+1.0WI	0.500	810.237	0	1	-40.378	0	2
	4:1.25DL	0.500	1.08E+3	0.500	1	-115.083	0.500	3
	5:1.1DL+1.0W)	0.500	868.021	0	1	-1.297	0	2
	6:CASE I: VX	0.500	581.498	0.500	3	-581.498	0.500	1
	7:1.1DL+1.0W.	0.500	1.16E+3	0.500	1	-56.186	0.500	3
	8:CASE I: VY	0.500	866.667	0.500	1	-92.067	0.500	3
	13:CASE III: V'	0.500	650.000	0.500	1	-69.050	0.500	3
	14:CASE III: V.	0.500	159.443	0	1			
	15:CASE III:VX	0.500	436.207	0.500	3	-425.209	0.500	1
10	2:DYNO DRUM	7.000	1.55E+3	0	1	-1.3E+3	0	2
	1:WEIGHT	7.000	3.37E+3	0	3	-3.37E+3	0	1
	10:WIND LOAI	7.000	98.654	0	3	-99.018	0	1
	11:WIND LOAI	7.000	4.31E+3	0	1	-4.31E+3	0	3
	12:DYNO DRU	7.000				-27.613	0	1
	16:WIND RESI	7.000	507.675	0	2	-606.505	0	1
	9:COMPRESS	7.000	0.000	0	3	-0.000	0	1
	3:1.1DL+1.0WI	7.000	4.21E+3	0	3	-4.3E+3	0	1
	4:1.25DL	7.000	4.22E+3	0	3	-4.22E+3	0	1

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	5:1.1DL+1.0W)	7.000	3.79E+3	0	3	-3.82E+3	0	1
	6:CASE I: VX	7.000	98.654	0	3	-99.018	0	1
	7:1.1DL+1.0W;	7.000	5.14E+3	0	3	-4.9E+3	0	1
	8:CASE I: VY	7.000	3.37E+3	0	3	-3.37E+3	0	1
	13:CASE III: V'	7.000	2.53E+3	0	3	-2.53E+3	0	1
	14:CASE III: V;	7.000	1.16E+3	0	1	-977.317	0	2
	15:CASE III:VX	7.000	58.337	0	3	-80.987	0	1
11	2:DYNO DRUN	0.670	464.323	0	2	-464.323	0	1
	1:WEIGHT	0.670	6.11E+3	0	2	-6.29E+3	0	1
	10:WIND LOAI	0.670	1.99E+3	0.670	4	-1.92E+3	0.670	2
	11:WIND LOAI	0.670	8.55E+3	0	1	-8.23E+3	0	2
	12:DYNO DRU	0.670	397.413	0	1	-416.594	0	3
	16:WIND RESI	0.670	958.260	0.670	3	-920.721	0.670	1
	9:COMPRESS	0.670	0.000	0.670	1	-0.000	0.670	3
	3:1.1DL+1.0WI	0.670	6.81E+3	0	3	-6.98E+3	0	1
	4:1.25DL	0.670	7.64E+3	0	2	-7.86E+3	0	1
	5:1.1DL+1.0W)	0.670	6.36E+3	0	3	-6.52E+3	0	1
	6:CASE I: VX	0.670	1.99E+3	0.670	4	-1.92E+3	0.670	2
	7:1.1DL+1.0W;	0.670	7.13E+3	0	2	-7.33E+3	0	1
	8:CASE I: VY	0.670	6.11E+3	0	2	-6.29E+3	0	1
	13:CASE III: V'	0.670	4.58E+3	0	2	-4.72E+3	0	1
	14:CASE III: V;	0.670	348.242	0	2	-348.242	0	1
	15:CASE III:VX	0.670	1.26E+3	0.670	4	-1.23E+3	0.670	2
14	2:DYNO DRUN	0.670	874.350	0.670	1	-874.350	0.670	2
	1:WEIGHT	0.670	8.46E+3	0	1	-8.64E+3	0	2
	10:WIND LOAI	0.670	1.92E+3	0.670	3	-1.99E+3	0.670	1
	11:WIND LOAI	0.670	12.6E+3	0	2	-12.3E+3	0	1
	12:DYNO DRU	0.670	416.595	0	1	-397.414	0	3
	16:WIND RESI	0.670	1.15E+3	0.670	3	-1.19E+3	0.670	1
	9:COMPRESS	0.670	0.000	0.670	2	-0.000	0.670	4
	3:1.1DL+1.0WI	0.670	8.45E+3	0	1	-8.69E+3	0	2
	4:1.25DL	0.670	10.6E+3	0	1	-10.8E+3	0	2
	5:1.1DL+1.0W)	0.670	7.79E+3	0	1	-8.04E+3	0	2
	6:CASE I: VX	0.670	1.92E+3	0.670	3	-1.99E+3	0.670	1
	7:1.1DL+1.0W;	0.670	9.71E+3	0	1	-9.91E+3	0	2
	8:CASE I: VY	0.670	8.46E+3	0	1	-8.64E+3	0	2
	13:CASE III: V'	0.670	6.34E+3	0	1	-6.48E+3	0	2
	14:CASE III: V;	0.670	655.762	0.670	1	-655.762	0.670	2
	15:CASE III:VX	0.670	1.23E+3	0.670	3	-1.26E+3	0.670	1
20	2:DYNO DRUN	7.000	1.29E+3	7.000	1	-1.54E+3	7.000	2
	1:WEIGHT	7.000	2.63E+3	7.000	3	-2.63E+3	7.000	1
	10:WIND LOAI	7.000	101.076	7.000	3	-101.440	7.000	1
	11:WIND LOAI	7.000	3.33E+3	7.000	1	-3.33E+3	7.000	3
	12:DYNO DRU	7.000	27.241	7.000	2			

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	16:WIND RESI	7.000	626.343	7.000	2	-507.442	7.000	1
	9:COMPRESS	7.000	0.000	7.000	3	-0.000	7.000	1
	3:1.1DL+1.0WI	7.000	3.52E+3	7.000	3	-3.4E+3	7.000	1
	4:1.25DL	7.000	3.29E+3	7.000	3	-3.29E+3	7.000	1
	5:1.1DL+1.0W)	7.000	3.01E+3	7.000	3	-2.98E+3	7.000	1
	6:CASE I: VX	7.000	101.076	7.000	3	-101.440	7.000	1
	7:1.1DL+1.0W2	7.000	4.08E+3	7.000	4	-4.32E+3	7.000	2
	8:CASE I: VY	7.000	2.63E+3	7.000	3	-2.63E+3	7.000	1
	13:CASE III: V	7.000	1.97E+3	7.000	3	-1.97E+3	7.000	1
	14:CASE III: V2	7.000	970.330	7.000	1	-1.15E+3	7.000	2
	15:CASE III:VX	7.000	82.251	7.000	3	-60.821	7.000	1
21	2:DYNO DRUM	7.000	1.54E+3	7.000	1	-1.3E+3	7.000	2
	1:WEIGHT	7.000	4.56E+3	7.000	3	-4.56E+3	7.000	1
	10:WIND LOAD	7.000	99.018	7.000	1	-98.654	7.000	3
	11:WIND LOAD	7.000	6.05E+3	7.000	1	-6.05E+3	7.000	3
	12:DYNO DRU	7.000	27.013	7.000	3			
	16:WIND RESI	7.000	545.005	7.000	2	-619.758	7.000	1
	9:COMPRESS	7.000	0.000	7.000	1	-0.000	7.000	3
	3:1.1DL+1.0WI	7.000	5.5E+3	7.000	3	-5.57E+3	7.000	1
	4:1.25DL	7.000	5.7E+3	7.000	3	-5.7E+3	7.000	1
	5:1.1DL+1.0W)	7.000	4.94E+3	7.000	3	-4.91E+3	7.000	1
	6:CASE I: VX	7.000	99.018	7.000	1	-98.654	7.000	3
	7:1.1DL+1.0W2	7.000	6.55E+3	7.000	4	-6.31E+3	7.000	2
	8:CASE I: VY	7.000	4.56E+3	7.000	3	-4.56E+3	7.000	1
	13:CASE III: V	7.000	3.42E+3	7.000	3	-3.42E+3	7.000	1
	14:CASE III: V2	7.000	1.16E+3	7.000	1	-971.905	7.000	2
	15:CASE III:VX	7.000	80.537	7.000	2	-57.887	7.000	4
22	2:DYNO DRUM	0.500				-222.179	0	1
	1:WEIGHT	0.500	1.5E+3	0.500	3	-1.4E+3	0.500	1
	10:WIND LOAD	0.500	232.567	0	3	-232.567	0	1
	11:WIND LOAD	0.500	1.95E+3	0.500	1	-2.09E+3	0.500	3
	12:DYNO DRU	0.500	110.404	0	1	-125.127	0	2
	16:WIND RESI	0.500	322.844	0	1	-214.157	0	2
	9:COMPRESS	0.500	0.000	0	3	-0.000	0	1
	3:1.1DL+1.0WI	0.500	1.71E+3	0.500	3	-1.48E+3	0.500	1
	4:1.25DL	0.500	1.88E+3	0.500	3	-1.75E+3	0.500	1
	5:1.1DL+1.0W)	0.500	1.65E+3	0.500	3	-1.55E+3	0.500	1
	6:CASE I: VX	0.500	232.567	0	3	-232.567	0	1
	7:1.1DL+1.0W2	0.500	1.6E+3	0.500	3	-1.74E+3	0.500	1
	8:CASE I: VY	0.500	1.5E+3	0.500	3	-1.4E+3	0.500	1
	13:CASE III: V	0.500	1.13E+3	0.500	3	-1.05E+3	0.500	1
	14:CASE III: V2	0.500				-166.634	0	1
	15:CASE III:VX	0.500	239.737	0	1	-250.778	0	2
23	2:DYNO DRUM	0.500	262.766	0	1	-12.859	0	2

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	1:WEIGHT	0.500	1.6E+3	0	3	-827.225	0	1
	10:WIND LOAI	0.500	581.498	0	1	-581.498	0	3
	11:WIND LOAI	0.500	1.25E+3	0	1	-2.27E+3	0	3
	12:DYNO DRU	0.500	212.848	0	4	-227.571	0	1
	16:WIND RESI	0.500	448.937	0	1	-531.138	0	2
	9:COMPRESS	0.500	0.000	0	1	-0.000	0	3
	3:1.1DL+1.0WI	0.500	1.73E+3	0	3	-958.821	0	1
	4:1.25DL	0.500	2E+3	0	3	-1.03E+3	0	1
	5:1.1DL+1.0W)	0.500	1.62E+3	0	3	-779.673	0	1
	6:CASE I: VX	0.500	581.498	0	1	-581.498	0	3
	7:1.1DL+1.0W	0.500	2.02E+3	0	3	-922.807	0	1
	8:CASE I: VY	0.500	1.6E+3	0	3	-827.225	0	1
	13:CASE III: V	0.500	1.2E+3	0	3	-620.419	0	1
	14:CASE III: V	0.500	197.074	0	1	-9.644	0	2
	15:CASE III:VX	0.500	425.177	0	1	-436.219	0	3
24	2:DYNO DRUN	1.500	409.001	1.500	4	-806.095	1.500	2
	1:WEIGHT	1.500	4.79E+3	1.500	3	-4.79E+3	1.500	1
	10:WIND LOAI	1.500	611.547	1.500	1	-639.564	1.500	3
	11:WIND LOAI	1.500	6.71E+3	1.500	1	-6.72E+3	1.500	3
	12:DYNO DRU	1.500	163.040	1.500	4	-174.739	1.500	2
	16:WIND RESI	1.500	379.521	1.500	1	-277.027	1.500	3
	9:COMPRESS	1.500	0.000	1.500	1	-0.000	1.500	3
	3:1.1DL+1.0WI	1.500	5.39E+3	1.500	4	-5.28E+3	1.500	2
	4:1.25DL	1.500	5.99E+3	1.500	3	-5.99E+3	1.500	1
	5:1.1DL+1.0W)	1.500	5.06E+3	1.500	4	-5.09E+3	1.500	2
	6:CASE I: VX	1.500	611.547	1.500	1	-639.564	1.500	3
	7:1.1DL+1.0W	1.500	5.68E+3	1.500	4	-6.07E+3	1.500	2
	8:CASE I: VY	1.500	4.79E+3	1.500	3	-4.79E+3	1.500	1
	13:CASE III: V	1.500	3.6E+3	1.500	3	-3.59E+3	1.500	1
	14:CASE III: V	1.500	306.751	1.500	4	-604.571	1.500	2
	15:CASE III:VX	1.500	509.785	1.500	1	-539.572	1.500	3
25	2:DYNO DRUN	1.500	760.263	1.500	1	-373.460	1.500	3
	1:WEIGHT	1.500	2.96E+3	1.500	1	-1.93E+3	1.500	3
	10:WIND LOAI	1.500	2.03E+3	1.500	4	-2E+3	1.500	2
	11:WIND LOAI	1.500	3.06E+3	1.500	3	-4.42E+3	1.500	1
	12:DYNO DRU	1.500	599.547	1.500	1	-558.461	1.500	3
	16:WIND RESI	1.500	1.02E+3	1.500	4	-1.1E+3	1.500	2
	9:COMPRESS	1.500	0.000	1.500	3	-0.000	1.500	1
	3:1.1DL+1.0WI	1.500	2.46E+3	1.500	1	-1.4E+3	1.500	3
	4:1.25DL	1.500	3.7E+3	1.500	1	-2.42E+3	1.500	3
	5:1.1DL+1.0W)	1.500	2.14E+3	1.500	1	-938.302	1.500	3
	6:CASE I: VX	1.500	2.03E+3	1.500	4	-2E+3	1.500	2
	7:1.1DL+1.0W	1.500	4.02E+3	1.500	1	-2.5E+3	1.500	3
	8:CASE I: VY	1.500	2.96E+3	1.500	1	-1.93E+3	1.500	3

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
	13:CASE III: V	1.500	2.22E+3	1.500	1	-1.45E+3	1.500	3
	14:CASE III: V	1.500	570.197	1.500	1	-280.095	1.500	3
	15:CASE III:VX	1.500	1.29E+3	1.500	4	-1.24E+3	1.500	2
26	2:DYNO DRUM	1.000	808.316	0	2	-897.070	0	1
	1:WEIGHT	1.000	255.049	0	3	-255.524	0	1
	10:WIND LOAD	1.000	4.826	0	1	-4.584	0	3
	11:WIND LOAD	1.000	83.151	0	1	-82.524	0	3
	12:DYNO DRU	1.000	2.370	0	1	-2.238	0	2
	16:WIND RESI	1.000	360.260	0	1	-332.245	0	2
	9:COMPRESS	1.000	0.000	0	1	-0.000	0	3
	3:1.1DL+1.0WI	1.000	639.291	0	1	-611.797	0	2
	4:1.25DL	1.000	318.812	0	3	-319.405	0	1
	5:1.1DL+1.0W	1.000	281.424	0	3	-281.572	0	1
	6:CASE I: VX	1.000	4.826	0	1	-4.584	0	3
	7:1.1DL+1.0W	1.000	1.09E+3	0	2	-1.18E+3	0	1
	8:CASE I: VY	1.000	255.049	0	3	-255.524	0	1
	13:CASE III: V	1.000	191.287	0	3	-191.643	0	1
	14:CASE III: V	1.000	606.237	0	2	-672.802	0	1
	15:CASE III:VX	1.000	5.020	0	1	-4.739	0	2
27	2:DYNO DRUM	1.000	897.830	0	2	-809.355	0	1
	1:WEIGHT	1.000	235.561	0	3	-236.125	0	1
	10:WIND LOAD	1.000	6.526	0	3	-6.556	0	1
	11:WIND LOAD	1.000	50.503	0	1	-49.758	0	3
	12:DYNO DRU	1.000	2.399	0	1	-2.602	0	2
	16:WIND RESI	1.000	331.171	0	1	-360.384	0	2
	9:COMPRESS	1.000	0.000	0	3	-0.000	0	1
	3:1.1DL+1.0WI	1.000	590.288	0	1	-620.122	0	2
	4:1.25DL	1.000	294.451	0	3	-295.156	0	1
	5:1.1DL+1.0W	1.000	267.020	0	3	-267.873	0	1
	6:CASE I: VX	1.000	6.526	0	3	-6.556	0	1
	7:1.1DL+1.0W	1.000	1.15E+3	0	2	-1.06E+3	0	1
	8:CASE I: VY	1.000	235.561	0	3	-236.125	0	1
	13:CASE III: V	1.000	176.671	0	3	-177.094	0	1
	14:CASE III: V	1.000	673.373	0	2	-607.016	0	1
	15:CASE III:VX	1.000	5.927	0	3	-6.101	0	1
28	2:DYNO DRUM	2.500				-0.000	2.292	1
	1:WEIGHT	2.500	3.47E+3	0	1	-3.47E+3	0	3
	10:WIND LOAD	2.500	982.292	0	3	-982.292	0	1
	11:WIND LOAD	2.500	4.79E+3	0	3	-4.79E+3	0	1
	12:DYNO DRU	2.500	290.717	0	1	-290.717	0	3
	16:WIND RESI	2.500	568.945	0	3	-568.945	0	1
	9:COMPRESS	2.500	1.03E+3	0	1			
	3:1.1DL+1.0WI	2.500	3.25E+3	0	1	-3.25E+3	0	3
	4:1.25DL	2.500	4.34E+3	0	1	-4.34E+3	0	3

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	5:1.1DL+1.0W)	2.500	3.13E+3	0	1	-3.13E+3	0	3
	6:CASE I: VX	2.500	982.292	0	3	-982.292	0	1
	7:1.1DL+1.0W∠	2.500	3.82E+3	0	1	-3.82E+3	0	3
	8:CASE I: VY	2.500	3.47E+3	0	1	-3.47E+3	0	3
	13:CASE III: V'	2.500	2.61E+3	0	1	-2.61E+3	0	3
	14:CASE III: V∠	2.500				-0.000	2.292	1
	15:CASE III:VX	2.500	518.681	0	3	-518.681	0	1
29	2:DYNO DRUN	2.500	874.350	2.292	3	-874.350	2.292	1
	1:WEIGHT	2.500	9.3E+3	2.500	3	-9.3E+3	2.500	1
	10:WIND LOAI	2.500	982.292	0	1	-982.292	0	3
	11:WIND LOAI	2.500	13.7E+3	2.500	1	-13.7E+3	2.500	3
	12:DYNO DRU	2.500	290.717	0	3	-290.717	0	1
	16:WIND RES(	2.500	910.312	2.500	3	-910.312	2.500	1
	9:COMPRESS	2.500	1.03E+3	0	1			
	3:1.1DL+1.0WI	2.500	11.1E+3	2.500	3	-11.1E+3	2.500	1
	4:1.25DL	2.500	11.6E+3	2.500	3	-11.6E+3	2.500	1
	5:1.1DL+1.0W)	2.500	10.2E+3	2.500	3	-10.2E+3	2.500	1
	6:CASE I: VX	2.500	982.292	0	1	-982.292	0	3
	7:1.1DL+1.0W∠	2.500	11.1E+3	2.500	3	-11.1E+3	2.500	1
	8:CASE I: VY	2.500	9.3E+3	2.500	3	-9.3E+3	2.500	1
	13:CASE III: V'	2.500	6.97E+3	2.500	3	-6.97E+3	2.500	1
	14:CASE III: V∠	2.500	655.763	2.292	3	-655.763	2.292	1
	15:CASE III:VX	2.500	518.681	0	1	-518.681	0	3
30	2:DYNO DRUN	1.000	0.000	1.000	1	-0.000	1.000	3
	1:WEIGHT	1.000	20.588	0	3	-20.588	0	1
	10:WIND LOAI	1.000	41.667	0	1	-41.667	0	2
	11:WIND LOAI	1.000	41.666	0	1	-41.666	0	3
	12:DYNO DRU	1.000	0.000	0	1	-0.000	0	3
	16:WIND RES(	1.000	56.769	0	1	-66.975	0	2
	9:COMPRESS	1.000	0.000	1.000	3	-0.000	1.000	1
	3:1.1DL+1.0WI	1.000	79.416	0	1	-89.621	0	2
	4:1.25DL	1.000	25.735	0	3	-25.735	0	1
	5:1.1DL+1.0W)	1.000	64.313	0	1	-64.313	0	2
	6:CASE I: VX	1.000	41.667	0	1	-41.667	0	2
	7:1.1DL+1.0W∠	1.000	22.647	0	3	-22.647	0	1
	8:CASE I: VY	1.000	20.588	0	3	-20.588	0	1
	13:CASE III: V'	1.000	15.441	0	3	-15.441	0	1
	14:CASE III: V∠	1.000	0.000	1.000	1	-0.000	1.000	3
	15:CASE III:VX	1.000	31.250	0	1	-31.250	0	2
31	2:DYNO DRUN	1.000	0.000	0.917	1	-0.000	0.917	3
	1:WEIGHT	1.000	20.588	0	3	-20.588	0	1
	10:WIND LOAI	1.000	41.667	0	1	-41.667	0	2
	11:WIND LOAI	1.000	41.667	0	1	-41.667	0	3
	12:DYNO DRU	1.000	0.000	0	3	-0.000	0	1

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
	16:WIND RESI	1.000	56.769	0	1	-66.975	0	2
	9:COMPRESSI	1.000	0.000	0	2	-0.000	0	1
	3:1.1DL+1.0WI	1.000	79.416	0	1	-89.622	0	2
	4:1.25DL	1.000	25.735	0	3	-25.735	0	1
	5:1.1DL+1.0WX	1.000	64.314	0	1	-64.314	0	2
	6:CASE I: VX	1.000	41.667	0	1	-41.667	0	2
	7:1.1DL+1.0WZ	1.000	22.647	0	3	-22.647	0	1
	8:CASE I: VY	1.000	20.588	0	3	-20.588	0	1
	13:CASE III: VY	1.000	15.441	0	3	-15.441	0	1
	14:CASE III: VZ	1.000	0.000	0.917	1	-0.000	0.917	3
	15:CASE III:VX	1.000	31.250	0	1	-31.250	0	2
32	2:DYNO DRUM	4.830	874.350	0	1	-874.350	0	2
	1:WEIGHT	4.830	5.73E+3	0	1	-5.93E+3	4.830	2
	10:WIND LOAD	4.830	1.92E+3	0	3	-1.99E+3	0	1
	11:WIND LOAD	4.830	9.03E+3	0	2	-8.72E+3	0	1
	12:DYNO DRU	4.830	300.308	0	1	-281.127	0	2
	16:WIND RESI	4.830	1.15E+3	0	3	-1.19E+3	0	1
	9:COMPRESSI	4.830	0.000	4.830	2	-0.000	4.830	1
	3:1.1DL+1.0WI	4.830	6.62E+3	0	1	-6.89E+3	4.830	2
	4:1.25DL	4.830	7.16E+3	0	1	-7.42E+3	4.830	2
	5:1.1DL+1.0WX	4.830	6.56E+3	0	1	-6.81E+3	0	2
	6:CASE I: VX	4.830	1.92E+3	0	3	-1.99E+3	0	1
	7:1.1DL+1.0WZ	4.830	7.18E+3	0	1	-7.4E+3	4.830	2
	8:CASE I: VY	4.830	5.73E+3	0	1	-5.93E+3	4.830	2
	13:CASE III: VY	4.830	4.3E+3	0	1	-4.45E+3	4.830	2
	14:CASE III: VZ	4.830	655.762	0	1	-655.762	0	2
	15:CASE III:VX	4.830	1.23E+3	0	3	-1.26E+3	0	1
33	2:DYNO DRUM	4.830	0.000	0	1	-0.000	0	2
	1:WEIGHT	4.830	3.38E+3	0	2	-3.59E+3	4.830	1
	10:WIND LOAD	4.830	1.99E+3	0	1	-1.92E+3	0	2
	11:WIND LOAD	4.830	4.95E+3	4.830	1	-4.63E+3	4.830	2
	12:DYNO DRU	4.830	281.127	0	2	-300.308	0	1
	16:WIND RESI	4.830	958.260	0	3	-920.721	0	1
	9:COMPRESSI	4.830	0.000	0	1	-0.000	0	2
	3:1.1DL+1.0WI	4.830	4.68E+3	0	2	-4.85E+3	0	1
	4:1.25DL	4.830	4.23E+3	0	2	-4.48E+3	4.830	1
	5:1.1DL+1.0WX	4.830	4.02E+3	0	2	-4.18E+3	0	1
	6:CASE I: VX	4.830	1.99E+3	0	1	-1.92E+3	0	2
	7:1.1DL+1.0WZ	4.830	3.72E+3	0	2	-3.94E+3	4.830	1
	8:CASE I: VY	4.830	3.38E+3	0	2	-3.59E+3	4.830	1
	13:CASE III: VY	4.830	2.54E+3	0	2	-2.69E+3	4.830	1
	14:CASE III: VZ	4.830	0.000	0	1	-0.000	0	2
	15:CASE III:VX	4.830	1.26E+3	0	3	-1.23E+3	0	1

Plate Center Stress Summary

	Plate	L/C	Shear		Membrane			Bending		
			Qx (psi)	**Qy** (psi)	**Sx** (psi)	**Sy** (psi)	**Sxy** (psi)	**Mx** (lb-in/in)	**My** (lb-in/in)	**Mxy** (lb-in/in)
Max Qx	17	4:1.25DL	**7.324**	-0.147	-0.065	-0.204	-0.047	-1.308	-0.259	0.219
Min Qx	17	11:WIND LOAI	**-8.297**	0.024	0.068318	0.216	0.050	1.462	0.415	-0.250
Max Qy	18	11:WIND LOAI	2.482	**1.951**	9.159	31.689	-0.000	-1.165	-1.412	4.276
Min Qy	18	4:1.25DL	-2.508	**-1.659**	-8.665	-29.979	0.000	0.898	1.218	-3.636
Max Sx	18	11:WIND LOAI	2.482	1.951	**9.159**	31.689	-0.000	-1.165	-1.412	4.276
Min Sx	18	4:1.25DL	-2.508	-1.659	**-8.665**	-29.979	0.000	0.898	1.218	-3.636
Max Sy	18	11:WIND LOAI	2.482	1.951	9.159	**31.689**	-0.000	-1.165	-1.412	4.276
Min Sy	18	4:1.25DL	-2.508	-1.659	-8.665	**-29.979**	0.000	0.898	1.218	-3.636
Max Sxy	17	2:DYNO DRUM	0.317	0.001	-0.011	-0.044	**77.028**	-0.143	-0.043	0.008
Min Sxy	19	2:DYNO DRUM	-0.361	0.001	-0.011	-0.044	**-77.028**	0.143	0.042553	0.010
Max Mx	19	4:1.25DL	-1.688	0.181	-0.065	-0.204	0.047	**2.487**	0.873	0.025
Min Mx	19	11:WIND LOAI	2.301	-0.064	0.068	0.216	-0.050	**-3.000**	-0.915	-0.037
Max My	18	4:1.25DL	-2.508	-1.659	-8.665	-29.979	0.000	0.898	**1.218**	-3.636
Min My	18	11:WIND LOAI	2.482	1.951	9.159	31.689	-0.000	-1.165	**-1.412**	4.276
Max Mxy	18	11:WIND LOAI	2.482	1.951	9.159	31.689	-0.000	-1.165	-1.412	**4.276**
Min Mxy	18	4:1.25DL	-2.508	-1.659	-8.665	-29.979	0.000	0.898	1.218	**-3.636**

Reaction Summary

	Node	L/C	Horizontal	Vertical	Horizontal	Moment		
			FX (kip)	**FY** (kip)	**FZ** (kip)	**MX** (kip-in)	**MY** (kip-in)	**MZ** (kip-in)
Max FX	15	11:WIND LOAI	**1.290**	0	-0.000	0	0	0
Min FX	15	3:1.1DL+1.0WI	**-1.332**	0	-0.155	0	0	0
Max FY	17	5:1.1DL+1.0W	0	**0.447**	0	0	0	0
Min FY	17	11:WIND LOAI	0	**-0.460**	0	0	0	0
Max FZ	15	7:1.1DL+1.0W	-1.064	0	**0.157**	0	0	0
Min FZ	12	16:WIND RESI	-0.251	0	**-0.353**	0	0	0
Max MX	12	2:DYNO DRUM	-0.010	0	0.157	**0**	0	0
Min MX	12	2:DYNO DRUM	-0.010	0	0.157	**0**	0	0
Max MY	12	2:DYNO DRUM	-0.010	0	0.157	0	**0**	0
Min MY	12	2:DYNO DRUM	-0.010	0	0.157	0	**0**	0
Max MZ	12	2:DYNO DRUM	-0.010	0	0.157	0	0	**0**
Min MZ	12	2:DYNO DRUM	-0.010	0	0.157	0	0	**0**

Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
1	HSST3X3X0	HSST3X3X0	0.028	1.000	0.028	HSS FLEX+A	7	1.890	2.460	2.460	4.030
2	HSST3X3X0	HSST3X3X0	0.092	1.000	0.092	HSS TORSIO	11	1.890	2.460	2.460	4.030
3	HSST3X3X0	HSST3X3X0	0.104	1.000	0.104	HSS T+SH+F	11	1.890	2.460	2.460	4.030
4	HSST3X3X0	HSST3X3X0	0.156	1.000	0.156	HSS T+SH+F	11	1.890	2.460	2.460	4.030
5	HSST3.5X3.	HSST3.5X3.	0.094	1.000	0.094	HSS TORSIO	11	2.910	5.040	5.040	8.350
6	HSST3.5X3.	HSST3.5X3.	0.196	1.000	0.196	HSS T+SH+F	11	2.910	5.040	5.040	8.350
7	HSST3X3X0	HSST3X3X0	0.031	1.000	0.031	HSS FLEX+A	7	1.890	2.460	2.460	4.030
8	HSST3X3X0	HSST3X3X0	0.203	1.000	0.203	HSS T+SH+F	11	1.890	2.460	2.460	4.030
9	HSST3X3X0	HSST3X3X0	0.139	1.000	0.139	HSS TORSIO	11	1.890	2.460	2.460	4.030
10	HSST3X3X0	HSST3X3X0	0.133	1.000	0.133	HSS T+SH+F	11	1.890	2.460	2.460	4.030
11	HSST3.5X3.	HSST3.5X3.	0.216	1.000	0.216	HSS FLEX+A	11	2.910	5.040	5.040	8.350
14	HSST3.5X3.	HSST3.5X3.	0.319	1.000	0.319	HSS FLEX+A	11	2.910	5.040	5.040	8.350
20	HSST3X3X0	HSST3X3X0	0.110	1.000	0.110	HSS FLEX+A	7	1.890	2.460	2.460	4.030
21	HSST3X3X0	HSST3X3X0	0.187	1.000	0.187	HSS T+SH+F	11	1.890	2.460	2.460	4.030
22	HSST3X3X0	HSST3X3X0	0.091	1.000	0.091	HSS TORSIO	11	1.890	2.460	2.460	4.030
23	HSST3X3X0	HSST3X3X0	0.139	1.000	0.139	HSS TORSIO	11	1.890	2.460	2.460	4.030
24	HSST3X3X0	HSST3X3X0	0.215	1.000	0.215	HSS T+SH+F	11	1.890	2.460	2.460	4.030
25	HSST3X3X0	HSST3X3X0	0.155	1.000	0.155	HSS T+SH+F	11	1.890	2.460	2.460	4.030
26	HSST3X3X0	HSST3X3X0	29757	1.000	0.029757	HSS FLEX+A	7	1.890	2.460	2.460	4.030
27	HSST3X3X0	HSST3X3X0	0.029	1.000	0.029	HSS FLEX+A	7	1.890	2.460	2.460	4.030
28	HSST3.5X3.	HSST3.5X3.	0.122	1.000	0.122	HSS BEND Z	11	2.910	5.040	5.040	8.350
29	HSST3.5X3.	HSST3.5X3.	0.347	1.000	0.347	HSS BEND Z	11	2.910	5.040	5.040	8.350
30	HSST3.5X3.	HSST3.5X3.	0.002	1.000	0.002	HSS FLEX+A	3	2.910	5.040	5.040	8.350
31	HSST3.5X3.	HSST3.5X3.	0.002	1.000	0.002	HSS FLEX+A	3	2.910	5.040	5.040	8.350
32	HSST3.5X3.	N/A						2.910	5.040	5.040	8.350
33	HSST3.5X3.	N/A						2.910	5.040	5.040	8.350

Failed Members

There is no data of this type.

Base Pressure Summary

	Node	L/C	FX (psi)	FY (psi)	FZ (psi)
Max FX	12	2:DYNO DRUI	**0**	0	0
Min FX	12	2:DYNO DRUI	**0**	0	0
Max FY	12	2:DYNO DRUI	0	**0**	0
Min FY	12	2:DYNO DRUI	0	**0**	0
Max FZ	12	2:DYNO DRUI	0	0	**0**
Min FZ	12	2:DYNO DRUI	0	0	**0**

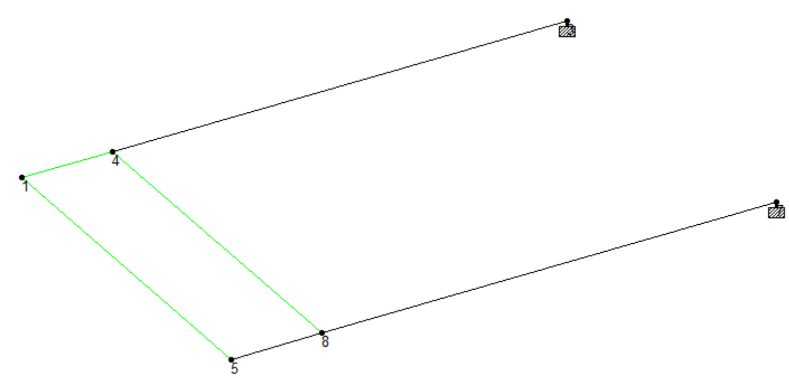
Statics Check Results

L/C		FX (kip)	FY (kip)	FZ (kip)	MX (kip`in)	MY (kip`in)	MZ (kip`in)
2:DYNO DRUM H	Loads	0	0	-0.313	0	37.584	0
2:DYNO DRUM H	Reactions	-0.000	0.000	0.313	2.518	-37.584	0.000
	Difference	-0.000	0.000	0.000	2.518	-0.000	0.000
1:WEIGHT	Loads	0	-0.692	0	-18.888	0	-83.024
1:WEIGHT	Reactions	-0.000	0.692	0.000	45.663	-0.000	83.024
	Difference	-0.000	0.000	0.000	26.776	-0.000	0.000
10:WIND LOAD (	Loads	0.340	0	0	0	-10.080	-7.260
10:WIND LOAD (	Reactions	-0.340	-0.000	-0.000	-0.000	10.080	7.260
	Difference	0.000	-0.000	-0.000	-0.000	-0.000	-0.000
11:WIND LOAD (	Loads	0	0.920	0	21.360	0	110.400
11:WIND LOAD (	Reactions	0.000	-0.920	-0.000	-60.720	0.000	-110.400
	Difference	0.000	-0.000	-0.000	-39.360	0.000	-0.000
12:DYNO DRUM	Loads	0.167	0	0	0	-3.999	0
12:DYNO DRUM	Reactions	-0.167	0.000	0.000	0.000	3.999	0.000
	Difference	-0.000	0.000	0.000	0.000	-0.000	0.000
16:WIND RESUL	Loads	0.508	0	0.508	6.709	-74.564	-6.709
16:WIND RESUL	Reactions	-0.508	0.000	-0.508	-4.088	74.564	6.709
	Difference	-0.000	0.000	0.000	2.622	-0.000	0.000
9:COMPRESSIO	Loads	0	0	0	0	0	0
9:COMPRESSIO	Reactions	0.000	-0.000	0.000	0.000	-0.000	-0.000
	Difference	0.000	-0.000	0.000	0.000	-0.000	-0.000

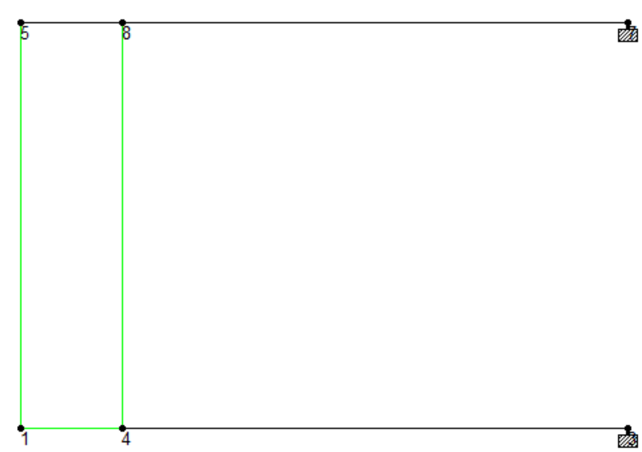
Straddle Bent-Sides

The following structure spacing was accommodated from analyzing the THEA contract plans reinforcement for the straddle bent. It was concluded that the HSS arm would be welded to the plate and bolted onto the straddle bent column. The 2ft width of the arms can vary based on field rebar measurements. The distance was chosen for a worst case scenario.

3D View-Length:

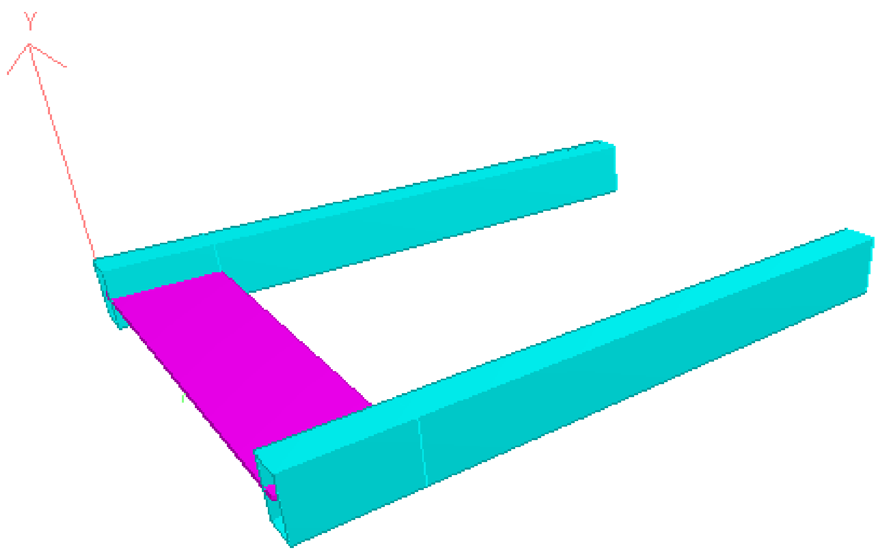


Plan View:

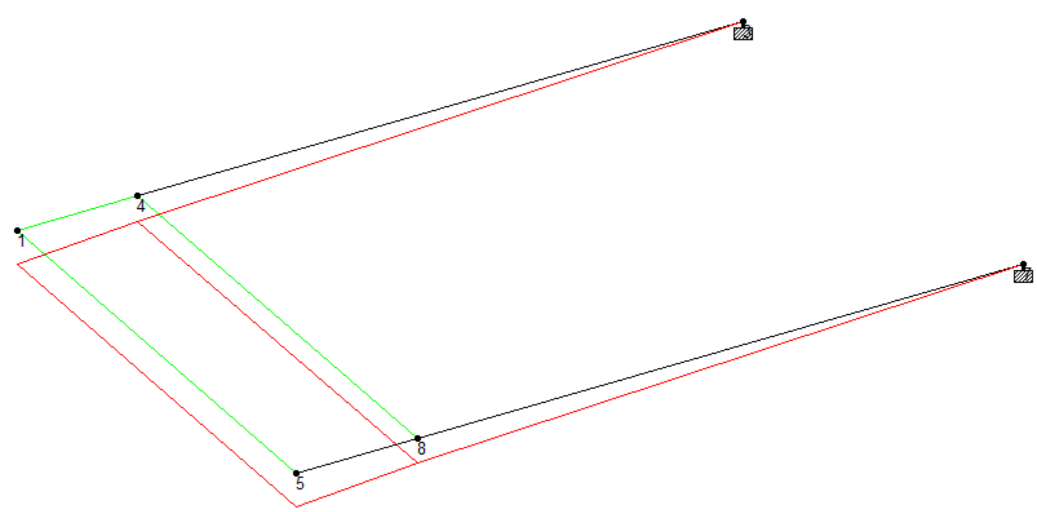


Side View:

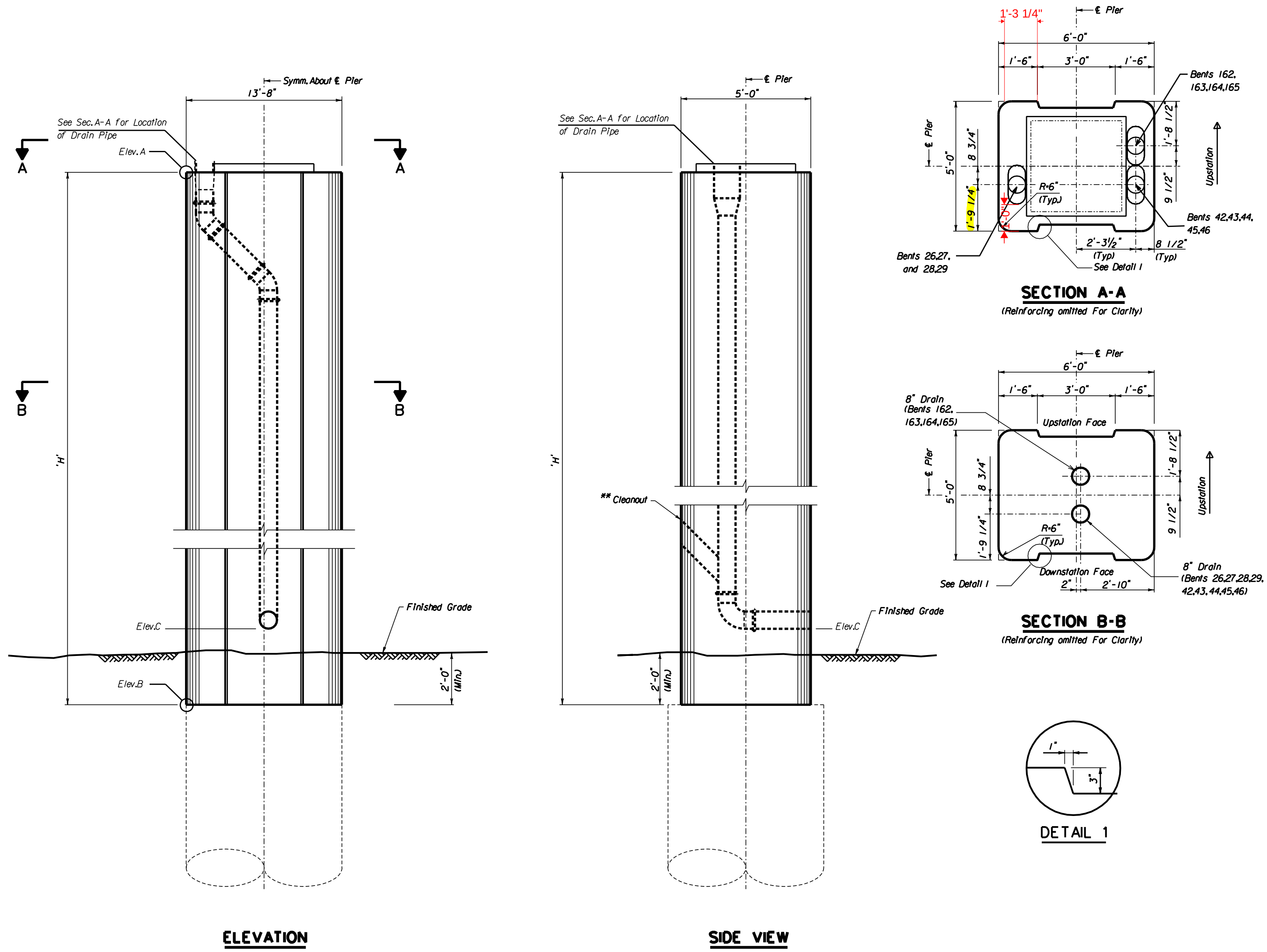
3D View:



Deflection View:



Existing Structural Plans



Pier	'H'	'A' Elev.	'B' Elev.	'C' Elev.	*Pipe Exit Face
165 L	56.00	63.93	7.93	8.4	Downstation
165 R	57.00	65.43	8.43	-	-
164 L	59.00	65.93	6.93	8.4	Downstation
164 R	61.50	67.32	5.82	-	-
163 L	59.50	67.20	7.70	8.4	Downstation
163 R	62.50	68.84	6.34	-	-
162 L	60.00	67.81	7.81	8.4	Downstation
162 R	63.00	69.47	6.47	-	-
46 L	34.50	51.79	17.29	17.5	Upstation
46 R	31.00	53.40	22.40	-	-
45 L	36.00	51.45	15.45	15.5	Upstation
45 R	33.00	52.94	19.94	-	-
44 L	37.00	51.11	14.11	14.5	Upstation
44 R	35.00	52.48	17.48	-	-
43 L	39.50	50.64	11.14	11.5	Upstation
43 R	38.50	52.22	13.72	-	-
42 L	41.50	50.07	8.57	9	Upstation
42 R	41.50	52.17	10.67	-	-
29 L	37.00	43.40	6.40	-	-
29 R	34.00	41.34	7.34	9.78	Upstation
28 L	37.00	42.94	5.94	-	-
28 R	34.50	41.29	6.79	9	Upstation
27 L	37.50	43.06	5.56	-	-
27 R	35.50	41.46	5.96	8.39	Upstation
26 L	40.00	43.91	3.91	-	-
26 R	37.00	42.26	5.26	7.45	Upstation

* Denotes Exit Face for Pipe (see Section B-B).

NOTE:

1. For Bearing Details, See Bearing Details sheets.
2. For Straddle Bent Details, See Straddle Bent Dimensions and Reinforcement sheets.
3. For Drainage Details, See Drainage Details sheets.
4. For Collar Details, See Drilled Shaft Collar Details sheets.
5. For Drilled Shaft Details, See Drilled Shaft Dimensions and Reinforcement sheets.

** 6. Provide cleanout for all pipes connecting to underground drainage pipes (Piers 42L-46L and 162L-165L).

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JMF	12-13-02
Checked by	MDR	12-13-02
Designed by	CF	12-13-02
Checked by	ADH	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD: Figg Bridge Engineers, 424 No. Calhoun Street, Tallahassee, Florida 32301. Florida Certificate of Authorization No. 5618. Jose M. Rodriguez, P.E. - P.E. No. 52532. • Tallahassee, FL • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: STRADDLE BENT COLUMN DIMENSIONS

Drawing No. T-173

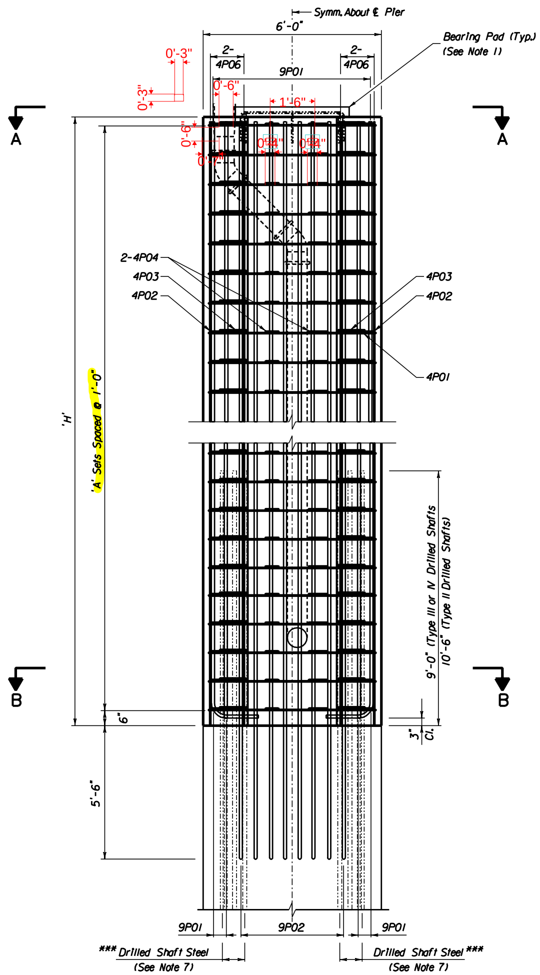
Index No.

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

13 DEC 2002 16:59:19

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

*Note:
Based on the location of the drainage pipe 1'-9" into the bent. The plate will be drilled without any obstruction.

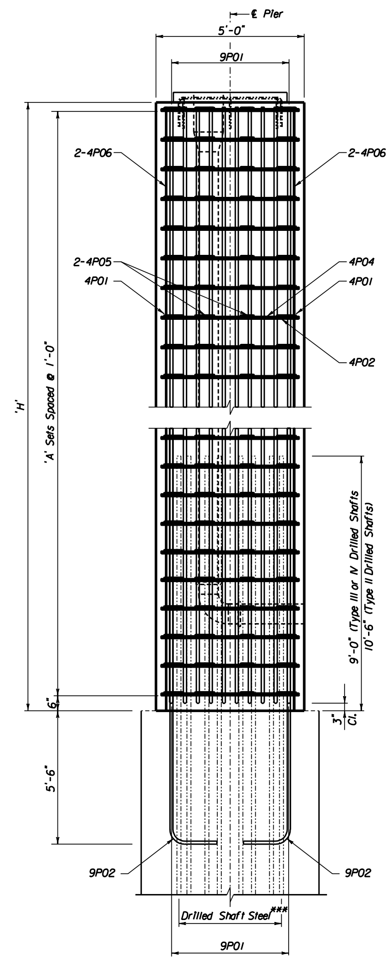


ELEVATION

***(11S01, 11S02 & 11S03 Bars Terminating at Top of Drilled Shaft Not Shown)

Pier	'A' Sets
165 L	57
165 R	58
164 L	60
164 R	62
163 L	60
163 R	63
162 L	61
162 R	64
46 L	35
46 R	32
45 L	37
45 R	34
44 L	38
44 R	36
43 L	40
43 R	39
42 L	42
42 R	42
29 L	38
29 R	35
28 L	38
28 R	35
27 L	38
27 R	36
26 L	41
26 R	38

'A' Sets Contain 2-4P01, 2-4P02, 2-4P03, 2-4P04, 2-4P05



SIDE VIEW

***(11S01, 11S02 & 11S03 Bars Terminating at Top of Drilled Shaft Not Shown)

NOTE:

1. For Bearing Details, See Bearing Details sheets.
2. For Straddle Bent Details, See Straddle Bent Dimensions and Reinforcement sheets.
3. For Drainage Details, See Drainage Details sheets.
4. For Drilled Shaft Details, See Drilled Shaft Dimensions and Reinforcement sheets.
5. E.F. Denotes Each Face
   O.F. Denotes Outside Face
   I.F. Denotes Inside Face
6. Minimum Concrete Cover = 2", Unless Otherwise Noted
7. For Placement of Drilled Shaft Reinforcement, See Sheets T-156 and T-157.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JMF	12-13-02
Checked by	CF	12-13-02
Designed by	CF	12-13-02
Checked by	ADH	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

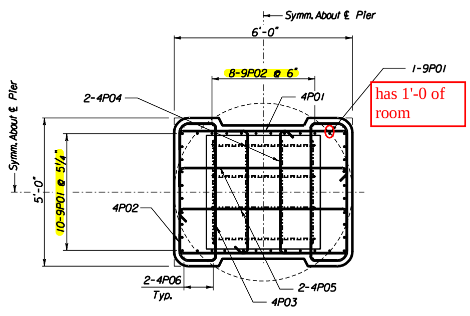
SHEET TITLE: STRADDLE BENT COLUMN REINFORCEMENT 1

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

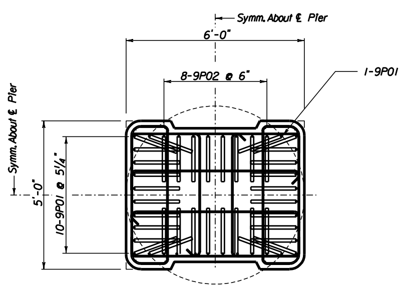
Drawing No. T-174

Index No.

13 DEC 2002 16:59:20



SECTION A-A

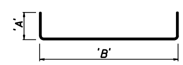


SECTION B-B

(Drilled Shaft Reinforcing Not Shown)
(See Section A-A for
callouts of #4 bars)

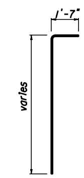
BAR BENDING DIAGRAMS

(All dimensions are out to out)

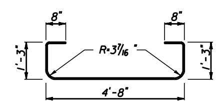


4P01 & 4P03

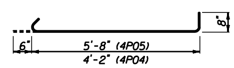
VARIABLES		
Bar	'A'	'B'
4P01	8"	5'-8"
4P03	11"	4'-8"



9P01 & 9P02



4P02



4P04 & 4P05

BAR LIST / PIER

* Bar	No.	Length	Bent	Str.
4P01	Varies	7'-0"	•	
4P02	Varies	8'-6"	•	
4P03	Varies	6'-6"	•	
4P04	Varies	5'-4"	•	
4P05	Varies	6'-10"	•	
4P06	8	Varies		•
9P01	24	Varies	•	
9P02	16	Varies	•	

*Number preceding letter denotes Bar size.
All Bar Bends shall be in accordance with A.C.I. Standards.

ESTIMATED QUANTITIES

Pier	Number					Variable Length			Class IV Concrete (5500 psi) (Cu.Yds.)	Reinforcing Steel (lbs.)
	4P01	4P02	4P03	4P04	4P05	4P06	9P01	9P02		
165 L	114	114	114	114	114	55'-10"	55'-1"	61'-1"	58.02	10718
165 R	116	116	116	116	116	56'-10"	56'-1"	62'-1"	59.06	10905
164 L	120	120	120	120	120	58'-10"	58'-1"	64'-1"	61.13	11279
164 R	124	124	124	124	124	61'-4"	60'-7"	66'-7"	63.72	11724
163 L	120	120	120	120	120	59'-4"	58'-7"	64'-7"	61.65	11350
163 R	126	126	126	126	126	62'-4"	61'-7"	67'-7"	64.76	11911
162 L	122	122	122	122	122	59'-10"	59'-1"	65'-1"	62.17	11466
162 R	128	128	128	128	128	62'-10"	62'-1"	68'-1"	65.28	12027
46 L	70	70	70	70	70	34'-4"	33'-7"	39'-7"	35.75	6675
46 R	64	64	64	64	64	30'-10"	30'-1"	36'-1"	32.12	6043
45 L	74	74	74	74	74	35'-10"	35'-1"	41'-1"	37.30	6978
45 R	68	68	68	68	68	32'-10"	32'-1"	38'-1"	34.19	6417
44 L	76	76	76	76	76	36'-10"	36'-1"	42'-1"	38.34	7165
44 R	72	72	72	72	72	34'-10"	34'-1"	40'-1"	36.27	6791
43 L	80	80	80	80	80	39'-4"	38'-7"	44'-7"	40.93	7610
43 R	78	78	78	78	78	38'-4"	37'-7"	43'-7"	39.89	7423
42 L	84	84	84	84	84	41'-4"	40'-7"	46'-7"	43.00	7984
42 R	84	84	84	84	84	41'-4"	40'-7"	46'-7"	43.00	7984
29 L	76	76	76	76	76	36'-10"	36'-1"	42'-1"	38.34	7165
29 R	70	70	70	70	70	33'-10"	33'-1"	39'-1"	35.23	6604
28 L	76	76	76	76	76	36'-10"	36'-1"	42'-1"	38.34	7165
28 R	70	70	70	70	70	34'-4"	33'-7"	39'-7"	35.75	6675
27 L	76	76	76	76	76	37'-4"	36'-7"	42'-7"	38.86	7236
27 R	72	72	72	72	72	35'-4"	34'-7"	40'-7"	36.78	6862
26 L	82	82	82	82	82	39'-10"	39'-1"	45'-1"	41.45	7726
26 R	76	76	76	76	76	36'-10"	36'-1"	42'-1"	38.34	7165

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by		12-13-02
Checked by		12-13-02
Designed by		12-13-02
Checked by		12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY
EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE:
STRADDLE BENT COLUMN
REINFORCEMENT 2

PROJECT NAME:
SEGMENTAL BRIDGES BETWEEN TWIGGS
ST & 78TH ST AND GATEWAY BRIDGE

Drawing No.
T-175

Index No.

13 DEC 2002 16:59:20

STAAD Analysis

```
 ****************************************************
 *                                                  *
 *           STAAD.Pro V8i SELECTseries6            *
 *           Version  20.07.11.70                   *
 *           Proprietary Program of                 *
 *           Bentley Systems, Inc.                  *
 *           Date=    JUL 19, 2018                  *
 *           Time=    15:51:29                      *
 *                                                  *
 *      USER ID: Kimley-Horn and Associates         *
 ****************************************************
```

```
     1. STAAD SPACE
INPUT FILE: \\kimley-horn.com\FL_ORL\ORL_Structures\_Projects-Structures\148872000 THEA Lighting Proje.. .STD
     2. START JOB INFORMATION
     3. ENGINEER DATE 19-JUN-18
     4. JOB NAME STRADDLE BENT - SIDES
     5. JOB CLIENT THEA
     6. JOB NO 148872000
     7. JOB REV 3
     8. ENGINEER NAME IERM
     9. END JOB INFORMATION
    10. INPUT WIDTH 79
    11. UNIT FEET KIP
    12. JOINT COORDINATES
    13. 1 0 0 0; 3 3 0 0; 4 0.5 0 0; 5 0 0 2; 7 3 0 2; 8 0.5 0 2
    14. MEMBER INCIDENCES
    15. 1 1 4; 4 5 8; 8 4 3; 9 8 7
    16. ELEMENT INCIDENCES SHELL
    17. 7 5 1 4 8
    18. ELEMENT PROPERTY
    19. 7 THICKNESS 0.020833
    20. DEFINE MATERIAL START
    21. ISOTROPIC STEEL
    22. E 4.176E+006
    23. POISSON 0.3
    24. DENSITY 0.489024
    25. ALPHA 6E-006
    26. DAMP 0.03
    27. TYPE STEEL
    28. STRENGTH FY 5184 FU 8352 RY 1.5 RT 1.2
    29. ISOTROPIC A500-GR.
    30. E 4.176E+006
    31. POISSON 0.3
    32. DENSITY 0.49
    33. ALPHA 6E-006
    34. DAMP 0.03
    35. G 1.6128E-006
    36. TYPE STEEL
    37. STRENGTH FY 6624 FU 8352 RY 1.1 RT 1.2
    38. END DEFINE MATERIAL
```

```
 39. MEMBER PROPERTY AMERICAN
 40. 1 4 8 9 TABLE ST HSST3.5X2X0.188
 41. CONSTANTS
 42. MATERIAL STEEL MEMB 7
 43. MATERIAL A500-GR. MEMB 1 4 8 9
 44. SUPPORTS
 45. 3 7 FIXED
 46. LOAD 1 LOADTYPE DEAD  TITLE DL
 47. SELFWEIGHT Y -1 LIST ALL
 48. JOINT LOAD
 49. 1 5 FY -0.0528
 50. LOAD 2 LOADTYPE WIND  TITLE W1
 51. JOINT LOAD
 52. 1 5 FZ -0.0277
 53. 1 5 MX -0.0159
 54. 1 5 FX 0.0293
 55. 1 5 MZ -0.0173
 56. LOAD 3 LOADTYPE WIND  TITLE 0.75W2
 57. JOINT LOAD
 58. 1 5 FZ -0.021
 59. 1 5 MX -0.012
 60. 1 5 FX 0.022
 61. 1 5 MZ -0.013
 62. LOAD COMB 4 1.25DL
 63. 1 1.25
 64. LOAD COMB 5 1.1DL+1.0W1
 65. 1 1.1 2 1.0
 66. LOAD COMB 6 1.1DL+1.0W2
 67. 1 1.1 3 1.0
 68. PERFORM ANALYSIS PRINT ALL
```

P R O B L E M   S T A T I S T I C S

```
  NUMBER OF JOINTS          6  NUMBER OF MEMBERS       4
  NUMBER OF PLATES          1  NUMBER OF SOLIDS        0
  NUMBER OF SURFACES        0  NUMBER OF SUPPORTS      2


       SOLVER USED IS THE OUT-OF-CORE BASIC SOLVER

  ORIGINAL/FINAL BAND-WIDTH=     5/     5/     24 DOF
TOTAL      PRIMARY LOAD CASES =     3, TOTAL DEGREES OF FREEDOM =      24
TOTAL LOAD COMBINATION  CASES =     3  SO FAR.
  SIZE OF STIFFNESS MATRIX =        1 DOUBLE  KILO-WORDS
  REQRD/AVAIL. DISK SPACE  =     12.0/      0.0 MB
```

LOADING 1 LOADTYPE DEAD TITLE DL

SELFWEIGHT Y -1.000

ACTUAL WEIGHT OF THE STRUCTURE = 0.045 KIP

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00	-0.05	0.00	0.00	0.00	0.00
5	0.00	-0.05	0.00	0.00	0.00	0.00

LOADING 2 LOADTYPE WIND TITLE W1

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00	0.00	-0.03	0.00	0.00	0.00
5	0.00	0.00	-0.03	0.00	0.00	0.00
1	0.00	0.00	0.00	-0.02	0.00	0.00
5	0.00	0.00	0.00	-0.02	0.00	0.00
1	0.03	0.00	0.00	0.00	0.00	0.00
5	0.03	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	-0.02
5	0.00	0.00	0.00	0.00	0.00	-0.02

LOADING 3 LOADTYPE WIND TITLE 0.75W2

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00	0.00	-0.02	0.00	0.00	0.00
5	0.00	0.00	-0.02	0.00	0.00	0.00
1	0.00	0.00	0.00	-0.01	0.00	0.00
5	0.00	0.00	0.00	-0.01	0.00	0.00
1	0.02	0.00	0.00	0.00	0.00	0.00
5	0.02	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	-0.01
5	0.00	0.00	0.00	0.00	0.00	-0.01

FOR LOADING - 1
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z

```
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
     1 0.00000E+00-5.68016E-02 0.00000E+00 0.00000E+00 0.00000E+00-1.21224E-04
     3 0.00000E+00-7.27344E-03 0.00000E+00 0.00000E+00 0.00000E+00 3.03060E-03
     4 0.00000E+00-1.12751E-02 0.00000E+00 0.00000E+00 0.00000E+00-2.90938E-03
     5 0.00000E+00-5.68016E-02 0.00000E+00 0.00000E+00 0.00000E+00-1.21224E-04
     7 0.00000E+00-7.27344E-03 0.00000E+00 0.00000E+00 0.00000E+00 3.03060E-03
     8 0.00000E+00-1.12751E-02 0.00000E+00 0.00000E+00 0.00000E+00-2.90938E-03

          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     1
          LOADTYPE DEAD  TITLE DL


           CENTER OF FORCE BASED ON Y FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.364403388E+00
                        Y =  0.000000000E+00
                        Z =  0.100000003E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     1 )
       SUMMATION FORCE-X =           0.00
       SUMMATION FORCE-Y =          -0.15
       SUMMATION FORCE-Z =           0.00

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=           0.15  MY=           0.00  MZ=          -0.05


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     1 )
       SUMMATION FORCE-X =           0.00
       SUMMATION FORCE-Y =           0.15
       SUMMATION FORCE-Z =           0.00

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=          -0.15  MY=           0.00  MZ=           0.05


   MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      1)
             MAXIMUMS    AT NODE
      X =  0.00000E+00       0
      Y = -1.31106E-02       5
      Z =  0.00000E+00       0
      RX=  9.57666E-06       4
      RY=  0.00000E+00       0
      RZ=  5.38717E-04       5



   EXTERNAL AND INTERNAL JOINT LOAD SUMMARY ( KIP  FEET )-

   JT     EXT FX/   EXT FY/   EXT FZ/    EXT MX/    EXT MY/    EXT MZ/
          INT FX    INT FY    INT FZ     INT MX     INT MY     INT MZ

                                                                      SUPPORT=1
     3      0.00     -0.01      0.00       0.00       0.00       0.00
            0.00     -0.07      0.00       0.00       0.00       0.20  111111
```

```
     7      0.00     -0.01      0.00       0.00       0.00       0.00
            0.00     -0.07      0.00      -0.00       0.00       0.20  111111

FOR LOADING -     2
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
     1 2.93000E-02 0.00000E+00-2.77000E-02-1.59000E-02 0.00000E+00-1.73000E-02
     5 2.93000E-02 0.00000E+00-2.77000E-02-1.59000E-02 0.00000E+00-1.73000E-02

          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     2
          LOADTYPE WIND  TITLE W1


           CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.000000000E+00
                        Y =  0.590443686E+00
                        Z =  0.100000003E+01

           CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.000000000E+00
                        Y =  0.574007281E+00
                        Z =  0.100000003E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     2 )
       SUMMATION FORCE-X =  5.8600001E-02
       SUMMATION FORCE-Y =  0.0000000E+00
       SUMMATION FORCE-Z = -5.5399999E-02

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX= -3.1800003E-02  MY=  5.8600003E-02  MZ= -3.4600001E-02


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     2 )
       SUMMATION FORCE-X = -5.8600001E-02
       SUMMATION FORCE-Y =  8.5625951E-15
       SUMMATION FORCE-Z =  5.5399999E-02

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=  3.1800003E-02  MY= -5.8600003E-02  MZ=  3.4600001E-02


   MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      2)
            MAXIMUMS    AT NODE
      X =  5.24405E-05       1
      Y =  4.35162E-03       5
      Z = -2.38559E-03       1
      RX= -2.04126E-03       1
      RY= -2.45045E-05       8
      RZ= -1.97655E-04       5
```

```
   EXTERNAL AND INTERNAL JOINT LOAD SUMMARY ( KIP  FEET )-

   JT     EXT FX/   EXT FY/   EXT FZ/    EXT MX/    EXT MY/    EXT MZ/
          INT FX    INT FY    INT FZ     INT MX     INT MY     INT MZ

                                                                         SUPPORT=1
FOR LOADING -     3
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
     1 2.20000E-02 0.00000E+00-2.10000E-02-1.20000E-02 0.00000E+00-1.30000E-02
     5 2.20000E-02 0.00000E+00-2.10000E-02-1.20000E-02 0.00000E+00-1.30000E-02

          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     3
          LOADTYPE WIND  TITLE 0.75W2


           CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.000000000E+00
                        Y =  0.590909124E+00
                        Z =  0.100000003E+01

           CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.000000000E+00
                        Y =  0.571428572E+00
                        Z =  0.100000003E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     3 )
       SUMMATION FORCE-X =  4.4000000E-02
       SUMMATION FORCE-Y =  0.0000000E+00
       SUMMATION FORCE-Z = -4.1999999E-02

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX= -2.4000000E-02  MY=  4.4000001E-02  MZ= -2.6000001E-02


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     3 )
       SUMMATION FORCE-X = -4.4000000E-02
       SUMMATION FORCE-Y =  6.4392935E-15
       SUMMATION FORCE-Z =  4.1999999E-02

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=  2.4000000E-02  MY= -4.4000001E-02  MZ=  2.6000001E-02
```

```
  MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      3)
            MAXIMUMS    AT NODE
     X =  3.96028E-05       1
     Y =  3.27843E-03       5
     Z = -1.80856E-03       1
     RX= -1.54054E-03       1
     RY= -1.85754E-05       8
     RZ= -1.48851E-04       5



  EXTERNAL AND INTERNAL JOINT LOAD SUMMARY ( KIP  FEET )-

  JT     EXT FX/   EXT FY/   EXT FZ/    EXT MX/    EXT MY/    EXT MZ/
         INT FX    INT FY    INT FZ     INT MX     INT MY     INT MZ

                                                                      SUPPORT=1

  LOAD COMBINATION NO.     4
  1.25DL

LOADING-     1.
FACTOR -   1.25

  LOAD COMBINATION NO.     5
  1.1DL+1.0W1

LOADING-     1.     2.
FACTOR -   1.10   1.00

  LOAD COMBINATION NO.     6
  1.1DL+1.0W2

LOADING-     1.     3.
FACTOR -   1.10   1.00


  ************ END OF DATA FROM INTERNAL STORAGE ************


   69. PARAMETER 2
   70. CODE LRFD
   71. CHECK CODE ALL
```

STAAD.Pro CODE CHECKING - (LRFD 3RD EDITION) v1.0
****

ALL UNITS ARE - KIP FEET (UNLESS OTHERWISE Noted)

```
MEMBER     TABLE       RESULT/   CRITICAL COND/     RATIO/     LOADING/
                         FX            MY             MZ       LOCATION
=======================================================================


     1  ST   HSST3.5X2X0.188         (AISC SECTIONS)
                          PASS     HSS FLEX+AXL       0.012         5
                       0.06 C          0.03           0.02        0.50
     4  ST   HSST3.5X2X0.188         (AISC SECTIONS)
                          PASS     HSS FLEX+AXL       0.012         2
                       0.00 C          0.03          -0.02        0.50
     8  ST   HSST3.5X2X0.188         (AISC SECTIONS)
                          PASS     HSS FLEX+AXL       0.059         5
                       0.08 C         -0.04           0.24        2.50
     9  ST   HSST3.5X2X0.188         (AISC SECTIONS)
                          PASS     HSS BEND Z         0.049         4
                       0.00 C          0.00           0.25        2.50
```

************** END OF TABULATED RESULT OF DESIGN **************

72. PERFORM ANALYSIS PRINT STATICS CHECK

```
       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     1
       LOADTYPE DEAD  TITLE DL


        CENTER OF FORCE BASED ON Y FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                    X =  0.364403388E+00
                    Y =  0.000000000E+00
                    Z =  0.100000003E+01

 ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     1 )
     SUMMATION FORCE-X =           0.00
     SUMMATION FORCE-Y =          -0.15
     SUMMATION FORCE-Z =           0.00

    SUMMATION OF MOMENTS AROUND THE ORIGIN-
    MX=           0.15  MY=           0.00  MZ=          -0.05


 ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     1 )
     SUMMATION FORCE-X =           0.00
     SUMMATION FORCE-Y =           0.15
     SUMMATION FORCE-Z =           0.00

    SUMMATION OF MOMENTS AROUND THE ORIGIN-
    MX=          -0.15  MY=           0.00  MZ=           0.05


 MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      1)
          MAXIMUMS    AT NODE
    X =  0.00000E+00       0
    Y = -1.31106E-02       5
    Z =  0.00000E+00       0
    RX=  9.57666E-06       4
    RY=  0.00000E+00       0
    RZ=  5.38717E-04       5


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     2
       LOADTYPE WIND  TITLE W1


        CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                    X =  0.000000000E+00
                    Y =  0.590443686E+00
                    Z =  0.100000003E+01
```

```
        CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                     X =  0.000000000E+00
                     Y =  0.574007281E+00
                     Z =  0.100000003E+01

 ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     2 )
     SUMMATION FORCE-X =  5.8600001E-02
     SUMMATION FORCE-Y =  0.0000000E+00
     SUMMATION FORCE-Z = -5.5399999E-02

    SUMMATION OF MOMENTS AROUND THE ORIGIN-
    MX= -3.1800003E-02  MY=  5.8600003E-02  MZ= -3.4600001E-02


 ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     2 )
     SUMMATION FORCE-X = -5.8600001E-02
     SUMMATION FORCE-Y =  8.5625951E-15
     SUMMATION FORCE-Z =  5.5399999E-02

    SUMMATION OF MOMENTS AROUND THE ORIGIN-
    MX=  3.1800003E-02  MY= -5.8600003E-02  MZ=  3.4600001E-02


 MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      2)
           MAXIMUMS    AT NODE
    X =  5.24405E-05       1
    Y =  4.35162E-03       5
    Z = -2.38559E-03       1
    RX= -2.04126E-03       1
    RY= -2.45045E-05       8
    RZ= -1.97655E-04       5


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     3
       LOADTYPE WIND  TITLE 0.75W2


        CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                     X =  0.000000000E+00
                     Y =  0.590909124E+00
                     Z =  0.100000003E+01

        CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                     X =  0.000000000E+00
                     Y =  0.571428572E+00
                     Z =  0.100000003E+01
```

```
***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     3 )
    SUMMATION FORCE-X =  4.4000000E-02
    SUMMATION FORCE-Y =  0.0000000E+00
    SUMMATION FORCE-Z = -4.1999999E-02

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX= -2.4000000E-02  MY=  4.4000001E-02  MZ= -2.6000001E-02


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     3 )
    SUMMATION FORCE-X = -4.4000000E-02
    SUMMATION FORCE-Y =  6.4392935E-15
    SUMMATION FORCE-Z =  4.1999999E-02

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=  2.4000000E-02  MY= -4.4000001E-02  MZ=  2.6000001E-02


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      3)
          MAXIMUMS    AT NODE
   X =  3.96028E-05       1
   Y =  3.27843E-03       5
   Z = -1.80856E-03       1
   RX= -1.54054E-03       1
   RY= -1.85754E-05       8
   RZ= -1.48851E-04       5



************ END OF DATA FROM INTERNAL STORAGE ************


 73. FINISH
```

```
     *********** END OF THE STAAD.Pro RUN ***********

       **** DATE= JUL 19,2018   TIME= 15:51:31 ****

 ************************************************************
 *   For technical assistance on STAAD.Pro, please visit    *
 *   http://selectservices.bentley.com/en-US/               *
 *                                                          *
 *   Details about additional assistance from               *
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Job Information

	Engineer	Checked	Approved
Name:	IERM		
Date:	19-Jun-18		

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	6	Highest Node	8
Number of Elements	4	Highest Beam	9
Number of Plates	1	Highest Plate	7

Number of Basic Load Cases	3
Number of Combination Load Cases	3

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

Type	L/C	Name
Primary	1	DL
Primary	2	W1
Primary	3	0.75W2
Combination	4	1.25DL
Combination	5	1.1DL+1.0W1
Combination	6	1.1DL+1.0W2

Beams

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	1	4	0.500	2	0
4	5	8	0.500	2	0
8	4	3	2.500	2	0
9	8	7	2.500	2	0

Plates

Plate	Node A	Node B	Node C	Node D	Property
7	5	1	4	8	1

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	STEEL	29E+3	0.300	0.000	6E -6
2	STAINLESSSTEEL	28E+3	0.300	0.000	10E -6
3	ALUMINUM	10E+3	0.330	0.000	13E -6
4	A500-GR.	29E+3	0.300	0.000	6E -6
5	CONCRETE	3.15E+3	0.170	0.000	5E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip˙ft/deg)	rY (kip˙ft/deg)	rZ (kip˙ft/deg)
3	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
7	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

Primary Load Cases

Number	Name	Type
1	DL	Dead
2	W1	Wind
3	0.75W2	Wind

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
4	1.25DL	1	DL	1.25
5	1.1DL+1.0W1	1	DL	1.10
		2	W1	1.00
6	1.1DL+1.0W2	1	DL	1.10
		3	0.75W2	1.00

Node Displacement Summary

	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Max X	1	2:W1	**0.000**	-0.001	-0.002	0.003	-0.002	0.000	0.000
Min X	8	2:W1	**-0.000**	0.003	-0.002	0.004	0.001	-0.000	-0.000
Max Y	5	2:W1	-0.000	**0.004**	-0.002	0.005	-0.002	0.000	-0.000
Min Y	1	4:1.25DL	0.000	**-0.016**	0.000	0.016	0.000	0.000	0.001
Max Z	1	1:DL	0.000	-0.013	**0.000**	0.013	0.000	0.000	0.001
Min Z	1	2:W1	0.000	-0.001	**-0.002**	0.003	-0.002	0.000	0.000
Max rX	8	2:W1	-0.000	0.003	-0.002	0.004	**0.001**	-0.000	-0.000
Min rX	1	2:W1	0.000	-0.001	-0.002	0.003	**-0.002**	0.000	0.000
Max rY	5	2:W1	-0.000	0.004	-0.002	0.005	-0.002	**0.000**	-0.000
Min rY	8	2:W1	-0.000	0.003	-0.002	0.004	0.001	**-0.000**	-0.000
Max rZ	1	4:1.25DL	0.000	-0.016	0.000	0.016	0.000	0.000	**0.001**
Min rZ	5	2:W1	-0.000	0.004	-0.002	0.005	-0.002	0.000	**-0.000**
Max Rst	1	4:1.25DL	0.000	-0.016	0.000	**0.016**	0.000	0.000	0.001

Beam Displacement Detail Summary

Displacements shown in italic indicate the presence of an offset

	Beam	L/C	d (ft)	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	1	2:W1	0.000	**0.000**	-0.001	-0.002	0.003
Min X	4	2:W1	0.350	**-0.000**	0.004	-0.002	0.004
Max Y	4	2:W1	0.000	-0.000	**0.004**	-0.002	0.005
Min Y	1	4:1.25DL	0.000	0.000	**-0.016**	0.000	0.016
Max Z	1	1:DL	0.000	0.000	-0.013	**0.000**	0.013
Min Z	4	2:W1	0.150	-0.000	0.004	**-0.002**	0.005
Max Rst	1	4:1.25DL	0.000	0.000	-0.016	0.000	**0.016**

Beam End Displacement Summary

Displacements shown in italic indicate the presence of an offset

	Beam	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	1	1	2:W1	**0.000**	-0.001	-0.002	0.003
Min X	4	8	2:W1	**-0.000**	0.003	-0.002	0.004
Max Y	4	5	2:W1	-0.000	**0.004**	-0.002	0.005
Min Y	1	1	4:1.25DL	0.000	**-0.016**	0.000	0.016
Max Z	1	1	1:DL	0.000	-0.013	**0.000**	0.013
Min Z	1	1	2:W1	0.000	-0.001	**-0.002**	0.003
Max Rst	1	1	4:1.25DL	0.000	-0.016	0.000	**0.016**

Beam End Force Summary

The signs of the forces at end B of each beam have been reversed. For example: this means that the Min Fx entry gives the largest tension value for an beam.

				Axial	Shear		Torsion	Bending	
	Beam	Node	L/C	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)
Max Fx	8	4	2:W1	**0.076**	-0.016	-0.028	0.000	0.391	-0.194
Min Fx	9	8	2:W1	**-0.017**	0.016	-0.028	0.000	0.389	-0.222
Max Fy	9	8	2:W1	-0.017	**0.016**	-0.028	0.000	0.389	-0.222
Min Fy	8	3	5:1.1DL+1.0W´	0.076	**-0.099**	-0.028	0.000	-0.441	2.905
Max Fz	1	1	2:W1	0.055	-0.015	**0.065**	-0.000	-0.067	-0.264
Min Fz	8	4	2:W1	0.076	-0.016	**-0.028**	0.000	0.391	-0.194
Max Mx	9	8	2:W1	-0.017	0.016	-0.028	**0.000**	0.389	-0.222
Min Mx	1	1	5:1.1DL+1.0W´	0.055	-0.076	0.065	**-0.000**	-0.067	-0.265
Max My	8	4	2:W1	0.076	-0.016	-0.028	0.000	**0.391**	-0.194
Min My	8	3	2:W1	0.076	-0.016	-0.028	0.000	**-0.441**	0.283
Max Mz	8	3	4:1.25DL	-0.000	-0.094	-0.000	0.000	-0.000	**2.979**
Min Mz	9	7	2:W1	-0.017	0.016	-0.028	0.000	-0.440	**-0.699**

Beam Force Detail Summary

Sign convention as diagrams:- positive above line, negative below line except Fx where positive is compression. Distance d is given from beam end A.

				Axial	Shear		Torsion	Bending	
	Beam	L/C	d (ft)	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)
Max Fx	8	2:W1	0.000	**0.076**	-0.016	-0.028	0.000	0.391	-0.194
Min Fx	9	2:W1	0.000	**-0.017**	0.016	-0.028	0.000	0.389	-0.222
Max Fy	9	2:W1	0.000	-0.017	**0.016**	-0.028	0.000	0.389	-0.222
Min Fy	8	5:1.1DL+1.0W´	2.500	0.076	**-0.099**	-0.028	0.000	-0.441	2.905
Max Fz	1	2:W1	0.000	0.055	-0.015	**0.065**	-0.000	-0.067	-0.264
Min Fz	8	2:W1	0.000	0.076	-0.016	**-0.028**	0.000	0.391	-0.194
Max Mx	9	2:W1	0.000	-0.017	0.016	-0.028	**0.000**	0.389	-0.222
Min Mx	1	5:1.1DL+1.0W´	0.000	0.055	-0.076	0.065	**-0.000**	-0.067	-0.265
Max My	8	2:W1	0.000	0.076	-0.016	-0.028	0.000	**0.391**	-0.194
Min My	8	2:W1	2.500	0.076	-0.016	-0.028	0.000	**-0.441**	0.283
Max Mz	8	4:1.25DL	2.500	-0.000	-0.094	-0.000	0.000	-0.000	**2.979**
Min Mz	9	2:W1	2.500	-0.017	0.016	-0.028	0.000	-0.440	**-0.699**

Beam Combined Axial and Bending Stresses Summary

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
1	1:DL	0.500	227.822	0.500	3	-227.822	0.500	1
	2:W1	0.500	450.225	0.500	2	-385.801	0.500	4
	3:0.75W2	0.500	340.380	0.500	2	-291.777	0.500	4
	4:1.25DL	0.500	284.777	0.500	3	-284.777	0.500	1
	5:1.1DL+1.0W'	0.500	465.047	0.500	3	-400.623	0.500	1
	6:1.1DL+1.0W2	0.500	413.940	0.500	3	-365.338	0.500	1
4	1:DL	0.500	227.822	0.500	3	-227.822	0.500	1
	2:W1	0.500	467.111	0.500	2	-465.891	0.500	4
	3:0.75W2	0.500	352.987	0.500	2	-352.301	0.500	4
	4:1.25DL	0.500	284.777	0.500	3	-284.777	0.500	1
	5:1.1DL+1.0W'	0.500	400.029	0.500	3	-398.809	0.500	1
	6:1.1DL+1.0W2	0.500	364.734	0.500	3	-364.047	0.500	1
8	1:DL	2.500	1.6E+3	2.500	3	-1.6E+3	2.500	1
	2:W1	2.500	642.965	2.500	4	-554.465	2.500	2
	3:0.75W2	2.500	487.126	2.500	4	-420.282	2.500	2
	4:1.25DL	2.500	2E+3	2.500	3	-2E+3	2.500	1
	5:1.1DL+1.0W'	2.500	2.4E+3	2.500	4	-2.31E+3	2.500	2
	6:1.1DL+1.0W2	2.500	2.24E+3	2.500	4	-2.18E+3	2.500	2
9	1:DL	2.500	1.6E+3	2.500	3	-1.6E+3	2.500	1
	2:W1	2.500	866.009	2.500	1	-885.971	2.500	3
	3:0.75W2	2.500	654.370	2.500	1	-669.753	2.500	3
	4:1.25DL	2.500	2E+3	2.500	3	-2E+3	2.500	1
	5:1.1DL+1.0W'	2.500	1.69E+3	2.500	4	-1.71E+3	2.500	2
	6:1.1DL+1.0W2	2.500	1.71E+3	2.500	4	-1.72E+3	2.500	2

Plate Center Principal Stress Summary

			Principal		Von Mis		Tresca	
	Plate	L/C	Top (psi)	Bottom (psi)	Top (psi)	Bottom (psi)	Top (psi)	Bottom (psi)
Max (t)	7	2:W1	**625.041**	676.984	1.07E+3	1.18E+3	1.24E+3	1.36E+3
Max (b)	7	5:1.1DL+1.0W'	620.600	**681.389**	1.07E+3	1.18E+3	1.24E+3	1.36E+3
Max VM (t)	7	2:W1	625.041	676.984	**1.07E+3**	1.18E+3	1.24E+3	1.36E+3
Max VM (b)	7	2:W1	625.041	676.984	1.07E+3	**1.18E+3**	1.24E+3	1.36E+3
Tresca (t)	7	2:W1	625.041	676.984	1.07E+3	1.18E+3	**1.24E+3**	1.36E+3
Tresca (b)	7	2:W1	625.041	676.984	1.07E+3	1.18E+3	1.24E+3	**1.36E+3**

Reaction Summary

			Horizontal	Vertical	Horizontal	Moment		
	Node	L/C	FX (kip)	FY (kip)	FZ (kip)	MX (kip`in)	MY (kip`in)	MZ (kip`in)
Max FX	7	2:W1	**0.017**	-0.016	0.028	-0.000	0.440	0.699
Min FX	3	2:W1	**-0.076**	0.016	0.028	-0.000	0.441	-0.283
Max FY	3	5:1.1DL+1.0W´	-0.076	**0.099**	0.028	-0.000	0.441	-2.905
Min FY	7	2:W1	0.017	**-0.016**	0.028	-0.000	0.440	0.699
Max FZ	3	2:W1	-0.076	0.016	**0.028**	-0.000	0.441	-0.283
Min FZ	3	1:DL	0.000	0.075	**0.000**	-0.000	0.000	-2.383
Max MX	7	4:1.25DL	0.000	0.094	0.000	**0.000**	0.000	-2.979
Min MX	7	2:W1	0.017	-0.016	0.028	**-0.000**	0.440	0.699
Max MY	3	2:W1	-0.076	0.016	0.028	-0.000	**0.441**	-0.283
Min MY	3	1:DL	0.000	0.075	0.000	-0.000	**0.000**	-2.383
Max MZ	7	2:W1	0.017	-0.016	0.028	-0.000	0.440	**0.699**
Min MZ	3	4:1.25DL	0.000	0.094	0.000	-0.000	0.000	**-2.979**

Steel Design (Track 2) Beam 1 Check 1

```
|--------------------------------------------------------------------------|
|                                                   Y        PROPERTIES    |
|*************                                      |        IN INCH UNIT  |
|            *   |=============================|             ------------  |
|MEMBER   1  *   |  AISC SECTIONS              |             AX=0.1710E+1  |
|            *   | ST  HSST3.5X2X0.188         |        --Z  AY=0.1218E+1  |
|DESIGN CODE *   |                             |             AZ=0.4640E+0  |
| LRFD 2001  *   ===============================             PY=0.1270E+1  |
|            *                                               PZ=0.1890E+1  |
|            *   |<---LENGTH (FT)=    0.50 --->|             RY=0.7947E+0  |
|*************                                               RZ=0.1235E+1  |
|                                                                          |
|                  0.0 (KIP-FEET)                                          |
|PARAMETER        |                                     L4   CAPACITIES    |
|IN KIP  INCH     |                                          IN KIP  INCH  |
|---------------  +                                  L4      ------------- |
| KL/R-Y=   7.55  |                              L4            PNC=0.5217E+2|
| KL/R-Z=   4.86  +                                            pnc=0.5508E-1|
| UNL   =   6.00  |                          L4                PNT=0.5540E+2|
| CB    =   1.00  +                      L4                    pnt=0.0000E+0|
| PHIC  =   0.00  |L5 L2                                       MNZ=0.6124E+2|
| PHIB  =   0.90  +       L2  L2  L2                           mnz=0.1979E+0|
| FYLD  =  36.00  |                  L2                        MNY=0.4115E+2|
| NSF   =   1.00  +---+---+---+---+---+---+---+---+---+---|    mny=0.3241E+0|
| DFF =     0.00   0.0                                         VN =0.2368E+2|
| dff =     0.00               ABSOLUTE MZ ENVELOPE            vn =0.7874E-1|
|                                  (WITH LOAD NO.)                          |
|                                                                          |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)               |
|                      -------------------------                           |
|                                                                          |
|               AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z      |
|                                                                          |
|     VALUE       0.1         0.1        0.1         0.0         0.0      |
|   LOCATION      0.0         0.5        0.0         0.5         0.5      |
|    LOADING        2           5          2           2           4      |
|                                                                          |
|**************************************************************************|
|*                                                                        *|
|*                        DESIGN SUMMARY  (KIP-FEET)                      *|
|*                        --------------                                  *|
|*                                                                        *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/            *|
|         FX              MY             MZ          LOCATION             |
|        ======================================================           |
|          PASS        HSS FLEX+AXL     0.012             5                |
|          0.06 C          0.03         0.02             0.50              |
|*                                                                        *|
|**************************************************************************|
|                                                                          |
|--------------------------------------------------------------------------|
     1  ST   HSST3.5X2X0.188          (AISC SECTIONS)
```

Steel Design (Track 2) Beam 4 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES     |
|*************                                        |         IN INCH UNIT   |
|            *  |=============================|                 ------------   |
|MEMBER   4  *  |  AISC SECTIONS              |                 AX=0.1710E+1   |
|            *  | ST  HSST3.5X2X0.188        |              --Z AY=0.1218E+1   |
|DESIGN CODE *  |                             |                 AZ=0.4640E+0   |
| LRFD 2001  *  ===============================                 PY=0.1270E+1   |
|            *                                                  PZ=0.1890E+1   |
|            *  |<---LENGTH (FT)=    0.50 --->|                 RY=0.7947E+0   |
|*************                                                  RZ=0.1235E+1   |
|                                                                              |
|                  0.0 (KIP-FEET)                                              |
|PARAMETER        |                                   L4        CAPACITIES    |
|IN KIP  INCH     |                               L4            IN KIP  INCH  |
|---------------  +                           L4                -------------|
| KL/R-Y=   7.55  |                                             PNC=0.5217E+2|
| KL/R-Z=   4.86  +                       L4                    pnc=0.1044E-2|
| UNL    =  6.00  |                   L4                        PNT=0.5540E+2|
| CB     =  1.00  +                                             pnt=0.0000E+0|
| PHIC   =  0.00  |               L4                            MNZ=0.6124E+2|
| PHIB   =  0.90  +          L2  L2                             mnz=0.2369E+0|
| FYLD   = 36.00  |L5 L2  L2                                    MNY=0.4115E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|     mny=0.3323E+0|
| DFF =     0.00   0.0                                          VN =0.2368E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE              vn =0.1466E-1|
|                                (WITH LOAD NO.)                              |
|                                                                              |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                               |
|                                                                              |
|               AXIAL      SHEAR-Y     SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                              |
|      VALUE       0.0         0.1         0.1         0.0         0.0        |
|   LOCATION       0.0         0.5         0.0         0.5         0.5        |
|    LOADING         2           4           2           2           4        |
|                                                                              |
|**************************************************************************** |
|*                                                                          * |
|*                        DESIGN SUMMARY  (KIP-FEET)                        * |
|*                        --------------                                    * |
|*                                                                          * |
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/              * |
|          FX              MY            MZ          LOCATION                |
|        =====================================================               |
|          PASS        HSS FLEX+AXL     0.012             2                  |
|          0.00 C          0.03        -0.02            0.50                 |
|*                                                                          * |
|**************************************************************************** |
|                                                                              |
|-----------------------------------------------------------------------------|
    4  ST   HSST3.5X2X0.188          (AISC SECTIONS)
```

Steel Design (Track 2) Beam 8 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y        PROPERTIES      |
|*************                                       |        IN INCH UNIT    |
|            *  |=============================|                ------------   |
|MEMBER   8  *  |  AISC SECTIONS              |                AX=0.1710E+1   |
|            *  | ST  HSST3.5X2X0.188         |          --Z   AY=0.1218E+1   |
|DESIGN CODE *  |                             |                AZ=0.4640E+0   |
| LRFD 2001  *  ===============================                PY=0.1270E+1   |
|            *                                                 PZ=0.1890E+1   |
|            *  |<---LENGTH (FT)=    2.50 --->|                RY=0.7947E+0   |
|*************                                                 RZ=0.1235E+1   |
|                                                                             |
|                  0.2 (KIP-FEET)                                             |
|PARAMETER        |                                  L4       CAPACITIES      |
|IN KIP  INCH     |                              L4           IN KIP  INCH    |
|---------------  +                       L4  L4              -------------   |
| KL/R-Y=  37.75  |                   L4                      PNC=0.4854E+2|
| KL/R-Z=  24.28  +                                           pnc=0.7567E-1|
| UNL    =  30.00 |           L4  L4                          PNT=0.5540E+2|
| CB     =   1.00 +                                           pnt=0.0000E+0|
| PHIC   =   0.00 |       L4                                  MNZ=0.6124E+2|
| PHIB   =   0.90 +   L4  L4                                  mnz=0.2905E+1|
| FYLD   =  36.00 |L4                                         MNY=0.4115E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|   mny=0.4414E+0|
| DFF =      0.00   0.0                                       VN =0.2368E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE           vn =0.9879E-1|
|                                 (WITH LOAD NO.)                            |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|     VALUE        0.1        0.1        0.0        0.0         0.2          |
|   LOCATION       0.0        2.5        0.0        2.5         2.5          |
|    LOADING        2          5          2          2           4           |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                        DESIGN SUMMARY  (KIP-FEET)                         *|
|*                        --------------                                     *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX             MY              MZ          LOCATION                |
|        ======================================================              |
|          PASS       HSS FLEX+AXL      0.059             5                  |
|          0.08 C        -0.04          0.24             2.50                |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    8  ST   HSST3.5X2X0.188          (AISC SECTIONS)
```

Steel Design (Track 2) Beam 9 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES     |
|*************                                        |         IN INCH UNIT   |
|             *  |=============================|                ------------- |
|MEMBER    9  *  |  AISC SECTIONS              |                AX=0.1710E+1  |
|             *  | ST   HSST3.5X2X0.188        |            --Z AY=0.1218E+1  |
|DESIGN CODE  *  |                             |                AZ=0.4640E+0  |
| LRFD 2001   *  ===============================                PY=0.1270E+1  |
|             *                                                 PZ=0.1890E+1  |
|             *  |<---LENGTH (FT)=     2.50 --->|                RY=0.7947E+0  |
|*************                                                  RZ=0.1235E+1  |
|                                                                             |
|                  0.2 (KIP-FEET)                                             |
|PARAMETER        |                                         L4   CAPACITIES   |
|IN KIP  INCH     |                                     L4       IN KIP  INCH |
|---------------  +                             L4  L4           -------------|
| KL/R-Y=  37.75  |                           L4                 PNC=0.4854E+2|
| KL/R-Z=  24.28  +                                              pnc=0.0000E+0|
| UNL    =  30.00 |               L4  L4                          PNT=0.5540E+2|
| CB     =   1.00 +                                              pnt=0.0000E+0|
| PHIC   =   0.00 |           L4                                 MNZ=0.6124E+2|
| PHIB   =   0.90 +   L4  L4                                     mnz=0.2979E+1|
| FYLD   =  36.00 |L4                                            MNY=0.4115E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|      mny=0.0000E+0|
| DFF =      0.00   0.0                                          VN =0.2368E+2|
| dff =      0.00            ABSOLUTE MZ ENVELOPE                vn =0.9419E-1|
|                               (WITH LOAD NO.)                               |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE      -0.0         0.1        0.0         0.0         0.2         |
|   LOCATION       0.0         2.5        0.0         2.5         2.5         |
|    LOADING         2           4          2           2           4         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                          DESIGN SUMMARY  (KIP-FEET)                       *|
|*                          --------------                                   *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX              MY              MZ            LOCATION              |
|        ======================================================               |
|          PASS          HSS BEND Z       0.049             4                 |
|          0.00 C         0.00            0.25            2.50                |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     9  ST   HSST3.5X2X0.188          (AISC SECTIONS)
```

Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
1	HSST3.5X2)	HSST3.5X2)	0.012	1.000	0.012	HSS FLEX+A	5	1.710	2.610	1.080	2.550
4	HSST3.5X2)	HSST3.5X2)	0.012	1.000	0.012	HSS FLEX+A	2	1.710	2.610	1.080	2.550
8	HSST3.5X2)	HSST3.5X2)	0.059	1.000	0.059	HSS FLEX+A	5	1.710	2.610	1.080	2.550
9	HSST3.5X2)	HSST3.5X2)	0.049	1.000	0.049	HSS BEND Z	4	1.710	2.610	1.080	2.550

Failed Members

There is no data of this type.

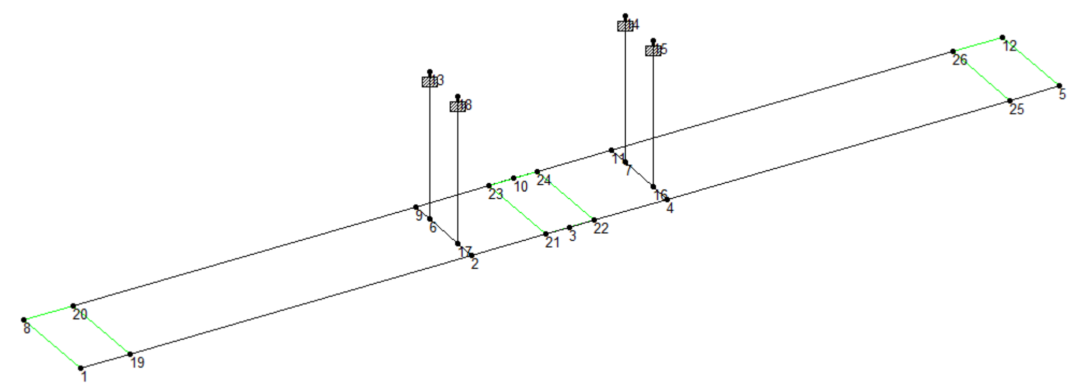
Statics Check Results

L/C		FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
1:DL	Loads	0.000	-0.151	0.000	1.808	0.000	-0.659
1:DL	Reactions	0.000	0.151	0.000	-1.808	0.000	0.659
	Difference	0.000	-0.000	0.000	0.000	0.000	-0.000
2:W1	Loads	0.059	0.000	-0.055	-0.382	0.703	-0.415
2:W1	Reactions	-0.059	0.000	0.055	0.382	-0.703	0.415
	Difference	0.000	0.000	-0.000	-0.000	0.000	0.000
3:0.75W2	Loads	0.044	0.000	-0.042	-0.288	0.528	-0.312
3:0.75W2	Reactions	-0.044	0.000	0.042	0.288	-0.528	0.312
	Difference	0.000	0.000	-0.000	-0.000	0.000	0.000

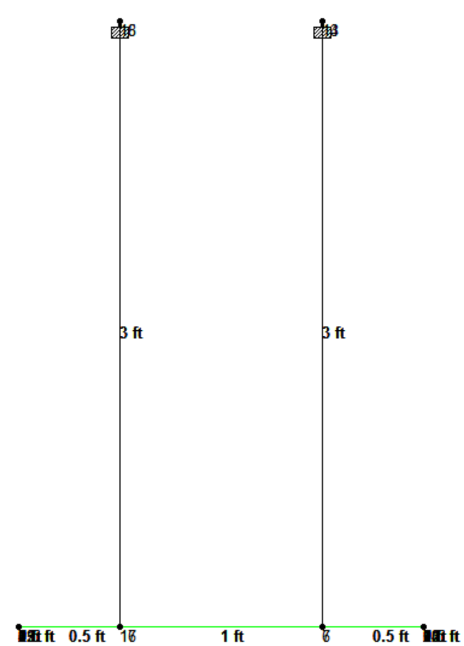
Straddle Bent- Middle

The following structure spacing was accommodated from analyzing the THEA contract plans reinforcement for the straddle bent middle. Based on which superstructure the structure is placed the distances will vary. An analysis of 4 feet width for the middle section was used.

3D View-Length:



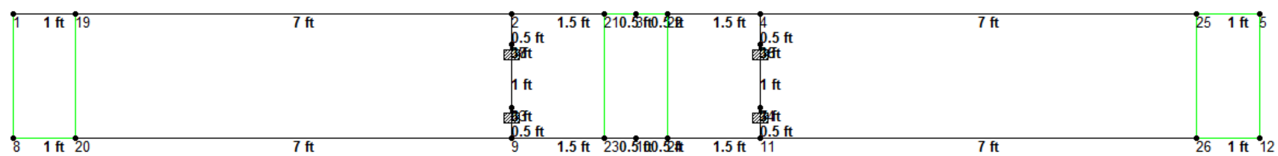
Side View:



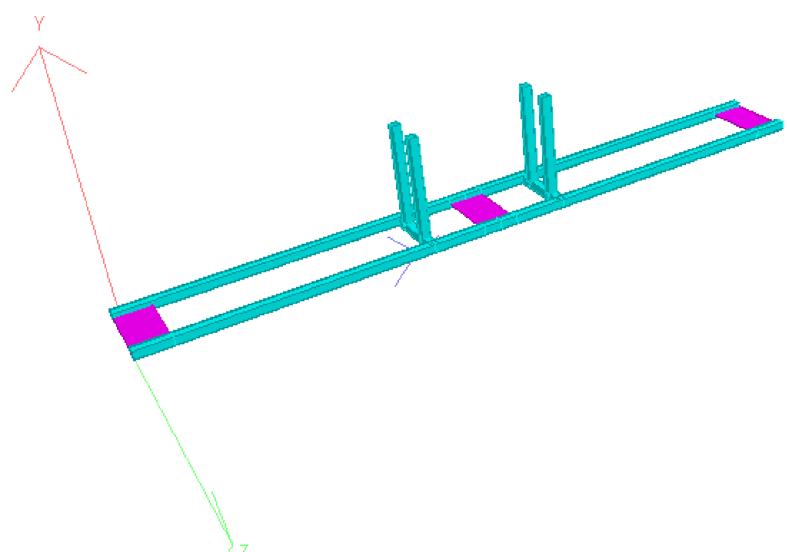
Kimley»Horn
189 South Orange Avenue
Orlando, FL 32801
Certificate of Authorization No. 00696

		Job No.	148872000	Sheet	1 of 1
Job	THEA Lighting Project	Design by	IERM	Date	7/19/18
Subject	Final Results	Checked by	JLP	Date	7/12/18

Plan View:



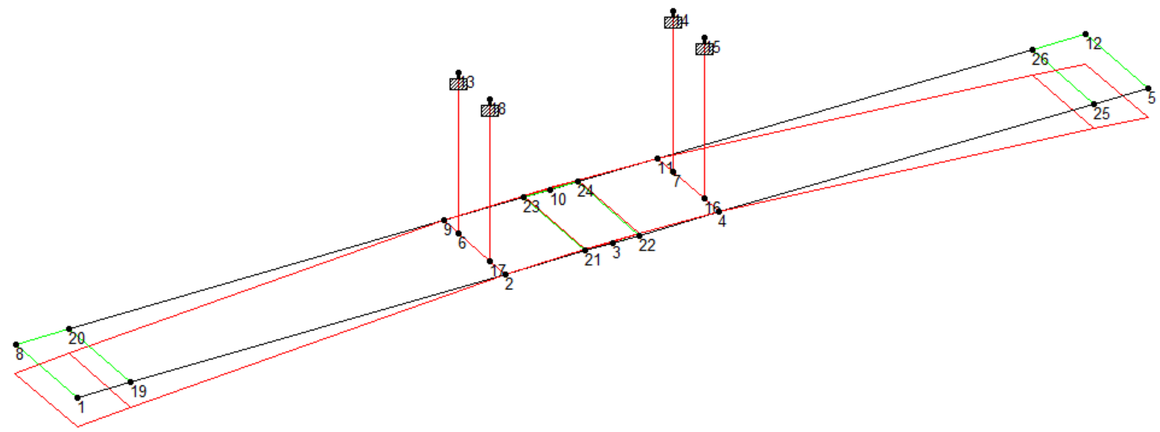
3D View:



Kimley»Horn
189 South Orange Avenue
Orlando, FL 32801
Certificate of Authorization No. 00696

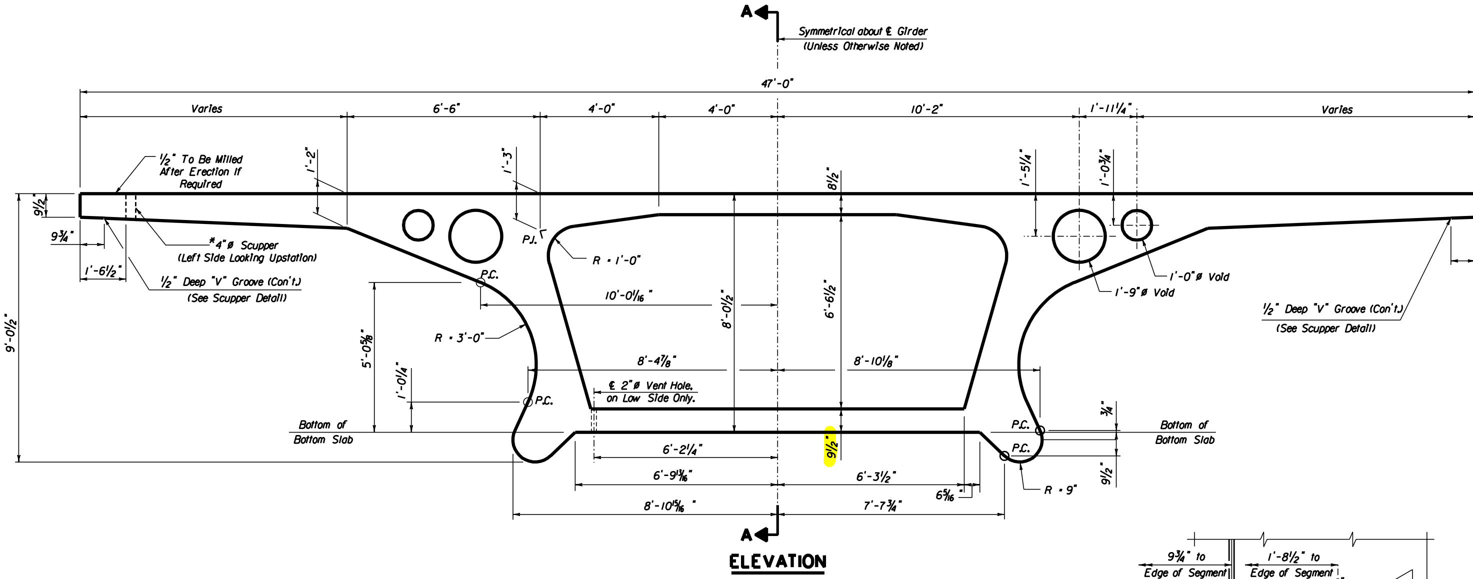
Job No.	148872000	Sheet	1	of	1
Job	THEA Lighting Project	Design by	IERM	Date	7/19/18
Subject	Final Results	Checked by	JLP	Date	7/12/18

Deflection View:

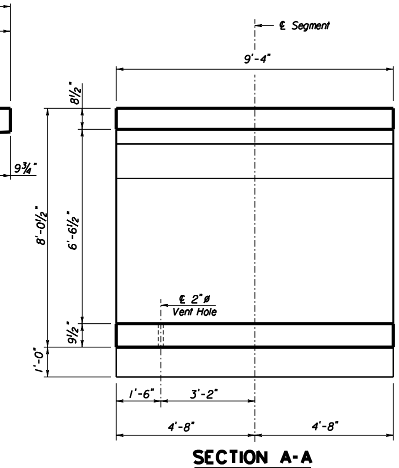


Existing Structural Plans

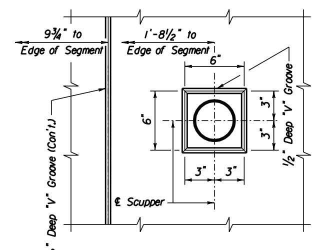
FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		



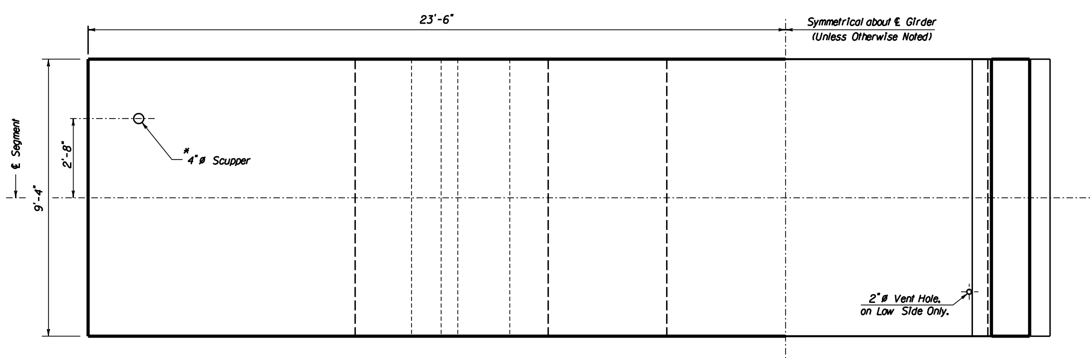
ELEVATION



SECTION A-A



SCUPPER DETAIL



HALF-PLAN TOP SLAB

HALF-PLAN BOTTOM SLAB

NOTES:

1. Approximate Lifting Weight = 61.1 Tons.
2. Dimensions Shown are Along ℄ Girder.
3. For Bottom Slab Access Details, See Miscellaneous Superstructure Details Sheet.
4. For Variable Segment Dimensions, see Variable Segment Dimensions Sheets.
* 5. Scuppers to be Provided in Segments Indicated on Variable Segment Dimensions Sheet. Contractor must address milling of deck when placing top of scupper pipe location. For Segments with Drain Inlets Specified, see Drainage Details Sheet and refer to Drain Segment Dimensions and Reinforcement Sheets for 59'-0" Box for Details.
6. For Vent Hole Location, See Variable Segment Dimensions Sheets.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	AKK	12-13-02
Designed by	WDP	12-13-02
Checked by	JMR	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: 9'-4" TYPICAL SEGMENT DIMENSIONS (47'-0" BOX)

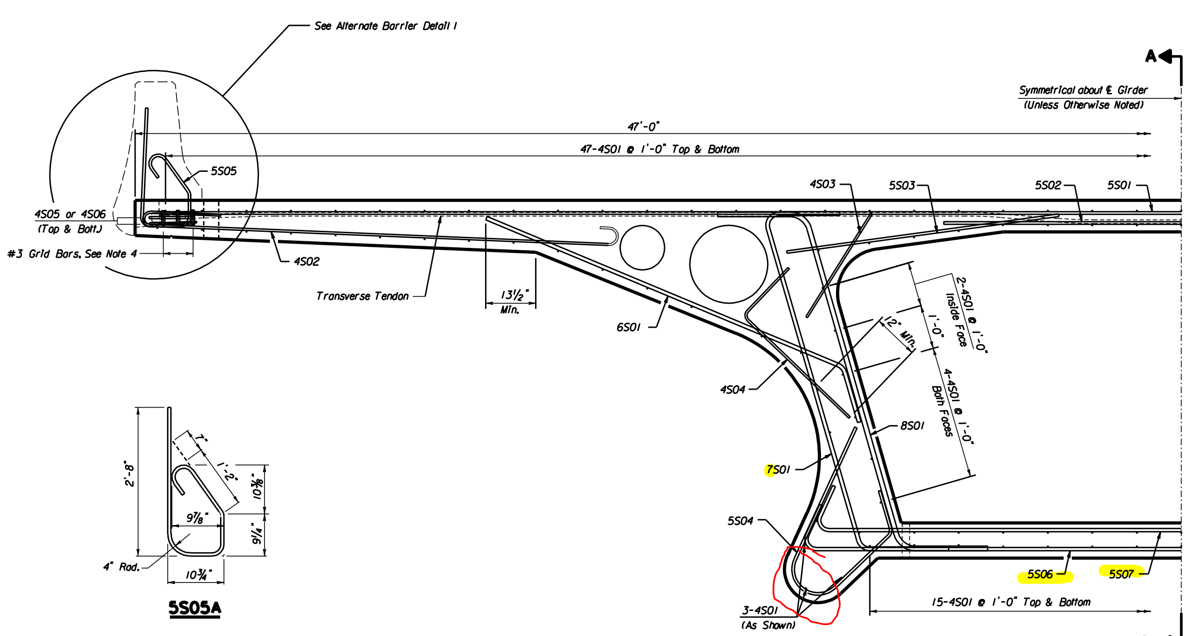
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-368

Index No.

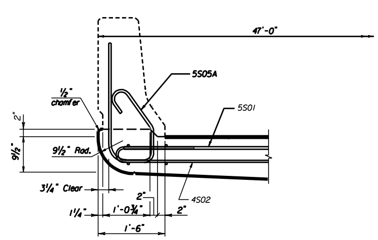
12 DEC 2002 19:42:54

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		



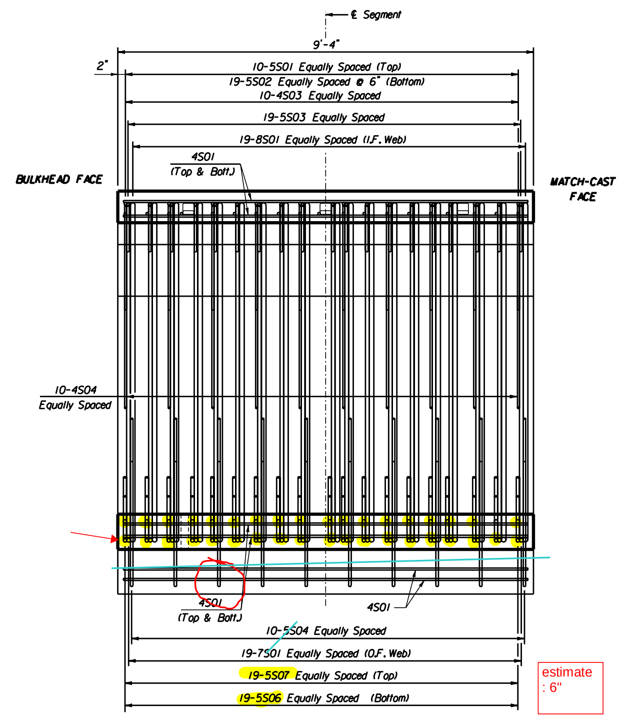
HALF-ELEVATION

5S05A



ALTERNATE BARRIER DETAIL 1

(SEE NOTE 5)



SECTION A-A

NOTE:

1. Concrete Cover: 2½" - Top of Top Slab
   1½" - All Interior Faces
   2" - All Exterior Faces
2. Space All Reinforcing Steel In Top Slab To Clear Transverse Tendons and Drains.
3. For Transverse P.T. Details, See Sheet T-440.
4. #3 Grid Bars and Bar 4T01 are Detailed on Sheet T-440.
5. The Contractor May use Either the Typical or Alternate Barrier Shown on Sheet T-6. Contractor Shall make Adjustments to Slab Dimensions and local Rebar as Shown to Accommodate the Alternate Barrier Shape.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	RGT	12-13-02
Checked by	MDR	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

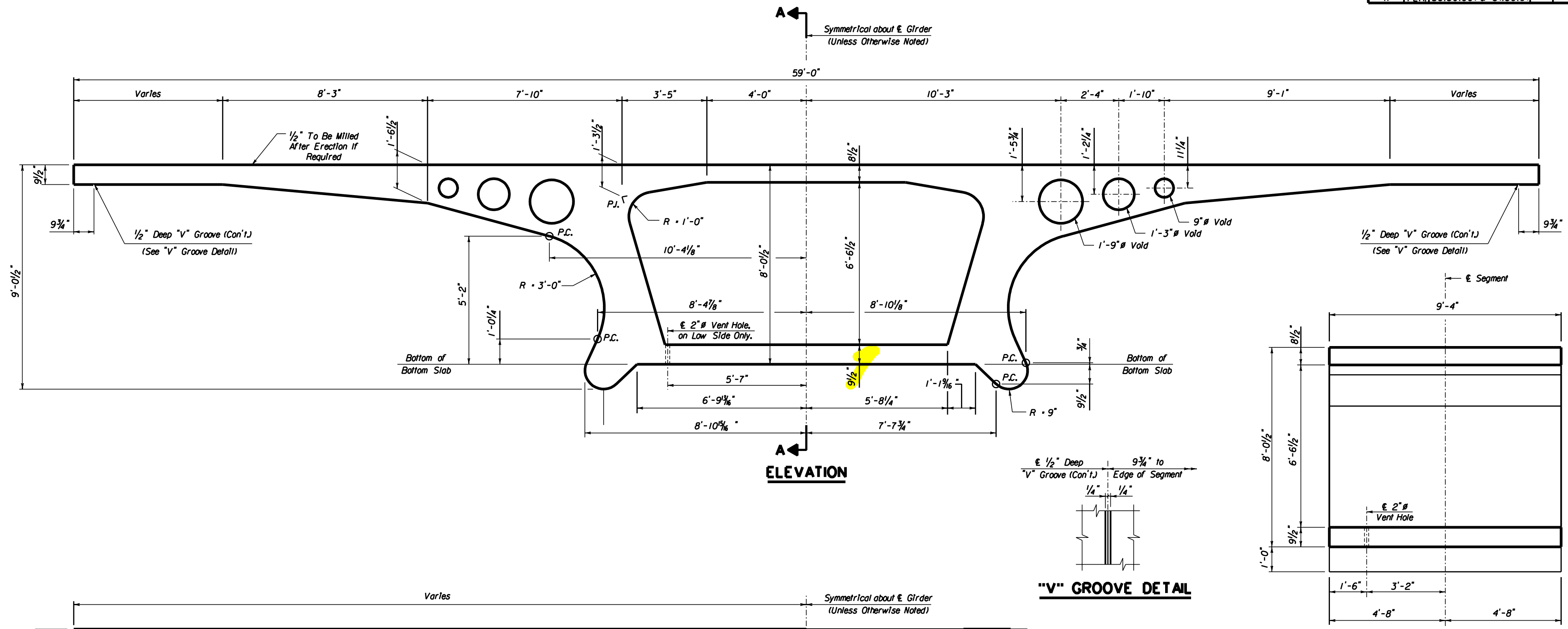
SHEET TITLE: 9'-4" TYPICAL SEGMENT REINFORCEMENT 1 (47'-0" BOX)

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-369

Index No.

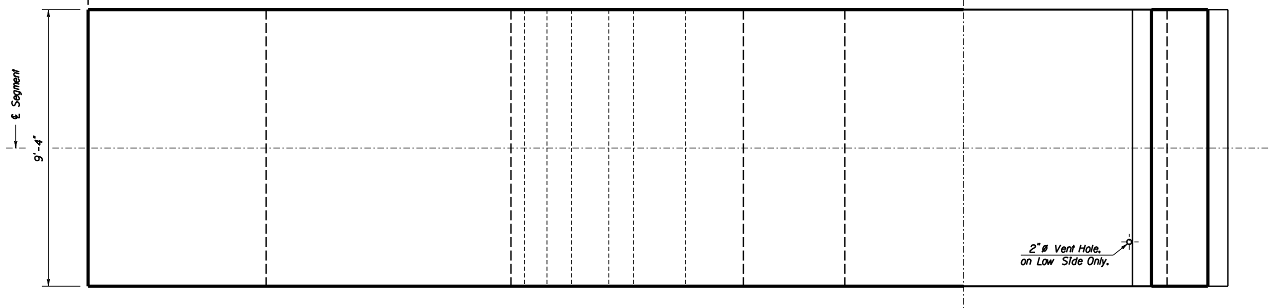
12 DEC 2002 19:42:55



ELEVATION

"V" GROOVE DETAIL

SECTION A-A



HALF-PLAN TOP SLAB

HALF-PLAN BOTTOM SLAB

NOTES:

1. Approximate Lifting Weight = 76.1 Tons.
2. Dimensions Shown are Along ℄ Girder.
3. For Bottom Slab Access Details, See Miscellaneous Superstructure Details Sheet.
4. For Variable Segment Dimensions, see Variable Segment Dimensions Sheets.
5. For Segments with Drain Inlets Specified, see Drainage Details Sheet and Drain Segment Dimensions and Reinforcement Sheets.
6. For Vent Hole Location, See Variable Segment Dimensions Sheets.

STRUCTURE NOS. 100800, 100806 & 100812

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	WDP	12-13-02
Checked by	JMR	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD: Figg Bridge Engineers, 424 No. Calhoun Street, Tallahassee, Florida 32301. Florida Certificate of Authorization No. 5618. Jose M. Rodriguez, P.E. - P.E. No. 52532. • Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

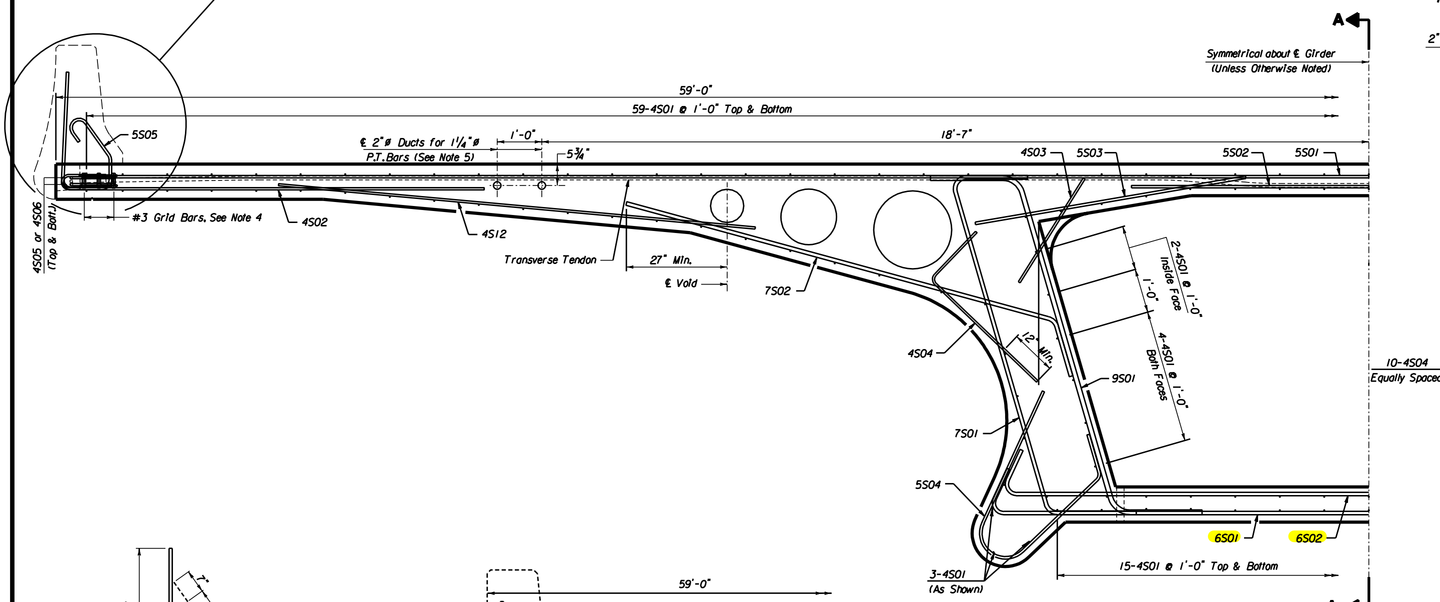
ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: 9'-4" TYPICAL SEGMENT DIMENSIONS (59'-0" BOX)

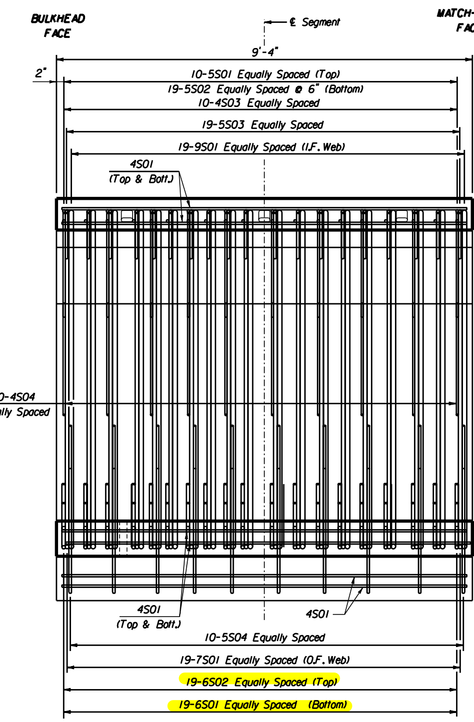
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-372

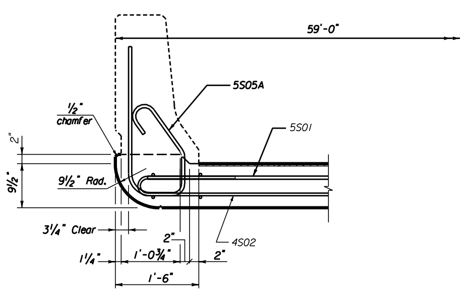
12 DEC 2002 19:42:57



HALF-ELEVATION

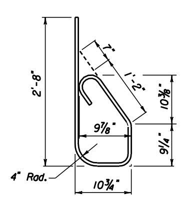


SECTION A-A



ALTERNATE BARRIER DETAIL 1

(SEE NOTE 6)



5S05A

NOTE:

1. Concrete Cover: 2½" - Top of Top Slab
   1½" - All Interior Faces
   2" - All Exterior Faces
2. Space All Reinforcing Steel In Top Slab To Clear Transverse Tendons and Drains.
3. For Transverse P.T. Details, See Sheet T-441.
4. #3 Grid Bars and Bar 4T01 are Detailed on Sheet T-441.
5. For Segments with 2"⌀ Ducts for 1¼" Wing P.T. Bars, See Variable Segment Dimensions Sheets.
6. The Contractor May use Either the Typical or Alternate Barrier Shown on Sheet T-6. Contractor Shall make Adjustments to Slab Dimensions and local Rebar as Shown to Accommodate the Alternate Barrier Shape.

STRUCTURE NOS. 100800, 100806 & 100812

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	RGT	12-13-02
Checked by	MDR	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

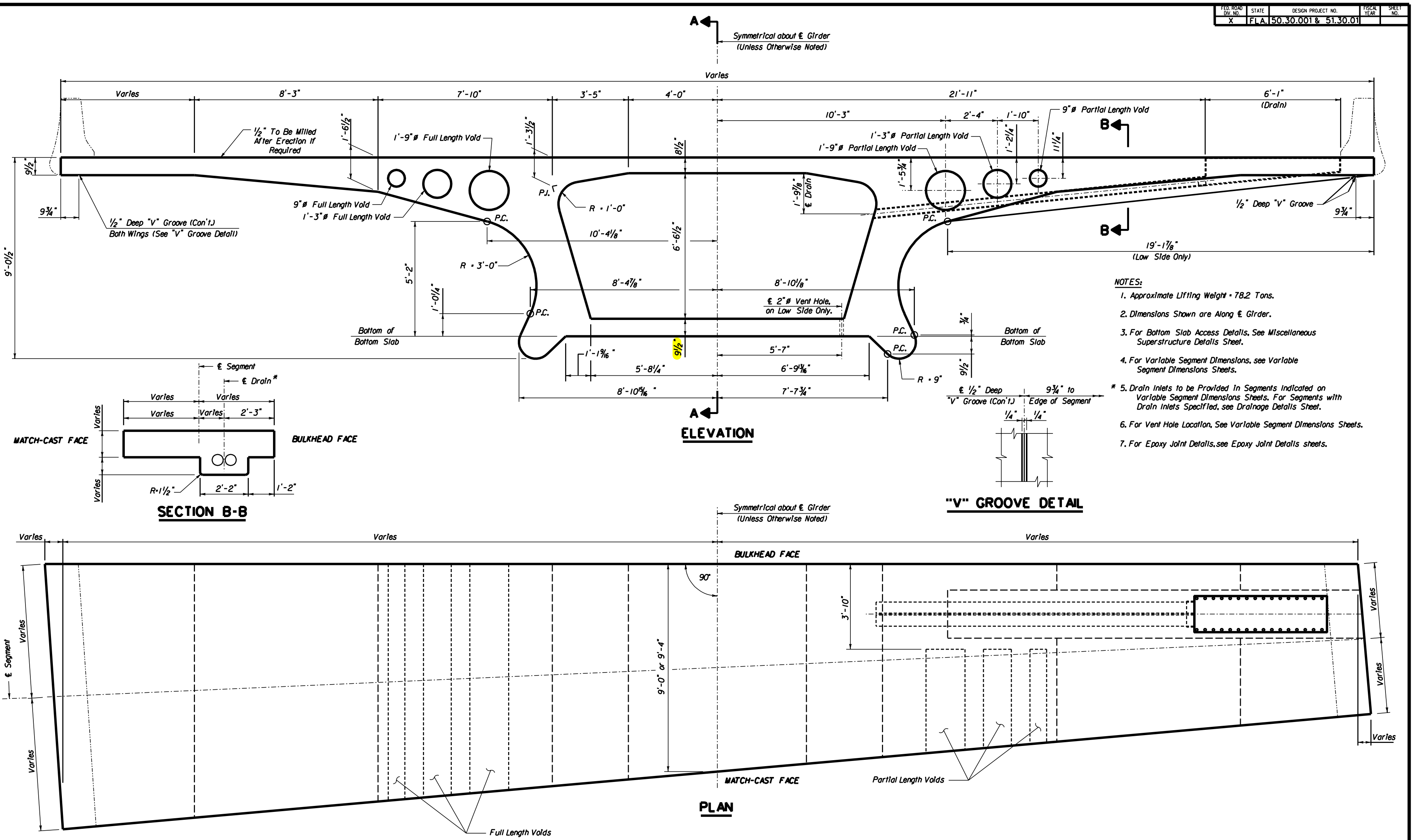
SHEET TITLE: 9'-4" TYPICAL SEGMENT REINFORCEMENT 1 (59'-0" BOX)

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-373

Index No.

12 DEC 2002 19:42:57



STRUCTURE NOS. 100800, 100806 & 100812

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

	Names	Dates
Drawn by	JMF	12-13-02
Checked by	MDR	12-13-02
Designed by	WDP	12-13-02
Checked by	JMR	12-13-02
Approved by	J.Rodriguez	

REVISIONS

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: 9'-4" DRAIN SEGMENT DIMENSIONS (59'-0" BOX)

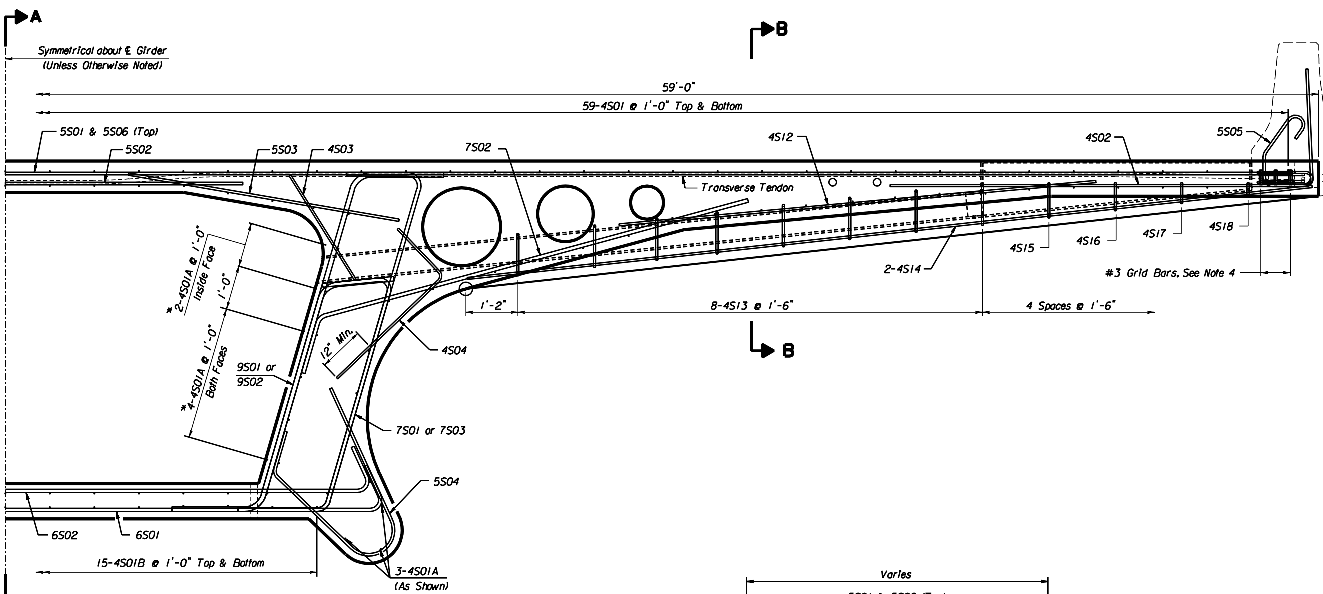
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-376

Index No.

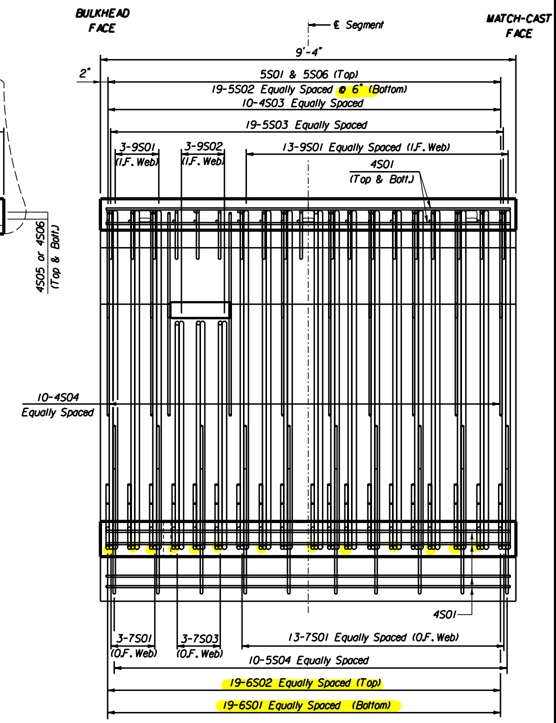
13 DEC 2002 17:08:31

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

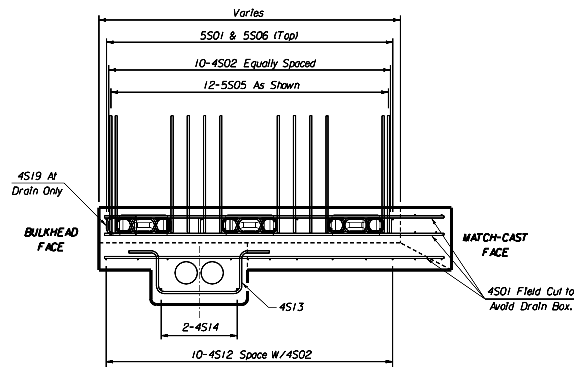


HALF-ELEVATION
(Bulkhead Face)

*4S01A Bars Are In The Right Web
4S01C Bars Are In The Left Web



SECTION A-A



SECTION B-B

NOTE:

1. Concrete Cover: $2\frac{1}{2}$" - Top of Top Slab
   $1\frac{1}{2}$" - All Interior Faces
   2" - All Exterior Faces
2. Space All Reinforcing Steel In Top Slab To Clear Transverse Tendons and Drains.
3. For Transverse P.T. Details, See Sheet T-441.
4. #3 Grid Bars are Detailed on Sheet T-441.
5. For Segments with 2"⌀ Ducts for $1\frac{1}{4}$" Wing P.T. Bars, See Variable Segment Dimensions Sheets.
6. For Epoxy Joint Details, see Epoxy Joint Details sheets.
7. For Wing Details with Alternate Barrier, see Sheet T-373.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JMF	12-13-02
Checked by	MDR	12-13-02
Designed by	RGT	12-13-02
Checked by	MDR	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: **9'-4" DRAIN SEGMENT REINFORCEMENT 1 (59'-0" BOX)**

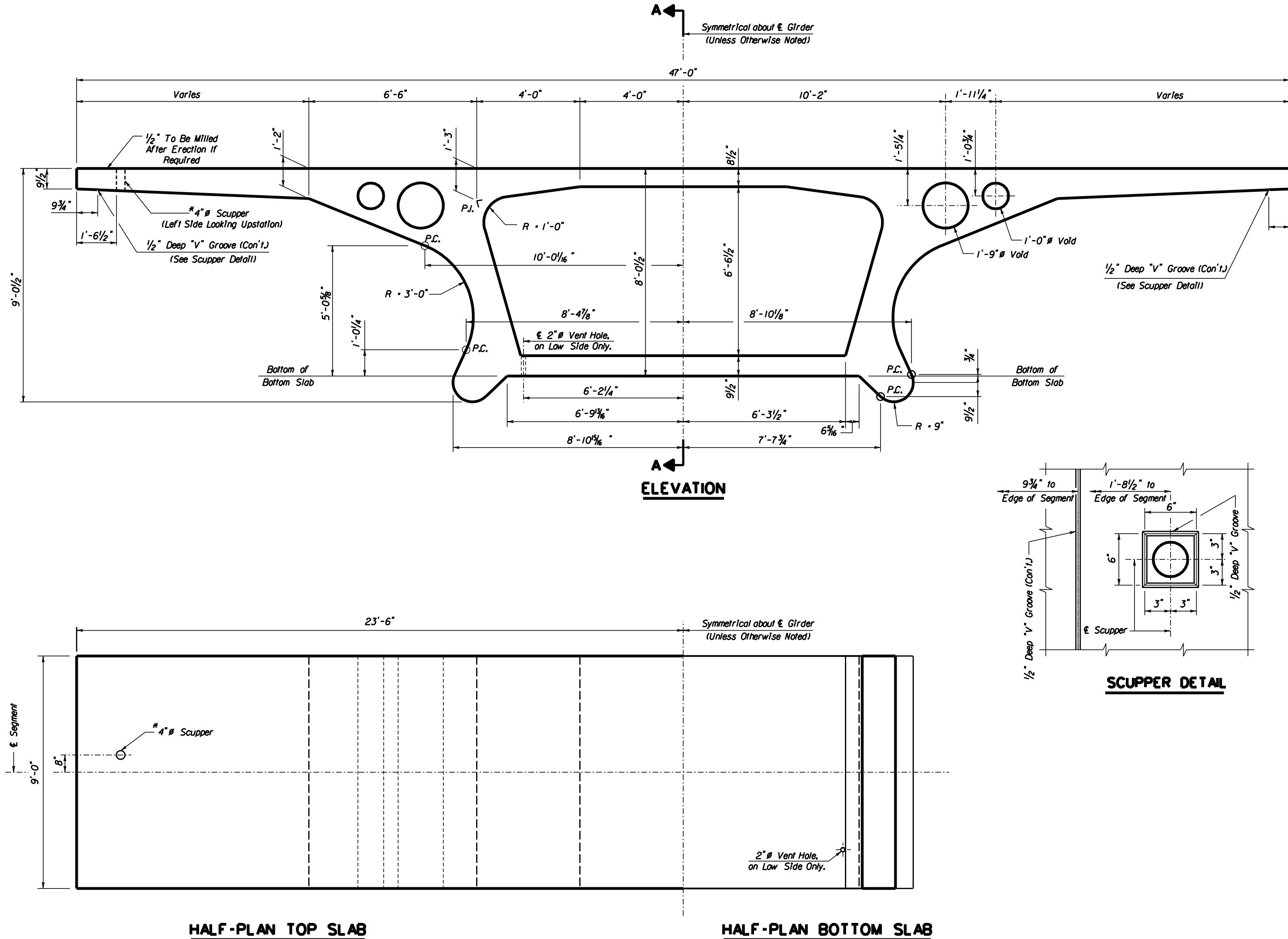
PROJECT NAME: **SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE**

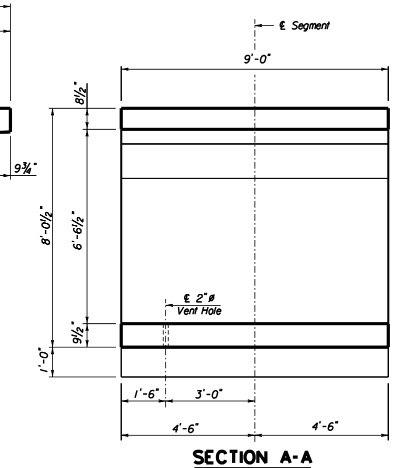
Drawing No. **T-377**

Index No.

13 DEC 2002 17:08:31

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		





NOTES:

1. Approximate Lifting Weight = 58.9 Tons.
2. Dimensions Shown are Along ℄ Girder.
3. For Bottom Slab Access Details, See Miscellaneous Superstructure Details Sheet.
4. For Variable Segment Dimensions, see Variable Segment Dimensions Sheets.
*5. Scuppers to be Provided In Segments Indicated on Variable Segment Dimensions Sheet. Contractor must address milling of deck when placing top of scupper pipe location. For Segments with Drain Inlets Specified, see Drainage Details Sheet and refer to Drain Segment Dimensions and Reinforcement sheets for 59'-0" Box for Details.
6. For Vent Hole Location, See Variable Segment Dimensions Sheets.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	AKK	12-13-02
Designed by	WDP	12-13-02
Checked by	JMR	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa.

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: 9'-0" TYPICAL SEGMENT DIMENSIONS (47'-0" BOX)

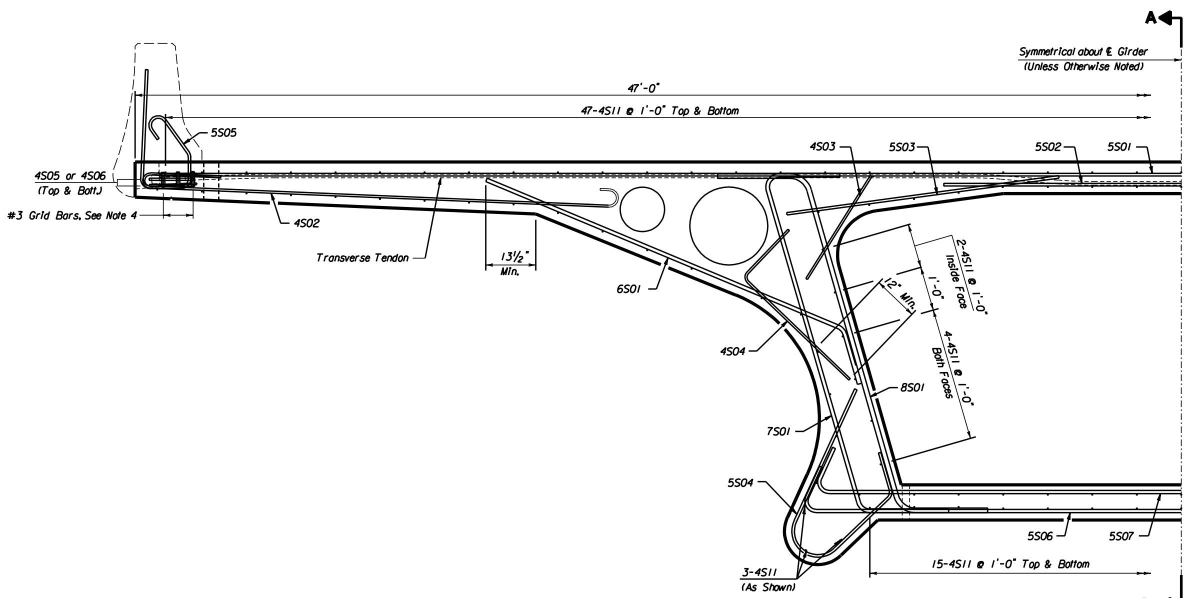
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-380

Index No.

12 DEC 2002 19:43:00

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		



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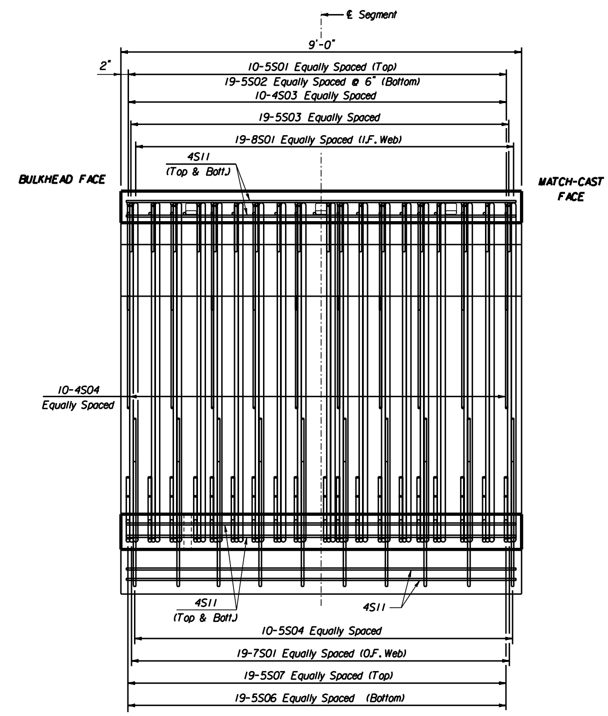


SECTION A-A

NOTE:

1. Concrete Cover: 2½" - Top of Top Slab
   1½" - All Interior Faces
   2" - All Exterior Faces
2. Space All Reinforcing Steel In Top Slab To Clear Transverse Tendons and Drains.
3. For Transverse P.T. Details, See Sheet T-440.
4. #3 Grid Bars and Bar 4T01 are Detailed on Sheet T-440.
5. For Wing Details with Alternate Barrier, see Sheet T-369.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	RGT	12-13-02
Checked by	MDR	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY
EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

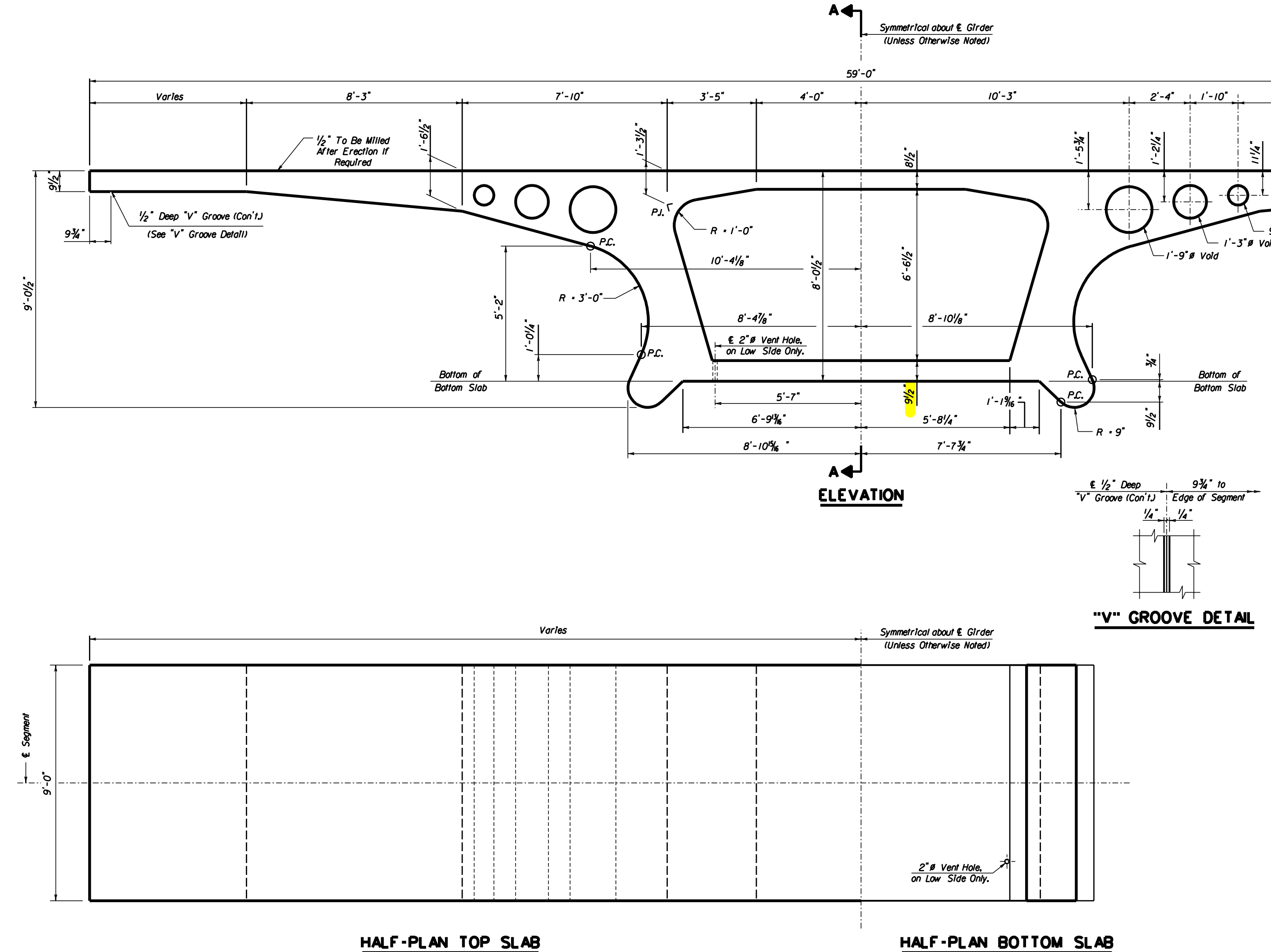
SHEET TITLE: 9'-0" TYPICAL SEGMENT REINFORCEMENT 1 (47'-0" BOX)

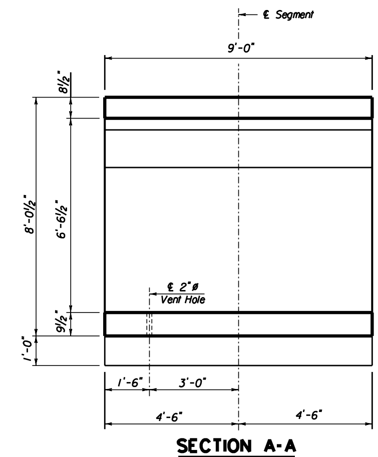
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-381

Index No.

12 DEC 2002 19:43:01





NOTES:

1. Approximate Lifting Weight = 73.3 Tons.
2. Dimensions Shown are Along ℄ Girder.
3. For Bottom Slab Access Details, See Miscellaneous Superstructure Details Sheet.
4. For Variable Segment Dimensions, see Variable Segment Dimensions Sheets.
5. For Segments with Drain Inlets Specified, see Drainage Details Sheet and Drain Segment Dimensions and Reinforcement sheets.
6. For Vent Hole Location, See Variable Segment Dimensions Sheets.

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	WDP	12-13-02
Checked by	JMR	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

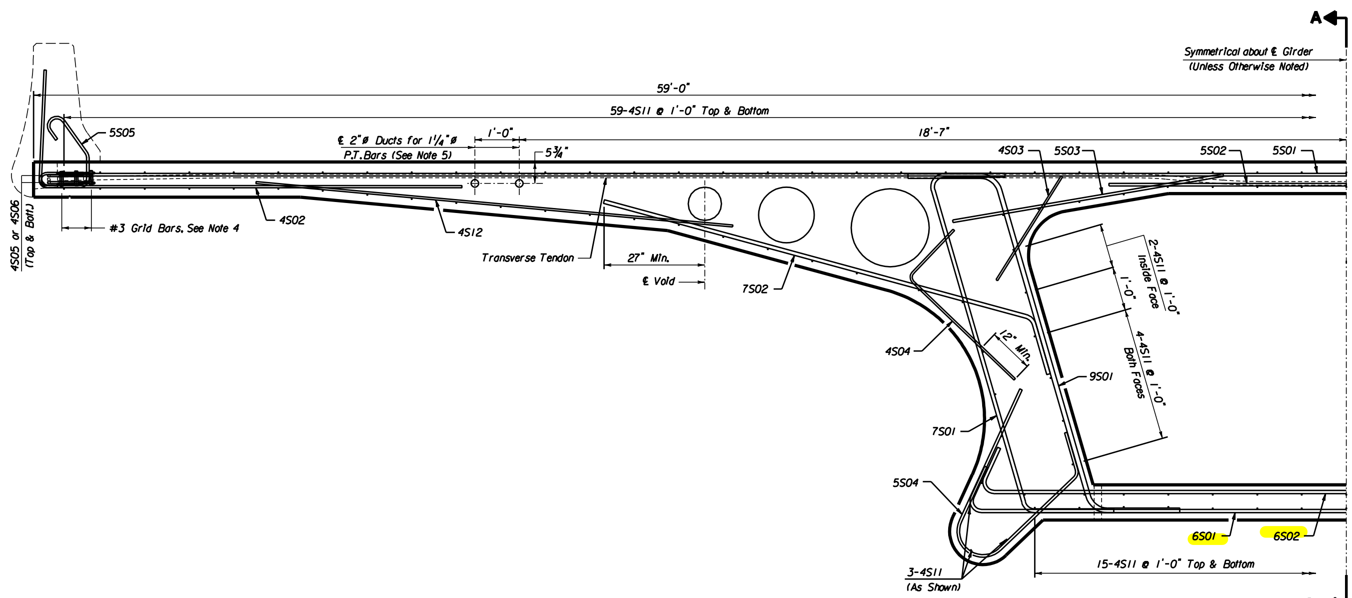
SHEET TITLE: 9'-0" TYPICAL SEGMENT DIMENSIONS (59'-0" BOX)

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-384

Index No.

12 DEC 2002 19:43:02



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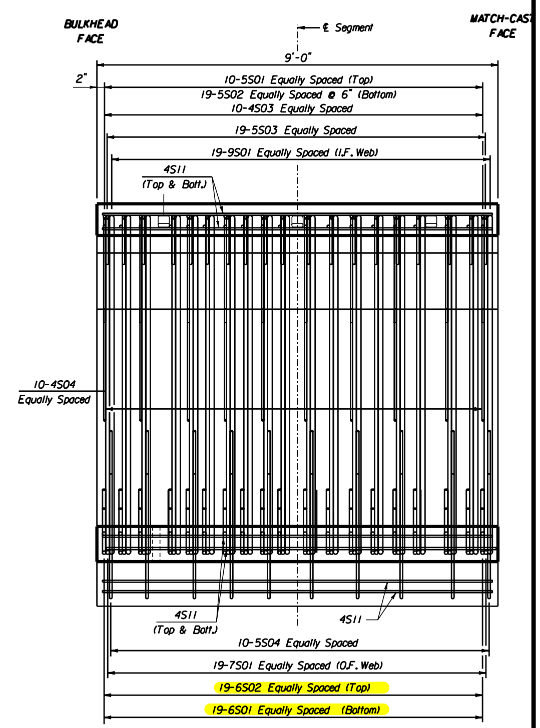

SECTION A-A

NOTE:

1. Concrete Cover: 2½" - Top of Top Slab
   1½" - All Interior Faces
   2" - All Exterior Faces
2. Space All Reinforcing Steel In Top Slab To Clear Transverse Tendons and Drains.
3. For Transverse P.T. Details, See Sheet T-441.
4. #3 Grid Bars and Bar 4T01 are Detailed on Sheet T-441.
5. For Segments with 2"ø Ducts for 1¼" P.T. Bars, See Variable Segment Dimensions Sheets.
6. For Wing Details with Alternate Barrier, see Sheet T-373.

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	RGT	12-13-02
Checked by	MDR	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
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Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY
EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

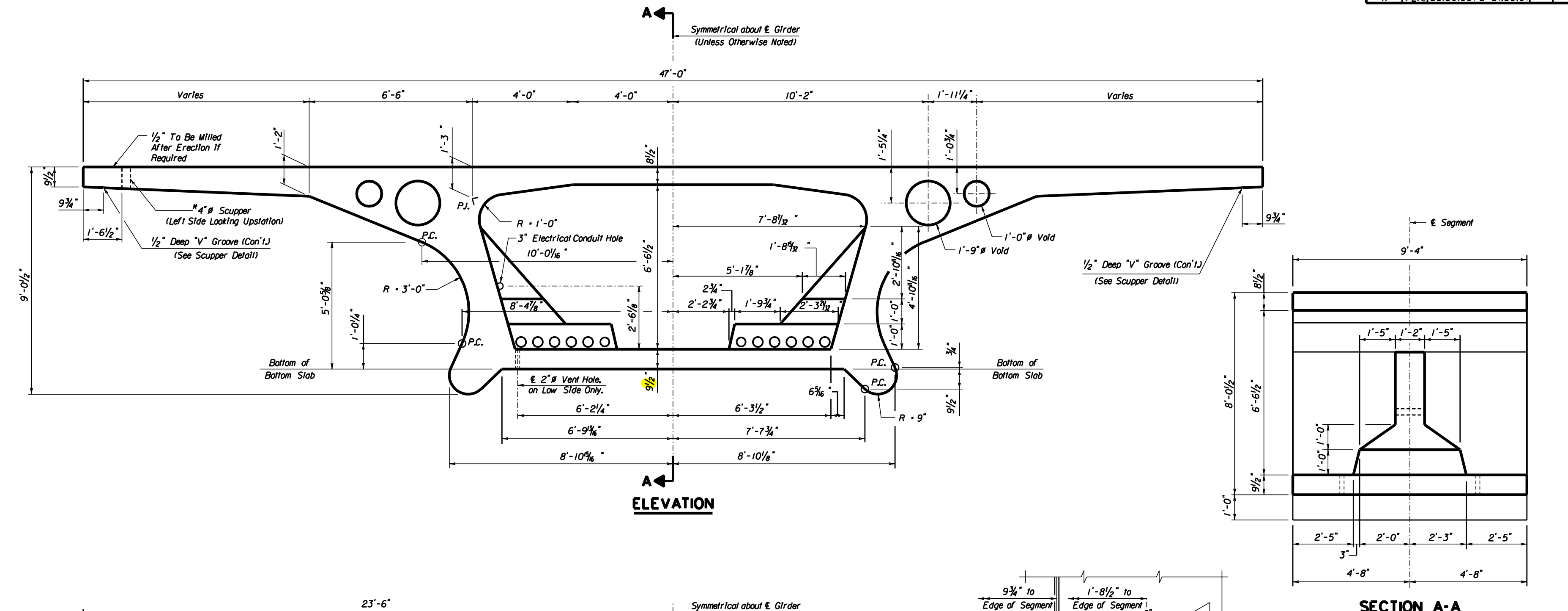
SHEET TITLE: 9'-0" TYPICAL SEGMENT REINFORCEMENT 1 (59'-0" BOX)

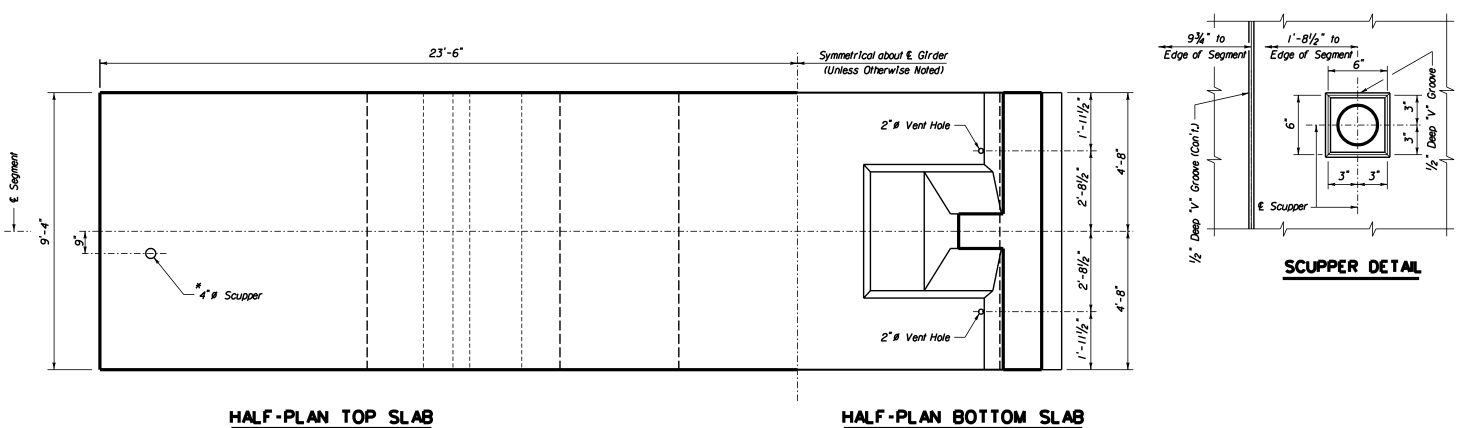
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-385

Index No.

12 DEC 2002 19:43:02





NOTES:

1. Approximate Lifting Weight = 64.6 Tons.
2. Dimensions Shown are Along ℄ Girder.
3. For Variable Segment Dimensions, see Variable Segment Dimensions Sheets.
*4. Scuppers to be Provided In Segments Indicated on Variable Segment Dimensions Sheets. Contractor must address milling of top deck when placing top of scupper pipe location.
5. For Vent Hole Location, see Variable Segment Dimension sheets.
6. For Epoxy Joint Details, see Epoxy Joint Details sheets.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	AKK	12-13-02
Designed by	WDP	12-13-02
Checked by	JMR	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD: Figg Bridge Engineers, 424 No. Calhoun Street, Tallahassee, Florida 32301. Florida Certificate of Authorization No. 5618. Jose M. Rodriguez, P.E. - P.E. No. 52532. • Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

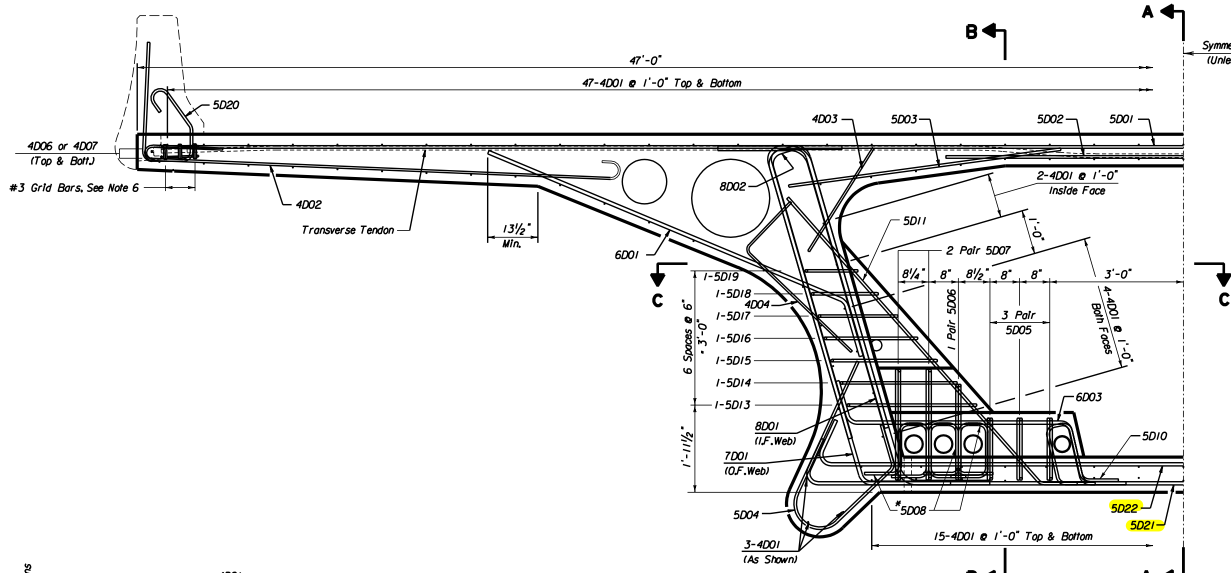
SHEET TITLE: 9'-4" DEVIATION SEGMENT DIMENSIONS (47'-0" BOX)

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

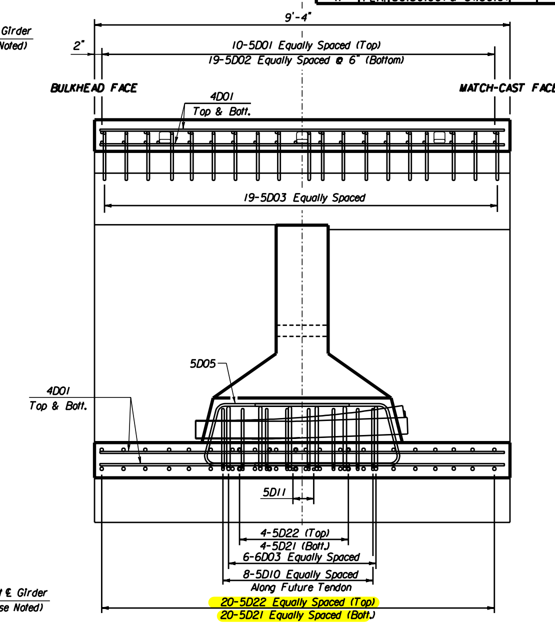
Drawing No. T-388

Index No.

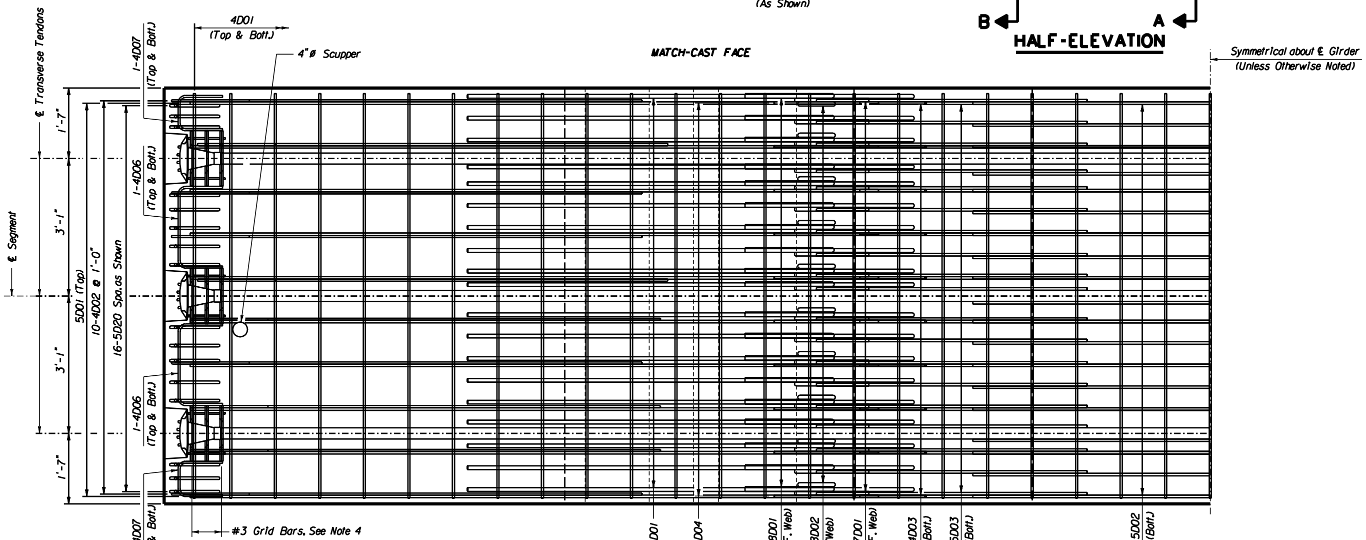
12 DEC 2002 19:43:04



HALF-ELEVATION



SECTION A-A



HALF-PLAN TOP SLAB

NOTES:

* 1. Type 'A' Block Shown.
For Type 'C' Block, Remove Tendon T3 and the 8-5D08 Along It.

2. Concrete Cover: 2½" - Top of Top Slab
1½" - All Interior Faces
2" - All Exterior Faces

3. For Deviation Block Types & Locations, See P.T. Layouts.
4. For Longitudinal P.T. Details, See P.T. Layouts.
5. For Transverse P.T. Details, see Sheet T-440.
6. #3 Grid Bars and Bar 4T01 are Detailed on Sheet T-440.
7. Space All Reinforcing Steel To Clear P.T. Tendons.
8. For Sections B-B & C-C, See Sheet T-390.
9. For Epoxy Joint Details, see Epoxy Joint Details sheets.
10. For Wing Details with Alternate Barrier, see Sheet T-369.

STRUCTURE NOS. 100800, 100806 & 100812

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	MFC	12-13-02
Checked by	GGH	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
- Tallahassee, Fl. - Denver, Co. - Philadelphia, Pa -

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY
EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

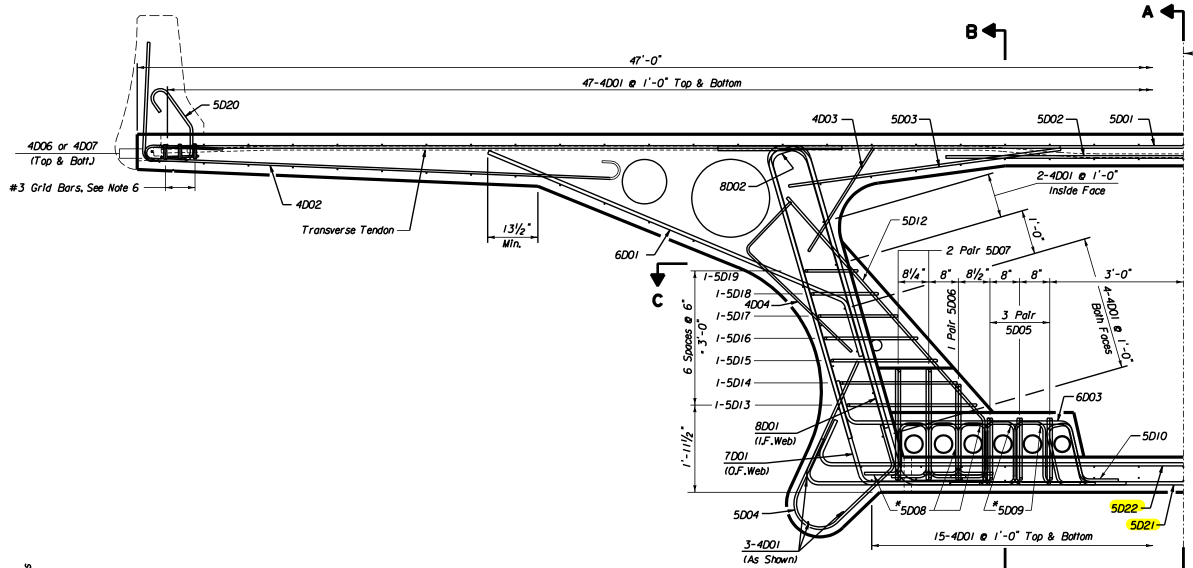
SHEET TITLE: 9'-4" DEVIATION SEGMENT REINFORCEMENT 1 - BLOCKS A & C

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-389

Index No.

12 DEC 2002 19:43:04



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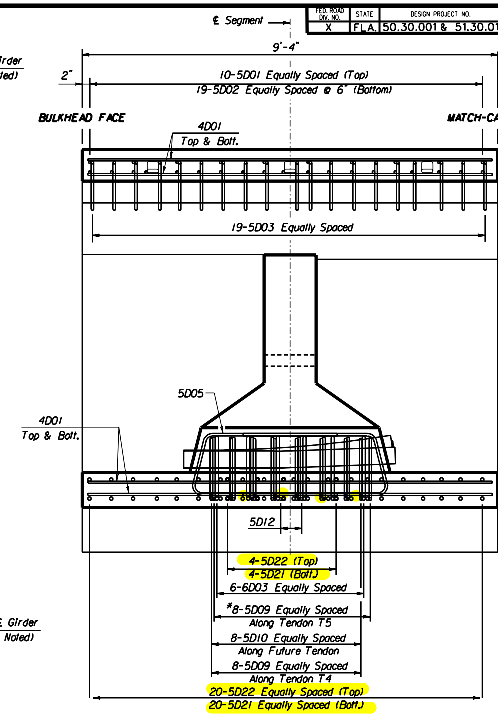
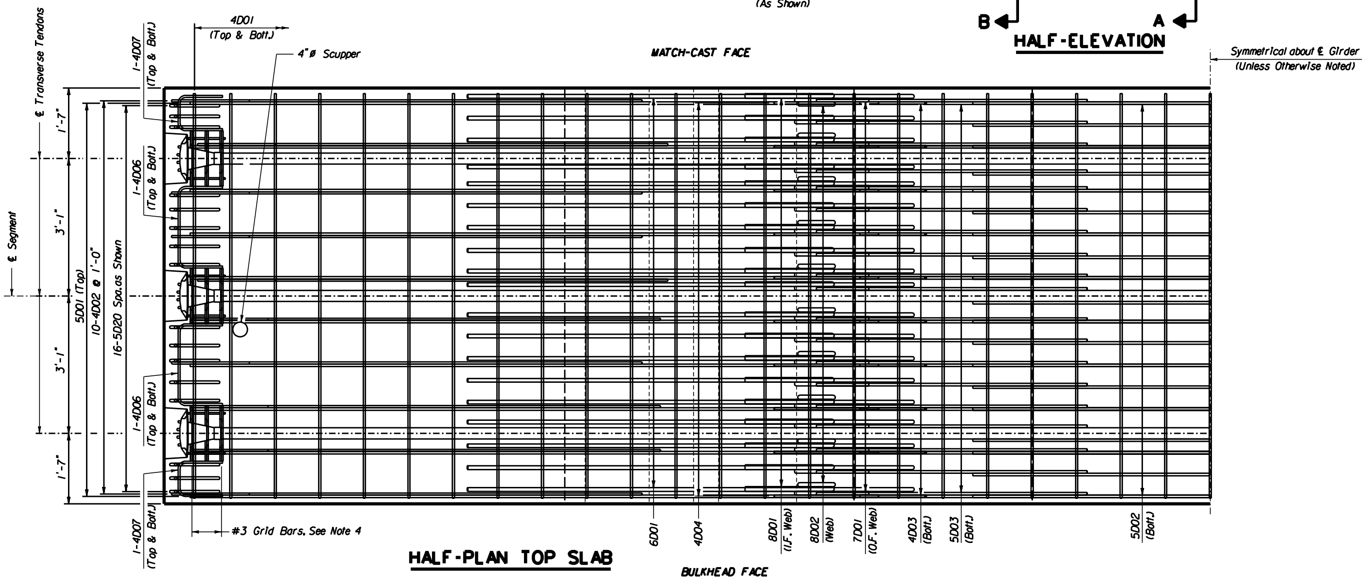


SECTION A-A



HALF-PLAN TOP SLAB

NOTES:

\# 1. Type 'T' Block Shown.
For Type 'B' Block, Remove Tendon T5 and the 8-5D09 Along It.
For Type 'D' Block, Remove Tendon T3 and the 8-5D08 Along It.
For Type 'G' Block, Remove Tendon T3 and the 8-5D08 Along It, and Remove Tendon T5 and the 8-5D09 along It.

2. Concrete Cover: 2½" - Top of Top Slab
1½" - All Interior Faces
2" - All Exterior Faces

3. For Deviation Block Types & Locations, See P.T. Layouts.

4. For Longitudinal P.T. Details, See P.T. Layouts.

5. For Transverse P.T. Details, see Sheet T-440.

6. #3 Grid Bars and Bar 4T01 are Detailed on Sheet T-440.

7. Space All Reinforcing Steel To Clear P.T. Tendons.

8. For Sections B-B & C-C, See Sheet T-392.

9. For Epoxy Joint Details, see Epoxy Joint Details sheets.

10. For Wing Details with Alternate Barrier, see Sheet T-369.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	MFC	12-13-02
Checked by	GGH	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY
EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

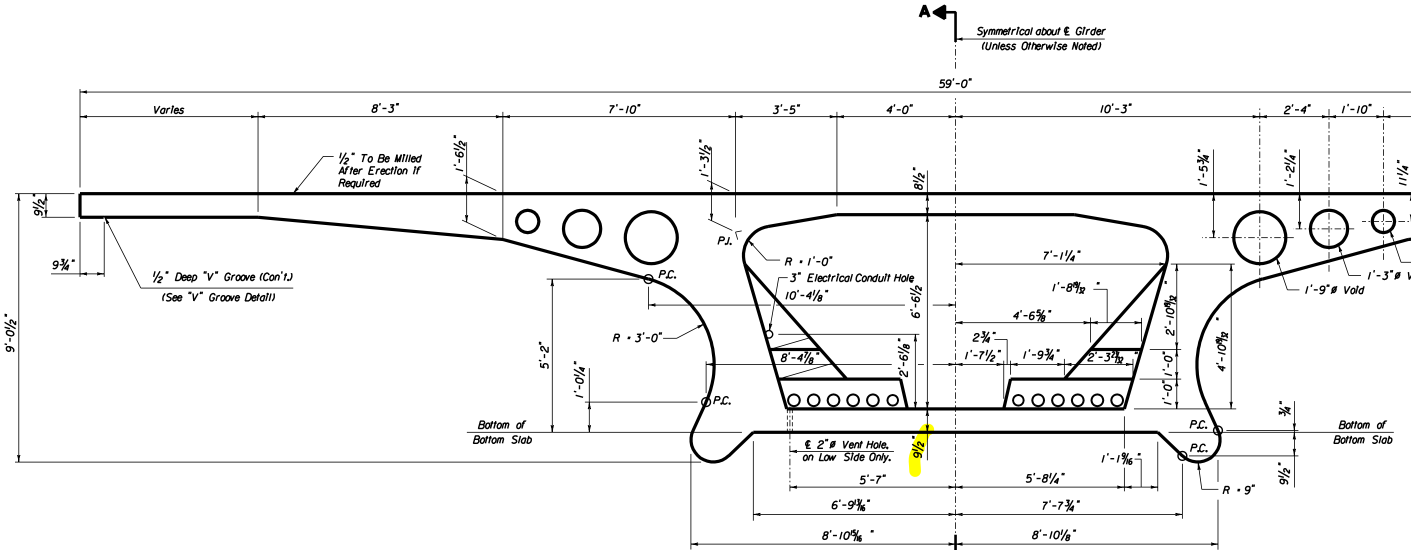
SHEET TITLE:
9'-4" DEVIATION SEGMENT
REINFORCEMENT 3-BLOCKS B, D, G & T

PROJECT NAME:
SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

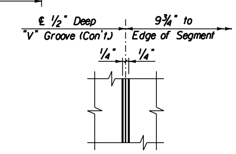
Drawing No.
T-391

Index No.

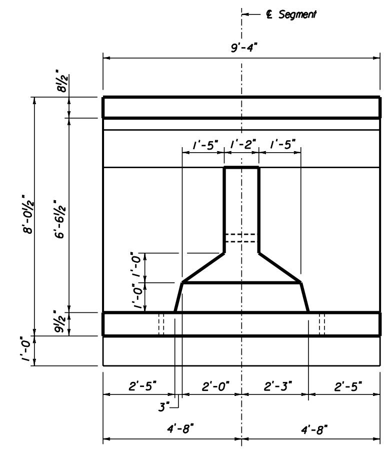
12 DEC 2002 19:43:05



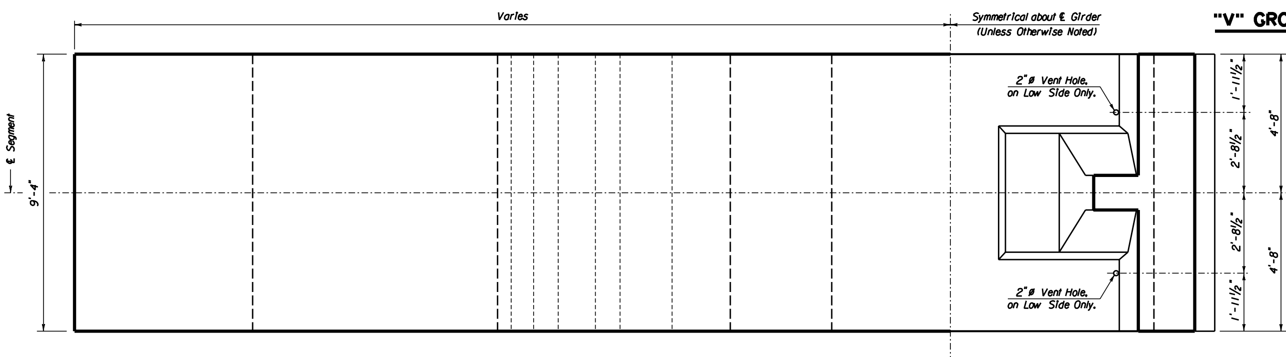
ELEVATION



"V" GROOVE DETAIL



SECTION A-A



HALF-PLAN TOP SLAB

HALF-PLAN BOTTOM SLAB

NOTES:

1. Approximate Lifting Weight = 78.1 Tons.
2. Dimensions Shown are Along ℄ Girder.
3. For Variable Segment Dimensions, see Variable Segment Dimensions Sheets.
4. For Vent Hole Location, see Variable Segment Dimensions sheets.
5. For Epoxy Joint Details, see Epoxy Joint Details sheets.

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

STRUCTURE NOS. 100800, 100806 & 100812

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	WDP	12-13-02
Checked by	JMR	12-13-02
Approved by	J. Rodriguez	

REVISIONS

Date	By	Description	Date	By	Description

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
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Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

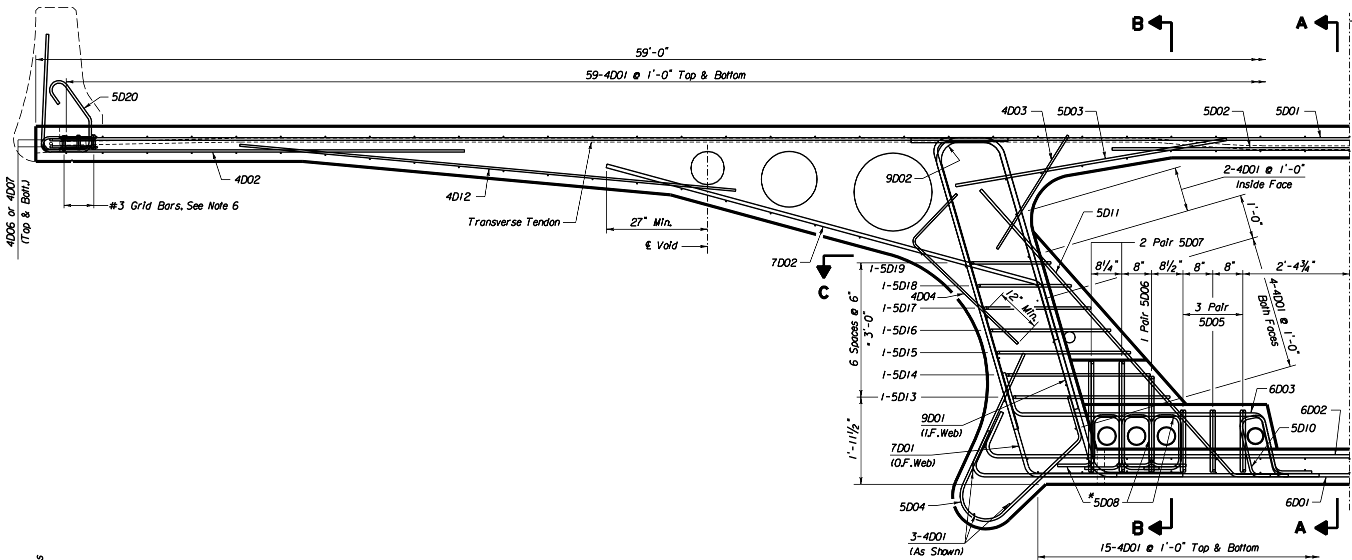
SHEET TITLE: 9'-4" DEVIATION SEGMENT DIMENSIONS (59'-0" BOX)

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

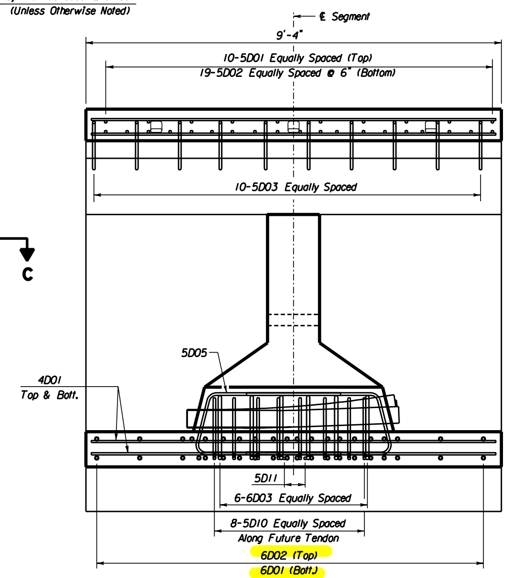
Drawing No. T-395

Index No.

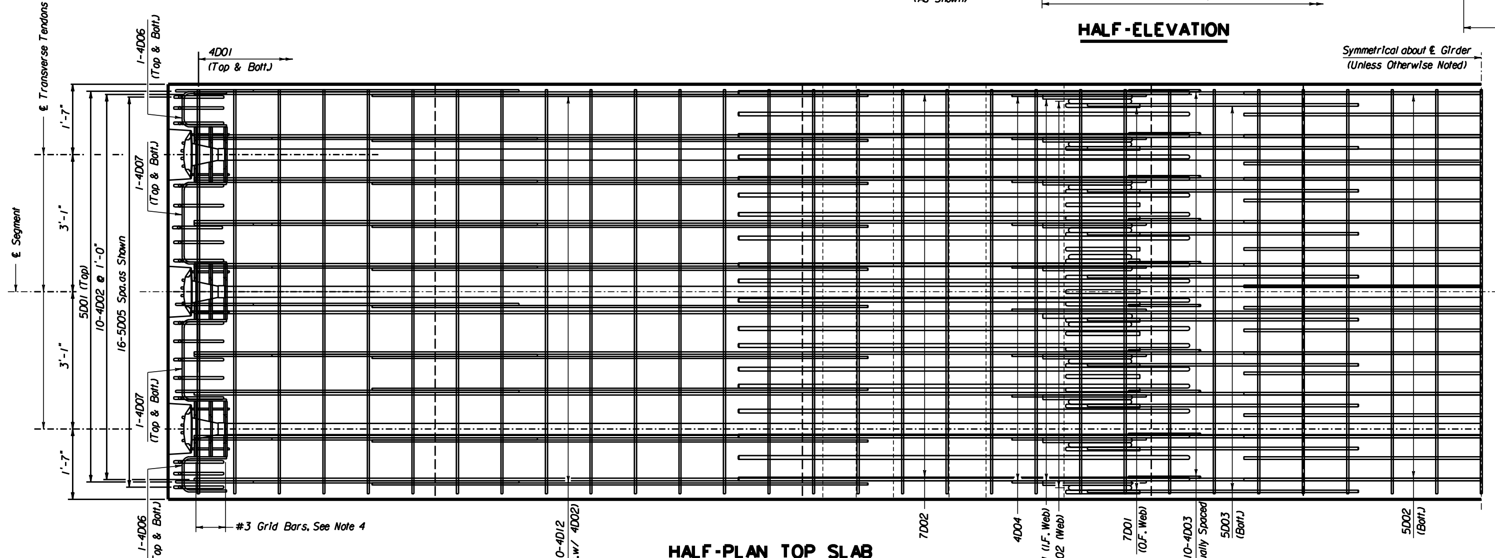
12 DEC 2002 19:43:07



HALF-ELEVATION



SECTION A-A



HALF-PLAN TOP SLAB

NOTES:

* 1. Type 'H' Block Shown. For Type 'J' Block, Remove Tendon T3 and the 8-5D08 Along It.

2. Concrete Cover: 2½" - Top of Top Slab
   1½" - All Interior Faces
   2" - All Exterior Faces
3. For Deviation Block Types & Locations, See P.T. Layouts.
4. For Longitudinal P.T. Details, See P.T. Layouts.
5. For Transverse P.T. Details, see Sheet T-441.
6. #3 Grid Bars and Bar 4T01 are Detailed on Sheet T-441.
7. Space All Reinforcing Steel To Clear P.T. Tendons.
8. For Sections B-B & C-C, See Sheet T-397.
9. For Epoxy Joint Details, see Epoxy Joint Details sheets.
10. For Wing Details with Alternate Barrier, see Sheet T-373.

STRUCTURE NOS. 100800, 100806 & 100812

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	MFC	12-13-02
Checked by	GGH	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
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Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: 9'-4" DEVIATION SEGMENT REINFORCEMENT 7 - BLOCKS H & J

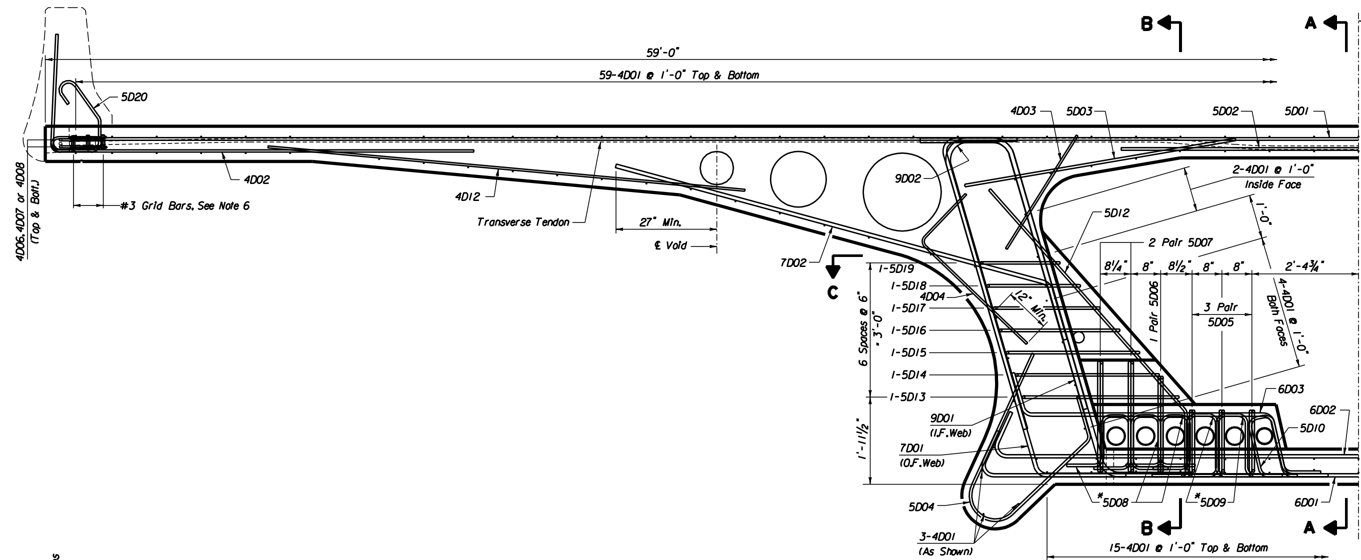
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-396

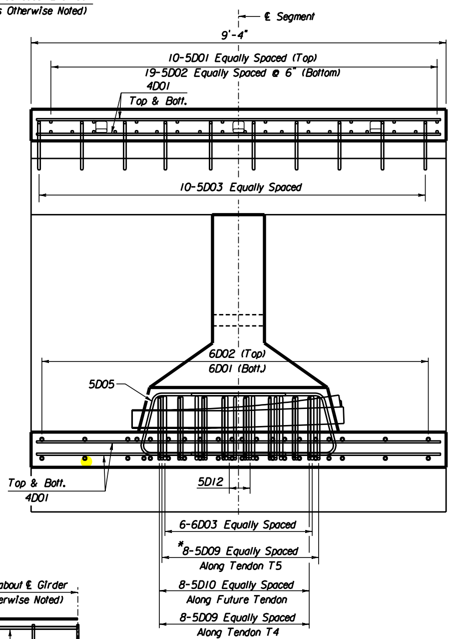
Index No.

12 DEC 2002 19:43:08

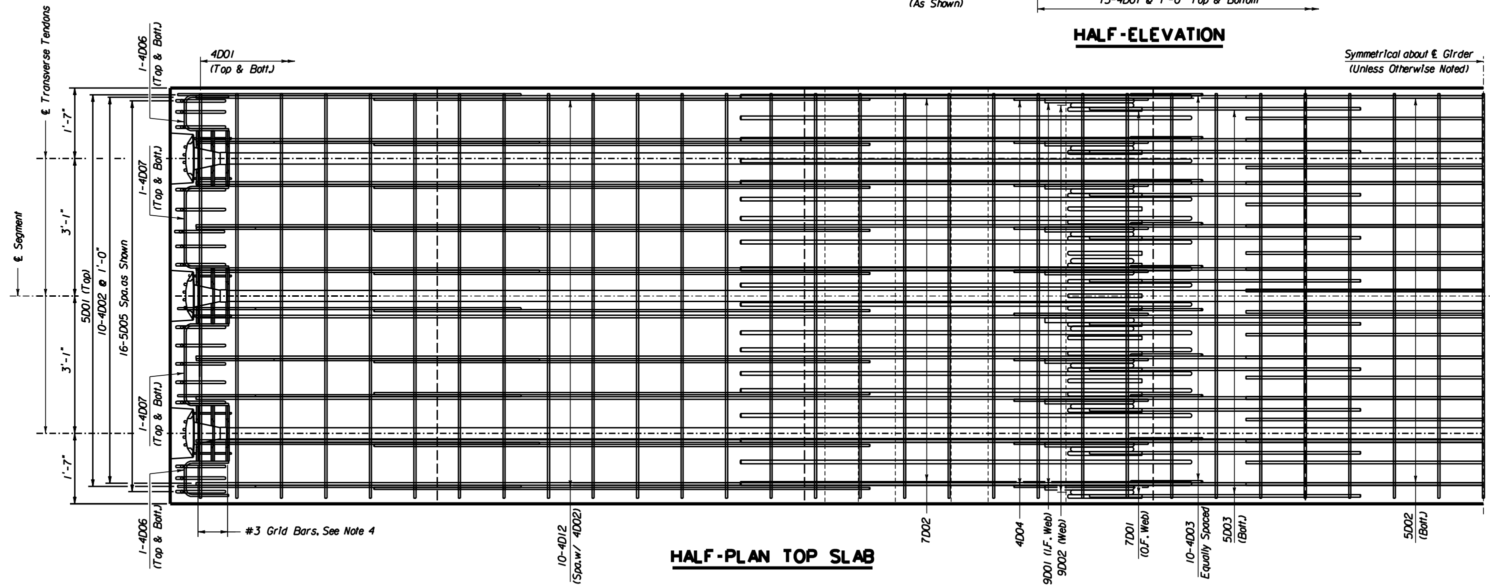
FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		



HALF-ELEVATION



SECTION A-A



HALF-PLAN TOP SLAB

NOTES:

* 1. Type 'I' Block Shown.
For Type 'K' Block, Remove Tendon T3 and the 8-5D08 Along It.
For Type 'O' Block, Remove Tendon T5 and the 8-5D09 along It.
For Type 'Q' Block, Remove Tendon T1 and the 8-5D08 along It, and Remove Tendon T5 and the 8-5D09 along It.

2. Concrete Cover: 2½" - Top of Top Slab
1½" - All Interior Faces
2" - All Exterior Faces

3. For Deviation Block Types & Locations, See P.T. Layouts.

4. For Longitudinal P.T. Details, See P.T. Layouts.

5. For Transverse P.T. Details, see Sheet T-441.

6. #3 Grid Bars and Bar 4T01 are Detailed on Sheet T-441.

7. Space All Reinforcing Steel To Clear P.T. Tendons.

8. For Sections B-B & C-C, See Sheet T-399.

9. For Epoxy Joint Details, see Epoxy Joint Details sheets.

10. For Wing Details with Alternate Barrier, see Sheet T-373.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	MFC	12-13-02
Checked by	GGH	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa.

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

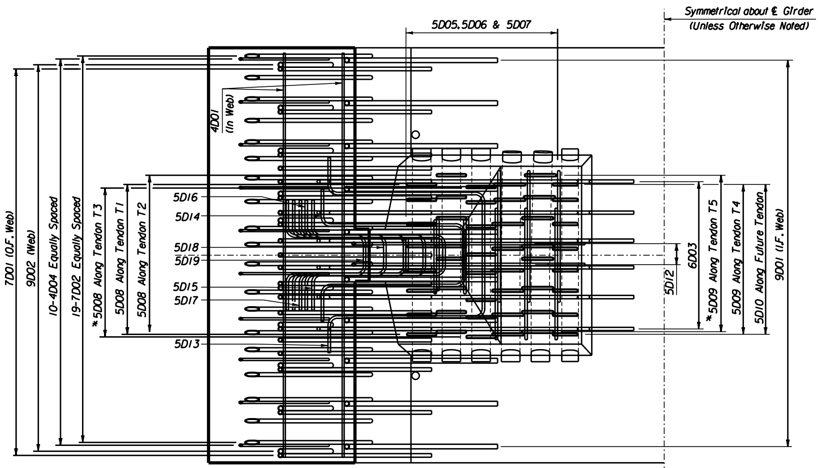
SHEET TITLE: 9'-4" DEVIATION SEGMENT REINFORCEMENT 9 - BLOCKS I, K, O & Q

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

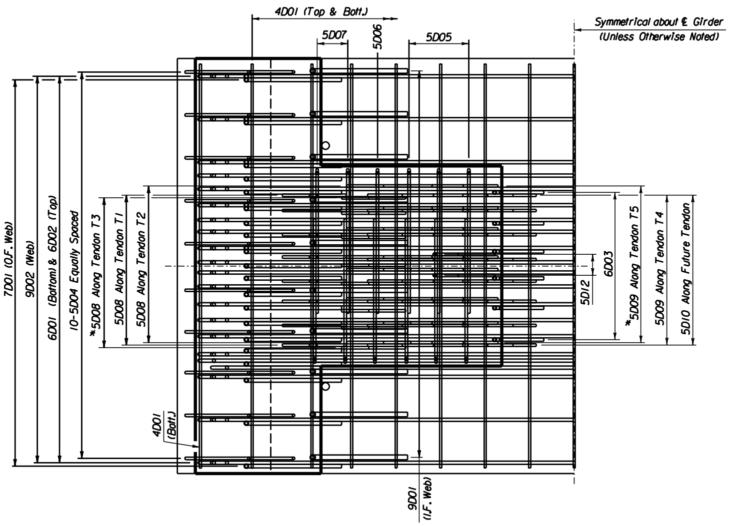
Drawing No. T-398

Index No.

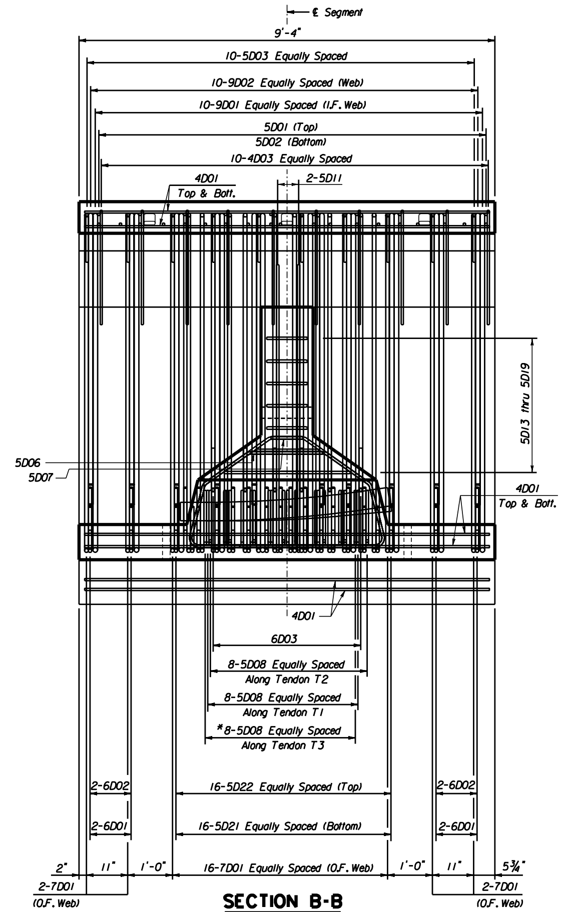
12 DEC 2002 19:43:09



SECTION C-C



HALF-PLAN BOTTOM SLAB



SECTION B-B

NOTES:

* 1. Type 'I' Block Shown.
For Type 'K' Block, Remove Tendon T3 and the 8-5D08 Along It.
For Type 'O' Block, Remove Tendon T5 and the 8-5D09 along It.
For Type 'Q' Block, Remove Tendon T1 and the 8-5D08 along It, and Remove Tendon T5 and the 8-5D09 along It.

2. Concrete Cover: 2½" - Top of Top Slab
1½" - All Interior Faces
2" - All Exterior Faces

3. For Deviation Block Types & Locations, See P.T. Layouts.

4. For Longitudinal P.T. Details, See P.T. Layouts.

5. Space All Reinforcing Steel To Clear P.T. Tendons.

6. For Epoxy Joint Details, see Epoxy Joint Details sheets.

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	MFC	12-13-02
Checked by	GGH	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

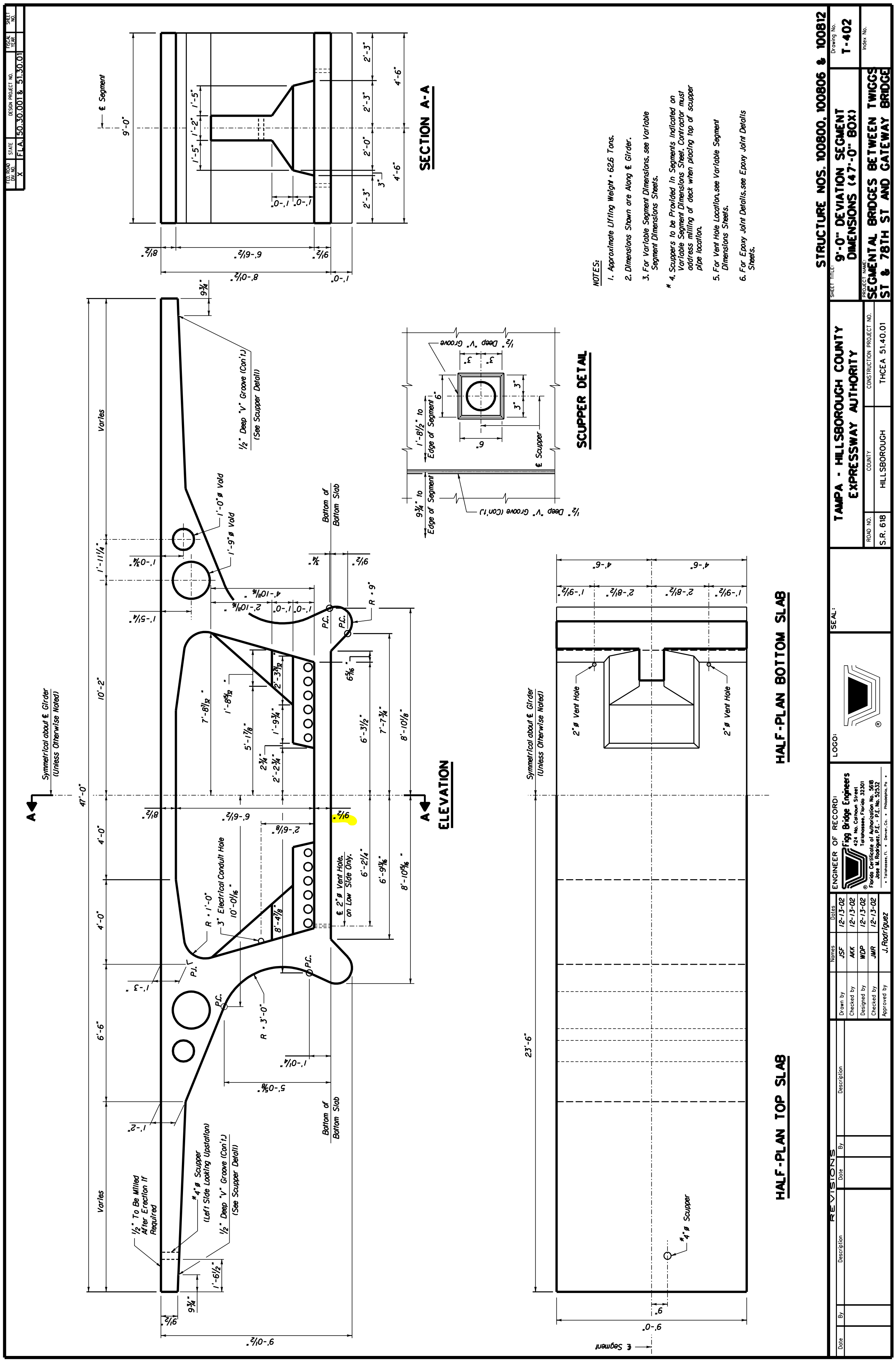
SHEET TITLE: 9'-4" DEVIATION SEGMENT REINFORCEMENT 10 - BLOCKS I, K, O & Q

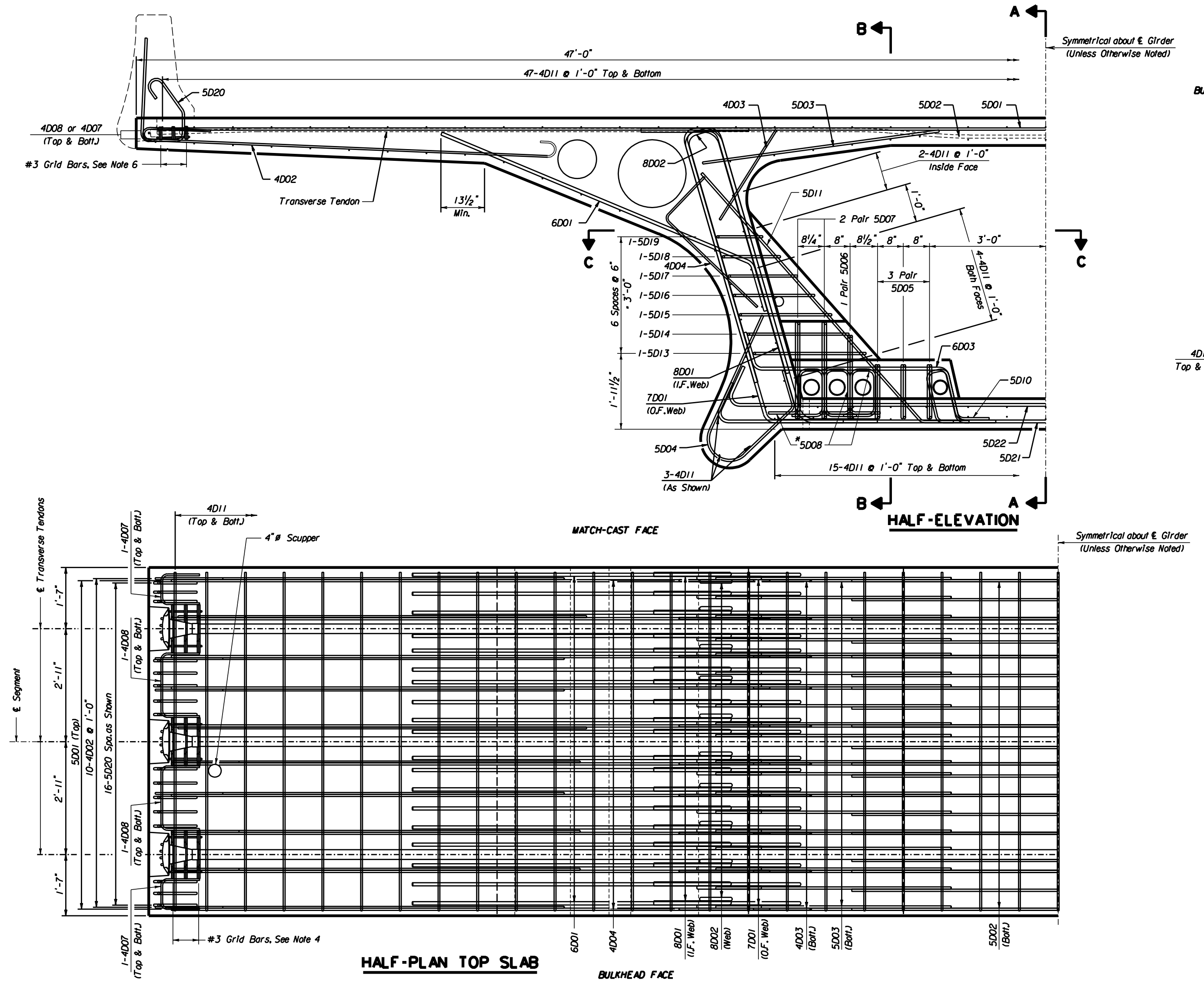
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

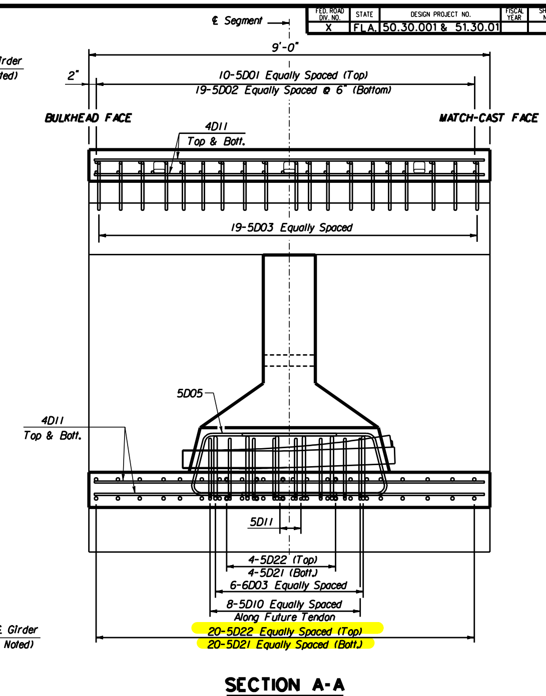
Drawing No. T-399

Index No.

12 DEC 2002 19:43:09


SECTION A-A
ELEVATION
SCUPPER DETAIL
HALF-PLAN TOP SLAB
HALF-PLAN BOTTOM SLAB
Symmetrical about ℄ Girder (Unless Otherwise Noted)
NOTES:
1. Approximate Lifting Weight = 62.6 Tons.
2. Dimensions Shown are Along ℄ Girder.
3. For Variable Segment Dimensions, see Variable Segment Dimensions Sheets.
* 4. Scuppers to be Provided in Segments Indicated on Variable Segment Dimensions Sheet. Contractor must address milling of deck when placing top of scupper pipe location.
5. For Vent Hole Location, see Variable Segment Dimensions Sheets.
6. For Epoxy Joint Details, see Epoxy Joint Details Sheets.
STRUCTURE NOS. 100800, 100806 & 100812
TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY
ROAD NO. S.R. 618
COUNTY HILLSBOROUGH
CONSTRUCTION PROJECT NO. THCEA 51.40.01
SHEET TITLE: 9'-0" DEVIATION SEGMENT DIMENSIONS (47'-0" BOX)
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE
Drawing No. T-402
Index No.
ENGINEER OF RECORD: Figg Bridge Engineers
FLA 50.30.001 & 51.30.01
12 DEC 2002





NOTES:

\# 1. Type 'E' Block Shown. For Type 'R' Block, Remove Tendon T3 and the 8-5D08 Along It.

2. Concrete Cover: 2½" • Top of Top Slab; 1½" • All Interior Faces; 2" • All Exterior Faces

3. For Deviation Block Types & Locations, See P.T. Layouts.

4. For Longitudinal P.T. Details, See P.T. Layouts.

5. For Transverse P.T. Details, see Sheet T-440.

6. #3 Grid Bars and Bar 4T01 are Detailed on Sheet T-440.

7. Space All Reinforcing Steel To Clear P.T. Tendons.

8. For Sections B-B & C-C, See Sheet T-404.

9. For Epoxy Joint Details, see Epoxy Joint Details sheets.

10. For Wing Details with Alternate Barrier, see Sheet T-369.

STRUCTURE NOS. 100800, 100806 & 100812

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	MFC	12-13-02
Checked by	GGH	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD: Figg Bridge Engineers, 424 No. Calhoun Street, Tallahassee, Florida 32301. Florida Certificate of Authorization No. 5618. Jose M. Rodriguez, P.E. - P.E. No. 52532. • Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

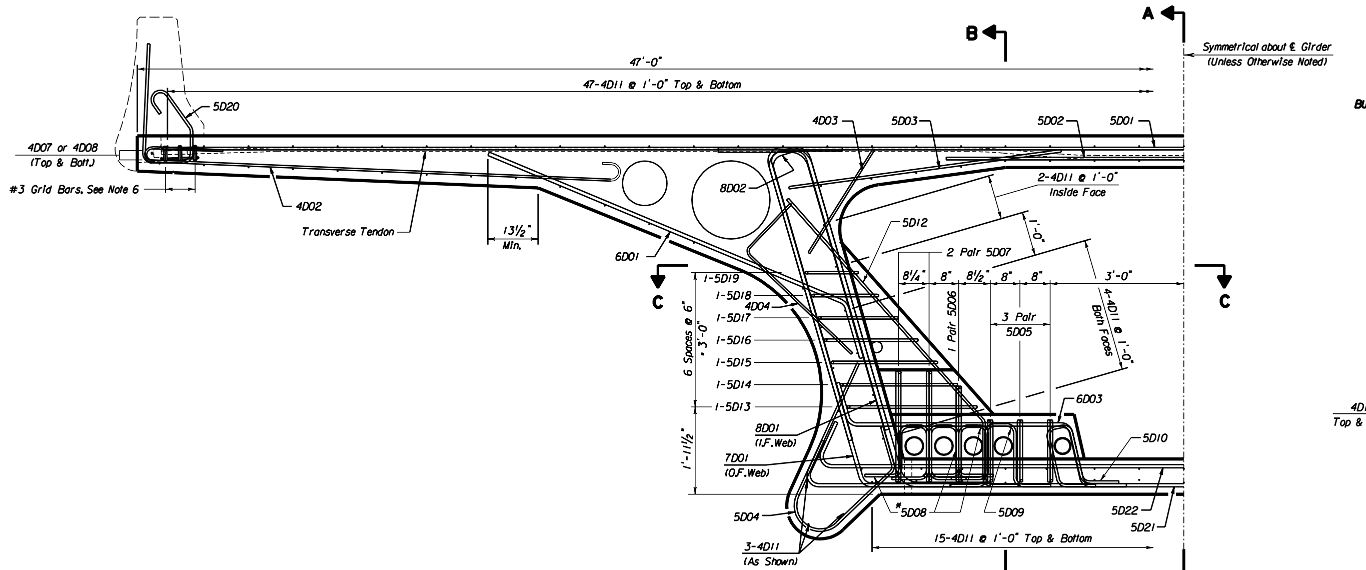
ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: 9'-0" DEVIATION SEGMENT REINFORCEMENT 1 - BLOCKS E & R

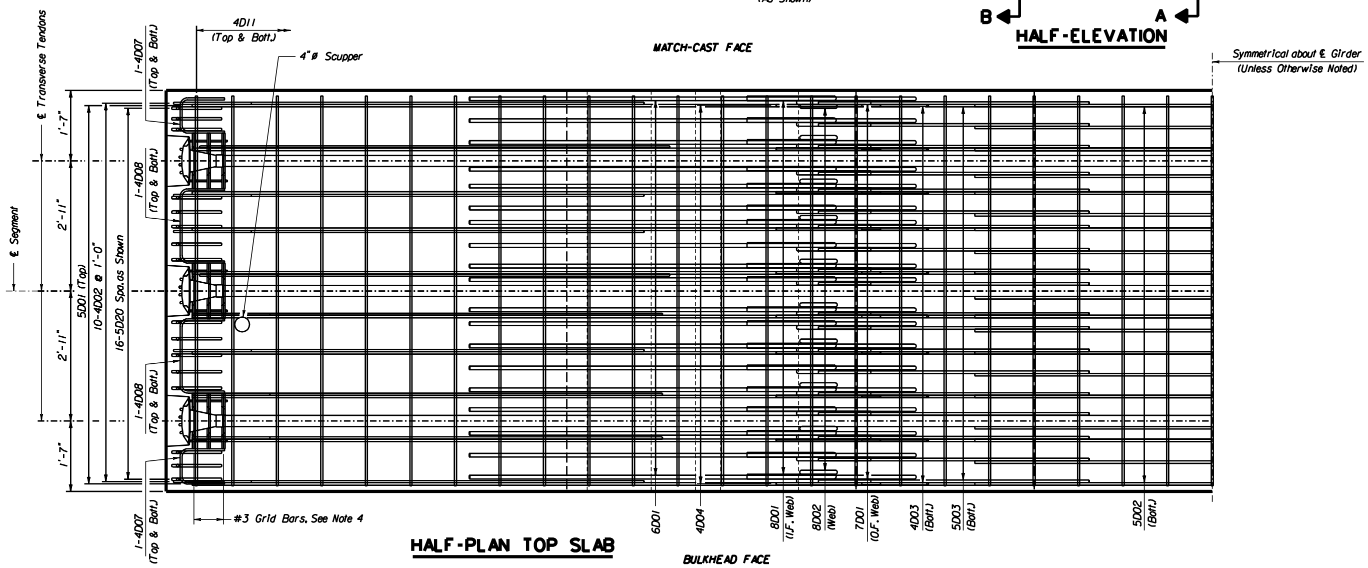
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-403

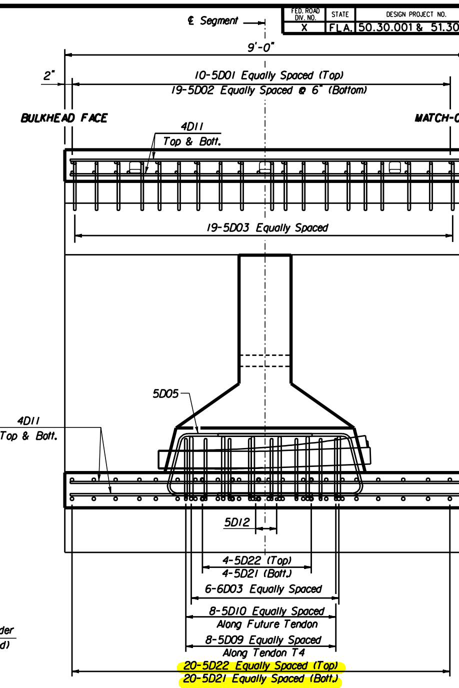
12 DEC 2002 19:43:11



HALF-ELEVATION



HALF-PLAN TOP SLAB



SECTION A-A

NOTES:

* 1. Type 'F' Block Shown.
For Type 'S' Block, Remove Tendon T3 and the 8-5D08 Along It.

2. Concrete Cover: 2½" = Top of Top Slab
1½" = All Interior Faces
2" = All Exterior Faces

3. For Deviation Block Types & Locations, See P.T. Layouts.
4. For Longitudinal P.T. Details, See P.T. Layouts.
5. For Transverse P.T. Details, see Sheet T-440.
6. #3 Grid Bars and Bar 4T01 are Detailed on Sheet T-440.
7. Space All Reinforcing Steel To Clear P.T. Tendons.
8. For Sections B-B & C-C, See Sheet T-406.
9. For Epoxy Joint Details, see Epoxy Joint Details sheets.
10. For Wing Details with Alternate Barrier, see Sheet T-369.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	MFC	12-13-02
Checked by	GGH	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: 9'-0" DEVIATION SEGMENT REINFORCEMENT 3 - BLOCKS F & S

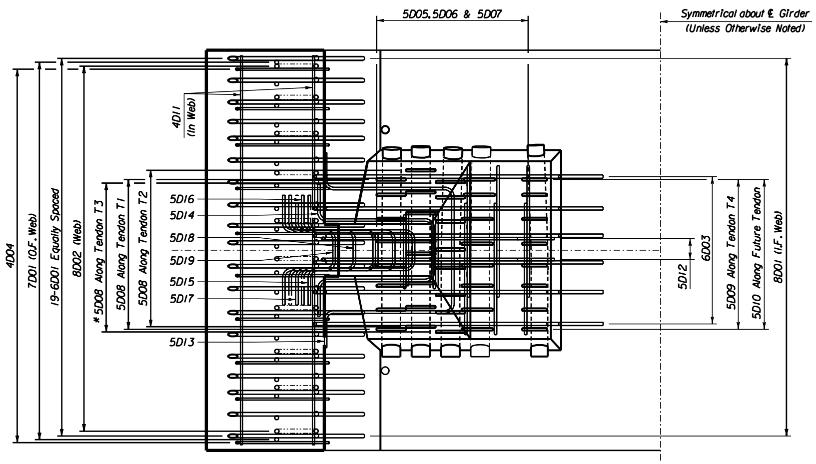
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-405

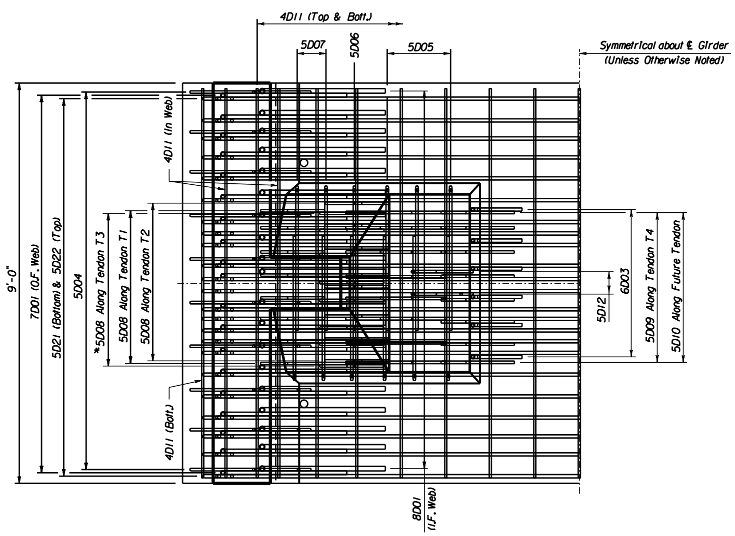
Index No.

12 DEC 2002 19:43:13

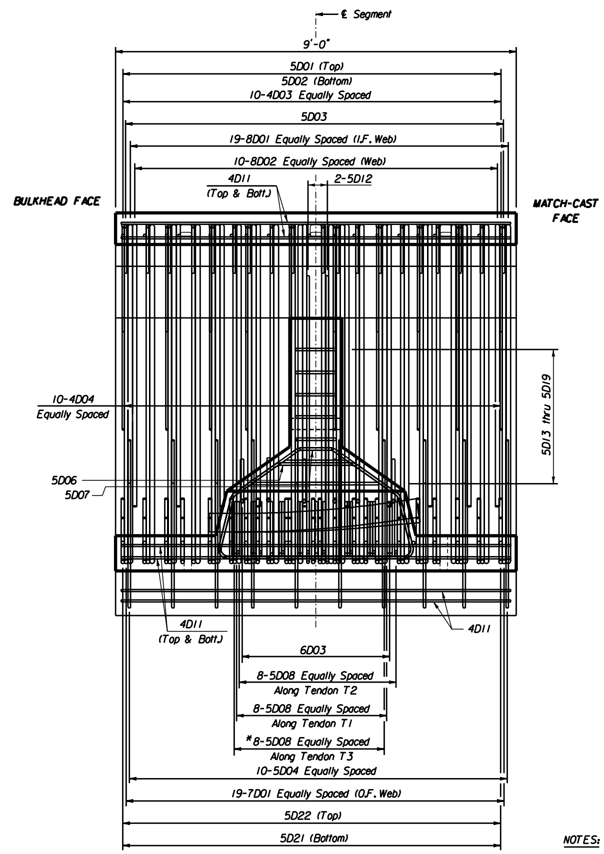
FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		



SECTION C-C



HALF-PLAN BOTTOM SLAB



SECTION B-B

NOTES:

* 1. Type 'F' Block Shown.
For Type 'S' Block, Remove Tendon T3 and the 8-5D08 Along It.

2. Concrete Cover: 2½" - Top of Top Slab
1½" - All Interior Faces
2" - All Exterior Faces

3. For Deviation Block Types & Locations, See P.T. Layouts.

4. For Longitudinal P.T. Details, See P.T. Layouts.

5. Space All Reinforcing Steel To Clear P.T. Tendons.

6. For Epoxy Joint Details, see Epoxy Joint Details sheets.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	MFC	12-13-02
Checked by	GGH	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

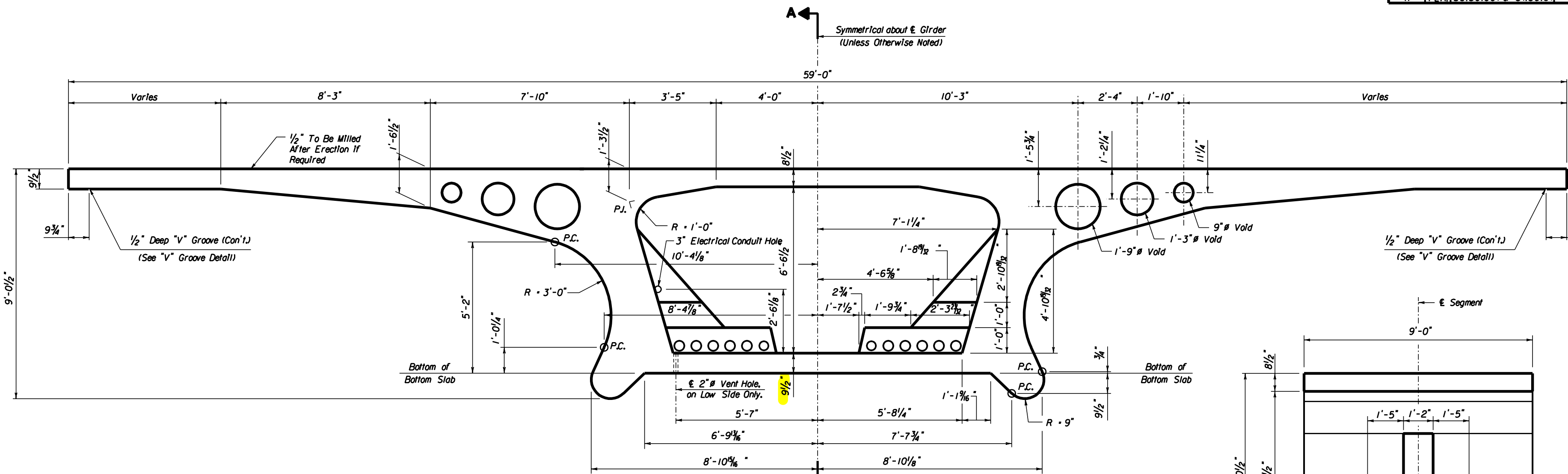
SHEET TITLE: 9'-0" DEVIATION SEGMENT REINFORCEMENT 4 - BLOCK F & S

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

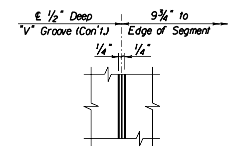
Drawing No. T-406

Index No.

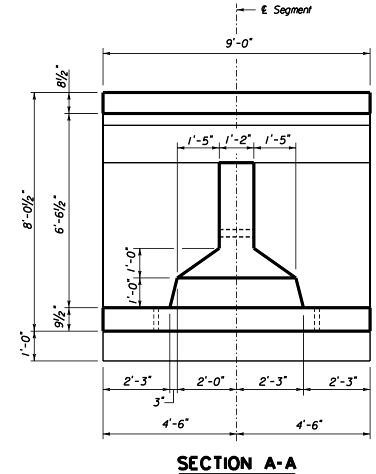
12 DEC 2002 19:43:13



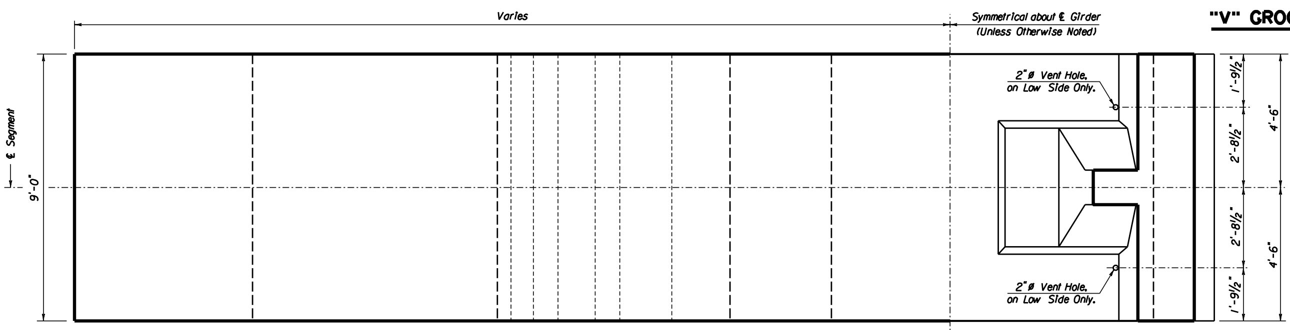
ELEVATION



"V" GROOVE DETAIL



SECTION A-A



HALF-PLAN TOP SLAB

HALF-PLAN BOTTOM SLAB

NOTES:

1. Approximate Lifting Weight = 75.3 Tons.
2. Dimensions Shown are Along ℄ Girder.
3. For Variable Segment Dimensions, see Variable Segment Dimensions Sheets.
4. For Vent Hole Location, see Variable Segment Dimensions Sheets.
5. For Epoxy Joint Details, see Epoxy Joint Details Sheets.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	WDP	12-13-02
Checked by	JMR	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

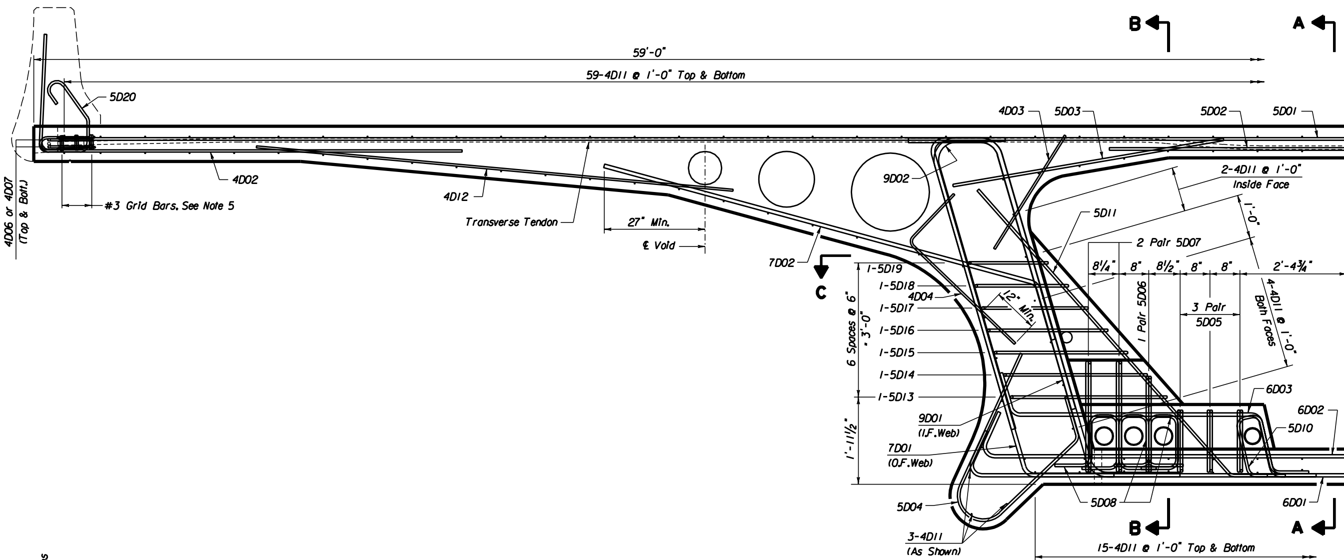
SHEET TITLE: 9'-0" DEVIATION SEGMENT DIMENSIONS (59'-0" BOX)

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

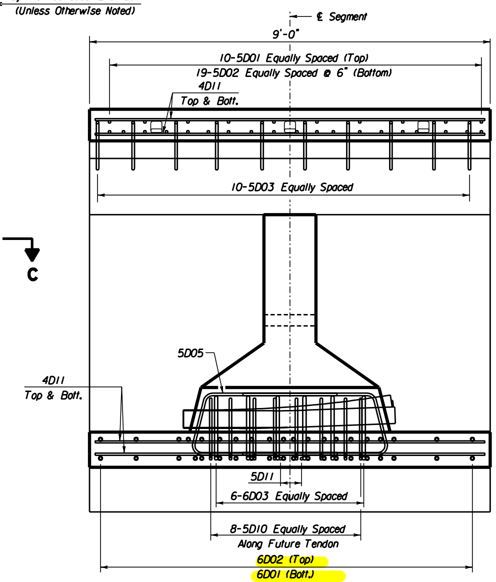
Drawing No. T-408

Index No.

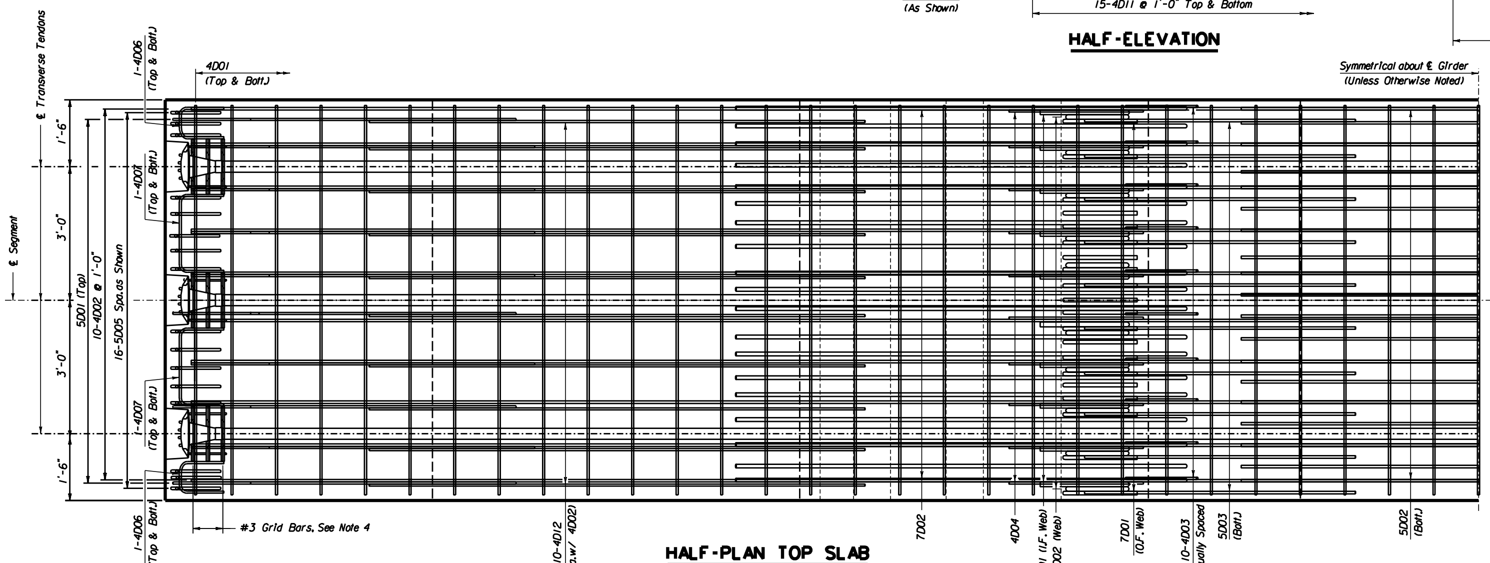
12 DEC 2002 19:43:14



HALF-ELEVATION



SECTION A-A



HALF-PLAN TOP SLAB

NOTES:

1. Concrete Cover: 2½" = Top of Top Slab
1½" = All Interior Faces
2" = All Exterior Faces
2. For Deviation Block Types & Locations, See P.T. Layouts.
3. For Longitudinal P.T. Details, See P.T. Layouts.
4. For Transverse P.T. Details, see Sheet T-441.
5. #3 Grid Bars and Bar 4T01 are Detailed on Sheet T-441.
6. Space All Reinforcing Steel To Clear P.T. Tendons.
7. For Sections B-B & C-C, See Sheet T-410.
8. For Epoxy Joint Details, see Epoxy Joint Details sheets.
9. For Wing Details with Alternate Barrier, see Sheet T-373.

STRUCTURE NOS. 100800, 100806 & 100812

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JSF	12-13-02
Checked by	MDR	12-13-02
Designed by	MFC	12-13-02
Checked by	GGH	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: 9'-0" DEVIATION SEGMENT REINFORCEMENT 6 - BLOCK L

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-409

Index No.

12 DEC 2002 19:43:15

STAAD Analysis

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*           Bentley Systems, Inc.                  *
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*           Time=    12:29: 7                      *
*                                                  *
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     3. ENGINEER DATE 19-JUN-18
     4. JOB NAME STRADDLE BENT - MIDDLE
     5. JOB CLIENT THEA
     6. JOB NO 148872000
     7. JOB REV 3
     8. ENGINEER NAME IERM
     9. END JOB INFORMATION
    10. INPUT WIDTH 79
    11. UNIT FEET KIP
    12. JOINT COORDINATES
    13. 1 0 0 0; 2 8 0 0; 3 10 0 0; 4 12 0 0; 5 20 0 0; 6 8 0 -1.5; 7 12 0 -1.5
    14. 8 0 0 -2; 9 8 0 -2; 10 10 0 -2; 11 12 0 -2; 12 20 0 -2; 13 8 3 -1.5
    15. 14 12 3 -1.5; 15 12 3 -0.5; 16 12 0 -0.5; 17 8 0 -0.5; 18 8 3 -0.5; 19 1 0 0
    16. 20 1 0 -2; 21 9.5 0 0; 22 10.5 0 0; 23 9.5 0 -2; 24 10.5 0 -2; 25 19 0 0
    17. 26 19 0 -2
    18. MEMBER INCIDENCES
    19. 1 1 19; 2 2 21; 3 3 22; 4 4 25; 5 2 17; 6 6 9; 7 4 16; 8 7 11; 9 8 20; 10 9 23
    20. 11 10 24; 12 11 26; 13 6 13; 14 7 14; 15 18 17; 16 15 16; 17 16 7; 18 17 6
    21. 19 19 2; 20 20 9; 21 21 3; 22 22 4; 23 23 10; 24 24 11; 25 25 5; 26 26 12
    22. ELEMENT INCIDENCES SHELL
    23. 27 1 8 20 19; 28 21 23 24 22; 29 25 26 12 5
    24. ELEMENT PROPERTY
    25. 27 TO 29 THICKNESS 0.0208333
    26. DEFINE MATERIAL START
    27. ISOTROPIC STEEL
    28. E 4.176E+006
    29. POISSON 0.3
    30. DENSITY 0.489024
    31. ALPHA 6E-006
    32. DAMP 0.03
    33. TYPE STEEL
    34. STRENGTH FY 5184 FU 8352 RY 1.5 RT 1.2
    35. ISOTROPIC A500-GR.
    36. E 4.176E+006
    37. POISSON 0.3
    38. DENSITY 0.49
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39. ALPHA 6E-006
40. DAMP 0.03
41. G 1.6128E-006
42. TYPE STEEL
43. STRENGTH FY 6624 FU 8352 RY 1.1 RT 1.2
44. END DEFINE MATERIAL
45. MEMBER PROPERTY AMERICAN
46. 1 TO 26 TABLE ST HSST3X3X0.188
47. CONSTANTS
48. MATERIAL STEEL MEMB 27 TO 29
49. MATERIAL A500-GR. MEMB 1 TO 26
50. SUPPORTS
51. 13 TO 15 18 FIXED
52. LOAD 1 LOADTYPE DEAD  TITLE DL
53. SELFWEIGHT Y -1
54. JOINT LOAD
55. 1 5 8 12 FY -0.015
56. 21 TO 24 FY -0.006
57. LOAD 2 LOADTYPE WIND  TITLE W1
58. JOINT LOAD
59. 1 5 8 12 FZ -0.0522
60. 1 5 8 12 MX -0.0324
61. 1 5 8 12 FX 0.0277
62. 1 5 8 12 MZ -0.017
63. LOAD 3 LOADTYPE WIND  TITLE W2
64. JOINT LOAD
65. 21 TO 24 FZ -0.007325
66. 21 TO 24 MX -0.004325
67. 21 TO 24 FX 0.006925
68. 21 TO 24 MZ -0.003975
69. LOAD 4 LOADTYPE WIND  TITLE 0.75W3
70. JOINT LOAD
71. 1 5 8 12 FZ -0.039
72. 1 5 8 12 MX -0.024
73. 1 5 8 12 FX 0.021
74. 1 5 8 12 MZ -0.013
75. 21 TO 24 FZ -0.00549
76. 21 TO 24 MX -0.00324
77. 21 TO 24 FX 0.00519
78. 21 TO 24 MZ 0.00298
79. LOAD COMB 5 1.25DL
80. 1 1.25
81. LOAD COMB 6 1.1DL+1.0W1
82. 1 1.1 2 1.0
83. LOAD COMB 7 1.1DL+1.0W2
84. 1 1.1 3 1.0
85. PERFORM ANALYSIS PRINT ALL
```

```
        P R O B L E M   S T A T I S T I C S
        -----------------------------------

  NUMBER OF JOINTS         26  NUMBER OF MEMBERS      26
  NUMBER OF PLATES          3  NUMBER OF SOLIDS        0
  NUMBER OF SURFACES        0  NUMBER OF SUPPORTS      4

      SOLVER USED IS THE OUT-OF-CORE BASIC SOLVER

  ORIGINAL/FINAL BAND-WIDTH=    21/     6/     42 DOF
TOTAL      PRIMARY LOAD CASES =     4, TOTAL DEGREES OF FREEDOM =     132
TOTAL LOAD COMBINATION  CASES =     3  SO FAR.
  SIZE OF STIFFNESS MATRIX =        6 DOUBLE  KILO-WORDS
  REQRD/AVAIL. DISK SPACE  =     12.1/      0.0 MB
```

LOADING 1 LOADTYPE DEAD TITLE DL

SELFWEIGHT Y -1.000

ACTUAL WEIGHT OF THE STRUCTURE = 0.421 KIP

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00	-0.01	0.00	0.00	0.00	0.00
5	0.00	-0.01	0.00	0.00	0.00	0.00
8	0.00	-0.01	0.00	0.00	0.00	0.00
12	0.00	-0.01	0.00	0.00	0.00	0.00
21	0.00	-0.01	0.00	0.00	0.00	0.00
22	0.00	-0.01	0.00	0.00	0.00	0.00
23	0.00	-0.01	0.00	0.00	0.00	0.00
24	0.00	-0.01	0.00	0.00	0.00	0.00

LOADING 2 LOADTYPE WIND TITLE W1

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00	0.00	-0.05	0.00	0.00	0.00
5	0.00	0.00	-0.05	0.00	0.00	0.00
8	0.00	0.00	-0.05	0.00	0.00	0.00
12	0.00	0.00	-0.05	0.00	0.00	0.00
1	0.00	0.00	0.00	-0.03	0.00	0.00
5	0.00	0.00	0.00	-0.03	0.00	0.00
8	0.00	0.00	0.00	-0.03	0.00	0.00
12	0.00	0.00	0.00	-0.03	0.00	0.00
1	0.03	0.00	0.00	0.00	0.00	0.00
5	0.03	0.00	0.00	0.00	0.00	0.00
8	0.03	0.00	0.00	0.00	0.00	0.00
12	0.03	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	-0.02
5	0.00	0.00	0.00	0.00	0.00	-0.02
8	0.00	0.00	0.00	0.00	0.00	-0.02
12	0.00	0.00	0.00	0.00	0.00	-0.02

LOADING 3 LOADTYPE WIND TITLE W2

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
21	0.00	0.00	-0.01	0.00	0.00	0.00
22	0.00	0.00	-0.01	0.00	0.00	0.00
23	0.00	0.00	-0.01	0.00	0.00	0.00
24	0.00	0.00	-0.01	0.00	0.00	0.00
21	0.00	0.00	0.00	-0.00	0.00	0.00
22	0.00	0.00	0.00	-0.00	0.00	0.00
23	0.00	0.00	0.00	-0.00	0.00	0.00
24	0.00	0.00	0.00	-0.00	0.00	0.00
21	0.01	0.00	0.00	0.00	0.00	0.00
22	0.01	0.00	0.00	0.00	0.00	0.00
23	0.01	0.00	0.00	0.00	0.00	0.00
24	0.01	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	-0.00
22	0.00	0.00	0.00	0.00	0.00	-0.00
23	0.00	0.00	0.00	0.00	0.00	-0.00
24	0.00	0.00	0.00	0.00	0.00	-0.00

LOADING 4 LOADTYPE WIND TITLE 0.75W3

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00	0.00	-0.04	0.00	0.00	0.00
5	0.00	0.00	-0.04	0.00	0.00	0.00
8	0.00	0.00	-0.04	0.00	0.00	0.00
12	0.00	0.00	-0.04	0.00	0.00	0.00
1	0.00	0.00	0.00	-0.02	0.00	0.00
5	0.00	0.00	0.00	-0.02	0.00	0.00
8	0.00	0.00	0.00	-0.02	0.00	0.00
12	0.00	0.00	0.00	-0.02	0.00	0.00
1	0.02	0.00	0.00	0.00	0.00	0.00
5	0.02	0.00	0.00	0.00	0.00	0.00
8	0.02	0.00	0.00	0.00	0.00	0.00
12	0.02	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	-0.01
5	0.00	0.00	0.00	0.00	0.00	-0.01
8	0.00	0.00	0.00	0.00	0.00	-0.01
12	0.00	0.00	0.00	0.00	0.00	-0.01
21	0.00	0.00	-0.01	0.00	0.00	0.00
22	0.00	0.00	-0.01	0.00	0.00	0.00
23	0.00	0.00	-0.01	0.00	0.00	0.00
24	0.00	0.00	-0.01	0.00	0.00	0.00
21	0.00	0.00	0.00	-0.00	0.00	0.00
22	0.00	0.00	0.00	-0.00	0.00	0.00
23	0.00	0.00	0.00	-0.00	0.00	0.00
24	0.00	0.00	0.00	-0.00	0.00	0.00

21	0.01	0.00	0.00	0.00	0.00	0.00
22	0.01	0.00	0.00	0.00	0.00	0.00
23	0.01	0.00	0.00	0.00	0.00	0.00
24	0.01	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00

```
*WARNING- ZERO STIFFNESS IN DIRECTION 4 AT JOINT      3 EQN.NO.      64
          LOADS APPLIED OR DISTRIBUTED HERE FROM ELEMENTS WILL BE IGNORED.
          THIS MAY BE DUE TO ALL MEMBERS AT THIS JOINT BEING RELEASED OR
          EFFECTIVELY RELEASED IN THIS DIRECTION.
*WARNING- ZERO STIFFNESS IN DIRECTION 4 AT JOINT     10 EQN.NO.      82
```

Stiffness at the connections is expected since the plates are the major contributing factor. The warning is considered but not a cause for concern in the design.

FOR LOADING - 1

APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00000E+00	-2.33096E-02	0.00000E+00	0.00000E+00	0.00000E+00	-5.35938E-04
2	0.00000E+00	-2.89406E-02	0.00000E+00	-1.33984E-04	0.00000E+00	2.50551E-02
3	0.00000E+00	-3.21562E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
4	0.00000E+00	-2.89406E-02	0.00000E+00	-1.33984E-04	0.00000E+00	-2.50551E-02
5	0.00000E+00	-2.33096E-02	0.00000E+00	0.00000E+00	0.00000E+00	5.35938E-04
6	0.00000E+00	-1.44703E-02	0.00000E+00	4.01953E-04	0.00000E+00	0.00000E+00
7	0.00000E+00	-1.44703E-02	0.00000E+00	4.01953E-04	0.00000E+00	0.00000E+00
8	0.00000E+00	-2.33096E-02	0.00000E+00	0.00000E+00	0.00000E+00	-5.35938E-04
9	0.00000E+00	-2.89406E-02	0.00000E+00	1.33984E-04	0.00000E+00	2.50551E-02
10	0.00000E+00	-3.21562E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
11	0.00000E+00	-2.89406E-02	0.00000E+00	1.33984E-04	0.00000E+00	-2.50551E-02
12	0.00000E+00	-2.33096E-02	0.00000E+00	0.00000E+00	0.00000E+00	5.35938E-04
13	0.00000E+00	-9.64687E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
14	0.00000E+00	-9.64687E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
15	0.00000E+00	-9.64687E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
16	0.00000E+00	-1.44703E-02	0.00000E+00	-4.01953E-04	0.00000E+00	0.00000E+00
17	0.00000E+00	-1.44703E-02	0.00000E+00	-4.01953E-04	0.00000E+00	0.00000E+00
18	0.00000E+00	-9.64687E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
19	0.00000E+00	-3.08190E-02	0.00000E+00	0.00000E+00	0.00000E+00	-2.57250E-02
20	0.00000E+00	-3.08190E-02	0.00000E+00	0.00000E+00	0.00000E+00	-2.57250E-02
21	0.00000E+00	-1.75252E-02	0.00000E+00	0.00000E+00	0.00000E+00	1.07188E-03
22	0.00000E+00	-1.75252E-02	0.00000E+00	0.00000E+00	0.00000E+00	-1.07188E-03
23	0.00000E+00	-1.75252E-02	0.00000E+00	0.00000E+00	0.00000E+00	1.07188E-03
24	0.00000E+00	-1.75252E-02	0.00000E+00	0.00000E+00	0.00000E+00	-1.07188E-03
25	0.00000E+00	-3.08190E-02	0.00000E+00	0.00000E+00	0.00000E+00	2.57250E-02
26	0.00000E+00	-3.08190E-02	0.00000E+00	0.00000E+00	0.00000E+00	2.57250E-02

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 1

LOADTYPE DEAD TITLE DL

CENTER OF FORCE BASED ON Y FORCES ONLY (FEET).

(FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

X = 0.100000003E+02

Y = 0.229106603E+00

Z = -0.100000003E+01

```
***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     1 )
    SUMMATION FORCE-X =           0.00
    SUMMATION FORCE-Y =          -0.51
    SUMMATION FORCE-Z =           0.00

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=          -0.51  MY=           0.00  MZ=          -5.05


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     1 )
    SUMMATION FORCE-X =          -0.00
    SUMMATION FORCE-Y =           0.51
    SUMMATION FORCE-Z =           0.00

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.51  MY=          -0.00  MZ=           5.05


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      1)
         MAXIMUMS    AT NODE
   X =  1.99407E-07      17
   Y = -3.28613E-01       1
   Z =  1.09662E-06       6
   RX= -2.24429E-04      21
   RY= -4.99911E-08       2
   RZ=  4.20218E-03       1



EXTERNAL AND INTERNAL JOINT LOAD SUMMARY ( KIP  FEET )-

JT     EXT FX/   EXT FY/   EXT FZ/    EXT MX/    EXT MY/    EXT MZ/
       INT FX    INT FY    INT FZ     INT MX     INT MY     INT MZ

                                                              SUPPORT=1
 13      0.00     -0.01      0.00       0.00       0.00       0.00
         0.00     -0.12     -0.01       0.01       0.00       0.00  111111

 14      0.00     -0.01      0.00       0.00       0.00       0.00
        -0.00     -0.12     -0.01       0.01      -0.00      -0.00  111111

 15      0.00     -0.01      0.00       0.00       0.00       0.00
        -0.00     -0.12      0.01      -0.01       0.00      -0.00  111111

 18      0.00     -0.01      0.00       0.00       0.00       0.00
         0.00     -0.12      0.01      -0.01      -0.00       0.00  111111

FOR LOADING -     2
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
    1 2.77000E-02 0.00000E+00-5.22000E-02-3.24000E-02 0.00000E+00-1.70000E-02
    5 2.77000E-02 0.00000E+00-5.22000E-02-3.24000E-02 0.00000E+00-1.70000E-02
    8 2.77000E-02 0.00000E+00-5.22000E-02-3.24000E-02 0.00000E+00-1.70000E-02
   12 2.77000E-02 0.00000E+00-5.22000E-02-3.24000E-02 0.00000E+00-1.70000E-02

          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     2
          LOADTYPE WIND  TITLE W1
```

```
          CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
        (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                       X =  0.100000003E+02
                       Y =  0.613718474E+00
                       Z = -0.100000003E+01

          CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
        (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                       X =  0.100000003E+02
                       Y =  0.620689705E+00
                       Z = -0.100000003E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     2 )
       SUMMATION FORCE-X =           0.11
       SUMMATION FORCE-Y =           0.00
       SUMMATION FORCE-Z =          -0.21

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=          -0.13  MY=           1.98  MZ=          -0.07


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     2 )
       SUMMATION FORCE-X =          -0.11
       SUMMATION FORCE-Y =           0.00
       SUMMATION FORCE-Z =           0.21

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=           0.13  MY=          -1.98  MZ=           0.07


   MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      2)
            MAXIMUMS    AT NODE
      X =  6.66256E-03       8
      Y = -2.21503E-01      12
      Z = -4.94213E-02       5
      RX= -2.08291E-02       5
      RY= -1.18390E-04       9
      RZ= -2.96009E-03       1



   EXTERNAL AND INTERNAL JOINT LOAD SUMMARY ( KIP  FEET )-

   JT     EXT FX/   EXT FY/   EXT FZ/    EXT MX/    EXT MY/    EXT MZ/
          INT FX    INT FY    INT FZ     INT MX     INT MY     INT MZ

                                                                          SUPPORT=1
FOR LOADING -     3
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
    21 6.92500E-03 0.00000E+00-7.32500E-03-4.32500E-03 0.00000E+00-3.97500E-03
    22 6.92500E-03 0.00000E+00-7.32500E-03-4.32500E-03 0.00000E+00-3.97500E-03
    23 6.92500E-03 0.00000E+00-7.32500E-03-4.32500E-03 0.00000E+00-3.97500E-03
    24 6.92500E-03 0.00000E+00-7.32500E-03-4.32500E-03 0.00000E+00-3.97500E-03
```

```
      STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     3
      LOADTYPE WIND  TITLE W2


       CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
     (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                    X =  0.100000003E+02
                    Y =  0.574007281E+00
                    Z = -0.100000003E+01

       CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
     (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                    X =  0.100000003E+02
                    Y =  0.590443686E+00
                    Z = -0.100000003E+01

 ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     3 )
     SUMMATION FORCE-X =  2.7700000E-02
     SUMMATION FORCE-Y =  0.0000000E+00
     SUMMATION FORCE-Z = -2.9300001E-02

    SUMMATION OF MOMENTS AROUND THE ORIGIN-
    MX=          -0.02  MY=           0.27  MZ=          -0.02


 ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     3 )
     SUMMATION FORCE-X = -2.7700000E-02
     SUMMATION FORCE-Y = -1.0928758E-16
     SUMMATION FORCE-Z =  2.9300001E-02

    SUMMATION OF MOMENTS AROUND THE ORIGIN-
    MX=           0.02  MY=          -0.27  MZ=           0.02


 MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      3)
          MAXIMUMS    AT NODE
    X =  1.52301E-03      21
    Y = -1.87683E-03       1
    Z = -5.74874E-04      10
    RX= -3.70313E-04      22
    RY=  4.79082E-06       2
    RZ=  6.31610E-05       6



 EXTERNAL AND INTERNAL JOINT LOAD SUMMARY ( KIP  FEET )-

 JT      EXT FX/   EXT FY/   EXT FZ/    EXT MX/    EXT MY/    EXT MZ/
         INT FX    INT FY    INT FZ     INT MX     INT MY     INT MZ

                                                                  SUPPORT=1
FOR LOADING -     4
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
```

```
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
     1 2.10000E-02 0.00000E+00-3.90000E-02-2.40000E-02 0.00000E+00-1.30000E-02
     5 2.10000E-02 0.00000E+00-3.90000E-02-2.40000E-02 0.00000E+00-1.30000E-02
     8 2.10000E-02 0.00000E+00-3.90000E-02-2.40000E-02 0.00000E+00-1.30000E-02
    12 2.10000E-02 0.00000E+00-3.90000E-02-2.40000E-02 0.00000E+00-1.30000E-02
    21 5.19000E-03 0.00000E+00-5.49000E-03-3.24000E-03 0.00000E+00 2.98000E-03
    22 5.19000E-03 0.00000E+00-5.49000E-03-3.24000E-03 0.00000E+00 2.98000E-03
    23 5.19000E-03 0.00000E+00-5.49000E-03-3.24000E-03 0.00000E+00 2.98000E-03
    24 5.19000E-03 0.00000E+00-5.49000E-03-3.24000E-03 0.00000E+00 2.98000E-03

          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     4
          LOADTYPE WIND  TITLE 0.75W3


           CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.100000003E+02
                        Y =  0.382588800E+00
                        Z = -0.100000003E+01

           CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.100000003E+02
                        Y =  0.612272402E+00
                        Z = -0.100000003E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     4 )
       SUMMATION FORCE-X =           0.10
       SUMMATION FORCE-Y =           0.00
       SUMMATION FORCE-Z =          -0.18

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=          -0.11  MY=           1.67  MZ=          -0.04


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     4 )
       SUMMATION FORCE-X =          -0.10
       SUMMATION FORCE-Y =           0.00
       SUMMATION FORCE-Z =           0.18

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=           0.11  MY=          -1.67  MZ=           0.04


   MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      4)
            MAXIMUMS    AT NODE
      X =  6.18301E-03       5
      Y = -1.63301E-01      12
      Z = -3.71637E-02       8
      RX= -1.53303E-02       5
      RY=  8.70662E-05       4
      RZ= -2.18833E-03       1
```

```
  EXTERNAL AND INTERNAL JOINT LOAD SUMMARY ( KIP  FEET )-

  JT     EXT FX/   EXT FY/   EXT FZ/    EXT MX/    EXT MY/    EXT MZ/
         INT FX    INT FY    INT FZ     INT MX     INT MY     INT MZ

                                                                     SUPPORT=1

  LOAD COMBINATION NO.     5
  1.25DL

LOADING-     1.
FACTOR -   1.25

  LOAD COMBINATION NO.     6
  1.1DL+1.0W1

LOADING-     1.     2.
FACTOR -   1.10   1.00

  LOAD COMBINATION NO.     7
  1.1DL+1.0W2

LOADING-     1.     3.
FACTOR -   1.10   1.00


  ************ END OF DATA FROM INTERNAL STORAGE ************


   86. PARAMETER 2
   87. CODE LRFD
   88. CHECK CODE ALL
```

STAAD.Pro CODE CHECKING - (LRFD 3RD EDITION) v1.0
****

ALL UNITS ARE - KIP FEET (UNLESS OTHERWISE Noted)

MEMBER	TABLE	RESULT/ FX	CRITICAL COND/ MY	RATIO/ MZ	LOADING/ LOCATION
1 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.028	2
		0.06 T	0.12	-0.03	1.00
2 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.095	5
		0.00 C	0.00	0.50	0.00
3 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS BEND Z	0.087	5
		0.00 T	-0.00	0.46	0.50
4 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS BEND Z	0.095	5
		0.00 C	0.00	0.50	0.00
5 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.030	2
		0.05 C	-0.16	0.00	0.00
6 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.028	6
		0.06 T	0.08	0.07	0.00
7 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.027	2
		0.06 C	0.14	0.00	0.00
8 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.030	2
		0.05 T	-0.16	0.00	0.50
9 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.027	6
		0.11 C	0.12	0.02	1.00
10 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.135	6
		0.38 C	-0.04	0.66	0.00
11 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.126	6
		0.25 C	-0.01	0.65	0.50
12 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.168	6
		0.21 C	-0.18	0.69	0.00
13 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.033	6
		0.05 T	-0.09	0.08	3.00
14 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.034	6
		0.07 T	-0.09	0.09	3.00
15 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.032	2
		0.07 T	-0.08	-0.09	0.00

ALL UNITS ARE - KIP FEET (UNLESS OTHERWISE Noted)

MEMBER	TABLE	RESULT/ FX	CRITICAL COND/ MY	RATIO/ MZ	LOADING/ LOCATION
16 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.031	2
		0.09 T	-0.08	-0.08	0.00
17 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.033	6
		0.02 C	0.08	0.09	0.00
18 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.029	6
		0.01 C	-0.07	0.09	0.00
19 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS BEND Z	0.095	5
		0.00 C	0.00	0.50	7.00
20 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.161	6
		0.26 C	-0.18	0.66	7.00
21 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS BEND Z	0.087	5
		0.00 T	-0.00	0.46	0.00
22 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.095	5
		0.00 C	0.00	0.50	1.50
23 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.125	6
		0.25 C	-0.01	0.64	0.50
24 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.139	6
		0.38 C	-0.03	0.69	1.50
25 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.029	6
		0.11 T	0.12	0.03	0.00
26 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.033	6
		0.06 C	0.12	0.05	0.00

************** END OF TABULATED RESULT OF DESIGN **************

89. PERFORM ANALYSIS PRINT STATICS CHECK

```
*WARNING- ZERO STIFFNESS IN DIRECTION 4 AT JOINT      3 EQN.NO.      64
          LOADS APPLIED OR DISTRIBUTED HERE FROM ELEMENTS WILL BE IGNORED.
          THIS MAY BE DUE TO ALL MEMBERS AT THIS JOINT BEING RELEASED OR
          EFFECTIVELY RELEASED IN THIS DIRECTION.
*WARNING- ZERO STIFFNESS IN DIRECTION 4 AT JOINT     10 EQN.NO.      82



          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     1
          LOADTYPE DEAD  TITLE DL


           CENTER OF FORCE BASED ON Y FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.100000003E+02
                        Y =  0.229106603E+00
                        Z = -0.100000003E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     1 )
       SUMMATION FORCE-X =           0.00
       SUMMATION FORCE-Y =          -0.51
       SUMMATION FORCE-Z =           0.00

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=          -0.51  MY=           0.00  MZ=          -5.05


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     1 )
       SUMMATION FORCE-X =          -0.00
       SUMMATION FORCE-Y =           0.51
       SUMMATION FORCE-Z =           0.00

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=           0.51  MY=          -0.00  MZ=           5.05


   MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      1)
             MAXIMUMS    AT NODE
      X =  1.99407E-07      17
      Y = -3.28613E-01       1
      Z =  1.09662E-06       6
      RX= -2.24429E-04      21
      RY= -4.99911E-08       2
      RZ=  4.20218E-03       1


          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     2
          LOADTYPE WIND  TITLE W1
```

```
       CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                    X =  0.100000003E+02
                    Y =  0.613718474E+00
                    Z = -0.100000003E+01

       CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                    X =  0.100000003E+02
                    Y =  0.620689705E+00
                    Z = -0.100000003E+01

***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     2 )
    SUMMATION FORCE-X =           0.11
    SUMMATION FORCE-Y =           0.00
    SUMMATION FORCE-Z =          -0.21

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=          -0.13  MY=           1.98  MZ=          -0.07


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     2 )
    SUMMATION FORCE-X =          -0.11
    SUMMATION FORCE-Y =           0.00
    SUMMATION FORCE-Z =           0.21

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.13  MY=          -1.98  MZ=           0.07


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      2)
          MAXIMUMS    AT NODE
   X =  6.66256E-03       8
   Y = -2.21503E-01      12
   Z = -4.94213E-02       5
   RX= -2.08291E-02       5
   RY= -1.18390E-04       9
   RZ= -2.96009E-03       1


      STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     3
      LOADTYPE WIND  TITLE W2


       CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                    X =  0.100000003E+02
                    Y =  0.574007281E+00
                    Z = -0.100000003E+01
```

```
        CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                   X =  0.100000003E+02
                   Y =  0.590443686E+00
                   Z = -0.100000003E+01

 ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     3 )
     SUMMATION FORCE-X =  2.7700000E-02
     SUMMATION FORCE-Y =  0.0000000E+00
     SUMMATION FORCE-Z = -2.9300001E-02

    SUMMATION OF MOMENTS AROUND THE ORIGIN-
    MX=          -0.02  MY=           0.27  MZ=          -0.02


 ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     3 )
     SUMMATION FORCE-X = -2.7700000E-02
     SUMMATION FORCE-Y = -1.0928758E-16
     SUMMATION FORCE-Z =  2.9300001E-02

    SUMMATION OF MOMENTS AROUND THE ORIGIN-
    MX=           0.02  MY=          -0.27  MZ=           0.02


 MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      3)
          MAXIMUMS    AT NODE
    X =  1.52301E-03      21
    Y = -1.87683E-03       1
    Z = -5.74874E-04      10
    RX= -3.70313E-04      22
    RY=  4.79082E-06       2
    RZ=  6.31610E-05       6


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     4
       LOADTYPE WIND  TITLE 0.75W3


        CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                   X =  0.100000003E+02
                   Y =  0.382588800E+00
                   Z = -0.100000003E+01

        CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                   X =  0.100000003E+02
                   Y =  0.612272402E+00
                   Z = -0.100000003E+01
```

```
***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     4 )
    SUMMATION FORCE-X =           0.10
    SUMMATION FORCE-Y =           0.00
    SUMMATION FORCE-Z =          -0.18

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=          -0.11  MY=           1.67  MZ=          -0.04


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     4 )
    SUMMATION FORCE-X =          -0.10
    SUMMATION FORCE-Y =           0.00
    SUMMATION FORCE-Z =           0.18

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           0.11  MY=          -1.67  MZ=           0.04


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      4)
          MAXIMUMS    AT NODE
   X =  6.18301E-03       5
   Y = -1.63301E-01      12
   Z = -3.71637E-02       8
   RX= -1.53303E-02       5
   RY=  8.70662E-05       4
   RZ= -2.18833E-03       1



************ END OF DATA FROM INTERNAL STORAGE ************


 90. FINISH
```

```
        *********** END OF THE STAAD.Pro RUN ***********

          **** DATE= JUL 19,2018   TIME= 12:29:10 ****

    ************************************************************
    *   For technical assistance on STAAD.Pro, please visit    *
    *   http://selectservices.bentley.com/en-US/               *
    *                                                          *
    *   Details about additional assistance from               *
    *   Bentley and Partners can be found at program menu      *
    *   Help->Technical Support                                *
    *                                                          *
    *      Copyright (c) 1997-2016 Bentley Systems, Inc.       *
    *                http://www.bentley.com                    *
    ************************************************************
```

Job Information

	Engineer	Checked	Approved
Name:	IERM		
Date:	19-Jun-18		

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	26	Highest Node	26
Number of Elements	26	Highest Beam	26
Number of Plates	3	Highest Plate	29

Number of Basic Load Cases	4
Number of Combination Load Cases	3

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

Type	L/C	Name
Primary	1	DL
Primary	2	W1
Primary	3	W2
Primary	4	0.75W3
Combination	5	1.25DL
Combination	6	1.1DL+1.0W1
Combination	7	1.1DL+1.0W2

Beams

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	1	19	1.000	2	0
2	2	21	1.500	2	0
3	3	22	0.500	2	0
4	4	25	7.000	2	0
5	2	17	0.500	2	0
6	6	9	0.500	2	0
7	4	16	0.500	2	0
8	7	11	0.500	2	0
9	8	20	1.000	2	0
10	9	23	1.500	2	0
11	10	24	0.500	2	0
12	11	26	7.000	2	0

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
16	15	16	3.000	2	0
17	16	7	1.000	2	0
18	17	6	1.000	2	0
19	19	2	7.000	2	0
20	20	9	7.000	2	0
21	21	3	0.500	2	0
22	22	4	1.500	2	0
23	23	10	0.500	2	0
24	24	11	1.500	2	0
25	25	5	1.000	2	0
26	26	12	1.000	2	0

Plates

Plate	Node A	Node B	Node C	Node D	Property
27	1	8	20	19	1
28	21	23	24	22	1
29	25	26	12	5	1

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	STEEL	29E+3	0.300	0.000	6E -6
2	STAINLESSSTEEL	28E+3	0.300	0.000	10E -6
3	ALUMINUM	10E+3	0.330	0.000	13E -6
4	A500-GR.	29E+3	0.300	0.000	6E -6
5	CONCRETE	3.15E+3	0.170	0.000	5E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip˙ft/deg)	rY (kip˙ft/deg)	rZ (kip˙ft/deg)
13	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
14	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
15	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
18	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

Primary Load Cases

Number	Name	Type
1	DL	Dead
2	W1	Wind
3	W2	Wind
4	0.75W3	Wind

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
5	1.25DL	1	DL	1.25
6	1.1DL+1.0W1	1	DL	1.10
		2	W1	1.00
7	1.1DL+1.0W2	1	DL	1.10
		3	W2	1.00

Node Displacement Summary

	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Max X	5	6:1.1DL+1.0W'	**0.007**	-0.171	-0.049	0.178	-0.021	0.000	-0.002
Min X	7	5:1.25DL	**-0.000**	-0.000	0.000	0.000	-0.000	-0.000	-0.000
Max Y	1	2:W1	0.006	**0.222**	-0.049	0.227	-0.021	-0.000	-0.003
Min Y	12	6:1.1DL+1.0W'	0.006	**-0.583**	-0.049	0.585	-0.021	0.000	-0.008
Max Z	6	5:1.25DL	0.000	-0.000	**0.000**	0.000	-0.000	0.000	0.000
Min Z	8	6:1.1DL+1.0W'	0.007	-0.552	**-0.049**	0.554	-0.021	-0.000	0.007
Max rX	24	6:1.1DL+1.0W'	0.006	0.029	-0.002	0.030	**0.001**	0.000	-0.001
Min rX	5	6:1.1DL+1.0W'	0.007	-0.171	-0.049	0.178	**-0.021**	0.000	-0.002
Max rY	4	6:1.1DL+1.0W'	0.006	-0.001	-0.003	0.007	0.000	**0.000**	-0.001
Min rY	9	2:W1	0.006	0.000	-0.003	0.007	0.000	**-0.000**	0.001
Max rZ	20	6:1.1DL+1.0W'	0.007	-0.468	-0.049	0.471	-0.013	-0.000	**0.007**
Min rZ	12	6:1.1DL+1.0W'	0.006	-0.583	-0.049	0.585	-0.021	0.000	**-0.008**
Max Rst	12	6:1.1DL+1.0W'	0.006	-0.583	-0.049	**0.585**	-0.021	0.000	-0.008

Beam Displacement Detail Summary

Displacements shown in italic indicate the presence of an offset

	Beam	L/C	d (ft)	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	25	2:W1	1.000	**0.007**	0.190	-0.049	0.197
Min X	4	1:DL	6.300	**-0.000**	-0.243	0.000	0.243
Max Y	1	2:W1	0.000	0.006	**0.222**	-0.049	0.227
Min Y	26	6:1.1DL+1.0W´	1.000	0.006	**-0.583**	-0.049	0.585
Max Z	15	5:1.25DL	2.100	0.000	-0.000	**0.000**	0.000
Min Z	25	2:W1	1.000	0.007	0.190	**-0.049**	0.197
Max Rst	26	6:1.1DL+1.0W´	1.000	0.006	-0.583	-0.049	**0.585**

Beam End Displacement Summary

Displacements shown in italic indicate the presence of an offset

	Beam	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	25	5	2:W1	**0.007**	0.190	-0.049	0.197
Min X	1	1	1:DL	**0.000**	-0.329	0.000	0.329
Max Y	1	1	2:W1	0.006	**0.222**	-0.049	0.227
Min Y	26	12	6:1.1DL+1.0W´	0.006	**-0.583**	-0.049	0.585
Max Z	6	6	1:DL	0.000	-0.000	**0.000**	0.000
Min Z	25	5	2:W1	0.007	0.190	**-0.049**	0.197
Max Rst	26	12	6:1.1DL+1.0W´	0.006	-0.583	-0.049	**0.585**

Beam End Force Summary

The signs of the forces at end B of each beam have been reversed. For example: this means that the Min Fx entry gives the largest tension value for an beam.

				Axial	Shear		Torsion	Bending	
	Beam	Node	L/C	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip`in)	My (kip`in)	Mz (kip`in)
Max Fx	10	9	2:W1	**0.384**	-0.009	0.005	-0.000	-0.479	2.615
Min Fx	2	2	6:1.1DL+1.0W´	**-0.384**	0.018	-0.005	-0.000	-0.334	2.286
Max Fy	8	7	6:1.1DL+1.0W´	-0.048	**0.155**	-0.177	-0.000	-0.813	0.920
Min Fy	5	17	5:1.25DL	-0.000	**-0.130**	0.000	-0.000	-0.000	0.767
Max Fz	1	1	2:W1	-0.059	0.025	**0.183**	-0.000	-0.761	-0.034
Min Fz	26	26	6:1.1DL+1.0W´	0.059	0.054	**-0.183**	0.000	1.437	0.641
Max Mx	26	26	6:1.1DL+1.0W´	0.059	0.054	-0.183	**0.000**	1.437	0.641
Min Mx	9	8	6:1.1DL+1.0W´	0.112	-0.047	0.183	**-0.000**	-0.776	-0.373
Max My	12	26	6:1.1DL+1.0W´	0.207	0.067	0.053	0.000	**2.202**	0.609
Min My	12	11	6:1.1DL+1.0W´	0.207	0.117	0.053	0.000	**-2.208**	8.332
Max Mz	12	11	6:1.1DL+1.0W´	0.207	0.117	0.053	0.000	-2.208	**8.332**
Min Mz	2	2	2:W1	-0.384	-0.009	-0.005	-0.000	-0.335	**-3.023**

Beam Force Detail Summary

Sign convention as diagrams:- positive above line, negative below line except Fx where positive is compression. Distance d is given from beam end A.

				Axial	Shear		Torsion	Bending	
	Beam	L/C	d (ft)	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip`in)	My (kip`in)	Mz (kip`in)
Max Fx	10	2:W1	0.000	**0.384**	-0.009	0.005	-0.000	-0.479	2.615
Min Fx	2	6:1.1DL+1.0W‘	0.000	**-0.384**	0.018	-0.005	-0.000	-0.334	2.286
Max Fy	8	6:1.1DL+1.0W‘	0.000	-0.048	**0.155**	-0.177	-0.000	-0.813	0.920
Min Fy	5	5:1.25DL	0.500	-0.000	**-0.130**	0.000	-0.000	-0.000	0.767
Max Fz	1	2:W1	0.000	-0.059	0.025	**0.183**	-0.000	-0.761	-0.034
Min Fz	26	6:1.1DL+1.0W‘	0.000	0.059	0.054	**-0.183**	0.000	1.437	0.641
Max Mx	26	6:1.1DL+1.0W‘	0.000	0.059	0.054	-0.183	**0.000**	1.437	0.641
Min Mx	9	6:1.1DL+1.0W‘	0.000	0.112	-0.047	0.183	**-0.000**	-0.776	-0.373
Max My	12	6:1.1DL+1.0W‘	7.000	0.207	0.067	0.053	0.000	**2.202**	0.609
Min My	12	6:1.1DL+1.0W‘	0.000	0.207	0.117	0.053	0.000	**-2.208**	8.332
Max Mz	12	6:1.1DL+1.0W‘	0.000	0.207	0.117	0.053	0.000	-2.208	**8.332**
Min Mz	2	2:W1	0.000	-0.384	-0.009	-0.005	-0.000	-0.335	**-3.023**

Beam Combined Axial and Bending Stresses Summary

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
1	1:DL	1.000	170.003	1.000	3	-170.020	1.000	1
	2:W1	1.000	1.05E+3	1.000	2	-1.11E+3	1.000	4
	3:W2	1.000	1.188	1.000	1	-0.818	1.000	3
	4:0.75W3	1.000	785.253	1.000	2	-831.093	1.000	4
	5:1.25DL	1.000	212.504	1.000	3	-212.525	1.000	1
	6:1.1DL+1.0W‘	1.000	861.783	1.000	2	-923.942	1.000	1
	7:1.1DL+1.0W2	1.000	187.659	1.000	3	-187.308	1.000	1
2	1:DL	1.500	2.94E+3	0.000	3	-2.94E+3	0.000	1
	2:W1	1.500	1.84E+3	0.000	1	-2.25E+3	0.000	3
	3:W2	1.500	109.371	1.500	3	-111.413	1.500	1
	4:0.75W3	1.500	1.39E+3	0.000	1	-1.69E+3	0.000	3
	5:1.25DL	1.500	3.68E+3	0.000	3	-3.68E+3	0.000	1
	6:1.1DL+1.0W‘	1.500	1.39E+3	0.000	3	-1.8E+3	0.000	1
	7:1.1DL+1.0W2	1.500	3.26E+3	0.000	3	-3.26E+3	0.000	1
3	1:DL	0.500	2.72E+3	0.500	3	-2.72E+3	0.500	1
	2:W1	0.500	1.66E+3	0.000	1	-1.92E+3	0.000	3
	3:W2	0.500	80.577	0.500	3	-77.704	0.500	1
	4:0.75W3	0.500	1.17E+3	0.000	1	-1.37E+3	0.000	3
	5:1.25DL	0.500	3.39E+3	0.500	3	-3.39E+3	0.500	1
	6:1.1DL+1.0W‘	0.500	1.24E+3	0.500	4	-1.5E+3	0.500	2
	7:1.1DL+1.0W2	0.500	3.07E+3	0.500	3	-3.07E+3	0.500	1
4	1:DL	7.000	2.94E+3	0.000	3	-2.94E+3	0.000	1
	2:W1	7.000	2.78E+3	0.000	1	-3.06E+3	0.000	3
	3:W2	7.000	3.347	7.000	1	-3.116	7.000	3

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
	4:0.75W3	7.000	2.06E+3	0.000	1	-2.27E+3	0.000	3
	5:1.25DL	7.000	3.68E+3	0.000	3	-3.68E+3	0.000	1
	6:1.1DL+1.0W'	7.000	2.83E+3	0.000	3	-3.11E+3	0.000	1
	7:1.1DL+1.0W2	7.000	3.24E+3	0.000	3	-3.24E+3	0.000	1
5	1:DL	0.500	374.048	0.500	3	-374.134	0.500	1
	2:W1	0.500	1.17E+3	0.000	1	-1.12E+3	0.000	2
	3:W2	0.500	55.247	0.500	2	-48.709	0.500	4
	4:0.75W3	0.500	859.205	0.000	1	-816.780	0.000	2
	5:1.25DL	0.500	467.560	0.500	3	-467.668	0.500	1
	6:1.1DL+1.0W'	0.500	1.17E+3	0.000	1	-1.12E+3	0.000	2
	7:1.1DL+1.0W2	0.500	420.114	0.500	3	-413.670	0.500	1
6	1:DL	0.500	374.048	0.000	3	-374.134	0.000	1
	2:W1	0.500	1E+3	0.500	2	-1.06E+3	0.500	1
	3:W2	0.500	44.181	0.500	1	-53.146	0.500	2
	4:0.75W3	0.500	707.863	0.500	2	-759.597	0.500	1
	5:1.25DL	0.500	467.560	0.000	3	-467.668	0.000	1
	6:1.1DL+1.0W'	0.500	1.06E+3	0.000	2	-1.12E+3	0.000	1
	7:1.1DL+1.0W2	0.500	421.377	0.000	3	-430.436	0.000	1
7	1:DL	0.500	374.048	0.500	3	-374.134	0.500	1
	2:W1	0.500	1.06E+3	0.000	2	-1E+3	0.000	1
	3:W2	0.500	53.146	0.000	1	-44.181	0.000	2
	4:0.75W3	0.500	759.597	0.000	2	-707.863	0.000	1
	5:1.25DL	0.500	467.560	0.500	3	-467.668	0.500	1
	6:1.1DL+1.0W'	0.500	1.06E+3	0.000	2	-1E+3	0.000	1
	7:1.1DL+1.0W2	0.500	412.841	0.500	3	-403.971	0.500	1
8	1:DL	0.500	374.048	0.000	3	-374.134	0.000	1
	2:W1	0.500	1.12E+3	0.500	1	-1.17E+3	0.500	2
	3:W2	0.500	48.709	0.000	2	-55.247	0.000	1
	4:0.75W3	0.500	816.780	0.500	1	-859.205	0.500	2
	5:1.25DL	0.500	467.560	0.000	3	-467.668	0.000	1
	6:1.1DL+1.0W'	0.500	1.12E+3	0.500	1	-1.17E+3	0.500	2
	7:1.1DL+1.0W2	0.500	460.162	0.000	3	-466.794	0.000	1
9	1:DL	1.000	170.003	1.000	3	-170.020	1.000	1
	2:W1	1.000	966.904	1.000	2	-848.588	1.000	1
	3:W2	1.000	1.711	1.000	4	-1.513	1.000	2
	4:0.75W3	1.000	724.042	1.000	2	-635.189	1.000	1
	5:1.25DL	1.000	212.504	1.000	3	-212.525	1.000	1
	6:1.1DL+1.0W'	1.000	1.07E+3	1.000	3	-948.958	1.000	1
	7:1.1DL+1.0W2	1.000	188.673	1.000	3	-188.494	1.000	1
10	1:DL	1.500	2.94E+3	0.000	3	-2.94E+3	0.000	1
	2:W1	1.500	2.13E+3	1.500	4	-1.72E+3	1.500	2
	3:W2	1.500	65.634	1.500	2	-78.248	1.500	4
	4:0.75W3	1.500	1.58E+3	0.000	3	-1.29E+3	0.000	1
	5:1.25DL	1.500	3.68E+3	0.000	3	-3.68E+3	0.000	1

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
	6:1.1DL+1.0W'	1.500	5.33E+3	0.000	3	-4.92E+3	0.000	1
	7:1.1DL+1.0W2	1.500	3.28E+3	0.000	3	-3.29E+3	0.000	1
11	1:DL	0.500	2.72E+3	0.500	3	-2.72E+3	0.500	1
	2:W1	0.500	1.95E+3	0.500	4	-1.69E+3	0.500	2
	3:W2	0.500	69.757	0.000	1	-72.631	0.000	3
	4:0.75W3	0.500	1.39E+3	0.500	4	-1.19E+3	0.500	2
	5:1.25DL	0.500	3.39E+3	0.500	3	-3.39E+3	0.500	1
	6:1.1DL+1.0W'	0.500	4.94E+3	0.500	4	-4.68E+3	0.500	2
	7:1.1DL+1.0W2	0.500	2.95E+3	0.500	3	-2.95E+3	0.500	1
12	1:DL	7.000	2.94E+3	0.000	3	-2.94E+3	0.000	1
	2:W1	7.000	3.3E+3	0.000	3	-3.08E+3	0.000	1
	3:W2	7.000	4.650	0.000	1	-4.881	0.000	2
	4:0.75W3	7.000	2.46E+3	0.000	3	-2.3E+3	0.000	1
	5:1.25DL	7.000	3.68E+3	0.000	3	-3.68E+3	0.000	1
	6:1.1DL+1.0W'	7.000	6.54E+3	0.000	3	-6.32E+3	0.000	1
	7:1.1DL+1.0W2	7.000	3.24E+3	0.000	3	-3.24E+3	0.000	1
13	1:DL	3.000	91.236	0.000	2	-204.491	0.000	1
	2:W1	3.000	1.24E+3	3.000	4	-1.15E+3	3.000	2
	3:W2	3.000	243.898	3.000	4	-229.112	3.000	2
	4:0.75W3	3.000	1.12E+3	3.000	4	-1.04E+3	3.000	2
	5:1.25DL	3.000	114.045	0.000	2	-255.613	0.000	1
	6:1.1DL+1.0W'	3.000	1.25E+3	3.000	4	-1.3E+3	3.000	2
	7:1.1DL+1.0W2	3.000	251.605	3.000	4	-383.857	3.000	2
14	1:DL	3.000	91.236	0.000	2	-204.491	0.000	1
	2:W1	3.000	1.28E+3	3.000	4	-1.2E+3	3.000	2
	3:W2	3.000	243.403	3.000	4	-232.823	3.000	2
	4:0.75W3	3.000	1.14E+3	3.000	4	-1.07E+3	3.000	2
	5:1.25DL	3.000	114.045	0.000	2	-255.613	0.000	1
	6:1.1DL+1.0W'	3.000	1.28E+3	3.000	4	-1.35E+3	3.000	2
	7:1.1DL+1.0W2	3.000	251.065	3.000	4	-387.523	3.000	2
15	1:DL	3.000	91.236	3.000	1	-204.491	3.000	2
	2:W1	3.000	1.2E+3	0.000	1	-1.28E+3	0.000	2
	3:W2	3.000	232.823	0.000	1	-243.403	0.000	3
	4:0.75W3	3.000	1.07E+3	0.000	1	-1.14E+3	0.000	3
	5:1.25DL	3.000	114.045	3.000	1	-255.613	3.000	2
	6:1.1DL+1.0W'	3.000	1.04E+3	0.000	1	-1.27E+3	0.000	2
	7:1.1DL+1.0W2	3.000	78.122	0.000	1	-235.741	0.000	3
16	1:DL	3.000	91.236	3.000	1	-204.491	3.000	2
	2:W1	3.000	1.15E+3	0.000	1	-1.24E+3	0.000	2
	3:W2	3.000	229.112	0.000	1	-243.898	0.000	3
	4:0.75W3	3.000	1.04E+3	0.000	1	-1.12E+3	0.000	3
	5:1.25DL	3.000	114.045	3.000	1	-255.613	3.000	2
	6:1.1DL+1.0W'	3.000	991.348	0.000	1	-1.23E+3	0.000	2
	7:1.1DL+1.0W2	3.000	74.368	0.000	1	-236.192	0.000	3

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
17	1:DL	1.000	231.528	0.000	3	-220.928	0.000	1
	2:W1	1.000	1.03E+3	0.000	2	-1.02E+3	0.000	1
	3:W2	1.000	84.886	1.000	2	-83.464	1.000	4
	4:0.75W3	1.000	808.677	0.000	2	-803.500	0.000	1
	5:1.25DL	1.000	289.410	0.000	3	-276.160	0.000	1
	6:1.1DL+1.0W1	1.000	1.28E+3	0.000	3	-1.27E+3	0.000	1
	7:1.1DL+1.0W2	1.000	324.903	0.000	3	-311.821	0.000	1
18	1:DL	1.000	231.528	0.000	3	-220.928	0.000	1
	2:W1	1.000	1.02E+3	1.000	2	-1.03E+3	1.000	4
	3:W2	1.000	83.464	0.000	3	-84.886	0.000	1
	4:0.75W3	1.000	803.500	1.000	2	-808.677	1.000	4
	5:1.25DL	1.000	289.410	0.000	3	-276.160	0.000	1
	6:1.1DL+1.0W1	1.000	1.15E+3	0.000	3	-1.14E+3	0.000	1
	7:1.1DL+1.0W2	1.000	337.749	0.000	3	-327.509	0.000	1
19	1:DL	7.000	2.94E+3	7.000	3	-2.94E+3	7.000	1
	2:W1	7.000	3.08E+3	7.000	1	-3.3E+3	7.000	3
	3:W2	7.000	4.881	7.000	1	-4.650	7.000	3
	4:0.75W3	7.000	2.3E+3	7.000	1	-2.46E+3	7.000	3
	5:1.25DL	7.000	3.68E+3	7.000	3	-3.68E+3	7.000	1
	6:1.1DL+1.0W1	7.000	2.63E+3	7.000	4	-2.85E+3	7.000	2
	7:1.1DL+1.0W2	7.000	3.24E+3	7.000	3	-3.24E+3	7.000	1
20	1:DL	7.000	2.94E+3	7.000	3	-2.94E+3	7.000	1
	2:W1	7.000	3.06E+3	7.000	4	-2.78E+3	7.000	2
	3:W2	7.000	3.116	0.000	1	-3.347	0.000	2
	4:0.75W3	7.000	2.27E+3	7.000	4	-2.06E+3	7.000	2
	5:1.25DL	7.000	3.68E+3	7.000	3	-3.68E+3	7.000	1
	6:1.1DL+1.0W1	7.000	6.29E+3	7.000	4	-6.02E+3	7.000	2
	7:1.1DL+1.0W2	7.000	3.24E+3	7.000	3	-3.24E+3	7.000	1
21	1:DL	0.500	2.72E+3	0.000	3	-2.72E+3	0.000	1
	2:W1	0.500	1.69E+3	0.000	1	-1.95E+3	0.000	3
	3:W2	0.500	72.631	0.500	3	-69.757	0.500	1
	4:0.75W3	0.500	1.19E+3	0.000	1	-1.39E+3	0.000	3
	5:1.25DL	0.500	3.39E+3	0.000	3	-3.39E+3	0.000	1
	6:1.1DL+1.0W1	0.500	1.21E+3	0.500	4	-1.47E+3	0.500	2
	7:1.1DL+1.0W2	0.500	3.05E+3	0.500	3	-3.05E+3	0.500	1
22	1:DL	1.500	2.94E+3	1.500	3	-2.94E+3	1.500	1
	2:W1	1.500	1.72E+3	0.000	1	-2.13E+3	0.000	3
	3:W2	1.500	78.248	0.000	2	-65.634	0.000	1
	4:0.75W3	1.500	1.29E+3	1.500	1	-1.58E+3	1.500	3
	5:1.25DL	1.500	3.68E+3	1.500	3	-3.68E+3	1.500	1
	6:1.1DL+1.0W1	1.500	1.73E+3	1.500	4	-2.14E+3	1.500	2
	7:1.1DL+1.0W2	1.500	3.29E+3	1.500	4	-3.28E+3	1.500	2
23	1:DL	0.500	2.72E+3	0.000	3	-2.72E+3	0.000	1
	2:W1	0.500	1.92E+3	0.500	4	-1.66E+3	0.500	2

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
	3:W2	0.500	77.704	0.000	1	-80.577	0.000	3
	4:0.75W3	0.500	1.37E+3	0.500	4	-1.17E+3	0.500	2
	5:1.25DL	0.500	3.39E+3	0.000	3	-3.39E+3	0.000	1
	6:1.1DL+1.0W'	0.500	4.9E+3	0.500	4	-4.64E+3	0.500	2
	7:1.1DL+1.0W2	0.500	2.93E+3	0.500	3	-2.94E+3	0.500	1
24	1:DL	1.500	2.94E+3	1.500	3	-2.94E+3	1.500	1
	2:W1	1.500	2.25E+3	1.500	4	-1.84E+3	1.500	2
	3:W2	1.500	111.413	0.000	1	-109.371	0.000	3
	4:0.75W3	1.500	1.69E+3	1.500	4	-1.39E+3	1.500	2
	5:1.25DL	1.500	3.68E+3	1.500	3	-3.68E+3	1.500	1
	6:1.1DL+1.0W'	1.500	5.49E+3	1.500	4	-5.08E+3	1.500	2
	7:1.1DL+1.0W2	1.500	3.26E+3	1.500	4	-3.26E+3	1.500	2
25	1:DL	1.000	170.003	0.000	3	-170.020	0.000	1
	2:W1	1.000	848.588	0.000	2	-966.904	0.000	1
	3:W2	1.000	1.513	0.000	1	-1.711	0.000	2
	4:0.75W3	1.000	635.189	0.000	2	-724.042	0.000	1
	5:1.25DL	1.000	212.504	0.000	3	-212.525	0.000	1
	6:1.1DL+1.0W'	1.000	1.04E+3	0.000	2	-1.15E+3	0.000	1
	7:1.1DL+1.0W2	1.000	187.985	0.000	3	-188.201	0.000	1
26	1:DL	1.000	170.003	0.000	3	-170.020	0.000	1
	2:W1	1.000	1.11E+3	0.000	2	-1.05E+3	0.000	1
	3:W2	1.000	0.818	0.000	1	-1.188	0.000	2
	4:0.75W3	1.000	831.093	0.000	2	-785.253	0.000	1
	5:1.25DL	1.000	212.504	0.000	3	-212.525	0.000	1
	6:1.1DL+1.0W'	1.000	1.3E+3	0.000	2	-1.24E+3	0.000	1
	7:1.1DL+1.0W2	1.000	187.780	0.000	3	-188.169	0.000	1

Plate Center Principal Stress Summary

			Principal		Von Mis		Tresca	
	Plate	L/C	Top (psi)	Bottom (psi)	Top (psi)	Bottom (psi)	Top (psi)	Bottom (psi)
Max (t)	27	2:W1	**1.09E+3**	1.24E+3	1.88E+3	2.15E+3	2.17E+3	2.49E+3
Max (b)	29	6:1.1DL+1.0W'	1.08E+3	**1.25E+3**	1.88E+3	2.15E+3	2.17E+3	2.49E+3
Max VM (t)	29	6:1.1DL+1.0W'	1.08E+3	1.25E+3	**1.88E+3**	2.15E+3	2.17E+3	2.49E+3
Max VM (b)	29	6:1.1DL+1.0W'	1.08E+3	1.25E+3	1.88E+3	**2.15E+3**	2.17E+3	2.49E+3
Tresca (t)	29	6:1.1DL+1.0W'	1.08E+3	1.25E+3	1.88E+3	2.15E+3	**2.17E+3**	2.49E+3
Tresca (b)	29	6:1.1DL+1.0W'	1.08E+3	1.25E+3	1.88E+3	2.15E+3	2.17E+3	**2.49E+3**

Reaction Summary

			Horizontal	Vertical	Horizontal	Moment		
	Node	**L/C**	**FX** (kip)	**FY** (kip)	**FZ** (kip)	**MX** (kip`in)	**MY** (kip`in)	**MZ** (kip`in)
Max FX	14	5:1.25DL	**0.000**	0.158	0.013	-0.151	0.000	0.000
Min FX	18	6:1.1DL+1.0W'	**-0.028**	0.213	0.042	-0.873	-0.000	-1.022
Max FY	15	6:1.1DL+1.0W'	-0.027	**0.230**	0.040	-0.853	-0.000	-0.973
Min FY	13	2:W1	-0.027	**-0.091**	0.051	-0.986	0.000	-0.973
Max FZ	14	6:1.1DL+1.0W'	-0.028	0.065	**0.064**	-1.139	0.000	-1.022
Min FZ	15	5:1.25DL	0.000	0.158	**-0.013**	0.151	-0.000	0.000
Max MX	15	5:1.25DL	0.000	0.158	-0.013	**0.151**	-0.000	0.000
Min MX	14	6:1.1DL+1.0W'	-0.028	0.065	0.064	**-1.139**	0.000	-1.022
Max MY	13	2:W1	-0.027	-0.091	0.051	-0.986	**0.000**	-0.973
Min MY	15	6:1.1DL+1.0W'	-0.027	0.230	0.040	-0.853	**-0.000**	-0.973
Max MZ	14	5:1.25DL	0.000	0.158	0.013	-0.151	0.000	**0.000**
Min MZ	18	6:1.1DL+1.0W'	-0.028	0.213	0.042	-0.873	-0.000	**-1.022**

Steel Design (Track 2) Beam 1 Check 1

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|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES      |
|*************                                        |        IN INCH UNIT    |
|            *  |=============================|                ------------    |
|MEMBER    1 *  |  AISC SECTIONS              |                AX=0.1890E+1    |
|            *  | ST  HSST3X3X0.188          |           --Z  AY=0.1044E+1    |
|DESIGN CODE *  |                             |                AZ=0.1044E+1    |
| LRFD 2001  *  ===============================                PY=0.1970E+1    |
|            *                                                 PZ=0.1970E+1    |
|            *  |<---LENGTH (FT)=    1.00 --->|                RY=0.1141E+1    |
|*************                                                 RZ=0.1141E+1    |
|                                                                              |
|                  0.0 (KIP-FEET)                                              |
|PARAMETER        |                                       L5   CAPACITIES      |
|IN KIP  INCH     |                                   L5       IN KIP  INCH    |
|---------------  +                               L2           -------------|  |
| KL/R-Y=  10.52  |                       L2  L2                PNC=0.5750E+2|  |
| KL/R-Z=  10.52  +                                            pnc=0.0000E+0|  |
| UNL    =  12.00  |               L2  L2                        PNT=0.6124E+2|  |
| CB     =   1.00  +                                           pnt=0.5872E-1|  |
| PHIC   =   0.00  |           L2                               MNZ=0.6383E+2|  |
| PHIB   =   0.90  +   L2  L2                                  mnz=0.3344E+0|  |
| FYLD   =  36.00  |L6                                          MNY=0.6383E+2|  |
| NSF    =   1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.1437E+1|  |
| DFF =      0.00   0.0                                        VN =0.2030E+2|  |
| dff =      0.00              ABSOLUTE MZ ENVELOPE            vn =0.2507E-1|  |
|                                 (WITH LOAD NO.)                              |
|                                                                              |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                   |
|                      -------------------------                               |
|                                                                              |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z          |
|                                                                              |
|      VALUE      -0.1        0.0        0.2         0.1         0.0           |
|   LOCATION       0.0        1.0        0.0         1.0         1.0           |
|    LOADING         6          5          2           2           5           |
|                                                                              |
|******************************************************************************|
|*                                                                            *|
|*                         DESIGN SUMMARY  (KIP-FEET)                         *|
|*                         --------------                                     *|
|*                                                                            *|
|*       RESULT/     CRITICAL COND/     RATIO/          LOADING/              *|
|         FX              MY            MZ            LOCATION                 |
|        ===================================================                   |
|          PASS          HSS FLEX+AXL     0.028               2                |
|          0.06 T            0.12        -0.03             1.00                |
|*                                                                            *|
|******************************************************************************|
|                                                                              |
|-----------------------------------------------------------------------------|
     1  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 2 Check 1

```
|--------------------------------------------------------------------------|
|                                                     Y        PROPERTIES  |
|*************                                        |        IN INCH UNIT |
|            *  |=============================|                ------------ |
|MEMBER   2  *  |  AISC SECTIONS              |                AX=0.1890E+1 |
|            *  | ST  HSST3X3X0.188          |           --Z  AY=0.1044E+1 |
|DESIGN CODE *  |                             |                AZ=0.1044E+1 |
| LRFD 2001  *  ===============================                PY=0.1970E+1 |
|            *                                                 PZ=0.1970E+1 |
|            *  |<---LENGTH (FT)=    1.50 --->|                RY=0.1141E+1 |
|*************                                                 RZ=0.1141E+1 |
|                                                                           |
|                  0.5 (KIP-FEET)                                           |
|PARAMETER        |L5                                          CAPACITIES   |
|IN KIP  INCH     |   L5                                       IN KIP  INCH |
|---------------  +       L5                                   -------------|
| KL/R-Y=  15.78  |           L5                               PNC=0.5708E+2|
| KL/R-Z=  15.78  +               L5                           pnc=0.0000E+0|
| UNL    =  18.00  |                  L5                       PNT=0.6124E+2|
| CB     =   1.00  +                      L5                   pnt=0.0000E+0|
| PHIC   =   0.00  |                          L5               MNZ=0.6383E+2|
| PHIB   =   0.90  +                              L5  L5       mnz=0.6033E+1|
| FYLD   =  36.00  |                                      L5   MNY=0.6383E+2|
| NSF    =   1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.6638E-3|
| DFF =      0.00   0.5                                        VN =0.2030E+2|
| dff =      0.00             ABSOLUTE MZ ENVELOPE             vn =0.2995E-1|
|                                (WITH LOAD NO.)                            |
|                                                                           |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                |
|                      -------------------------                            |
|                                                                           |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z      |
|                                                                           |
|      VALUE      -0.4        0.0        0.0         0.0         0.5        |
|   LOCATION       0.0        0.0        0.0         1.5         0.0        |
|    LOADING        6          5          3           6           5         |
|                                                                           |
|**************************************************************************|
|*                                                                        *|
|*                       DESIGN SUMMARY  (KIP-FEET)                       *|
|*                       --------------                                   *|
|*                                                                        *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/            *|
|         FX              MY             MZ           LOCATION             |
|        ======================================================            |
|          PASS        HSS FLEX+AXL      0.095             5               |
|          0.00 C          0.00          0.50            0.00              |
|*                                                                        *|
|**************************************************************************|
|                                                                           |
|--------------------------------------------------------------------------|
     2  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 3 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y        PROPERTIES      |
|*************                                       |        IN INCH UNIT    |
|            *  |=============================|               ------------    |
|MEMBER   3  *  |  AISC SECTIONS              |               AX=0.1890E+1    |
|            *  | ST   HSST3X3X0.188         |           --Z AY=0.1044E+1    |
|DESIGN CODE *  |                             |               AZ=0.1044E+1    |
| LRFD 2001  *  ===============================               PY=0.1970E+1    |
|            *                                                PZ=0.1970E+1    |
|            *  |<---LENGTH (FT)=    0.50 --->|               RY=0.1141E+1    |
|*************                                                RZ=0.1141E+1    |
|                                                                             |
|                 0.5 (KIP-FEET)                                              |
|PARAMETER        |                                      L5   CAPACITIES      |
|IN KIP  INCH     |                                  L5       IN KIP  INCH    |
|---------------  +                                           -------------   |
| KL/R-Y=   5.26  |                                L5         PNC=0.5775E+2   |
| KL/R-Z=   5.26  +                            L5             pnc=0.0000E+0   |
| UNL    =  6.00  |                        L5                 PNT=0.6124E+2   |
| CB     =  1.00  +                                           pnt=0.2818E-3   |
| PHIC   =  0.00  |               L5   L5                     MNZ=0.6383E+2   |
| PHIB   =  0.90  +           L5                              mnz=0.5567E+1   |
| FYLD   = 36.00  |L5 L5  L5                                  MNY=0.6383E+2   |
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.1374E-3   |
| DFF =     0.00   0.5                                       VN =0.2030E+2   |
| dff =     0.00              ABSOLUTE MZ ENVELOPE            vn =0.4020E-2   |
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|     VALUE      -0.2         0.0        0.0        0.0         0.5          |
|   LOCATION      0.0         0.5        0.0        0.0         0.5          |
|    LOADING        6           6          2          6           5          |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                        DESIGN SUMMARY  (KIP-FEET)                         *|
|*                        --------------                                     *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX                MY           MZ           LOCATION               |
|        ======================================================              |
|          PASS         HSS BEND Z       0.087              5                |
|          0.00 T          -0.00         0.46             0.50               |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    3  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 4 Check 1

```
|-------------------------------------------------------------------------|
|                                                    Y        PROPERTIES  |
|*************                                       |        IN INCH UNIT |
|            *  |=============================|               ------------ |
|MEMBER   4  *  | AISC SECTIONS               |               AX=0.1890E+1 |
|            *  | ST  HSST3X3X0.188           |           --Z AY=0.1044E+1 |
|DESIGN CODE *  |                             |               AZ=0.1044E+1 |
| LRFD 2001  *  ===============================               PY=0.1970E+1 |
|            *                                                PZ=0.1970E+1 |
|            *  |<---LENGTH (FT)=    7.00 --->|               RY=0.1141E+1 |
|*************                                                RZ=0.1141E+1 |
|                                                                          |
|                  0.5 (KIP-FEET)                                          |
|PARAMETER        |L5                                         CAPACITIES   |
|IN KIP  INCH     |   L5                                      IN KIP  INCH |
|---------------  +       L5                                  -------------|
| KL/R-Y=  73.63  |           L5                              PNC=0.4348E+2|
| KL/R-Z=  73.63  +               L5                          pnc=0.0000E+0|
| UNL    =  84.00 |                   L5                      PNT=0.6124E+2|
| CB     =   1.00 +                       L5                  pnt=0.0000E+0|
| PHIC   =   0.00 |                                           MNZ=0.6383E+2|
| PHIB   =   0.90 +                           L5  L5          mnz=0.6033E+1|
| FYLD   =  36.00 |                                   L5  L6  MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|   mny=0.2871E-3|
| DFF =      0.00   0.0                                       VN =0.2030E+2|
| dff =      0.00             ABSOLUTE MZ ENVELOPE            vn =0.9580E-1|
|                                (WITH LOAD NO.)                           |
|                                                                          |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)               |
|                      -------------------------                           |
|                                                                          |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z     |
|                                                                          |
|      VALUE      -0.3         0.1        0.1         0.2         0.5      |
|    LOCATION      0.0         0.0        0.0         7.0         0.0      |
|     LOADING        2           5          2           2           5      |
|                                                                          |
|**************************************************************************|
|*                                                                        *|
|*                        DESIGN SUMMARY  (KIP-FEET)                      *|
|*                        --------------                                  *|
|*                                                                        *|
|*      RESULT/     CRITICAL COND/     RATIO/        LOADING/             *|
|        FX              MY             MZ          LOCATION              |
|       ======================================================            |
|          PASS        HSS BEND Z       0.095            5                |
|          0.00 C        0.00           0.50          0.00                |
|*                                                                        *|
|**************************************************************************|
|                                                                          |
|--------------------------------------------------------------------------|
    4  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 5 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y         PROPERTIES     |
|*************                                       |         IN INCH UNIT   |
|             *  |=============================|              -------------  |
|MEMBER   5  *  |  AISC SECTIONS                |              AX=0.1890E+1   |
|             *  | ST  HSST3X3X0.188            |         --Z  AY=0.1044E+1   |
|DESIGN CODE *  |                               |              AZ=0.1044E+1   |
| LRFD 2001  *  ===============================               PY=0.1970E+1   |
|             *                                               PZ=0.1970E+1   |
|             *  |<---LENGTH (FT)=    0.50 --->|               RY=0.1141E+1   |
|*************                                               RZ=0.1141E+1   |
|                                                                             |
|                 0.1 (KIP-FEET)                                              |
|PARAMETER        |                                      L5    CAPACITIES     |
|IN KIP  INCH     |                                  L5        IN KIP  INCH   |
|---------------  +                              L5  L5        -------------  |
| KL/R-Y=   5.26  |                            L5                PNC=0.5775E+2|
| KL/R-Z=   5.26  +                                              pnc=0.4753E-1|
| UNL    =  6.00  |                    L5  L5                    PNT=0.6124E+2|
| CB     =  1.00  +                                              pnt=0.0000E+0|
| PHIC   =  0.00  |                L5                            MNZ=0.6383E+2|
| PHIB   =  0.90  +    L5  L5                                    mnz=0.0000E+0|
| FYLD   = 36.00  |L0                                            MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|     mny=0.1873E+1|
| DFF =     0.00  -0.0                                           VN =0.2030E+2|
| dff =     0.00               ABSOLUTE MZ ENVELOPE              vn =0.4090E-1|
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                     MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                    |
|                     -------------------------                                |
|                                                                             |
|               AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z         |
|                                                                             |
|     VALUE       0.0          0.1        0.2         0.2         0.1         |
|   LOCATION      0.0          0.5        0.0         0.0         0.5         |
|    LOADING        2            5          6           6           5         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX                MY            MZ          LOCATION               |
|        ======================================================              |
|          PASS          HSS FLEX+AXL     0.030              2               |
|          0.05 C          -0.16          0.00            0.00               |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     5  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 6 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES     |
|*************                                        |        IN INCH UNIT   |
|            *  |=============================|                ------------   |
|MEMBER   6  *  |  AISC SECTIONS              |                AX=0.1890E+1   |
|            *  | ST  HSST3X3X0.188          |           --Z  AY=0.1044E+1   |
|DESIGN CODE *  |                             |                AZ=0.1044E+1   |
| LRFD 2001  *  ===============================                PY=0.1970E+1   |
|            *                                                 PZ=0.1970E+1   |
|            *  |<---LENGTH (FT)=    0.50 --->|                RY=0.1141E+1   |
|*************                                                 RZ=0.1141E+1   |
|                                                                             |
|                  0.1 (KIP-FEET)                                             |
|PARAMETER        |L6                                          CAPACITIES     |
|IN KIP  INCH     |   L6                                       IN KIP  INCH   |
|---------------  +       L6  L6                               -------------|
| KL/R-Y=   5.26  |               L6                             PNC=0.5775E+2|
| KL/R-Z=   5.26  +                                              pnc=0.0000E+0|
| UNL    =  6.00  |                   L6  L6                     PNT=0.6124E+2|
| CB     =  1.00  +                                              pnt=0.5696E-1|
| PHIC   =  0.00  |                           L6                 MNZ=0.6383E+2|
| PHIB   =  0.90  +                               L6  L6         mnz=0.8179E+0|
| FYLD   = 36.00  |                                       L0     MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|      mny=0.9647E+0|
| DFF =     0.00  -0.0                                           VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE               vn =0.1381E+0|
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE      -0.1        0.1        0.1         0.1         0.1          |
|   LOCATION       0.0        0.0        0.0         0.5         0.0          |
|    LOADING         6          6          2           2           6          |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX              MY             MZ          LOCATION                |
|        =======================================================             |
|          PASS        HSS FLEX+AXL     0.028            6                    |
|          0.06 T          0.08         0.07            0.00                  |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     6  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 7 Check 1

```
|---------------------------------------------------------------------------|
|                                                     Y        PROPERTIES    |
|*************                                        |        IN INCH UNIT  |
|             *  |=============================|               ------------  |
|MEMBER   7  *  |  AISC SECTIONS                |              AX=0.1890E+1  |
|            *  | ST  HSST3X3X0.188            |         --Z  AY=0.1044E+1  |
|DESIGN CODE *  |                              |              AZ=0.1044E+1  |
| LRFD 2001  *  ==============================              PY=0.1970E+1  |
|            *                                                PZ=0.1970E+1  |
|            *  |<---LENGTH (FT)=    0.50 --->|               RY=0.1141E+1  |
|*************                                               RZ=0.1141E+1  |
|                                                                           |
|                 0.1 (KIP-FEET)                                            |
|PARAMETER        |                                    L5    CAPACITIES    |
|IN KIP  INCH     |                                L5        IN KIP  INCH  |
|---------------  +                        L5  L5            -------------|
| KL/R-Y=   5.26  |                    L5                    PNC=0.5775E+2|
| KL/R-Z=   5.26  +                                          pnc=0.5687E-1|
| UNL    =  6.00  |            L5  L5                        PNT=0.6124E+2|
| CB     =  1.00  +                                          pnt=0.0000E+0|
| PHIC   =  0.00  |        L5                                MNZ=0.6383E+2|
| PHIB   =  0.90  +   L5  L5                                 mnz=0.0000E+0|
| FYLD   = 36.00  |L0                                        MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|  mny=0.1692E+1|
| DFF =     0.00  -0.0                                       VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE           vn =0.2390E-1|
|                                (WITH LOAD NO.)                            |
|                                                                           |
|                     MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                 |
|                     -------------------------                             |
|                                                                           |
|               AXIAL      SHEAR-Y     SHEAR-Z    MOMENT-Y    MOMENT-Z      |
|                                                                           |
|     VALUE       0.1         0.1         0.1         0.1         0.1       |
|  LOCATION      0.0         0.5         0.0         0.0         0.5       |
|   LOADING         2           5           6           6           5       |
|                                                                           |
|***************************************************************************|
|*                                                                         *|
|*                     DESIGN SUMMARY  (KIP-FEET)                          *|
|*                     --------------                                      *|
|*                                                                         *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/            *|
|         FX                MY           MZ           LOCATION             |
|        ======================================================            |
|          PASS        HSS FLEX+AXL      0.027              2              |
|          0.06 C          0.14          0.00            0.00              |
|*                                                                         *|
|***************************************************************************|
|                                                                           |
|---------------------------------------------------------------------------|
    7  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 8 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y        PROPERTIES      |
|*************                                       |        IN INCH UNIT    |
|            *  |=============================|               ------------    |
|MEMBER   8  *  | AISC SECTIONS               |               AX=0.1890E+1    |
|            *  | ST  HSST3X3X0.188           |           --Z AY=0.1044E+1    |
|DESIGN CODE *  |                             |               AZ=0.1044E+1    |
| LRFD 2001  *  ===============================               PY=0.1970E+1    |
|            *                                                PZ=0.1970E+1    |
|            *  |<---LENGTH (FT)=    0.50 --->|               RY=0.1141E+1    |
|*************                                                RZ=0.1141E+1    |
|                                                                             |
|                 0.1 (KIP-FEET)                                              |
|PARAMETER       |L6                                          CAPACITIES      |
|IN KIP  INCH    |   L6                                       IN KIP  INCH    |
|---------------  +      L6  L6                               -------------|  |
| KL/R-Y=   5.26  |               L6                            PNC=0.5775E+2|
| KL/R-Z=   5.26  +                                             pnc=0.0000E+0|
| UNL    =  6.00  |                   L6  L6                    PNT=0.6124E+2|
| CB     =  1.00  +                                             pnt=0.4753E-1|
| PHIC   =  0.00  |                           L6                MNZ=0.6383E+2|
| PHIB   =  0.90  +                               L6  L6        mnz=0.0000E+0|
| FYLD   = 36.00  |                                       L0    MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|     mny=0.1873E+1|
| DFF =     0.00  -0.0                                          VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE              vn =0.4090E-1|
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|     VALUE      -0.0          0.2        0.2         0.2         0.1         |
|   LOCATION      0.0          0.0        0.0         0.5         0.0         |
|    LOADING        6            6          2           2           6         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX            MY              MZ          LOCATION                  |
|        ======================================================               |
|          PASS        HSS FLEX+AXL     0.030            2                    |
|          0.05 T         -0.16         0.00            0.50                  |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     8  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 9 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES     |
|*************                                       |         IN INCH UNIT   |
|             *  |=============================|                ------------ |
|MEMBER   9  *  |  AISC SECTIONS               |                AX=0.1890E+1 |
|             *  | ST  HSST3X3X0.188           |           --Z  AY=0.1044E+1 |
|DESIGN CODE *  |                             |                AZ=0.1044E+1 |
| LRFD 2001  *  ===============================                PY=0.1970E+1 |
|             *                                                 PZ=0.1970E+1 |
|             *  |<---LENGTH (FT)=    1.00 --->|                RY=0.1141E+1 |
|*************                                                  RZ=0.1141E+1 |
|                                                                             |
|                  0.0 (KIP-FEET)                                             |
|PARAMETER        |L6                                           CAPACITIES   |
|IN KIP  INCH     |                                         L5  IN KIP  INCH |
|---------------  +   L2                                        -------------|
| KL/R-Y=  10.52  |       L2                           L5      PNC=0.5750E+2|
| KL/R-Z=  10.52  +                                             pnc=0.1118E+0|
| UNL    =  12.00  |           L2                   L5          PNT=0.6124E+2|
| CB     =   1.00  +               L2                           pnt=0.0000E+0|
| PHIC   =   0.00  |                            L5              MNZ=0.6383E+2|
| PHIB   =   0.90  +                                            mnz=0.2356E+0|
| FYLD   =  36.00  |                   L2  L5                   MNY=0.6383E+2|
| NSF    =   1.00  +---+---+---+---+---+---+---+---+---+---|    mny=0.1418E+1|
| DFF =      0.00   0.0                                         VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE             vn =0.5423E-1|
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.1        0.1        0.2         0.1         0.0         |
|   LOCATION       0.0        1.0        0.0         1.0         0.0         |
|    LOADING         2          6          6           6           6         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX              MY              MZ         LOCATION                |
|        ======================================================              |
|          PASS         HSS FLEX+AXL     0.027             6                  |
|          0.11 C           0.12         0.02            1.00                 |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     9  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 10 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y        PROPERTIES      |
|*************                                       |        IN INCH UNIT    |
|            *  |=============================|                ------------   |
|MEMBER  10  *  |  AISC SECTIONS              |                AX=0.1890E+1   |
|            *  | ST  HSST3X3X0.188           |           --Z  AY=0.1044E+1   |
|DESIGN CODE *  |                             |                AZ=0.1044E+1   |
| LRFD 2001  *  ===============================                PY=0.1970E+1   |
|            *                                                 PZ=0.1970E+1   |
|            *  |<---LENGTH (FT)=    1.50 --->|                RY=0.1141E+1   |
|*************                                                 RZ=0.1141E+1   |
|                                                                             |
|                 0.7 (KIP-FEET)                                              |
|PARAMETER        |L6                                          CAPACITIES     |
|IN KIP  INCH     |   L6                                       IN KIP  INCH   |
|---------------  +       L6                                   -------------  |
| KL/R-Y=  15.78  |           L6                               PNC=0.5708E+2  |
| KL/R-Z=  15.78  +               L6                           pnc=0.3840E+0  |
| UNL    =  18.00 |                   L6                       PNT=0.6124E+2  |
| CB     =   1.00 +                       L6                   pnt=0.0000E+0  |
| PHIC   =   0.00 |                           L6               MNZ=0.6383E+2  |
| PHIB   =   0.90 +                               L6           mnz=0.7924E+1  |
| FYLD   =  36.00 |                                   L6  L6   MNY=0.6383E+2  |
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|   mny=0.4799E+0  |
| DFF =      0.00   0.6                                        VN =0.2030E+2  |
| dff =      0.00               ABSOLUTE MZ ENVELOPE           vn =0.1785E-1  |
|                                  (WITH LOAD NO.)                            |
|                                                                             |
|                       MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                 |
|                       -------------------------                             |
|                                                                             |
|                 AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z       |
|                                                                             |
|      VALUE        0.4        0.0        0.0        0.0         0.7          |
|   LOCATION        0.0        0.0        0.0        0.0         0.0          |
|    LOADING          2          5          4          6           6          |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                          DESIGN SUMMARY  (KIP-FEET)                       *|
|*                          --------------                                   *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX               MY            MZ          LOCATION                |
|        =======================================================              |
|          PASS        HSS FLEX+AXL     0.135             6                    |
|          0.38 C         -0.04         0.66            0.00                   |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    10  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 11 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y        PROPERTIES      |
|*************                                       |        IN INCH UNIT    |
|            *  |=============================|              ------------    |
|MEMBER  11  *  | AISC SECTIONS               |              AX=0.1890E+1    |
|            *  | ST  HSST3X3X0.188           |          --Z AY=0.1044E+1    |
|DESIGN CODE *  |                             |              AZ=0.1044E+1    |
| LRFD 2001  *  ===============================              PY=0.1970E+1    |
|            *                                               PZ=0.1970E+1    |
|            *  |<---LENGTH (FT)=    0.50 --->|              RY=0.1141E+1    |
|*************                                               RZ=0.1141E+1    |
|                                                                             |
|                 0.6 (KIP-FEET)                                              |
|PARAMETER        |                                      L6   CAPACITIES      |
|IN KIP  INCH     |                                  L6       IN KIP  INCH    |
|---------------  +                              L6           -------------   |
| KL/R-Y=   5.26  |                      L6  L6               PNC=0.5775E+2   |
| KL/R-Z=   5.26  +                                           pnc=0.2477E+0   |
| UNL    =  6.00  |                  L6                       PNT=0.6124E+2   |
| CB     =  1.00  +              L6                           pnt=0.0000E+0   |
| PHIC   =  0.00  |          L6                               MNZ=0.6383E+2   |
| PHIB   =  0.90  +   L6  L6                                  mnz=0.7763E+1   |
| FYLD   = 36.00  |L6                                         MNY=0.6383E+2   |
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.1223E+0   |
| DFF =     0.00   0.6                                        VN =0.2030E+2   |
| dff =     0.00               ABSOLUTE MZ ENVELOPE           vn =0.1203E-1   |
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.2        0.0        0.0         0.0         0.6          |
|   LOCATION       0.0        0.5        0.0         0.5         0.5          |
|    LOADING         2          6          2           2           6          |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX            MY              MZ           LOCATION                |
|        ======================================================              |
|          PASS        HSS FLEX+AXL      0.126              6                 |
|          0.25 C         -0.01          0.65             0.50                |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   11  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 12 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES     |
|*************                                        |        IN INCH UNIT   |
|             *  |=============================|                ------------ |
|MEMBER  12  *  |  AISC SECTIONS              |                AX=0.1890E+1  |
|             *  | ST  HSST3X3X0.188           |          --Z   AY=0.1044E+1  |
|DESIGN CODE *  |                             |                AZ=0.1044E+1  |
| LRFD 2001  *  ===============================                PY=0.1970E+1  |
|             *                                                PZ=0.1970E+1  |
|             *  |<---LENGTH (FT)=    7.00 --->|                RY=0.1141E+1  |
|*************                                                 RZ=0.1141E+1  |
|                                                                             |
|                  0.7 (KIP-FEET)                                             |
|PARAMETER        |L6                                          CAPACITIES    |
|IN KIP  INCH     |   L6                                       IN KIP  INCH  |
|---------------  +       L6                                   --------------|
| KL/R-Y=  73.63  |           L6                               PNC=0.4348E+2|
| KL/R-Z=  73.63  +               L6                           pnc=0.2074E+0|
| UNL    =  84.00 |                   L6                       PNT=0.6124E+2|
| CB     =   1.00 +                       L6                   pnt=0.0000E+0|
| PHIC   =   0.00 |                           L6               MNZ=0.6383E+2|
| PHIB   =   0.90 +                               L6  L6       mnz=0.8332E+1|
| FYLD   =  36.00 |                                       L6   MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|    mny=0.2208E+1|
| DFF =      0.00   0.0                                        VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE            vn =0.1167E+0|
|                                 (WITH LOAD NO.)                           |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.2          0.1        0.1         0.2         0.7        |
|   LOCATION       0.0          0.0        0.0         0.0         0.0        |
|    LOADING         2            6          6           6           6        |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                          DESIGN SUMMARY  (KIP-FEET)                       *|
|*                          --------------                                   *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX              MY             MZ            LOCATION              |
|       =======================================================              |
|          PASS        HSS FLEX+AXL     0.168              6                 |
|          0.21 C         -0.18         0.69             0.00                |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    12  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 13 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES     |
|*************                                        |        IN INCH UNIT   |
|            *  |=============================|                ------------   |
|MEMBER  13  *  |  AISC SECTIONS              |                AX=0.1890E+1   |
|            *  | ST  HSST3X3X0.188           |           --Z  AY=0.1044E+1   |
|DESIGN CODE *  |                             |                AZ=0.1044E+1   |
| LRFD 2001  *  ===============================                PY=0.1970E+1   |
|            *                                                 PZ=0.1970E+1   |
|            *  |<---LENGTH (FT)=    3.00 --->|                RY=0.1141E+1   |
|*************                                                 RZ=0.1141E+1   |
|                                                                             |
|                 0.1 (KIP-FEET)                                              |
|PARAMETER        |                                       L6   CAPACITIES     |
|IN KIP  INCH     |                               L6  L6       IN KIP  INCH   |
|---------------  +                           L6  L6           -------------|
| KL/R-Y=  31.55  |                       L6                     PNC=0.5488E+2|
| KL/R-Z=  31.55  +                                              pnc=0.0000E+0|
| UNL   =  36.00  |               L6  L6                         PNT=0.6124E+2|
| CB    =   1.00  +                                              pnt=0.4801E-1|
| PHIC  =   0.00  |           L6                                 MNZ=0.6383E+2|
| PHIB  =   0.90  +   L6  L6                                     mnz=0.9728E+0|
| FYLD  =  36.00  |L0                                            MNY=0.6383E+2|
| NSF   =   1.00  +---+---+---+---+---+---+---+---+---+---|      mny=0.1119E+1|
| DFF =     0.00  -0.0                                           VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE               vn =0.2702E-1|
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|     VALUE      -0.2         0.0        0.1         0.1         0.1         |
|   LOCATION      3.0         0.0        0.0         0.0         3.0         |
|    LOADING        5           6          6           6           6         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX              MY             MZ          LOCATION                |
|        ======================================================               |
|          PASS       HSS FLEX+AXL     0.033              6                   |
|          0.05 T        -0.09         0.08            3.00                   |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   13  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 14 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES    |
|*************                                        |         IN INCH UNIT  |
|            *  |=============================|                 ------------  |
|MEMBER  14  *  |  AISC SECTIONS              |                 AX=0.1890E+1  |
|            *  | ST  HSST3X3X0.188           |             --Z AY=0.1044E+1  |
|DESIGN CODE *  |                             |                 AZ=0.1044E+1  |
| LRFD 2001  *  ===============================                 PY=0.1970E+1  |
|            *                                                  PZ=0.1970E+1  |
|            *  |<---LENGTH (FT)=    3.00 --->|                 RY=0.1141E+1  |
|*************                                                  RZ=0.1141E+1  |
|                                                                             |
|                 0.1 (KIP-FEET)                                              |
|PARAMETER        |                                        L2   CAPACITIES    |
|IN KIP  INCH     |                                    L2       IN KIP  INCH  |
|---------------  +                            L2  L2           -------------|
| KL/R-Y=  31.55  |                        L2                   PNC=0.5488E+2|
| KL/R-Z=  31.55  +                    L2                       pnc=0.0000E+0|
| UNL    =  36.00 |                L2                           PNT=0.6124E+2|
| CB     =   1.00 +                                             pnt=0.6501E-1|
| PHIC   =   0.00 |       L2  L2                                MNZ=0.6383E+2|
| PHIB   =   0.90 +   L2                                        mnz=0.1022E+1|
| FYLD   =  36.00 |L0                                           MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|     mny=0.1139E+1|
| DFF =      0.00  -0.0                                         VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE             vn =0.2838E-1|
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE      -0.2        0.0        0.1         0.1         0.1          |
|   LOCATION       3.0        0.0        0.0         0.0         3.0          |
|    LOADING         5          2          6           6           2          |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX               MY            MZ           LOCATION               |
|        ======================================================              |
|          PASS         HSS FLEX+AXL     0.034             6                 |
|          0.07 T         -0.09          0.09             3.00               |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    14  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 15 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y        PROPERTIES      |
|*************                                       |        IN INCH UNIT    |
|            *  |=============================|                ------------ |
|MEMBER  15  *  | AISC SECTIONS               |                AX=0.1890E+1 |
|            *  | ST  HSST3X3X0.188           |           --Z  AY=0.1044E+1 |
|DESIGN CODE *  |                             |                AZ=0.1044E+1 |
| LRFD 2001  *  ===============================                PY=0.1970E+1 |
|            *                                                 PZ=0.1970E+1 |
|            *  |<---LENGTH (FT)=    3.00 --->|                RY=0.1141E+1 |
|*************                                                 RZ=0.1141E+1 |
|                                                                             |
|                  0.1 (KIP-FEET)                                             |
|PARAMETER        |L6                                          CAPACITIES     |
|IN KIP  INCH     |   L6                                       IN KIP  INCH   |
|---------------  +           L6                               -------------|
| KL/R-Y=  31.55  |               L6                           PNC=0.5488E+2|
| KL/R-Z=  31.55  +                   L6                       pnc=0.0000E+0|
| UNL    =  36.00  |                      L6                   PNT=0.6124E+2|
| CB     =   1.00  +                                           pnt=0.7394E-1|
| PHIC   =   0.00  |                          L6  L6           MNZ=0.6383E+2|
| PHIB   =   0.90  +                                  L6       mnz=0.1022E+1|
| FYLD   =  36.00  |                                      L0   MNY=0.6383E+2|
| NSF    =   1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.1006E+1|
| DFF =      0.00  -0.0                                        VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE            vn =0.2838E-1|
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE      -0.2         0.0        0.1         0.1         0.1         |
|   LOCATION       0.0         0.0        0.0         0.0         0.0         |
|    LOADING        6           6          2           2           6          |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                          DESIGN SUMMARY  (KIP-FEET)                       *|
|*                          --------------                                   *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX            MY              MZ          LOCATION                  |
|        ======================================================               |
|          PASS        HSS FLEX+AXL     0.032            2                    |
|          0.07 T         -0.08        -0.09           0.00                   |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    15  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 16 Check 1

```
|--------------------------------------------------------------------------|
|                                                    Y        PROPERTIES   |
|*************                                       |        IN INCH UNIT |
|            *  |=============================|               ------------ |
|MEMBER  16  *  |  AISC SECTIONS              |               AX=0.1890E+1 |
|            *  | ST  HSST3X3X0.188           |           --Z AY=0.1044E+1 |
|DESIGN CODE *  |                             |               AZ=0.1044E+1 |
| LRFD 2001  *  ===============================               PY=0.1970E+1 |
|            *                                                PZ=0.1970E+1 |
|            *  |<---LENGTH (FT)=    3.00 --->|               RY=0.1141E+1 |
|*************                                                RZ=0.1141E+1 |
|                                                                          |
|                  0.1 (KIP-FEET)                                          |
|PARAMETER        |L2                                         CAPACITIES   |
|IN KIP  INCH     |   L2  L2                                  IN KIP  INCH |
|---------------  +           L2                              -------------|
| KL/R-Y=  31.55  |               L2                          PNC=0.5488E+2|
| KL/R-Z=  31.55  +                                           pnc=0.0000E+0|
| UNL    =  36.00 |                   L2  L2                  PNT=0.6124E+2|
| CB     =   1.00 +                                           pnt=0.9094E-1|
| PHIC   =   0.00 |                           L2              MNZ=0.6383E+2|
| PHIB   =   0.90 +                               L2  L2      mnz=0.9728E+0|
| FYLD   =  36.00 |                                       L0  MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|   mny=0.9857E+0|
| DFF =      0.00  -0.0                                       VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE           vn =0.2702E-1|
|                                 (WITH LOAD NO.)                          |
|                                                                          |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)               |
|                      -------------------------                           |
|                                                                          |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z     |
|                                                                          |
|      VALUE      -0.2         0.0        0.1         0.1         0.1      |
|   LOCATION       0.0         0.0        0.0         0.0         0.0      |
|    LOADING        6           2          2           2           2       |
|                                                                          |
|**************************************************************************|
|*                                                                        *|
|*                          DESIGN SUMMARY  (KIP-FEET)                    *|
|*                          --------------                                *|
|*                                                                        *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/            *|
|         FX             MY              MZ          LOCATION             |
|        ===================================================               |
|          PASS        HSS FLEX+AXL     0.031             2                |
|          0.09 T         -0.08        -0.08            0.00               |
|*                                                                        *|
|**************************************************************************|
|                                                                          |
|--------------------------------------------------------------------------|
   16  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 17 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES     |
|*************                                        |         IN INCH UNIT   |
|             *  |=============================|               ------------   |
|MEMBER  17  *  | AISC SECTIONS                |               AX=0.1890E+1   |
|             *  | ST  HSST3X3X0.188            |           --Z AY=0.1044E+1   |
|DESIGN CODE *  |                              |               AZ=0.1044E+1   |
| LRFD 2001  *  ==============================                 PY=0.1970E+1   |
|             *                                                PZ=0.1970E+1   |
|             *  |<---LENGTH (FT)=    1.00 --->|               RY=0.1141E+1   |
|*************                                                 RZ=0.1141E+1   |
|                                                                             |
|                  0.1 (KIP-FEET)                                             |
|PARAMETER        |L6                                          CAPACITIES     |
|IN KIP  INCH     |                                            IN KIP  INCH   |
|---------------  +   L6                                       -------------  |
| KL/R-Y=  10.52  |       L6                                   PNC=0.5750E+2|
| KL/R-Z=  10.52  +                                            pnc=0.1653E-1|
| UNL    =  12.00 |           L6                               PNT=0.6124E+2|
| CB     =  1.00  +               L6                      L2   pnt=0.0000E+0|
| PHIC   =  0.00  |                                            MNZ=0.6383E+2|
| PHIB   =  0.90  +                                   L2       mnz=0.1128E+1|
| FYLD   =  36.00 |                   L5  L5  L5  L5           MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|    mny=0.9653E+0|
| DFF =     0.00   0.0                                         VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE             vn =0.1184E+0|
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.0        0.1        0.1        0.1         0.1          |
|    LOCATION      0.0        0.0        0.0        0.0         0.0          |
|     LOADING       6          6          2          6           6           |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                       DESIGN SUMMARY  (KIP-FEET)                          *|
|*                       --------------                                      *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX               MY            MZ          LOCATION                |
|        ===================================================                  |
|          PASS        HSS FLEX+AXL     0.033            6                    |
|          0.02 C          0.08         0.09           0.00                   |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   17  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 18 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES     |
|*************                                       |         IN INCH UNIT   |
|            *   |=============================|               ------------   |
|MEMBER  18  *   |  AISC SECTIONS              |               AX=0.1890E+1   |
|            *   | ST  HSST3X3X0.188           |           --Z AY=0.1044E+1   |
|DESIGN CODE *   |                             |               AZ=0.1044E+1   |
| LRFD 2001  *   ===============================               PY=0.1970E+1   |
|            *                                                 PZ=0.1970E+1   |
|            *   |<---LENGTH (FT)=    1.00 --->|               RY=0.1141E+1   |
|*************                                                 RZ=0.1141E+1   |
|                                                                             |
|                  0.1 (KIP-FEET)                                             |
|PARAMETER        |L6                                          CAPACITIES     |
|IN KIP  INCH     |                                            IN KIP  INCH   |
|---------------  +   L6                                       -------------  |
| KL/R-Y=  10.52  |       L6                                   PNC=0.5750E+2  |
| KL/R-Z=  10.52  +                                            pnc=0.5511E-2  |
| UNL    =  12.00 |           L6                          L2   PNT=0.6124E+2  |
| CB     =   1.00 +                                            pnt=0.0000E+0  |
| PHIC   =   0.00 |               L6                  L2       MNZ=0.6383E+2  |
| PHIB   =   0.90 +                               L2           mnz=0.1066E+1  |
| FYLD   =  36.00 |                   L5   L5   L5             MNY=0.6383E+2  |
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|   mny=0.8136E+0  |
| DFF =      0.00   0.0                                        VN =0.2030E+2  |
| dff =      0.00               ABSOLUTE MZ ENVELOPE           vn =0.1184E+0  |
|                                  (WITH LOAD NO.)                            |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL       SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z       |
|                                                                             |
|     VALUE        0.0         0.1        0.1         0.1         0.1        |
|   LOCATION       0.0         0.0        0.0         1.0         0.0        |
|    LOADING         5           6          2           2           6        |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                          DESIGN SUMMARY  (KIP-FEET)                       *|
|*                          --------------                                   *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX              MY             MZ           LOCATION               |
|        ======================================================              |
|          PASS        HSS FLEX+AXL     0.029              6                 |
|          0.01 C         -0.07         0.09             0.00                |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     18  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 19 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES     |
|*************                                        |        IN INCH UNIT   |
|            *  |=============================|                ------------   |
|MEMBER  19  *  |  AISC SECTIONS              |                AX=0.1890E+1   |
|            *  | ST  HSST3X3X0.188           |            --Z AY=0.1044E+1   |
|DESIGN CODE *  |                             |                AZ=0.1044E+1   |
| LRFD 2001  *  ===============================                PY=0.1970E+1   |
|            *                                                 PZ=0.1970E+1   |
|            *  |<---LENGTH (FT)=    7.00 --->|                RY=0.1141E+1   |
|*************                                                 RZ=0.1141E+1   |
|                                                                             |
|                 0.5 (KIP-FEET)                                              |
|PARAMETER        |                                        L5  CAPACITIES     |
|IN KIP  INCH     |                                    L5      IN KIP  INCH   |
|---------------  +                                L5          -------------  |
| KL/R-Y=  73.63  |                            L5              PNC=0.4348E+2  |
| KL/R-Z=  73.63  +                        L5                  pnc=0.0000E+0  |
| UNL    =  84.00 |                    L5                      PNT=0.6124E+2  |
| CB     =   1.00 +                L5                          pnt=0.0000E+0  |
| PHIC   =   0.00 |            L5                              MNZ=0.6383E+2  |
| PHIB   =   0.90 +        L5                                  mnz=0.6033E+1  |
| FYLD   =  36.00 |L5 L5                                       MNY=0.6383E+2  |
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|   mny=0.2871E-3  |
| DFF =      0.00  0.0                                         VN =0.2030E+2  |
| dff =      0.00              ABSOLUTE MZ ENVELOPE            vn =0.9580E-1  |
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                     MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                   |
|                     -------------------------                               |
|                                                                             |
|               AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z         |
|                                                                             |
|      VALUE     -0.2          0.1        0.1         0.2         0.5         |
|   LOCATION      0.0          7.0        0.0         7.0         7.0         |
|    LOADING        2            5          2           2           5         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX            MY              MZ          LOCATION                   |
|        ======================================================               |
|          PASS         HSS BEND Z      0.095             5                    |
|          0.00 C       0.00            0.50            7.00                   |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   19  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 20 Check 1

```
|--------------------------------------------------------------------------|
|                                                    Y         PROPERTIES  |
|*************                                       |         IN INCH UNIT |
|            *  |=============================|                ------------ |
|MEMBER  20  *  |  AISC SECTIONS              |                AX=0.1890E+1 |
|            *  | ST  HSST3X3X0.188           |           --Z  AY=0.1044E+1 |
|DESIGN CODE *  |                             |                AZ=0.1044E+1 |
| LRFD 2001  *  ===============================                PY=0.1970E+1 |
|            *                                                 PZ=0.1970E+1 |
|            *  |<---LENGTH (FT)=    7.00 --->|                RY=0.1141E+1 |
|*************                                                 RZ=0.1141E+1 |
|                                                                          |
|                 0.7 (KIP-FEET)                                           |
|PARAMETER        |                                      L6    CAPACITIES  |
|IN KIP  INCH     |                                  L6        IN KIP  INCH |
|---------------  +                              L6            -------------|
| KL/R-Y=  73.63  |                          L6                PNC=0.4348E+2|
| KL/R-Z=  73.63  +                      L6                    pnc=0.2628E+0|
| UNL    =  84.00 |                  L6                        PNT=0.6124E+2|
| CB     =   1.00 +              L6                            pnt=0.0000E+0|
| PHIC   =   0.00 |          L6                                MNZ=0.6383E+2|
| PHIB   =   0.90 +      L6                                    mnz=0.7924E+1|
| FYLD   =  36.00 |L5 L6                                       MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|    mny=0.2172E+1|
| DFF =      0.00 -0.0                                         VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE            vn =0.1167E+0|
|                                 (WITH LOAD NO.)                           |
|                                                                          |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)               |
|                      -------------------------                           |
|                                                                          |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z     |
|                                                                          |
|     VALUE        0.3         0.1        0.1         0.2         0.7      |
|   LOCATION       0.0         7.0        0.0         0.0         7.0      |
|    LOADING         2           6          6           6           6      |
|                                                                          |
|**************************************************************************|
|*                                                                        *|
|*                        DESIGN SUMMARY  (KIP-FEET)                      *|
|*                        --------------                                  *|
|*                                                                        *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/            *|
|         FX            MY              MZ           LOCATION             |
|        =====================================================            |
|          PASS        HSS FLEX+AXL     0.161            6                |
|          0.26 C         -0.18         0.66           7.00               |
|*                                                                        *|
|**************************************************************************|
|                                                                          |
|--------------------------------------------------------------------------|
   20  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 21 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y         PROPERTIES     |
|*************                                       |         IN INCH UNIT   |
|             *  |=============================|              -------------  |
|MEMBER  21  *  |  AISC SECTIONS              |              AX=0.1890E+1   |
|             *  | ST   HSST3X3X0.188          |          --Z AY=0.1044E+1   |
|DESIGN CODE *  |                             |              AZ=0.1044E+1   |
| LRFD 2001  *  ===============================              PY=0.1970E+1   |
|             *                                               PZ=0.1970E+1   |
|             *  |<---LENGTH (FT)=    0.50 --->|              RY=0.1141E+1   |
|*************                                               RZ=0.1141E+1   |
|                                                                             |
|                  0.5 (KIP-FEET)                                             |
|PARAMETER        |L5                                         CAPACITIES     |
|IN KIP  INCH     |   L5                                      IN KIP  INCH   |
|---------------  +                                           -------------  |
| KL/R-Y=   5.26  |       L5                                  PNC=0.5775E+2|
| KL/R-Z=   5.26  +           L5                              pnc=0.0000E+0|
| UNL    =  6.00  |               L5                          PNT=0.6124E+2|
| CB     =  1.00  +                                           pnt=0.2818E-3|
| PHIC   =  0.00  |                   L5  L5                  MNZ=0.6383E+2|
| PHIB   =  0.90  +                           L5              mnz=0.5567E+1|
| FYLD   = 36.00  |                               L5  L5  L5  MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.1374E-3|
| DFF =     0.00   0.5                                        VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE            vn =0.4020E-2|
|                                (WITH LOAD NO.)                             |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|     VALUE       -0.2        0.0        0.0        0.0         0.5         |
|  LOCATION       0.0        0.0        0.0        0.0         0.0         |
|   LOADING         6          2          2          6           5         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX              MY             MZ          LOCATION                |
|        ======================================================              |
|          PASS          HSS BEND Z       0.087             5                 |
|          0.00 T          -0.00          0.46            0.00                |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   21  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 22 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES    |
|*************                                        |         IN INCH UNIT  |
|            *  |=============================|                 ------------  |
|MEMBER  22  *  | AISC SECTIONS               |                 AX=0.1890E+1  |
|            *  | ST  HSST3X3X0.188           |             --Z AY=0.1044E+1  |
|DESIGN CODE *  |                             |                 AZ=0.1044E+1  |
| LRFD 2001  *  ===============================                 PY=0.1970E+1  |
|            *                                                  PZ=0.1970E+1  |
|            *  |<---LENGTH (FT)=    1.50 --->|                 RY=0.1141E+1  |
|*************                                                  RZ=0.1141E+1  |
|                                                                             |
|                 0.5 (KIP-FEET)                                              |
|PARAMETER        |                                         L5  CAPACITIES    |
|IN KIP  INCH     |                                     L5      IN KIP  INCH  |
|---------------  +                                 L5          -------------|
| KL/R-Y=  15.78  |                               L5              PNC=0.5708E+2|
| KL/R-Z=  15.78  +                           L5                  pnc=0.0000E+0|
| UNL    =  18.00 |                       L5                      PNT=0.6124E+2|
| CB     =   1.00 +                   L5                          pnt=0.0000E+0|
| PHIC   =   0.00 |               L5                              MNZ=0.6383E+2|
| PHIB   =   0.90 +   L5  L5                                      mnz=0.6033E+1|
| FYLD   =  36.00 |L5                                             MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|       mny=0.6638E-3|
| DFF  =     0.00  0.5                                            VN =0.2030E+2|
| dff  =     0.00             ABSOLUTE MZ ENVELOPE                vn =0.2995E-1|
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                     MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                   |
|                     -------------------------                               |
|                                                                             |
|               AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z         |
|                                                                             |
|      VALUE     -0.4        0.0        0.0         0.0         0.5           |
|   LOCATION      0.0        1.5        0.0         1.5         1.5           |
|    LOADING        6          6          4           2           5           |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX            MY              MZ           LOCATION                |
|        ======================================================               |
|          PASS       HSS FLEX+AXL      0.095             5                   |
|          0.00 C        0.00           0.50           1.50                   |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     22  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 23 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y         PROPERTIES     |
|*************                                       |         IN INCH UNIT   |
|            *  |=============================|                ------------   |
|MEMBER  23  *  |  AISC SECTIONS              |                AX=0.1890E+1   |
|            *  | ST  HSST3X3X0.188           |           --Z  AY=0.1044E+1   |
|DESIGN CODE *  |                             |                AZ=0.1044E+1   |
| LRFD 2001  *  ===============================                PY=0.1970E+1   |
|            *                                                 PZ=0.1970E+1   |
|            *  |<---LENGTH (FT)=    0.50 --->|                RY=0.1141E+1   |
|*************                                                 RZ=0.1141E+1   |
|                                                                             |
|                 0.6 (KIP-FEET)                                              |
|PARAMETER       |                                       L6    CAPACITIES     |
|IN KIP  INCH    |                                   L6        IN KIP  INCH   |
|---------------  +                              L6            -------------  |
| KL/R-Y=    5.26  |                         L6                PNC=0.5775E+2  |
| KL/R-Z=    5.26  +                     L6                    pnc=0.2477E+0  |
| UNL   =    6.00  |                 L6                        PNT=0.6124E+2  |
| CB    =    1.00  +             L6                            pnt=0.0000E+0  |
| PHIC  =    0.00  |         L6                                MNZ=0.6383E+2  |
| PHIB  =    0.90  +   L6  L6                                  mnz=0.7702E+1  |
| FYLD  =   36.00  |L6                                         MNY=0.6383E+2  |
| NSF   =    1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.1178E+0  |
| DFF =      0.00   0.6                                        VN =0.2030E+2  |
| dff =      0.00               ABSOLUTE MZ ENVELOPE           vn =0.8495E-2  |
|                                  (WITH LOAD NO.)                            |
|                                                                             |
|                     MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                   |
|                     -------------------------                               |
|                                                                             |
|               AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z         |
|                                                                             |
|      VALUE      0.2        0.0        0.0        0.0         0.6            |
|   LOCATION      0.0        0.0        0.0        0.5         0.5            |
|    LOADING        2          2          2          2           6            |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX             MY             MZ          LOCATION                 |
|        ======================================================               |
|          PASS       HSS FLEX+AXL     0.125             6                    |
|          0.25 C        -0.01         0.64            0.50                   |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   23  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 24 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES    |
|*************                                        |         IN INCH UNIT  |
|             *  |=============================|                ------------ |
|MEMBER  24   *  |  AISC SECTIONS              |                AX=0.1890E+1 |
|             *  | ST  HSST3X3X0.188           |            --Z AY=0.1044E+1 |
|DESIGN CODE  *  |                             |                AZ=0.1044E+1 |
| LRFD 2001   *  ===============================                PY=0.1970E+1 |
|             *                                                 PZ=0.1970E+1 |
|             *  |<---LENGTH (FT)=    1.50 --->|                RY=0.1141E+1 |
|*************                                                  RZ=0.1141E+1 |
|                                                                             |
|                   0.7 (KIP-FEET)                                            |
|PARAMETER        |                                        L6   CAPACITIES    |
|IN KIP  INCH     |                                    L6       IN KIP  INCH  |
|---------------  +                                L6           -------------|
| KL/R-Y=  15.78  |                        L6  L6               PNC=0.5708E+2|
| KL/R-Z=  15.78  +                    L6                       pnc=0.3840E+0|
| UNL    = 18.00  |                L6                           PNT=0.6124E+2|
| CB     =  1.00  +            L6                               pnt=0.0000E+0|
| PHIC   =  0.00  |        L6                                   MNZ=0.6383E+2|
| PHIB   =  0.90  +   L6  L6                                    mnz=0.8332E+1|
| FYLD   = 36.00  |L6                                           MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|     mny=0.3354E+0|
| DFF =     0.00   0.6                                          VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE              vn =0.3485E-1|
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.4         0.0        0.0         0.0         0.7         |
|   LOCATION       0.0         1.5        0.0         0.0         1.5         |
|    LOADING         2           6          7           2           6         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                          DESIGN SUMMARY  (KIP-FEET)                       *|
|*                          --------------                                   *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX             MY             MZ            LOCATION               |
|        ======================================================              |
|          PASS         HSS FLEX+AXL      0.139             6                |
|          0.38 C         -0.03          0.69             1.50               |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    24  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 25 Check 1

```
|---------------------------------------------------------------------------|
|                                                     Y         PROPERTIES  |
|*************                                        |         IN INCH UNIT |
|            *  |=============================|                 ------------ |
|MEMBER  25  *  | AISC SECTIONS               |                 AX=0.1890E+1 |
|            *  | ST  HSST3X3X0.188           |             --Z AY=0.1044E+1 |
|DESIGN CODE *  |                             |                 AZ=0.1044E+1 |
| LRFD 2001  *  ===============================                 PY=0.1970E+1 |
|            *                                                  PZ=0.1970E+1 |
|            *  |<---LENGTH (FT)=    1.00 --->|                 RY=0.1141E+1 |
|*************                                                  RZ=0.1141E+1 |
|                                                                            |
|                  0.0 (KIP-FEET)                                            |
|PARAMETER        |L6                                           CAPACITIES  |
|IN KIP  INCH     |                                             IN KIP  INCH |
|---------------  +   L6                                        -------------|
| KL/R-Y=  10.52  |                                             PNC=0.5750E+2|
| KL/R-Z=  10.52  +                                       L2    pnc=0.0000E+0|
| UNL    =  12.00  |       L6                                   PNT=0.6124E+2|
| CB     =  1.00  +           L6                      L6        pnt=0.1118E+0|
| PHIC   =  0.00  |                                 L6          MNZ=0.6383E+2|
| PHIB   =  0.90  +               L6          L6                mnz=0.3777E+0|
| FYLD   =  36.00  |                   L6  L6                   MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|     mny=0.1418E+1|
| DFF =     0.00   0.0                                          VN =0.2030E+2|
| dff =     0.00             ABSOLUTE MZ ENVELOPE               vn =0.4092E-2|
|                               (WITH LOAD NO.)                              |
|                                                                            |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                 |
|                      -------------------------                             |
|                                                                            |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z       |
|                                                                            |
|     VALUE      -0.1        0.0        0.2        0.1         0.0           |
|   LOCATION      0.0        0.0        0.0        0.0         0.0           |
|    LOADING       6          5          2          2           6            |
|                                                                            |
|****************************************************************************|
|*                                                                          *|
|*                        DESIGN SUMMARY  (KIP-FEET)                        *|
|*                        --------------                                    *|
|*                                                                          *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/             *|
|         FX               MY            MZ           LOCATION              |
|        ======================================================             |
|          PASS         HSS FLEX+AXL     0.029              6               |
|          0.11 T          0.12          0.03            0.00               |
|*                                                                          *|
|****************************************************************************|
|                                                                            |
|----------------------------------------------------------------------------|
   25  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 26 Check 1

```
|-----------------------------------------------------------------------------|
|                                                      Y         PROPERTIES   |
|*************                                         |         IN INCH UNIT |
|             *  |=============================|                ------------ |
|MEMBER  26   *  | AISC SECTIONS               |                AX=0.1890E+1 |
|             *  | ST  HSST3X3X0.188           |          --Z   AY=0.1044E+1 |
|DESIGN CODE  *  |                             |                AZ=0.1044E+1 |
| LRFD 2001   *  ===============================                PY=0.1970E+1 |
|             *                                                 PZ=0.1970E+1 |
|             *  |<---LENGTH (FT)=    1.00 --->|                RY=0.1141E+1 |
|*************                                                  RZ=0.1141E+1 |
|                                                                             |
|                  0.1 (KIP-FEET)                                             |
|PARAMETER       |L6                                            CAPACITIES   |
|IN KIP  INCH    |   L6                                         IN KIP  INCH |
|---------------  +       L6  L6                                -------------|
| KL/R-Y=  10.52  |               L6                            PNC=0.5750E+2|
| KL/R-Z=  10.52  +                                             pnc=0.5870E-1|
| UNL    =  12.00 |                   L6  L6                    PNT=0.6124E+2|
| CB     =   1.00 +                                             pnt=0.0000E+0|
| PHIC   =   0.00 |                           L6                MNZ=0.6383E+2|
| PHIB   =   0.90 +                               L6  L6        mnz=0.6410E+0|
| FYLD   =  36.00 |                                       L2    MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|     mny=0.1437E+1|
| DFF =      0.00 -0.0                                          VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE             vn =0.5423E-1|
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.1        0.1        0.2         0.1         0.1          |
|   LOCATION       0.0        0.0        0.0         0.0         0.0          |
|    LOADING         2          6          6           6           6          |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX             MY              MZ           LOCATION               |
|        ======================================================              |
|          PASS        HSS FLEX+AXL      0.033             6                 |
|          0.06 C         0.12           0.05            0.00                |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     26  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
1	HSST3X3X0	HSST3X3X0	0.028	1.000	0.028	HSS FLEX+A	2	1.890	2.460	2.460	4.030
2	HSST3X3X0	HSST3X3X0	0.095	1.000	0.095	HSS FLEX+A	5	1.890	2.460	2.460	4.030
3	HSST3X3X0	HSST3X3X0	0.087	1.000	0.087	HSS BEND Z	5	1.890	2.460	2.460	4.030
4	HSST3X3X0	HSST3X3X0	0.095	1.000	0.095	HSS BEND Z	5	1.890	2.460	2.460	4.030
5	HSST3X3X0	HSST3X3X0	0.030	1.000	0.030	HSS FLEX+A	2	1.890	2.460	2.460	4.030
6	HSST3X3X0	HSST3X3X0	0.028	1.000	0.028	HSS FLEX+A	6	1.890	2.460	2.460	4.030
7	HSST3X3X0	HSST3X3X0	0.027	1.000	0.027	HSS FLEX+A	2	1.890	2.460	2.460	4.030
8	HSST3X3X0	HSST3X3X0	0.030	1.000	0.030	HSS FLEX+A	2	1.890	2.460	2.460	4.030
9	HSST3X3X0	HSST3X3X0	0.027	1.000	0.027	HSS FLEX+A	6	1.890	2.460	2.460	4.030
10	HSST3X3X0	HSST3X3X0	0.135	1.000	0.135	HSS FLEX+A	6	1.890	2.460	2.460	4.030
11	HSST3X3X0	HSST3X3X0	0.126	1.000	0.126	HSS FLEX+A	6	1.890	2.460	2.460	4.030
12	HSST3X3X0	HSST3X3X0	0.168	1.000	0.168	HSS FLEX+A	6	1.890	2.460	2.460	4.030
13	HSST3X3X0	HSST3X3X0	0.033	1.000	0.033	HSS FLEX+A	6	1.890	2.460	2.460	4.030
14	HSST3X3X0	HSST3X3X0	0.034	1.000	0.034	HSS FLEX+A	6	1.890	2.460	2.460	4.030
15	HSST3X3X0	HSST3X3X0	0.032	1.000	0.032	HSS FLEX+A	2	1.890	2.460	2.460	4.030
16	HSST3X3X0	HSST3X3X0	0.031	1.000	0.031	HSS FLEX+A	2	1.890	2.460	2.460	4.030
17	HSST3X3X0	HSST3X3X0	0.033	1.000	0.033	HSS FLEX+A	6	1.890	2.460	2.460	4.030
18	HSST3X3X0	HSST3X3X0	0.029	1.000	0.029	HSS FLEX+A	6	1.890	2.460	2.460	4.030
19	HSST3X3X0	HSST3X3X0	0.095	1.000	0.095	HSS BEND Z	5	1.890	2.460	2.460	4.030
20	HSST3X3X0	HSST3X3X0	0.161	1.000	0.161	HSS FLEX+A	6	1.890	2.460	2.460	4.030
21	HSST3X3X0	HSST3X3X0	0.087	1.000	0.087	HSS BEND Z	5	1.890	2.460	2.460	4.030
22	HSST3X3X0	HSST3X3X0	0.095	1.000	0.095	HSS FLEX+A	5	1.890	2.460	2.460	4.030
23	HSST3X3X0	HSST3X3X0	0.125	1.000	0.125	HSS FLEX+A	6	1.890	2.460	2.460	4.030
24	HSST3X3X0	HSST3X3X0	0.139	1.000	0.139	HSS FLEX+A	6	1.890	2.460	2.460	4.030
25	HSST3X3X0	HSST3X3X0	0.029	1.000	0.029	HSS FLEX+A	6	1.890	2.460	2.460	4.030
26	HSST3X3X0	HSST3X3X0	0.033	1.000	0.033	HSS FLEX+A	6	1.890	2.460	2.460	4.030

Failed Members

There is no data of this type.

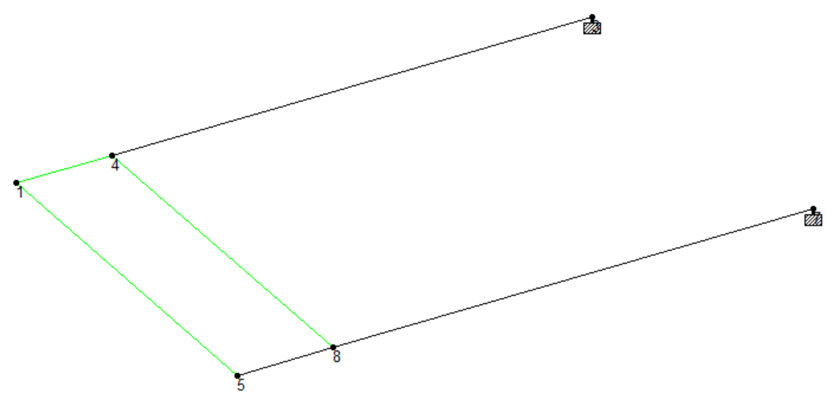
Statics Check Results

L/C		FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
1:DL	Loads	0.000	-0.505	0.000	-6.063	0.000	-60.633
1:DL	Reactions	-0.000	0.505	0.000	6.063	-0.000	60.633
	Difference	-0.000	0.000	0.000	0.000	-0.000	0.000
2:W1	Loads	0.111	0.000	-0.209	-1.555	23.726	-0.816
2:W1	Reactions	-0.111	0.000	0.209	1.555	-23.726	0.816
	Difference	-0.000	0.000	0.000	0.000	-0.000	-0.000
3:W2	Loads	0.028	0.000	-0.029	-0.208	3.184	-0.191
3:W2	Reactions	-0.028	-0.000	0.029	0.208	-3.184	0.191
	Difference	-0.000	-0.000	0.000	-0.000	-0.000	0.000
4:0.75W3	Loads	0.105	0.000	-0.178	-1.308	20.098	-0.481
4:0.75W3	Reactions	-0.105	0.000	0.178	1.308	-20.098	0.481
	Difference	-0.000	0.000	0.000	0.000	-0.000	-0.000

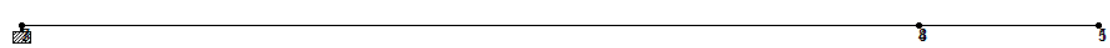
Abutment-Sides

The following structure spacing was accommodated from analyzing the THEA contract plans reinforcement for the abutment. The spacing is dependent on the abutment, refer to Table 1 for recommended distances.

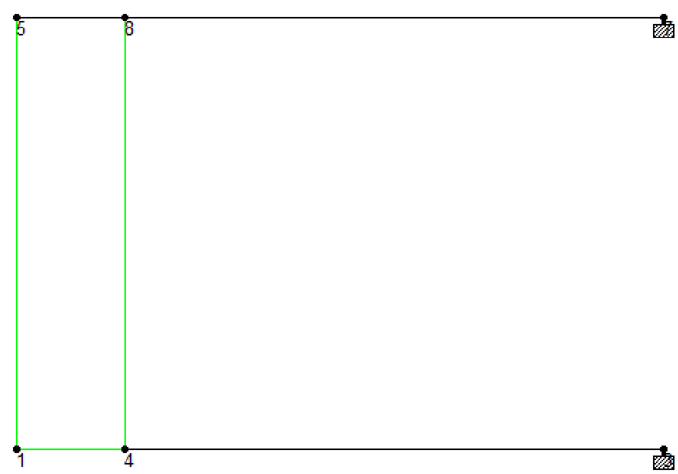
3D View-Length:



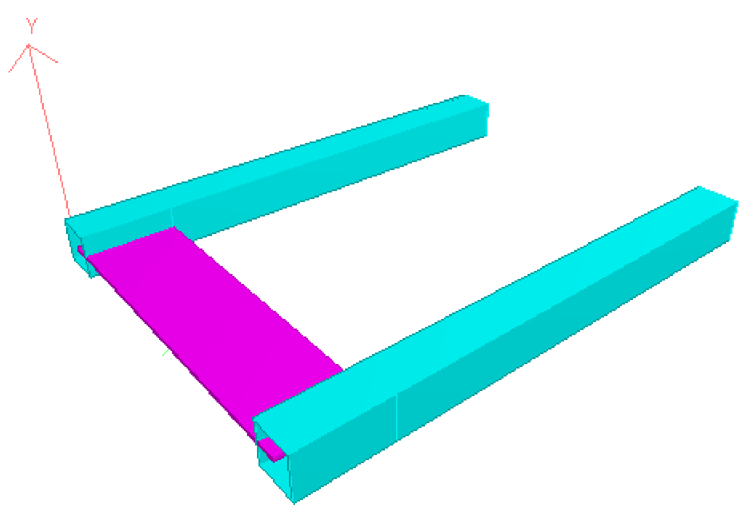
Side View:



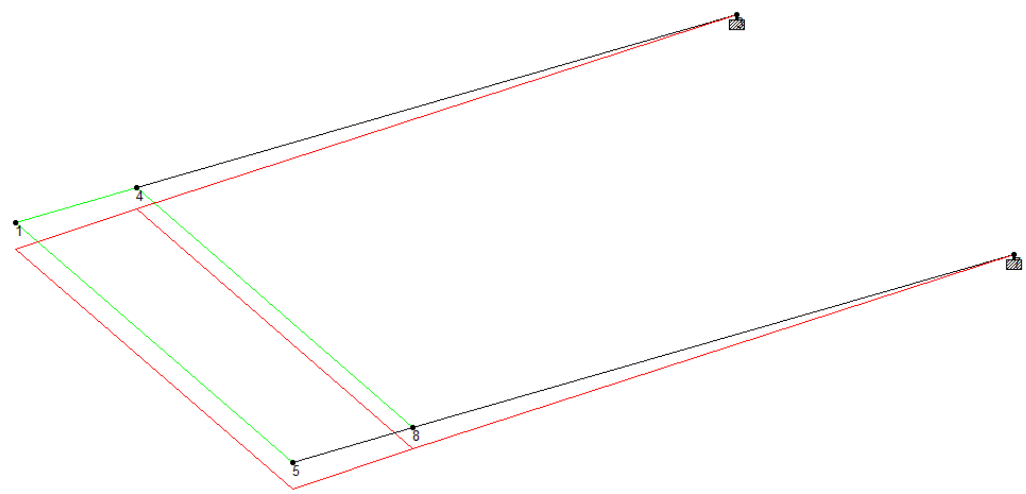
Plan View:



3D View:



Deflection View:



STAAD Analysis

Job Information

	Engineer	Checked	Approved
Name:	IERM		
Date:	19-Jun-18		

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	6	Highest Node	8
Number of Elements	4	Highest Beam	9
Number of Plates	1	Highest Plate	7

Number of Basic Load Cases	5
Number of Combination Load Cases	8

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

Type	L/C	Name
Primary	1	DL
Primary	2	DYNO DRUM HO: LIGHT WIND LOAD (X)
Primary	3	DYNO DRUM HO: LIGHT WIND LOAD (Z)
Primary	7	WIND LOAD ON STRUCTURE (Z) DIREC
Primary	8	WIND RESULTANT
Combination	4	1.25DL
Combination	5	1.1DL+1.0WX
Combination	6	CASE I:VX
Combination	9	1.1DL+WZ
Combination	10	CASE I: VY
Combination	11	CASE III: VY
Combination	12	CASE III: VZ
Combination	13	CASE III: VX

Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0	0	0
3	3.000	0	0
4	0.500	0	0
5	0	0	2.000
7	3.000	0	2.000
8	0.500	0	2.000

Beams

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	1	4	0.500	2	0
4	5	8	0.500	2	0
8	4	3	2.500	2	0
9	8	7	2.500	2	0

Plates

Plate	Node A	Node B	Node C	Node D	Property
7	5	1	4	8	1

Section Properties

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
2	HSST3X3X0.188	1.890	2.460	2.460	3.927	STEEL_36_KS

Plate Thickness

Prop	Node A (in)	Node B (in)	Node C (in)	Node D (in)	Material
1	0.250	0.250	0.250	0.250	-

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	CONCRETE	3.15E+3	0.170	8.68e-05	5.5E -6
2	ALUMINUM	10E+3	0.330	9.8e-05	12.8E -6
3	STEEL_50_KSI	29E+3	0.300	0.000283	6.5E -6
4	STAINLESSSTEEL	28E+3	0.300	0.000283	9.9E -6
5	A500-GR.B	29E+3	0.300	0.000	6E -6
6	STEEL_36_KSI	29E+3	0.300	0.000283	6.5E -6
7	STEEL_275_NMM2	29.7E+3	0.300	0.000	6.67E -6
8	STEEL	29E+3	0.300	0.000283	6E -6
9	STEEL_355_NMM2	29.7E+3	0.300	0.000	6.67E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip-ft/deg)	rY (kip-ft/deg)	rZ (kip-ft/deg)
3	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
7	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

Releases

There is no data of this type.

Primary Load Cases

Number	Name	Type
1	DL	Dead
2	DYNO DRUM HO: LIGHT WIND LOAD (X)	Wind
3	DYNO DRUM HO: LIGHT WIND LOAD (Z)	Wind
7	WIND LOAD ON STRUCTURE (Z) DIREC	Wind
8	WIND RESULTANT	Wind

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
4	1.25DL	1	DL	1.25
5	1.1DL+1.0WX	1	DL	1.10
		2	DYNO DRUM HO: LIGHT WIND LOAD (X)	1.00
6	CASE I:VX	2	DYNO DRUM HO: LIGHT WIND LOAD (X)	1.00
9	1.1DL+WZ	1	DL	1.10
		3	DYNO DRUM HO: LIGHT WIND LOAD (Z)	1.00
		7	WIND LOAD ON STRUCTURE (Z) DIREC	1.00
10	CASE I: VY	1	DL	1.00
11	CASE III: VY	1	DL	0.75
12	CASE III: VZ	3	DYNO DRUM HO: LIGHT WIND LOAD (Z)	0.75
13	CASE III: VX	2	DYNO DRUM HO: LIGHT WIND LOAD (X)	0.75

Load Generators

There is no data of this type.

1 DL : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
1	-	-0.0261	-	-	-	-
5	-	-0.0261	-	-	-	-

1 DL : Selfweight

Direction	Factor	Assigned Geometry
Y	-1.000	ALL

2 DYNO DRUM HO: LIGHT WIND LOAD (X) DIRECTION : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
1	0.0522	-	-	-	-	-
5	0.0522	-	-	-	-	-

3 DYNO DRUM HO: LIGHT WIND LOAD (Z) DIRECTION : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
1	-	-	0.02777	-	-	-
5	-	-	0.02777	-	-	-

7 WIND LOAD ON STRUCTURE (Z) DIRECTION : Beam Loads

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
1	UNI	lbf/ft	GZ	20.000	0	-	0.500	-
4	UNI	lbf/ft	GZ	20.000	0	-	0.500	-
8	UNI	lbf/ft	GZ	20.000	0	-	2.500	-
9	UNI	lbf/ft	GZ	20.000	0	-	2.500	-

8 WIND RESULTANT : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
1	0.022	-	-	-	-	-
3	-	0.053	-	-	-	-
4	0.022	-	-	-	-	-

Node Displacement Summary

	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Max X	5	9:1.1DL+WZ	**0.000**	-0.009	0.003	0.010	0.000	0.000	0.000
Min X	1	9:1.1DL+WZ	**-0.000**	-0.009	0.003	0.010	-0.000	0.000	0.000
Max Y	3	1:DL	0	**0**	0	0	0	0	0
Min Y	1	4:1.25DL	0	**-0.010**	0	0.010	-0.000	0	0.000
Max Z	1	9:1.1DL+WZ	-0.000	-0.009	**0.003**	0.010	-0.000	0.000	0.000
Min Z	1	2:DYNO DRUI	0.000	0	**-0.000**	0.000	0	-0.000	0
Max rX	5	4:1.25DL	0	-0.010	0	0.010	**0.000**	0	0.000
Min rX	1	4:1.25DL	0	-0.010	0	0.010	**-0.000**	0	0.000
Max rY	4	9:1.1DL+WZ	-0.000	-0.007	0.003	0.007	0.000	**0.000**	0.000
Min rY	1	2:DYNO DRUI	0.000	0	-0.000	0.000	0	**-0.000**	0
Max rZ	1	4:1.25DL	0	-0.010	0	0.010	-0.000	0	**0.000**
Min rZ	3	1:DL	0	0	0	0	0	0	**0**
Max Rst	1	4:1.25DL	0	-0.010	0	**0.010**	-0.000	0	0.000

Beam Displacement Detail Summary

Displacements shown in italic indicate the presence of an offset

	Beam	L/C	d (ft)	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	4	9:1.1DL+WZ	0	**0.000**	-0.009	0.003	0.010
Min X	1	9:1.1DL+WZ	0	**-0.000**	-0.009	0.003	0.010
Max Y	8	1:DL	2.500	0	**0**	0	0
Min Y	1	4:1.25DL	0	0	**-0.010**	0	0.010
Max Z	1	9:1.1DL+WZ	0	-0.000	-0.009	**0.003**	0.010
Min Z	1	1:DL	0	0	-0.008	**0**	0.008
Max Rst	1	4:1.25DL	0	0	-0.010	0	**0.010**

Beam End Displacement Summary

Displacements shown in italic indicate the presence of an offset

	Beam	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	4	5	9:1.1DL+WZ	**0.000**	-0.009	0.003	0.010
Min X	1	1	9:1.1DL+WZ	**-0.000**	-0.009	0.003	0.010
Max Y	8	3	1:DL	0	**0**	0	0
Min Y	1	1	4:1.25DL	0	**-0.010**	0	0.010
Max Z	1	1	9:1.1DL+WZ	-0.000	-0.009	**0.003**	0.010
Min Z	1	1	1:DL	0	-0.008	**0**	0.008
Max Rst	1	1	4:1.25DL	0	-0.010	0	**0.010**

Beam End Force Summary

The signs of the forces at end B of each beam have been reversed. For example: this means that the Min Fx entry gives the largest tension value for an beam.

				Axial	Shear		Torsion	Bending	
	Beam	Node	L/C	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)
Max Fx	9	8	9:1.1DL+WZ	**0.077**	-0.038	0.03777	-0.000	-0.729	0.200
Min Fx	8	4	9:1.1DL+WZ	**-0.077**	-0.038	0.03777	0.000	-0.729	0.200
Max Fy	1	1	2:DYNO DRUM	0.048	**0**	0.000	0	-0.015	0
Min Fy	8	3	4:1.25DL	-0	**-0.063**	-0	0.000	-0	1.818
Max Fz	8	3	9:1.1DL+WZ	-0.077	-0.055	**0.08777**	0.000	1.154	1.600
Min Fz	1	1	9:1.1DL+WZ	-0.038	-0.031	**-0.127**	-0.003	0.062	0.001
Max Mx	4	5	4:1.25DL	0	-0.035	0	**0.003**	0	0.001
Min Mx	1	1	4:1.25DL	0	-0.035	0	**-0.003**	0	0.001
Max My	8	3	9:1.1DL+WZ	-0.077	-0.055	0.08777	0.000	**1.154**	1.600
Min My	8	4	9:1.1DL+WZ	-0.077	-0.038	0.03777	0.000	**-0.729**	0.200
Max Mz	8	3	4:1.25DL	-0	-0.063	-0	0.000	-0	**1.818**
Min Mz	1	1	2:DYNO DRUM	0.048	0	0.000	0	-0.015	**0**

Beam Force Detail Summary

Sign convention as diagrams:- positive above line, negative below line except Fx where positive is compression. Distance d is given from beam end A.

				Axial	Shear		Torsion	Bending	
	Beam	L/C	d (ft)	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)
Max Fx	9	9:1.1DL+WZ	0	**0.077**	-0.038	0.03777	-0.000	-0.729	0.200
Min Fx	8	9:1.1DL+WZ	0	**-0.077**	-0.038	0.03777	0.000	-0.729	0.200
Max Fy	1	2:DYNO DRUM	0	0.048	**0**	0.000	0	-0.015	0
Min Fy	8	4:1.25DL	2.500	-0	**-0.063**	-0	0.000	-0	1.818
Max Fz	8	9:1.1DL+WZ	2.500	-0.077	-0.055	**0.08777**	0.000	1.154	1.600
Min Fz	1	9:1.1DL+WZ	0	-0.038	-0.031	**-0.127**	-0.003	0.062	0.001
Max Mx	4	4:1.25DL	0	0	-0.035	0	**0.003**	0	0.001
Min Mx	1	4:1.25DL	0	0	-0.035	0	**-0.003**	0	0.001
Max My	8	9:1.1DL+WZ	2.500	-0.077	-0.055	0.08777	0.000	**1.154**	1.600
Min My	8	9:1.1DL+WZ	0	-0.077	-0.038	0.03777	0.000	**-0.729**	0.200
Max Mz	8	4:1.25DL	2.500	-0	-0.063	-0	0.000	-0	**1.818**
Min Mz	1	2:DYNO DRUM	0	0.048	0	0.000	0	-0.015	**0**

Beam Combined Axial and Bending Stresses Summary

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
1	1:DL	0.500	109.198	0.500	3	-109.198	0.500	1
	2:DYNO DRUM	0.500	34.821	0	1			
	3:DYNO DRUM	0.500	196.041	0.500	1	-218.346	0.500	2
	7:WIND LOAD	0.500	190.456	0.500	1	-208.472	0.500	2
	8:WIND RESU	0.500	118.768	0.500	1	-119.339	0.500	2
	4:1.25DL	0.500	136.498	0.500	3	-136.498	0.500	1
	5:1.1DL+1.0W)	0.500	154.325	0.500	4	-103.397	0.500	2
	6:CASE I:VX	0.500	34.821	0	1			
	9:1.1DL+WZ	0.500	506.615	0.500	4	-546.936	0.500	2
	10:CASE I: VY	0.500	109.198	0.500	3	-109.198	0.500	1
	11:CASE III: V'	0.500	81.899	0.500	3	-81.899	0.500	1
	12:CASE III: V;	0.500	147.031	0.500	1	-163.760	0.500	2
	13:CASE III: V;	0.500	26.116	0	1			
4	1:DL	0.500	109.198	0.500	3	-109.198	0.500	1
	2:DYNO DRUM	0.500	34.821	0	1			
	3:DYNO DRUM	0.500	218.346	0.500	1	-196.041	0.500	2
	7:WIND LOAD	0.500	208.472	0.500	1	-190.456	0.500	2
	8:WIND RESU	0.500	121.007	0.500	1	-109.611	0.500	2
	4:1.25DL	0.500	136.498	0.500	3	-136.498	0.500	1
	5:1.1DL+1.0W)	0.500	154.325	0.500	3	-103.397	0.500	1
	6:CASE I:VX	0.500	34.821	0	1			
	9:1.1DL+WZ	0.500	546.936	0.500	4	-506.615	0.500	2
	10:CASE I: VY	0.500	109.198	0.500	3	-109.198	0.500	1
	11:CASE III: V'	0.500	81.899	0.500	3	-81.899	0.500	1
	12:CASE III: V;	0.500	163.760	0.500	1	-147.031	0.500	2
	13:CASE III: V;	0.500	26.116	0	1			
8	1:DL	2.500	886.765	2.500	3	-886.765	2.500	1
	2:DYNO DRUM	2.500	29.307	0	1			
	3:DYNO DRUM	2.500	258.157	2.500	2	-305.554	2.500	1
	7:WIND LOAD	2.500	404.684	2.500	2	-438.921	2.500	1
	8:WIND RESU	2.500	162.139	2.500	2	-151.870	2.500	1
	4:1.25DL	2.500	1.11E+3	2.500	3	-1.11E+3	2.500	1
	5:1.1DL+1.0W)	2.500	1E+3	2.500	3	-948.600	2.500	1
	6:CASE I:VX	2.500	29.307	0	1			
	9:1.1DL+WZ	2.500	1.64E+3	2.500	3	-1.72E+3	2.500	1
	10:CASE I: VY	2.500	886.765	2.500	3	-886.765	2.500	1
	11:CASE III: V'	2.500	665.074	2.500	3	-665.074	2.500	1
	12:CASE III: V;	2.500	193.618	2.500	2	-229.165	2.500	1
	13:CASE III: V;	2.500	21.980	0	1			
9	1:DL	2.500	886.765	2.500	3	-886.765	2.500	1
	2:DYNO DRUM	2.500	29.307	0	1			
	3:DYNO DRUM	2.500	305.554	2.500	2	-258.157	2.500	1
	7:WIND LOAD	2.500	438.921	2.500	2	-404.684	2.500	1
	8:WIND RESU	2.500	167.067	2.500	2	-144.411	2.500	1

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
	4:1.25DL	2.500	1.11E+3	2.500	3	-1.11E+3	2.500	1
	5:1.1DL+1.0W)	2.500	1E+3	2.500	3	-948.600	2.500	1
	6:CASE I:VX	2.500	29.307	0	1			
	9:1.1DL+WZ	2.500	1.72E+3	2.500	3	-1.64E+3	2.500	1
	10:CASE I: VY	2.500	886.765	2.500	3	-886.765	2.500	1
	11:CASE III: V'	2.500	665.074	2.500	3	-665.074	2.500	1
	12:CASE III: V:	2.500	229.165	2.500	2	-193.618	2.500	1
	13:CASE III: V:	2.500	21.980	0	1			

Plate Center Stress Summary

			Shear		Membrane			Bending		
	Plate	L/C	Qx (psi)	Qy (psi)	Sx (psi)	Sy (psi)	Sxy (psi)	Mx (lb-in/in)	My (lb-in/in)	Mxy (lb-in/in)
Max Qx	7	2:DYNO DRUI	**0**	0	-0.090	-1.358	-0.000	0	0	0
Min Qx	7	4:1.25DL	**-0.000**	-0.251	0	0	0	-0.020	-0.064	-0.000
Max Qy	7	2:DYNO DRUI	0	**0**	-0.090	-1.358	-0.000	0	0	0
Min Qy	7	4:1.25DL	-0.000	**-0.251**	0	0	0	-0.020	-0.064	-0.000
Max Sx	7	3:DYNO DRUI	0	0	**0.000**	0.000	29.860	0	0	0
Min Sx	7	8:WIND RESU	0	0	**-10.342**	-0.888	14.273	0	0	0
Max Sy	7	9:1.1DL+WZ	-0.000	-0.221	-0.000	**0.000**	51.430	-0.017	-0.057	-0.000
Min Sy	7	2:DYNO DRUI	0	0	-0.090	**-1.358**	-0.000	0	0	0
Max Sxy	7	9:1.1DL+WZ	-0.000	-0.221	-0.000	0.000	**51.430**	-0.017	-0.057	-0.000
Min Sxy	7	2:DYNO DRUI	0	0	-0.090	-1.358	**-0.000**	0	0	0
Max Mx	7	2:DYNO DRUI	0	0	-0.090	-1.358	-0.000	**0**	0	0
Min Mx	7	4:1.25DL	-0.000	-0.251	0	0	0	**-0.020**	-0.064	-0.000
Max My	7	2:DYNO DRUI	0	0	-0.090	-1.358	-0.000	0	**0**	0
Min My	7	4:1.25DL	-0.000	-0.251	0	0	0	-0.020	**-0.064**	-0.000
Max Mxy	7	2:DYNO DRUI	0	0	-0.090	-1.358	-0.000	0	0	**0**
Min Mxy	7	4:1.25DL	-0.000	-0.251	0	0	0	-0.020	-0.064	**-0.000**

Plate Center Principal Stress Summary

			Principal		Von Mis		Tresca	
	Plate	L/C	Top (psi)	Bottom (psi)	Top (psi)	Bottom (psi)	Top (psi)	Bottom (psi)
Max (t)	7	9:1.1DL+WZ	**47.906**	55.023	89.210	89.210	102.929	102.929
Max (b)	7	9:1.1DL+WZ	47.906	**55.023**	89.210	89.210	102.929	102.929
Max VM (t)	7	9:1.1DL+WZ	47.906	55.023	**89.210**	89.210	102.929	102.929
Max VM (b)	7	9:1.1DL+WZ	47.906	55.023	89.210	**89.210**	102.929	102.929
Tresca (t)	7	9:1.1DL+WZ	47.906	55.023	89.210	89.210	**102.929**	102.929
Tresca (b)	7	9:1.1DL+WZ	47.906	55.023	89.210	89.210	102.929	**102.929**

Reactions

		Horizontal	Vertical	Horizontal	Moment		
Node	**L/C**	**FX** (kip)	**FY** (kip)	**FZ** (kip)	**MX** (kip¯in)	**MY** (kip¯in)	**MZ** (kip¯in)
3	1:DL	0	0.050	0	-0.000	0	-1.454
	2:DYNO DRUN	-0.0522	0	0.000	0	0.001	0
	3:DYNO DRUN	0.045	0	-0.02777	0	-0.462	0
	7:WIND LOAD	0.032	0	-0.06	0	-0.692	0
	8:WIND RESU	-0.010	-0.053	-0.016	0	-0.257	0
	4:1.25DL	0	0.063	0	-0.000	0	-1.818
	5:1.1DL+1.0W)	-0.0522	0.055	0.000	-0.000	0.001	-1.600
	6:CASE I:VX	-0.0522	0	0.000	0	0.001	0
	9:1.1DL+WZ	0.077	0.055	-0.08777	-0.000	-1.154	-1.600
	10:CASE I: VY	0	0.050	0	-0.000	0	-1.454
	11:CASE III: V	0	0.038	0	-0.000	0	-1.091
	12:CASE III: V	0.034	0	-0.021	0	-0.347	0
	13:CASE III: V	-0.03915	0	0.000	0	0.001	0
7	1:DL	0	0.050	0	0.000	0	-1.454
	2:DYNO DRUN	-0.0522	0	-0.000	0	-0.001	0
	3:DYNO DRUN	-0.045	0	-0.02777	0	-0.462	0
	7:WIND LOAD	-0.032	0	-0.06	0	-0.692	0
	8:WIND RESU	-0.021	0	-0.016	0	-0.255	0
	4:1.25DL	0	0.063	0	0.000	0	-1.818
	5:1.1DL+1.0W)	-0.0522	0.055	-0.000	0.000	-0.001	-1.600
	6:CASE I:VX	-0.0522	0	-0.000	0	-0.001	0
	9:1.1DL+WZ	-0.077	0.055	-0.08777	0.000	-1.154	-1.600
	10:CASE I: VY	0	0.050	0	0.000	0	-1.454
	11:CASE III: V	0	0.038	0	0.000	0	-1.091
	12:CASE III: V	-0.034	0	-0.021	0	-0.347	0
	13:CASE III: V	-0.03915	0	-0.000	0	-0.001	0

Utilization Ratio

Beam	**Analysis** Property	**Design** Property	**Actual** Ratio	**Allowable** Ratio	**Ratio** (Act./Allow.)	**Clause**	**L/C**	**Ax** (in^2)	**Iz** (in^4)	**Iy** (in^4)	**Ix** (in^4)
1	HSST3X3X0	HSST3X3X0	0.014	1.000	0.014	HSS FLEX+A	9	1.890	2.460	2.460	4.030
4	HSST3X3X0	HSST3X3X0	0.014	1.000	0.014	HSS FLEX+A	9	1.890	2.460	2.460	4.030
8	HSST3X3X0	HSST3X3X0	0.044	1.000	0.044	HSS FLEX+A	9	1.890	2.460	2.460	4.030
9	HSST3X3X0	HSST3X3X0	0.044	1.000	0.044	HSS FLEX+A	9	1.890	2.460	2.460	4.030

Statics Check Results

L/C		FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
1:DL	Loads	0	-0.101	0	1.211	0	-0.724
1:DL	Reactions	0	0.101	0	-1.211	0	0.724
	Difference	0	-0.000	0	0.000	0	-0.000
2:DYNO DRUM H	Loads	0.104	0	0	0	1.253	0
2:DYNO DRUM H	Reactions	-0.104	0	0.000	0	-1.253	0
	Difference	0.000	0	0.000	0	0.000	0
3:DYNO DRUM H	Loads	0	0	0.05554	0	0	0
3:DYNO DRUM H	Reactions	0.000	0	-0.05554	0	-0.000	0
	Difference	0.000	0	-0.000	0	-0.000	0
7:WIND LOAD OI	Loads	0	0	0.120	0	-2.160	0
7:WIND LOAD OI	Reactions	0.000	0	-0.120	0	2.160	0
	Difference	0.000	0	-0.000	0	-0.000	0
8:WIND RESULT.	Loads	0.031	0.053	0.031	0	-0.093	1.908
8:WIND RESULT.	Reactions	-0.031	-0.053	-0.031	0	0.093	-1.908
	Difference	0.000	0	-0.000	0	-0.000	0

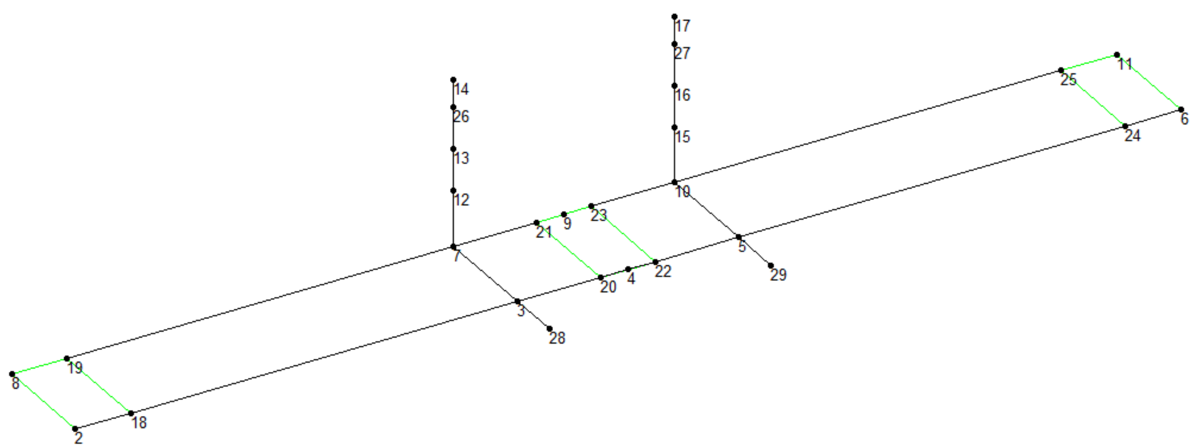
Reaction Summary

			Horizontal	Vertical	Horizontal	Moment		
	Node	L/C	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
Max FX	3	9:1.1DL+WZ	**0.077**	0.055	-0.08777	-0.000	-1.154	-1.600
Min FX	7	9:1.1DL+WZ	**-0.077**	0.055	-0.08777	0.000	-1.154	-1.600
Max FY	3	4:1.25DL	0	**0.063**	0	-0.000	0	-1.818
Min FY	3	8:WIND RESU	-0.010	**-0.053**	-0.016	0	-0.257	0
Max FZ	3	2:DYNO DRUM	-0.0522	0	**0.000**	0	0.001	0
Min FZ	3	9:1.1DL+WZ	0.077	0.055	**-0.08777**	-0.000	-1.154	-1.600
Max MX	7	4:1.25DL	0	0.063	0	**0.000**	0	-1.818
Min MX	3	4:1.25DL	0	0.063	0	**-0.000**	0	-1.818
Max MY	3	2:DYNO DRUM	-0.0522	0	0.000	0	**0.001**	0
Min MY	3	9:1.1DL+WZ	0.077	0.055	-0.08777	-0.000	**-1.154**	-1.600
Max MZ	3	2:DYNO DRUM	-0.0522	0	0.000	0	0.001	**0**
Min MZ	3	4:1.25DL	0	0.063	0	-0.000	0	**-1.818**

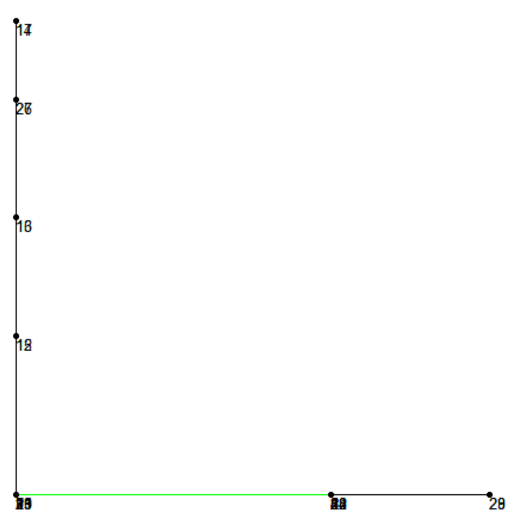
Abutment-Middle

The following structure spacing was accommodated from analyzing the THEA contract plans reinforcement for the abutment. It was concluded that the spacing is dependent on the abutment, refer to Table 2 for the reccomended grouping and spacing of the u-bolt connections and members.

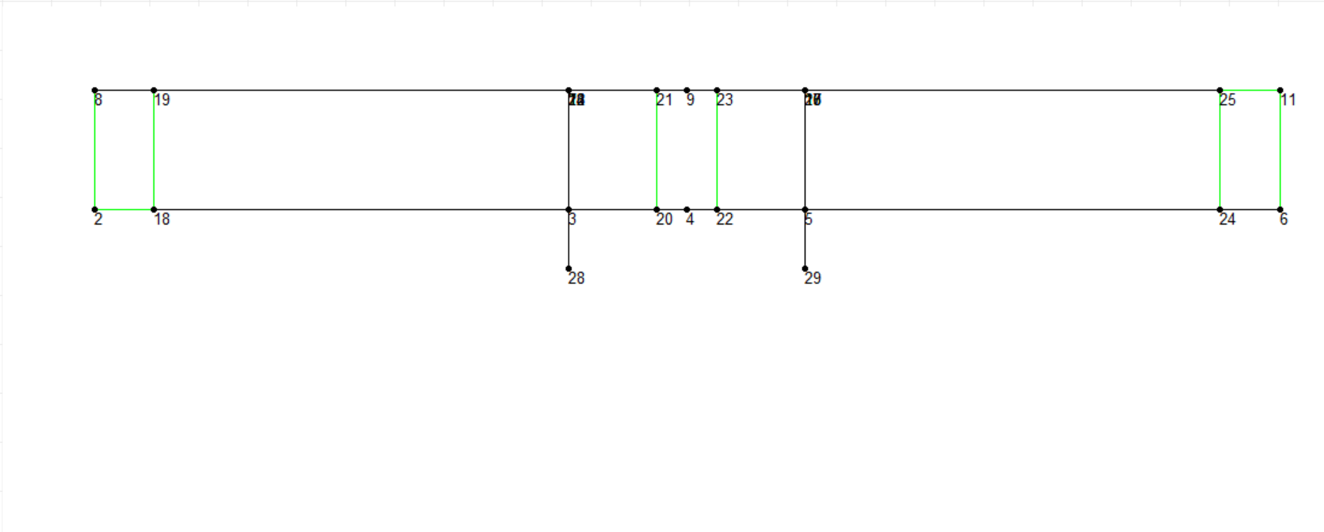
3D View-Length:



Side View:



Plan View:



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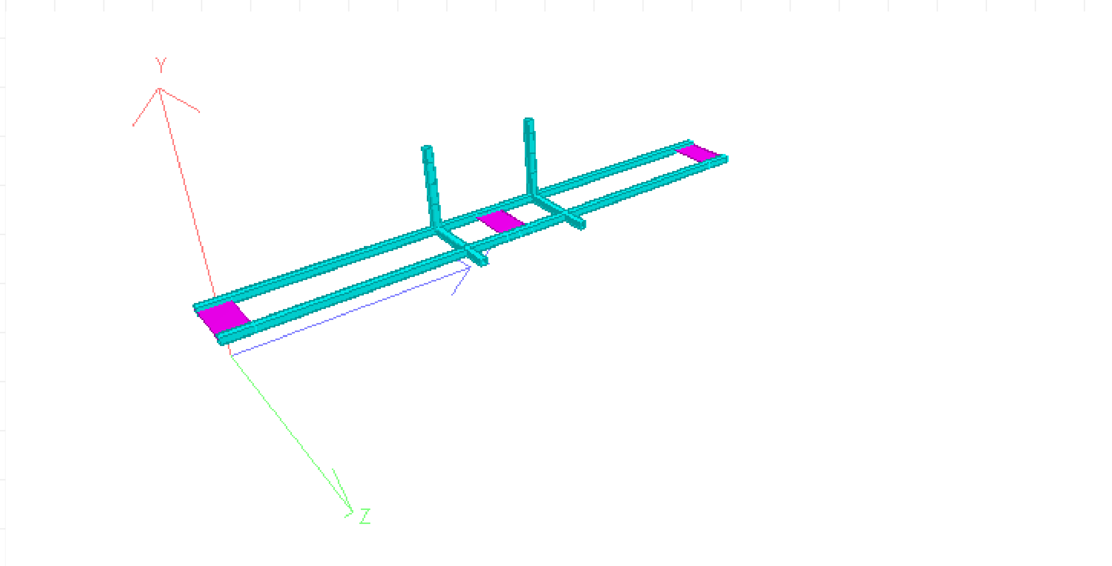
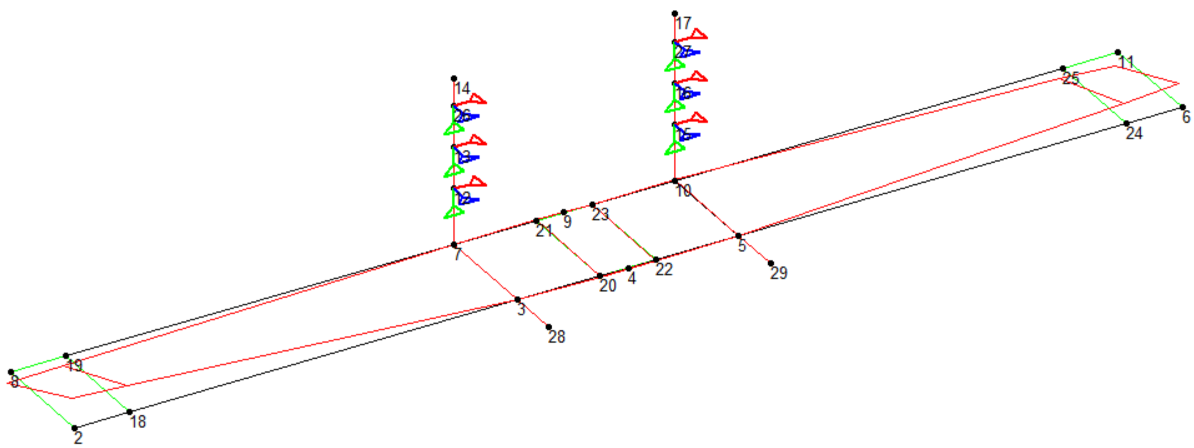
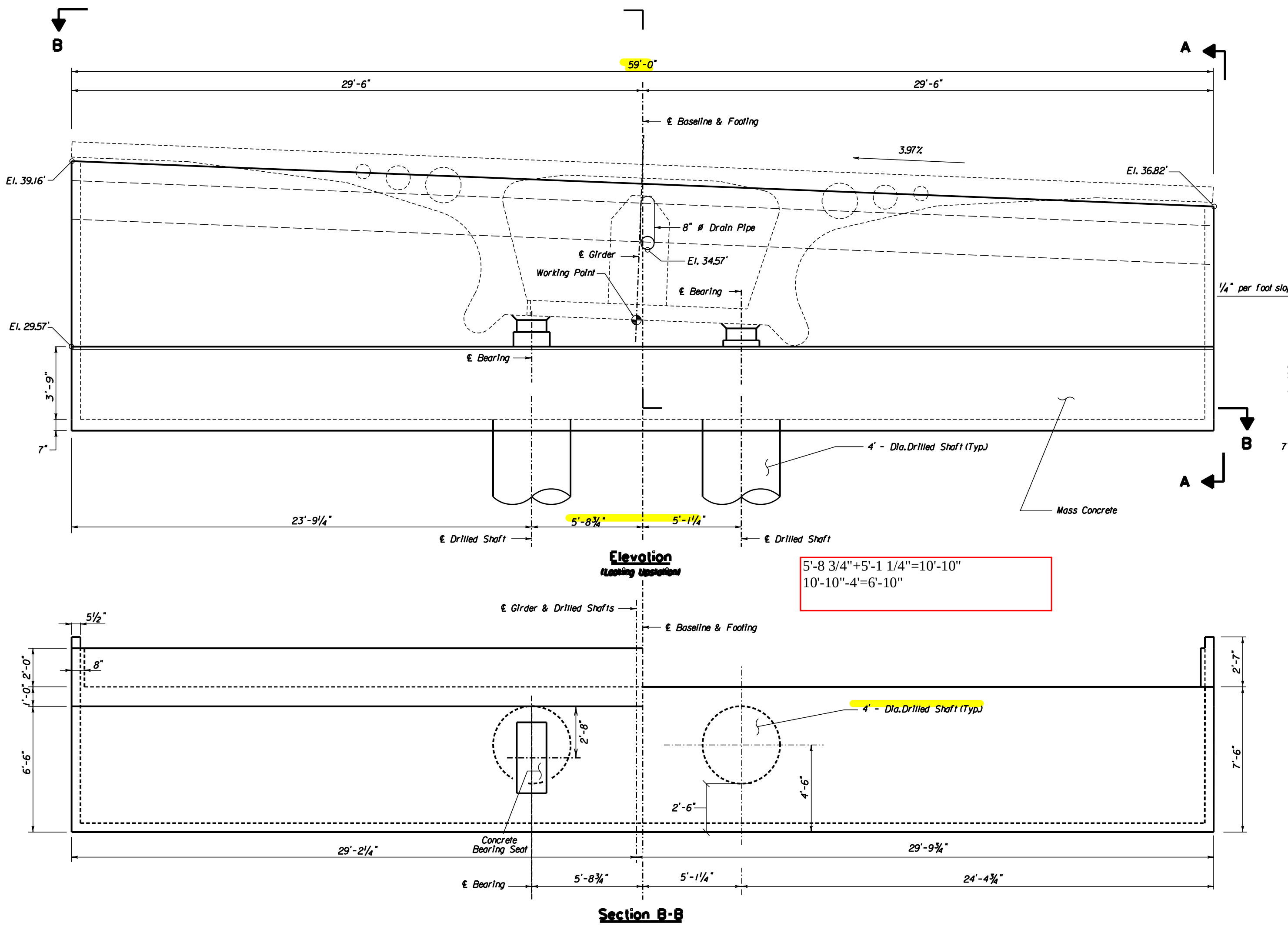
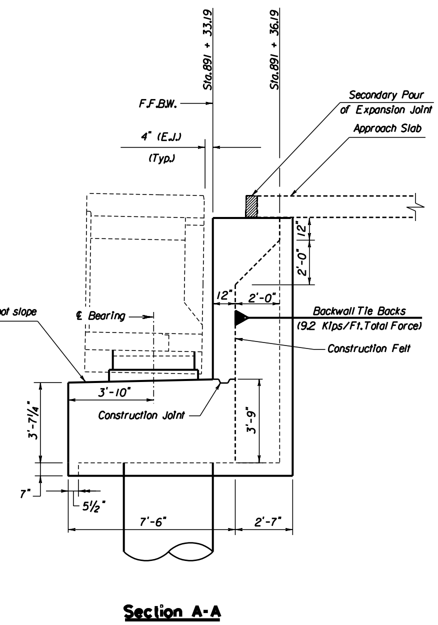


Deflection View:



Existing Structural Plans





NOTES:

1. For Approach Slab Details See Sheet T-7.
2. For Wall Details See Corresponding Wall Plans.
3. For Bearing Details See Bearing Details Sheets.
4. For Expansion Joint Details See Expansion Joint Details Sheets.
5. For Drilled Shaft Details See Sheets T-156 through T-164.
6. Provide for ½" Polystyrene Joint Material between the Wall and Reveal.
7. Contractor must Coordinate Construction of Back Wall to Allow for Post-Tensioning of Tendons in the Superstructure. Contractor may require Blockout with Rebar Couplers based on Construction Schedule.
8. For Drainage Details, see Sheet T-702.
9. Traffic Railing Barrier not shown. Barrier Transitions on Back Wall. See Sheet T-6 for Details.
10. Drainage Pipe to be Class 50 8"ø Ductile Iron Pipe w/ Push on Fittings. Cost of Bends to be included in the Cost of Pipe.

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	CFR	12-13-02
Checked by	DLS	12-13-02
Designed by	DLS	12-13-02
Checked by	DBU	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, FL • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

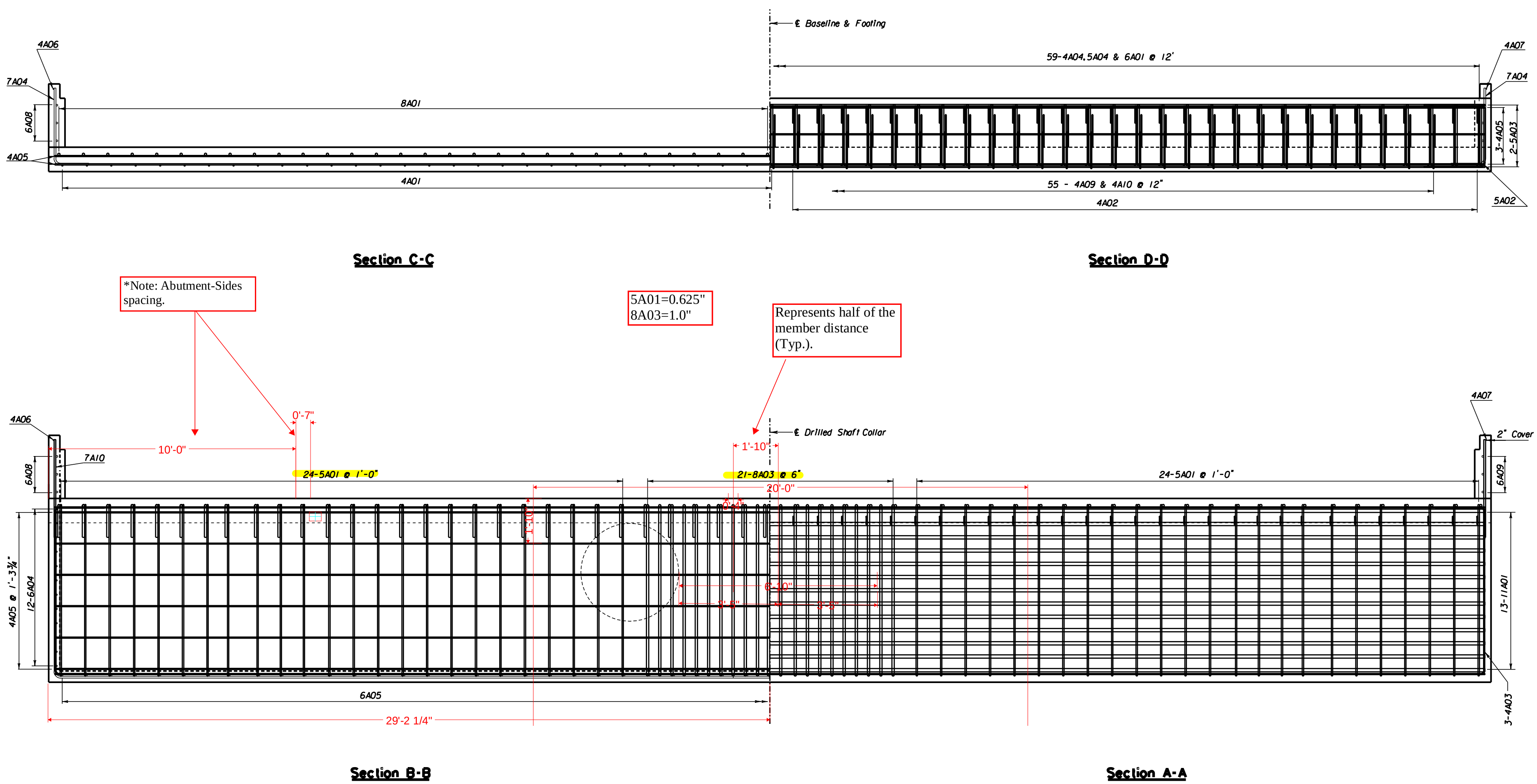
SHEET TITLE: ABUTMENT 1 DIMENSIONS

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-120

Index No.

13 DEC 2002 15:11:13



STRUCTURE NOS. 100800, 100806 & 100812

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	CFR	12-13-02
Checked by	DLS	12-13-02
Designed by	DLS	12-13-02
Checked by	DBU	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD:
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Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: ABUTMENT 1 REINFORCEMENT 2

Drawing No. T-122

Index No.

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

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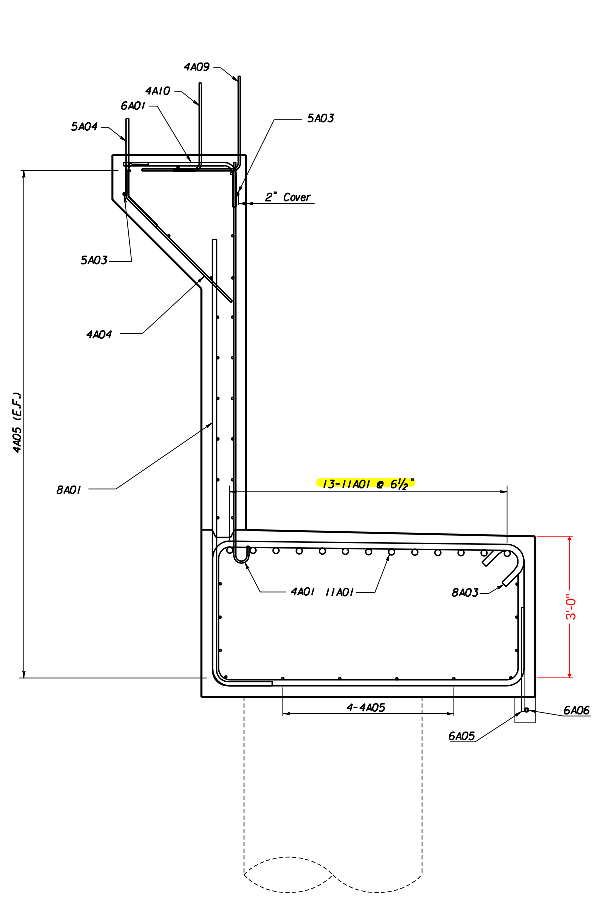
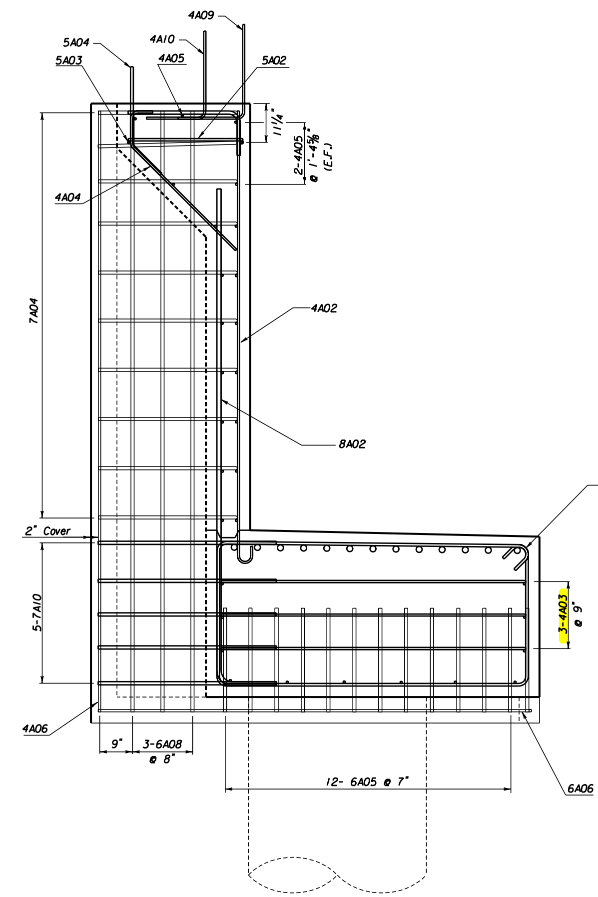


Section E-E



Side View

NOTE:
1. Minimum Concrete Cover - 3" (Unless Otherwise Noted).
2. (E.F.) Denotes Each Face
(O.F.) Denotes Outside Face
(I.F.) Denotes Inside Face

DBU

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	CFR	12-13-02
Checked by	DLS	12-13-02
Designed by	DLS	12-13-02
Checked by	DBU	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY
EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

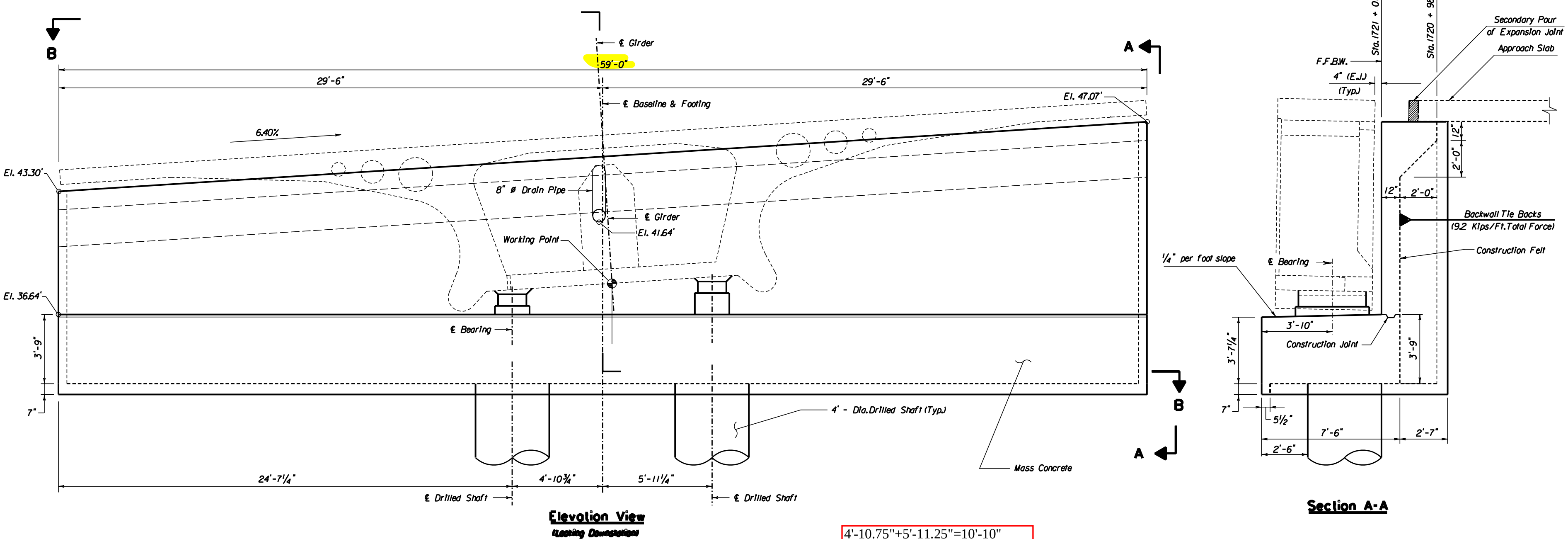
SHEET TITLE: ABUTMENT 1 REINFORCEMENT 3

Drawing No. T-123

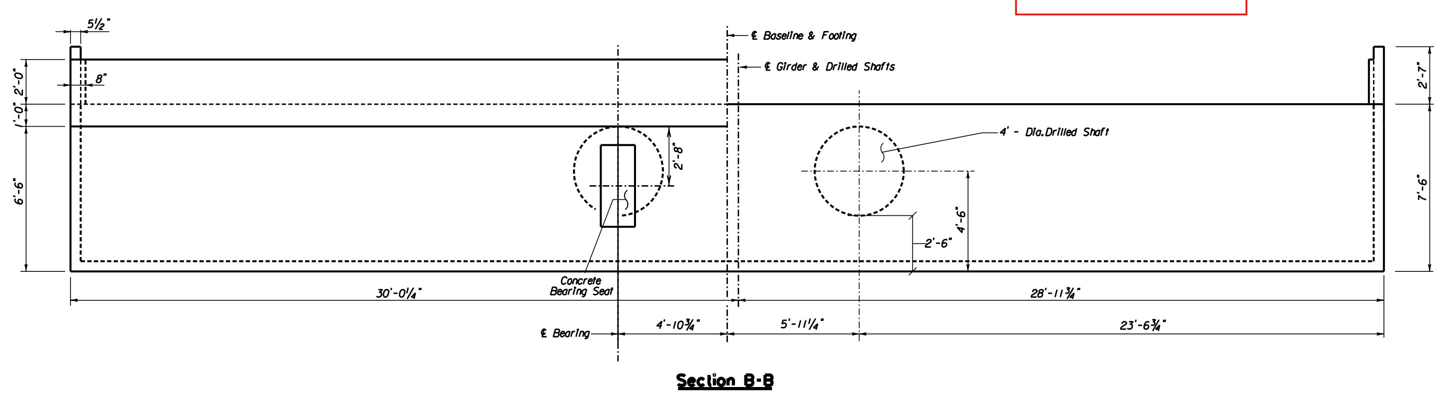
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Index No.

13 DEC 2002 15:11:15



4'-10.75"+5'-11.25"=10'-10"
10'-10"-4'=6'-10"



NOTES:

1. For Approach Slab Details See Sheet T-7.
2. For Wall Details See Corresponding Wall Plans.
3. For Bearing Details See Bearing Details Sheets.
4. For Expansion Joint Details See Expansion Joint Details Sheets.
5. For Drilled Shaft Details See Sheets T-156 through T-164.
6. Provide for ½" Polystyrene Joint Material between the Wall and Reveal.
7. Contractor must Coordinate Construction of Back Wall to Allow for Post-Tensioning of Tendons in the Superstructure. Contractor may require Blockout with Rebar Couplers based on Construction Schedule.
8. For Drainage Details, see Sheet T-702.
9. Traffic Railing Barrier not shown. Barrier Transitions on Back Wall. See Sheet T-6 for Details.
10. Drainage Pipe to be Class 50 8"ø Ductile Iron Pipe w/ Push on Fittings. Cost of Bends to be Included in the Cost of Pipe.

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

STRUCTURE NOS. 100800, 100806 & 100812

	Names	Dates
Drawn by	CFR	12-13-02
Checked by	DLS	12-13-02
Designed by	DLS	12-13-02
Checked by	DBU	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD: Figg Bridge Engineers, 424 No. Calhoun Street, Tallahassee, Florida 32301. Florida Certificate of Authorization No. 5618. Jose M. Rodriguez, P.E. - P.E. No. 52532. Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

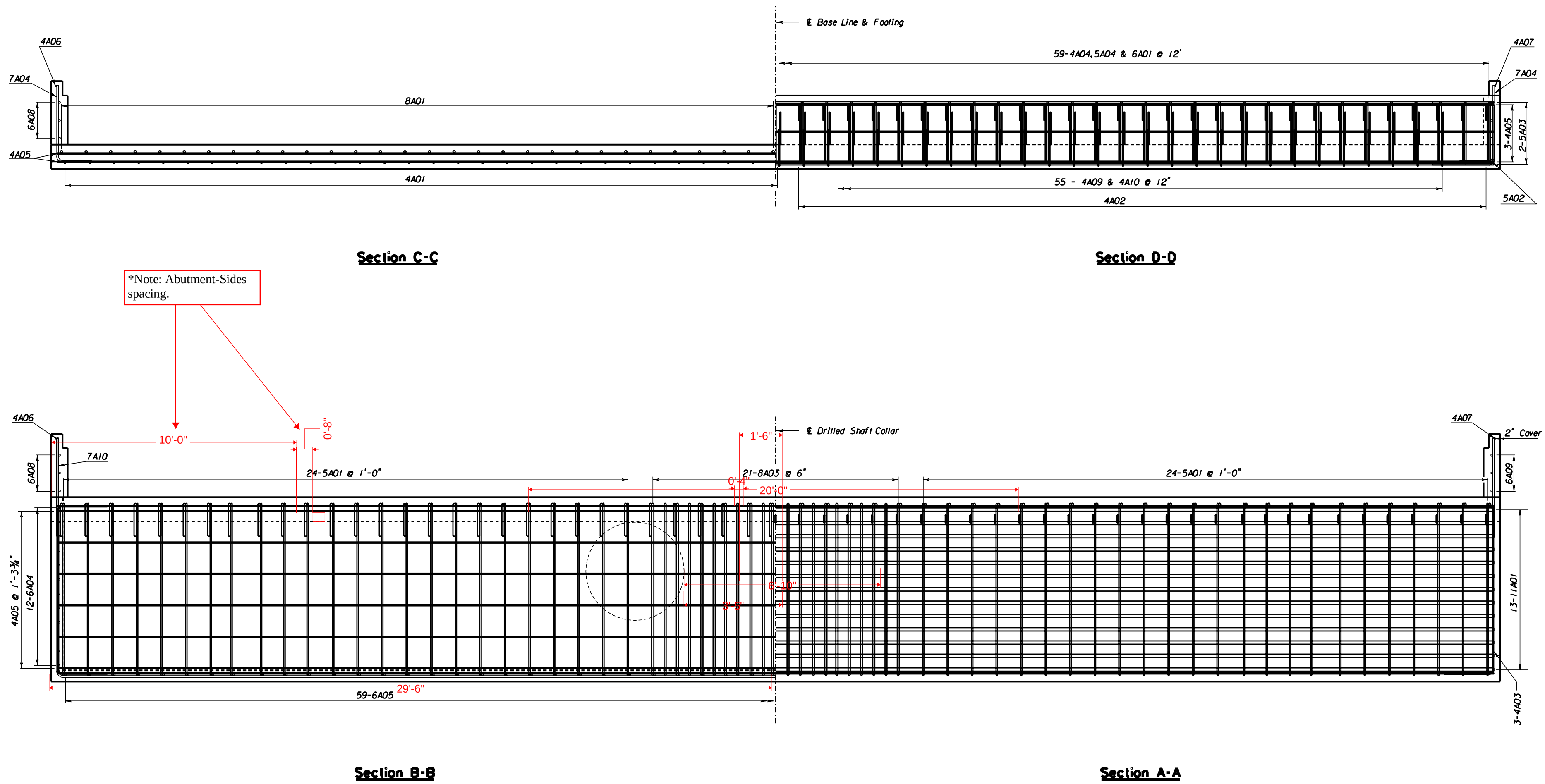
SHEET TITLE: ABUTMENT 123 DIMENSIONS

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-126

13 DEC 2002 15:11:16

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		



STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	CFR	12-13-02
Checked by	DLS	12-13-02
Designed by	DLS	12-13-02
Checked by	DBU	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: ABUTMENT 123 REINFORCEMENT 2

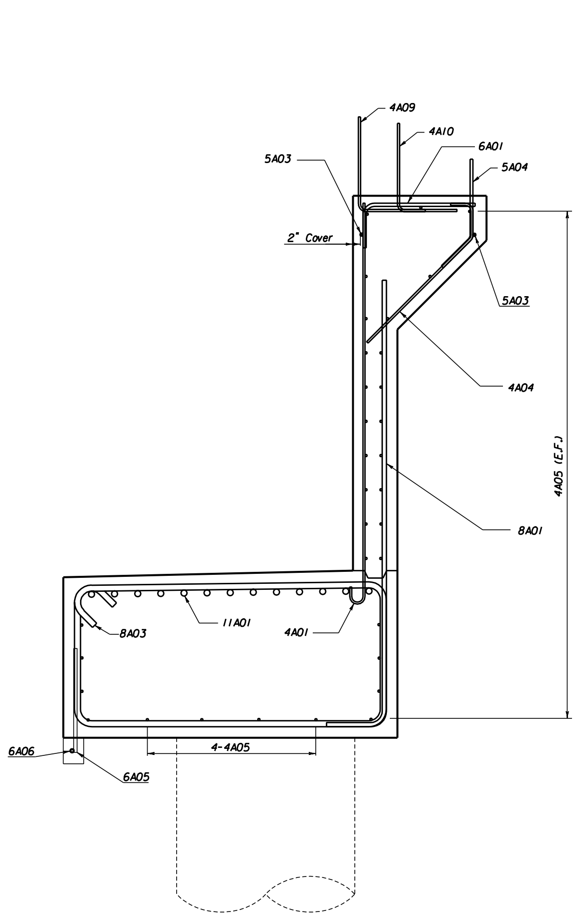
Drawing No. T-128

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

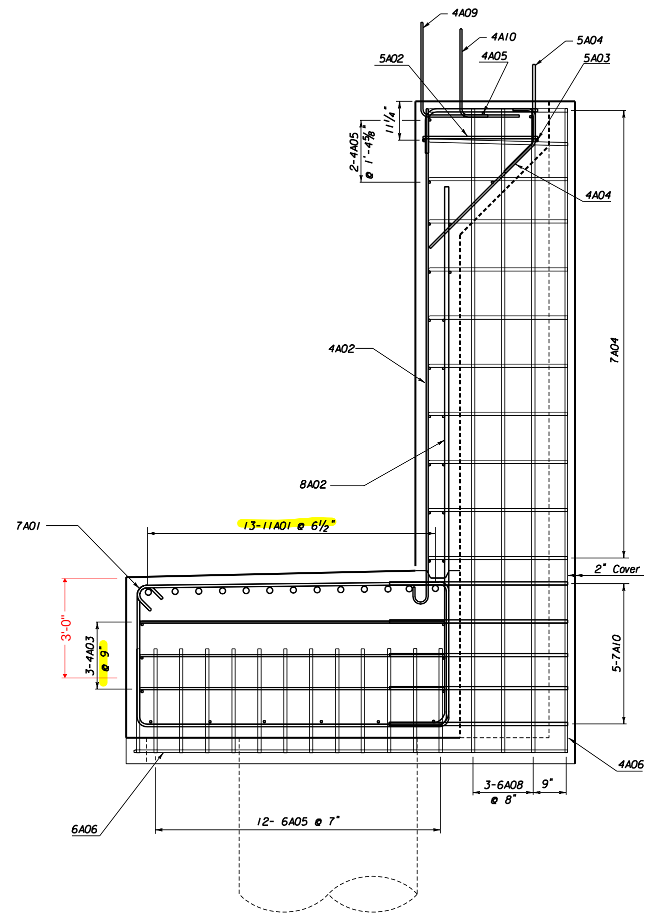
Index No.

13 DEC 2002 15:11:18

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		



Section E-E



Side View

NOTE:

1. Minimum Concrete Cover = 3" (Unless Otherwise Noted).
2. (E.F.) Denotes Each Face
   (O.F.) Denotes Outside Face
   (I.F.) Denotes Inside Face

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	CFR	12-13-02
Checked by	DLS	12-13-02
Designed by	DLS	12-13-02
Checked by	DBU	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

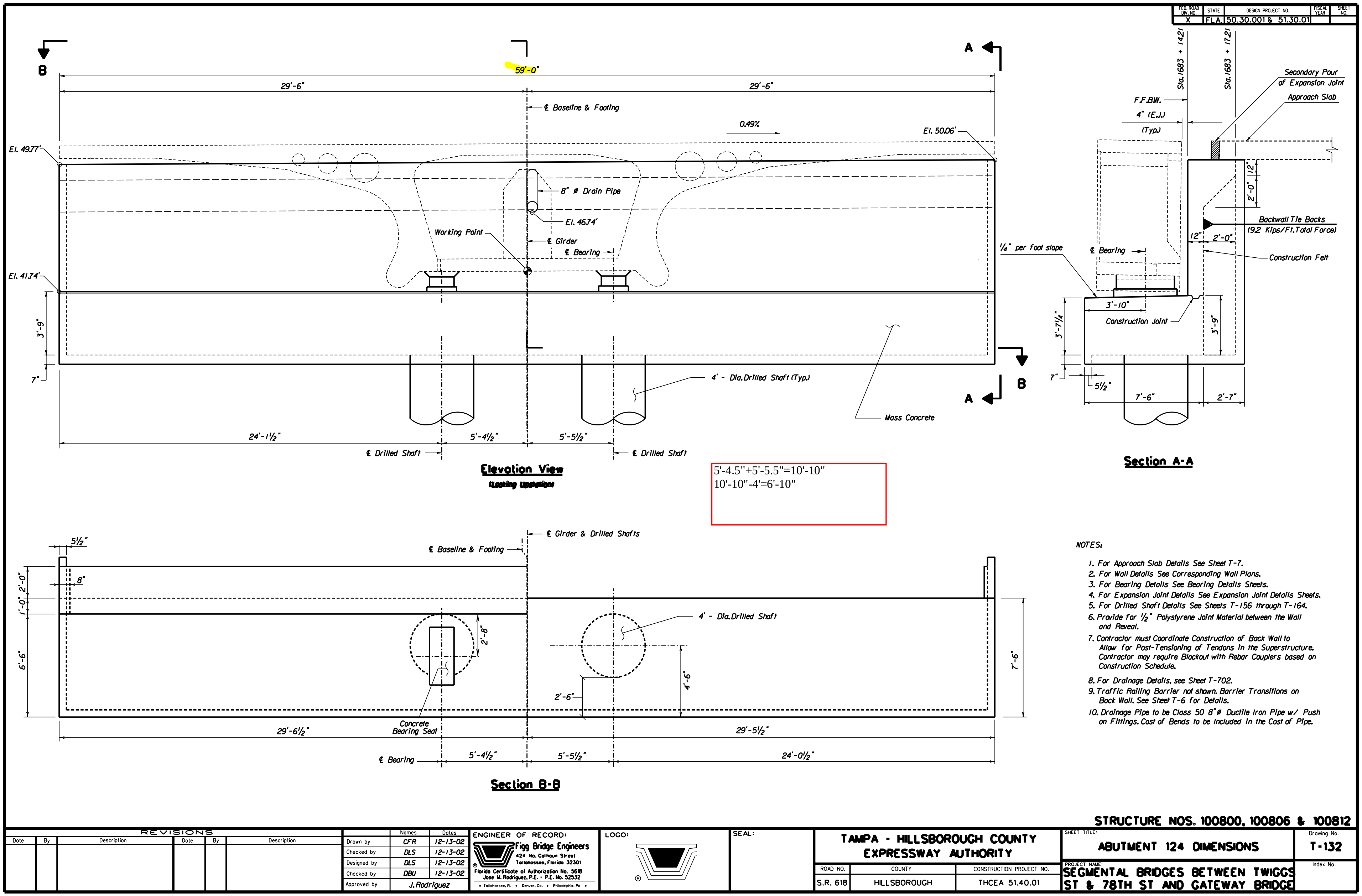
SHEET TITLE: ABUTMENT 123 REINFORCEMENT 3

Drawing No. T-129

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Index No.

13 DEC 2002 15:11:18


FED. ROAD DIV. NO. X
STATE FLA.
DESIGN PROJECT NO. 50.30.001 & 51.30.01
FISCAL YEAR
SHEET NO.
59'-0"
29'-6"
29'-6"
℄ Baseline & Footing
0.49%
El. 50.06'
El. 49.77'
8" ø Drain Pipe
El. 46.74'
Working Point
℄ Girder
℄ Bearing
El. 41.74'
3'-9"
7"
4' - Dia.Drilled Shaft (Typ.)
Mass Concrete
24'-1½"
5'-4½"
5'-5½"
℄ Drilled Shaft
℄ Drilled Shaft
Elevation View
(Looking Upstation)
5'-4.5"+5'-5.5"=10'-10"
10'-10"-4'=6'-10"
Sta.1683 + 14.21
Sta.1683 + 17.21
Secondary Pour of Expansion Joint
Approach Slab
F.F.BW.
4" (E.J.)
(Typ.)
12"
2'-0"
Backwall Tie Backs (9.2 Kips/Ft.Total Force)
12"
2'-0"
Construction Felt
¼" per foot slope
℄ Bearing
3'-10"
Construction Joint
3'-7¼"
3'-9"
7"
5½"
7'-6"
2'-7"
Section A-A
5½"
8"
2'-0"
1'-0"
6'-6"
℄ Girder & Drilled Shafts
℄ Baseline & Footing
4' - Dia.Drilled Shaft
2'-8"
4'-6"
2'-6"
7'-6"
Concrete Bearing Seat
29'-6½"
29'-5½"
℄ Bearing
5'-4½"
5'-5½"
24'-0½"
Section B-B
NOTES:
1. For Approach Slab Details See Sheet T-7.
2. For Wall Details See Corresponding Wall Plans.
3. For Bearing Details See Bearing Details Sheets.
4. For Expansion Joint Details See Expansion Joint Details Sheets.
5. For Drilled Shaft Details See Sheets T-156 through T-164.
6. Provide for ½" Polystyrene Joint Material between the Wall and Reveal.
7. Contractor must Coordinate Construction of Back Wall to Allow for Post-Tensioning of Tendons in the Superstructure. Contractor may require Blockout with Rebar Couplers based on Construction Schedule.
8. For Drainage Details, see Sheet T-702.
9. Traffic Railing Barrier not shown. Barrier Transitions on Back Wall. See Sheet T-6 for Details.
10. Drainage Pipe to be Class 50 8"ø Ductile Iron Pipe w/ Push on Fittings. Cost of Bends to be Included in the Cost of Pipe.
STRUCTURE NOS. 100800, 100806 & 100812
REVISIONS
Date By Description Date By Description
Names Dates
Drawn by CFR 12-13-02
Checked by DLS 12-13-02
Designed by DLS 12-13-02
Checked by DBU 12-13-02
Approved by J.Rodriguez
ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
LOGO:
SEAL:
TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY
ROAD NO. S.R. 618
COUNTY HILLSBOROUGH
CONSTRUCTION PROJECT NO. THCEA 51.40.01
SHEET TITLE: ABUTMENT 124 DIMENSIONS
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE
Drawing No. T-132
Index No.
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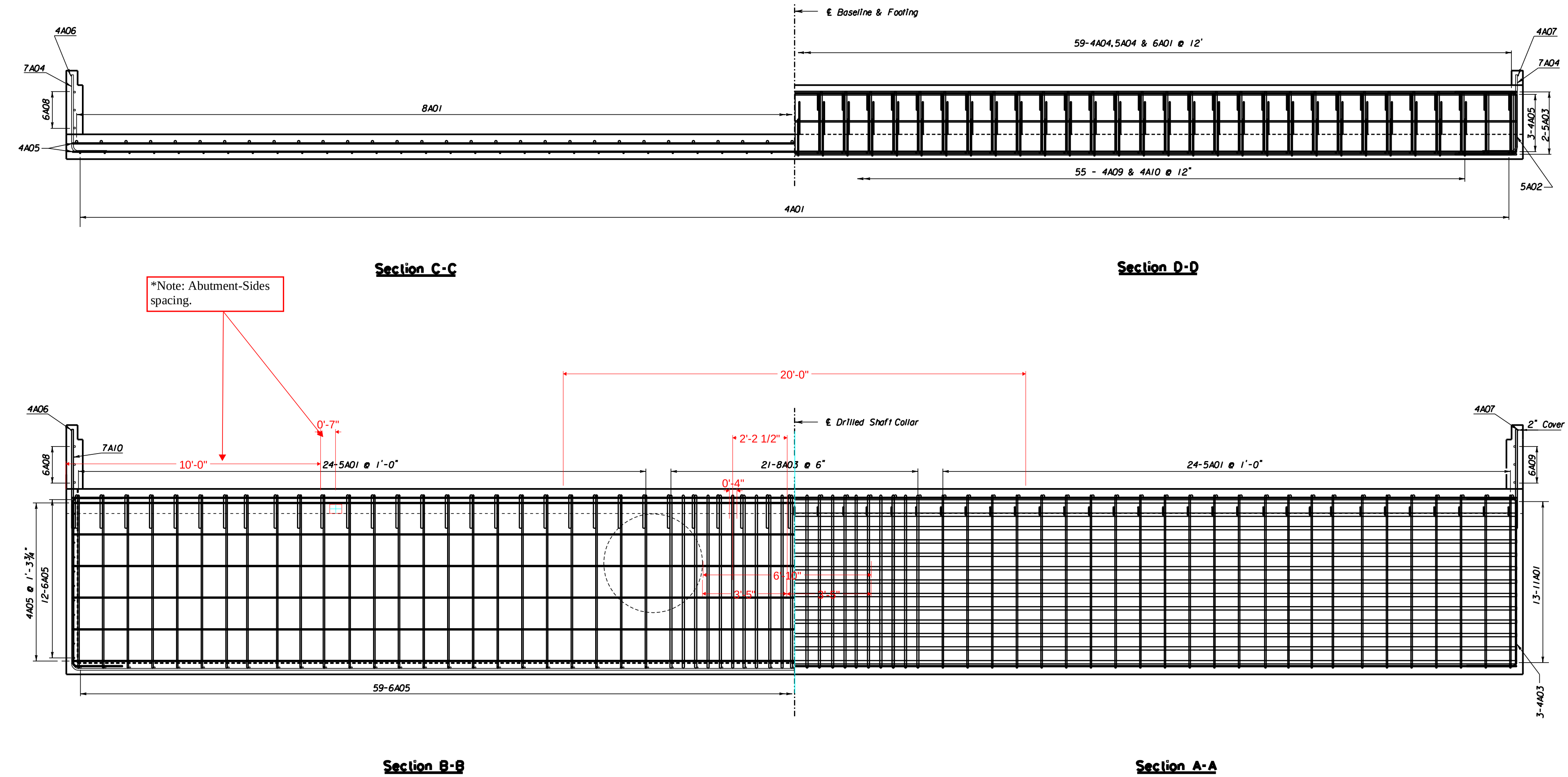


NOTE:

1. Minimum Concrete Cover = 3" (Unless Otherwise Noted).
2. (E.F.) Denotes Each Face
   (O.F.) Denotes Outside Face
   (I.F.) Denotes Inside Face

STRUCTURE NOS. 100800, 100806 & 100812

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	CFR	12-13-02
Checked by	DLS	12-13-02
Designed by	DLS	12-13-02
Checked by	DBU	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: ABUTMENT 124 REINFORCEMENT 2

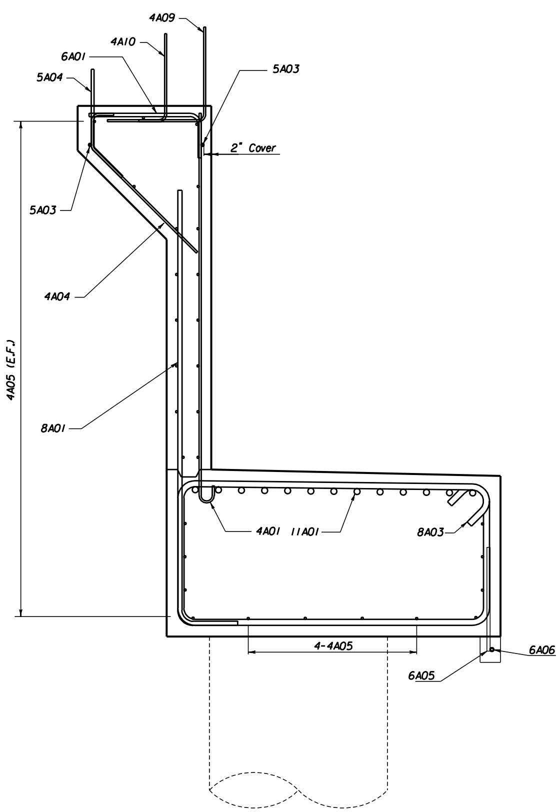
Drawing No. T-134

Index No.

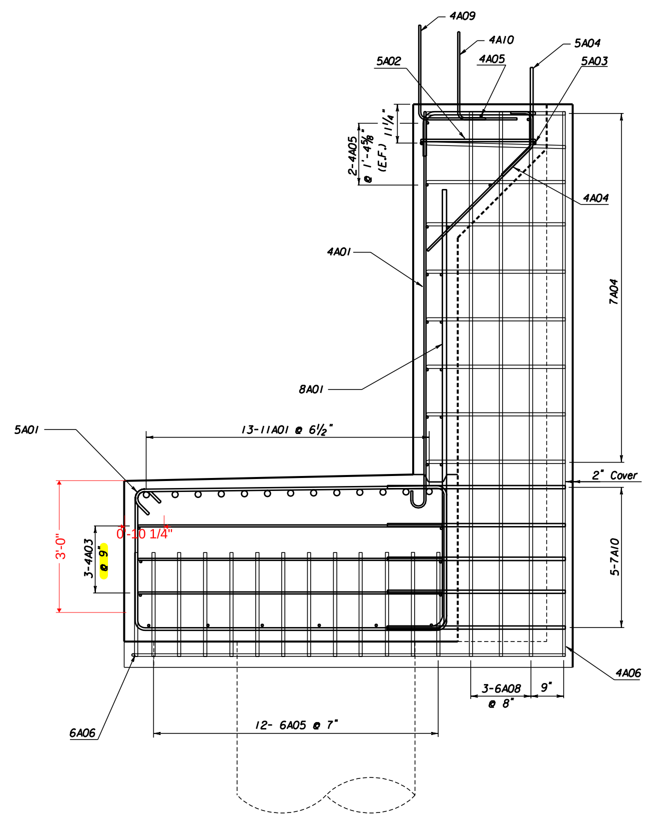
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

13 DEC 2002 15:11:21

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		



Section E-E



Side View

NOTE:

1. Minimum Concrete Cover = 3" (Unless Otherwise Noted).
2. (E.F.) Denotes Each Face
   (O.F.) Denotes Outside Face
   (I.F.) Denotes Inside Face

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	CFR	12-13-02
Checked by	DLS	12-13-02
Designed by	DLS	12-13-02
Checked by	DBU	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

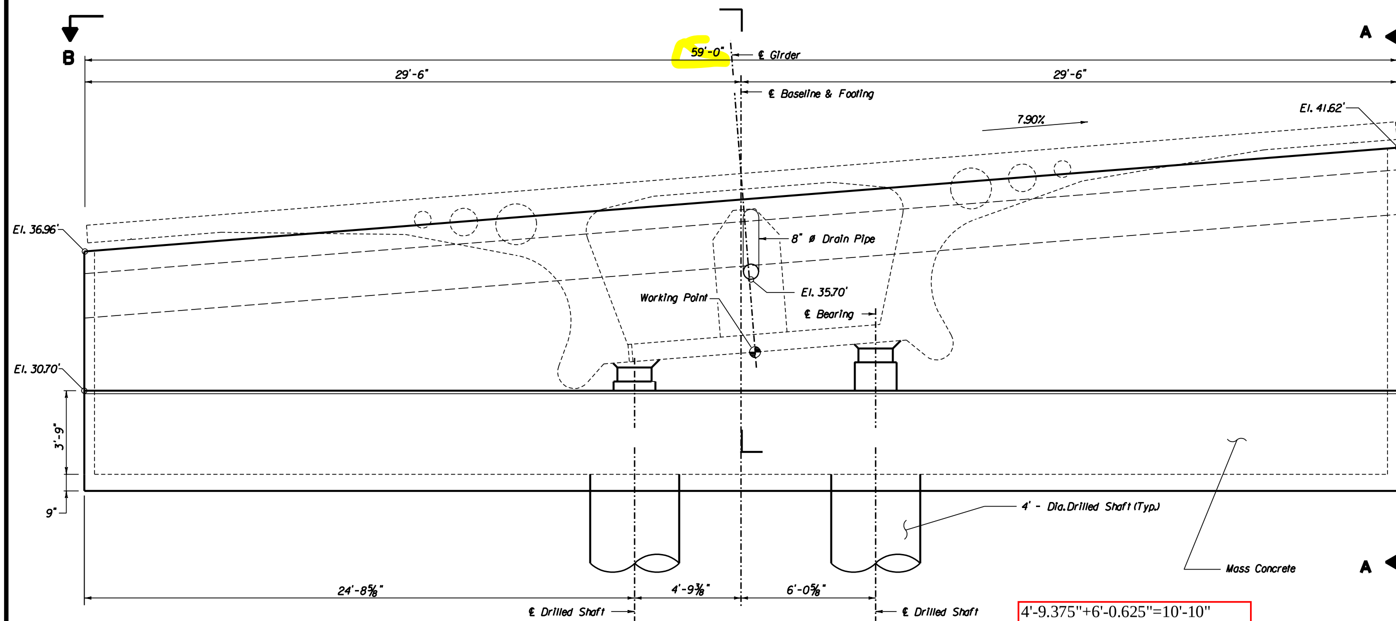
SHEET TITLE: ABUTMENT 124 REINFORCEMENT 3

Drawing No. T-135

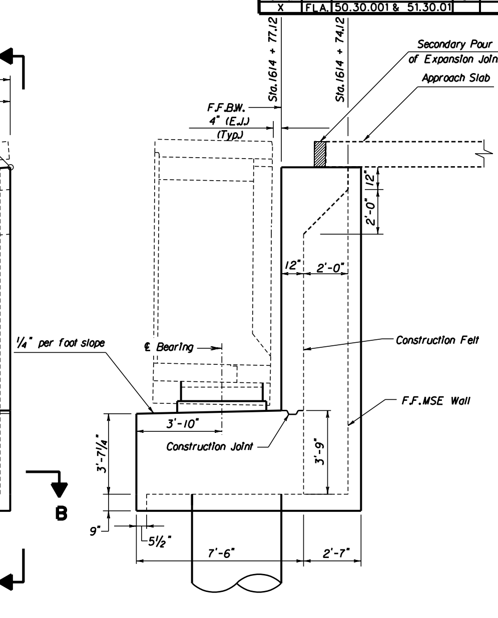
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Index No.

13 DEC 2002 15:11:23

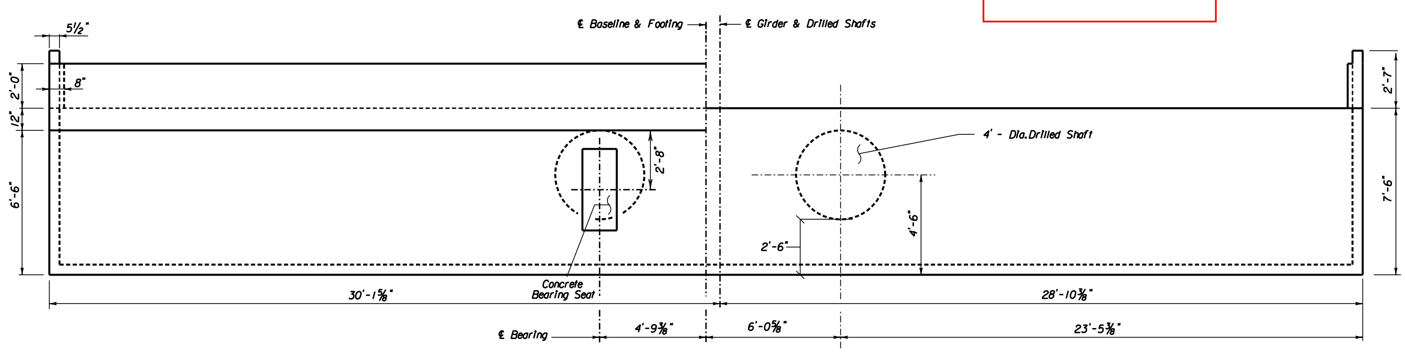


Elevation View
(Looking Downstation)



Section A-A

4'-9.375"+6'-0.625"=10'-10"
10'-10"-4'=6'-10"



Section B-B

NOTES:

1. For Approach Slab Details See Sheet T-7.
2. For Wall Details See Corresponding Wall Plans.
3. For Bearing Details See Bearing Details Sheets.
4. For Expansion Joint Details See Expansion Joint Details Sheets.
5. For Drilled Shaft Details See Sheets T-156 through T-164.
6. Provide for ½" Polystyrene Joint Material between the Wall and Reveal.
7. Contractor must Coordinate Construction of Back Wall to Allow for Post-Tensioning of Tendons in the Superstructure. Contractor may require Blockout with Rebar Couplers based on Construction Schedule.
8. For Drainage Details, see Sheet T-702.
9. Traffic Railing Barrier not shown. Barrier Transitions on Back Wall. See Sheet T-6 for Details.
10. Drainage Pipe to be Class 50 8"⌀ Ductile Iron Pipe w/ Push on Fittings. Cost of Bends to be Included in the Cost of Pipe.

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	CFR	12-13-02
Checked by	DLS	12-13-02
Designed by	DLS	12-13-02
Checked by	DBU	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: ABUTMENT 173 DIMENSIONS

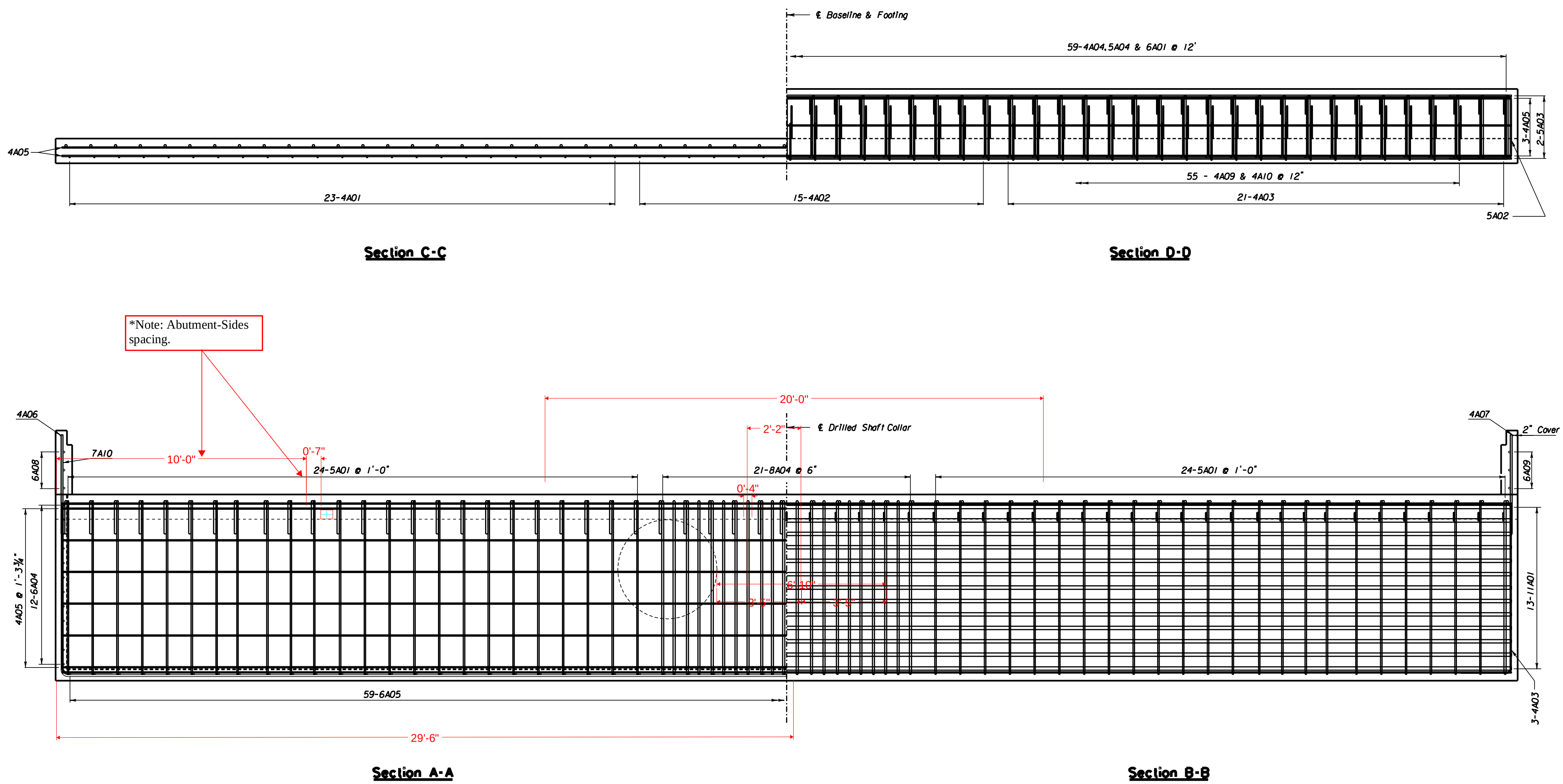
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-138

Index No.

13 DEC 2002 15:11:22

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		



NOTE:

1. Minimum Concrete Cover = 3" (Unless Otherwise Noted).
2. (E.F.) Denotes Each Face
   (O.F.) Denotes Outside Face
   (I.F.) Denotes Inside Face

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	CFR	12-13-02
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Designed by	DLS	12-13-02
Checked by	DBU	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: ABUTMENT 173 REINFORCEMENT 2

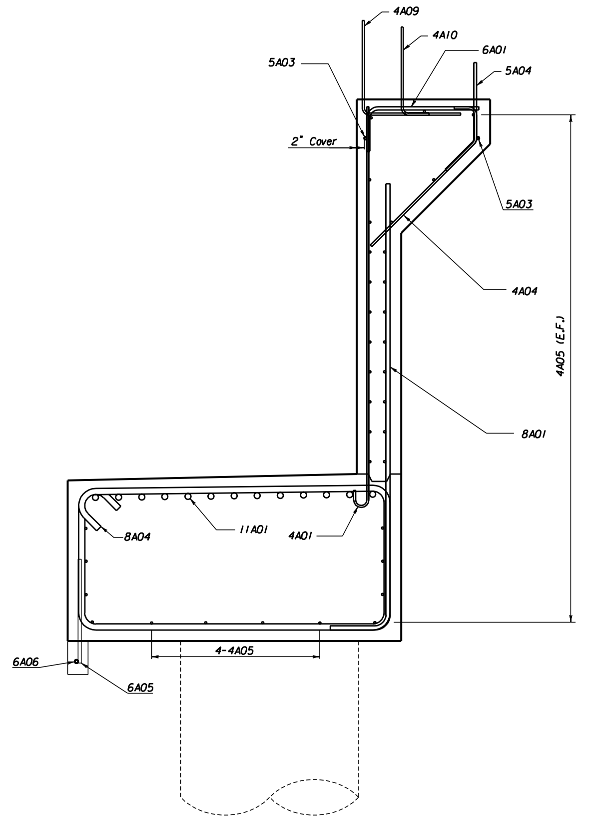
PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-140

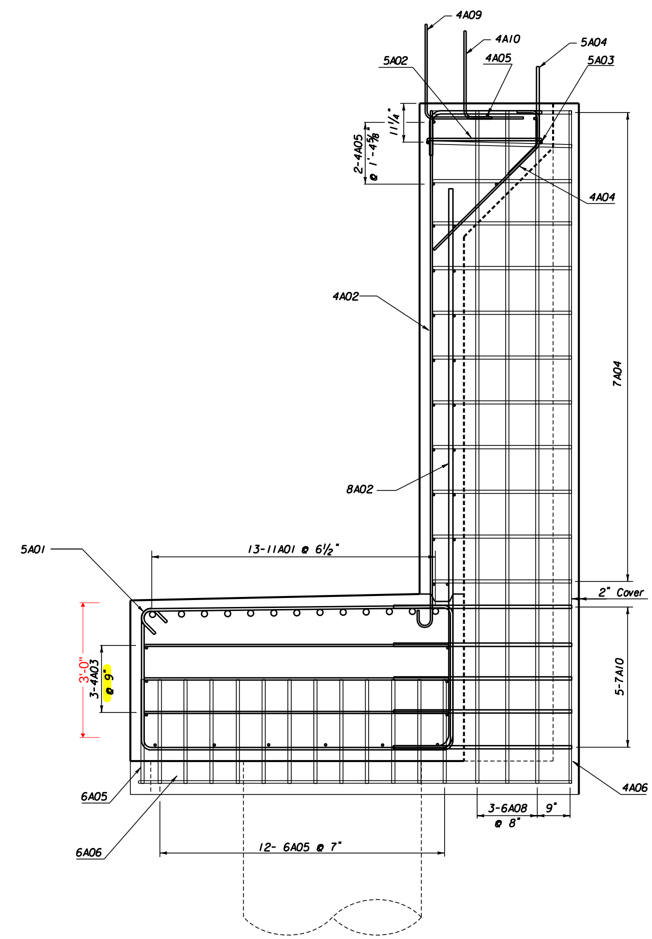
Index No.

13 DEC 2002 15:11:24

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		



Section E-E



Side View

1. Minimum Concrete Cover = 3" (Unless Otherwise Noted).
2. (E.F.) Denotes Each Face
   (O.F.) Denotes Outside Face
   (I.F.) Denotes Inside Face

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS					
Date	By	Description	Date	By	Description

	Names	Dates
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Checked by	DLS	12-13-02
Designed by	DLS	12-13-02
Checked by	DBU	12-13-02
Approved by	J. Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, FL • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY
EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE:
ABUTMENT 173 REINFORCEMENT 3

PROJECT NAME:
SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No.
T-141

Index No.

13 DEC 2002 15:11:25

STAAD Analysis

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*           Bentley Systems, Inc.                  *
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     3. ENGINEER DATE 05-JUN-18
     4. JOB NAME ABUTMENT MIDDLE
     5. JOB CLIENT THEA
     6. JOB NO 148872000
     7. JOB REV 3
     8. ENGINEER NAME IERM
     9. END JOB INFORMATION
    10. INPUT WIDTH 79
    11. UNIT FEET KIP
    12. JOINT COORDINATES
    13. 2 0 0 -1; 3 8 0 -1; 4 10 0 -1; 5 12 0 -1; 6 20 0 -1; 7 8 0 -3; 8 0 0 -3
    14. 9 10 0 -3; 10 12 0 -3; 11 20 0 -3; 12 8 1 -3; 13 8 1.75 -3; 14 8 3 -3
    15. 15 12 1 -3; 16 12 1.75 -3; 17 12 3 -3; 18 1 0 -1; 19 1 0 -3; 20 9.5 0 -1.
    16. 21 9.5 0 -3; 22 10.5 0 -1; 23 10.5 0 -3; 24 19 0 -1; 25 19 0 -3; 26 8 2.5 -3
    17. 27 12 2.5 -3; 28 8 0 0; 29 12 0 0
    18. MEMBER INCIDENCES
    19. 1 2 18; 2 3 20; 3 4 22; 4 5 24; 5 3 7; 6 5 10; 7 8 19; 8 7 21; 9 9 23
    20. 10 10 25; 11 7 12; 12 12 13; 13 13 26; 14 10 15; 15 15 16; 16 16 27; 17 18 3
    21. 18 19 7; 19 20 4; 20 21 9; 21 22 5; 22 23 10; 23 24 6; 24 25 11; 25 26 14
    22. 26 27 17; 30 3 28; 31 5 29
    23. ELEMENT INCIDENCES SHELL
    24. 32 2 8 19 18; 33 20 21 23 22; 34 24 25 11 6
    25. ELEMENT PROPERTY
    26. 32 TO 34 THICKNESS 0.020833
    27. DEFINE MATERIAL START
    28. ISOTROPIC STEEL
    29. E 4.176E+006
    30. POISSON 0.3
    31. DENSITY 0.489024
    32. ALPHA 6E-006
    33. DAMP 0.03
    34. TYPE STEEL
    35. STRENGTH FY 5184 FU 8352 RY 1.5 RT 1.2
    36. G 1.60615E+006
    37. ISOTROPIC ALUMINUM
    38. E 1.44E+006
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39. POISSON 0.33
40. DENSITY 0.169344
41. ALPHA 1.3E-005
42. DAMP 0.03
43. ISOTROPIC A500-GR.B
44. E 4.176E+006
45. POISSON 0.3
46. DENSITY 0.49
47. ALPHA 6E-006
48. DAMP 0.03
49. G 1.6128E-006
50. TYPE STEEL
51. STRENGTH FY 6624 FU 8352 RY 1.1 RT 1.2
52. END DEFINE MATERIAL
53. MEMBER PROPERTY AMERICAN
54. 1 TO 26 30 31 TABLE ST HSST3X3X0.188
55. CONSTANTS
56. MATERIAL STEEL MEMB 32 TO 34
57. MATERIAL A500-GR.B MEMB 1 TO 26 30 31
58. SUPPORTS
59. 12 13 15 16 26 27 FIXED BUT MX MY MZ
60. LOAD 2 LOADTYPE WIND  TITLE W1
61. JOINT LOAD
62. 2 6 8 11 FZ -0.0522
63. 2 6 8 11 MX -0.0324
64. 2 6 8 11 FX 0.0277
65. 2 6 8 11 MZ -0.017
66. LOAD 1 LOADTYPE DEAD  TITLE DL
67. SELFWEIGHT Y -1
68. JOINT LOAD
69. 2 6 8 11 FY -0.015
70. 4 9 FY -0.0264
71. LOAD 3 LOADTYPE WIND  TITLE W2
72. JOINT LOAD
73. 4 9 FZ -0.0293
74. 4 9 MX -0.0173
75. 4 9 FX 0.0277
76. 4 9 MZ -0.0159
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80. 2 6 8 11 MX -0.024
81. 2 6 8 11 FX 0.021
82. 2 6 8 11 MZ -0.013
83. 4 9 FZ -0.022
84. 4 9 MX -0.013
85. 4 9 FX 0.021
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87. LOAD COMB 4 1.25DL
88. 1 1.25
89. LOAD COMB 5 1.1DL+1.0W1
90. 1 1.1 2 1.0
91. LOAD COMB 6 1.1DL+1.0W2
92. 1 1.1 3 1.0
93. LOAD COMB 8 1.1DL+1.0W3
94. 1 1.1 7 1.0
```

```
95. PERFORM ANALYSIS PRINT ALL


        P R O B L E M   S T A T I S T I C S
        -----------------------------------

   NUMBER OF JOINTS         28  NUMBER OF MEMBERS      28
   NUMBER OF PLATES          3  NUMBER OF SOLIDS        0
   NUMBER OF SURFACES        0  NUMBER OF SUPPORTS      6


         SOLVER USED IS THE OUT-OF-CORE BASIC SOLVER

   ORIGINAL/FINAL BAND-WIDTH=    25/     6/     39 DOF
 TOTAL      PRIMARY LOAD CASES =     4, TOTAL DEGREES OF FREEDOM =     150
 TOTAL LOAD COMBINATION  CASES =     4  SO FAR.
   SIZE OF STIFFNESS MATRIX =        6 DOUBLE  KILO-WORDS
   REQRD/AVAIL. DISK SPACE  =     12.1/      0.0 MB
```

LOADING 2 LOADTYPE WIND TITLE W1

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
2	0.00	0.00	-0.05	0.00	0.00	0.00
6	0.00	0.00	-0.05	0.00	0.00	0.00
8	0.00	0.00	-0.05	0.00	0.00	0.00
11	0.00	0.00	-0.05	0.00	0.00	0.00
2	0.00	0.00	0.00	-0.03	0.00	0.00
6	0.00	0.00	0.00	-0.03	0.00	0.00
8	0.00	0.00	0.00	-0.03	0.00	0.00
11	0.00	0.00	0.00	-0.03	0.00	0.00
2	0.03	0.00	0.00	0.00	0.00	0.00
6	0.03	0.00	0.00	0.00	0.00	0.00
8	0.03	0.00	0.00	0.00	0.00	0.00
11	0.03	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	-0.02
6	0.00	0.00	0.00	0.00	0.00	-0.02
8	0.00	0.00	0.00	0.00	0.00	-0.02
11	0.00	0.00	0.00	0.00	0.00	-0.02

LOADING 1 LOADTYPE DEAD TITLE DL

SELFWEIGHT Y -1.000

ACTUAL WEIGHT OF THE STRUCTURE = 0.396 KIP

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
2	0.00	-0.01	0.00	0.00	0.00	0.00
6	0.00	-0.01	0.00	0.00	0.00	0.00
8	0.00	-0.01	0.00	0.00	0.00	0.00
11	0.00	-0.01	0.00	0.00	0.00	0.00
4	0.00	-0.03	0.00	0.00	0.00	0.00
9	0.00	-0.03	0.00	0.00	0.00	0.00

LOADING 3 LOADTYPE WIND TITLE W2

JOINT LOAD - UNIT KIP FEET

JOINT FORCE-X FORCE-Y FORCE-Z MOM-X MOM-Y MOM-Z

4	0.00	0.00	-0.03	0.00	0.00	0.00
9	0.00	0.00	-0.03	0.00	0.00	0.00
4	0.00	0.00	0.00	-0.02	0.00	0.00
9	0.00	0.00	0.00	-0.02	0.00	0.00
4	0.03	0.00	0.00	0.00	0.00	0.00
9	0.03	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	-0.02
9	0.00	0.00	0.00	0.00	0.00	-0.02

LOADING 7 LOADTYPE WIND TITLE 0.75W3

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
2	0.00	0.00	-0.04	0.00	0.00	0.00
6	0.00	0.00	-0.04	0.00	0.00	0.00
8	0.00	0.00	-0.04	0.00	0.00	0.00
11	0.00	0.00	-0.04	0.00	0.00	0.00
2	0.00	0.00	0.00	-0.02	0.00	0.00
6	0.00	0.00	0.00	-0.02	0.00	0.00
8	0.00	0.00	0.00	-0.02	0.00	0.00
11	0.00	0.00	0.00	-0.02	0.00	0.00
2	0.02	0.00	0.00	0.00	0.00	0.00
6	0.02	0.00	0.00	0.00	0.00	0.00
8	0.02	0.00	0.00	0.00	0.00	0.00
11	0.02	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	-0.01
6	0.00	0.00	0.00	0.00	0.00	-0.01
8	0.00	0.00	0.00	0.00	0.00	-0.01
11	0.00	0.00	0.00	0.00	0.00	-0.01
4	0.00	0.00	-0.02	0.00	0.00	0.00
9	0.00	0.00	-0.02	0.00	0.00	0.00
4	0.00	0.00	0.00	-0.01	0.00	0.00
9	0.00	0.00	0.00	-0.01	0.00	0.00
4	0.02	0.00	0.00	0.00	0.00	0.00
9	0.02	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	-0.01
9	0.00	0.00	0.00	0.00	0.00	-0.01

```
*WARNING- ZERO STIFFNESS IN DIRECTION 6 AT JOINT     28 EQN.NO.      48
          LOADS APPLIED OR DISTRIBUTED HERE FROM ELEMENTS WILL BE IGNORED.
          THIS MAY BE DUE TO ALL MEMBERS AT THIS JOINT BEING RELEASED OR
          EFFECTIVELY RELEASED IN THIS DIRECTION.
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     12 EQN.NO.      56
*WARNING- ZERO STIFFNESS IN DIRECTION 4 AT JOINT      4 EQN.NO.      61
*WARNING- ZERO STIFFNESS IN DIRECTION 4 AT JOINT      9 EQN.NO.      79
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     13 EQN.NO.      83
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     26 EQN.NO.      98
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     15 EQN.NO.     107
*WARNING- ZERO STIFFNESS IN DIRECTION 6 AT JOINT     29 EQN.NO.     120
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     14 EQN.NO.     125
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     16 EQN.NO.     140
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     27 EQN.NO.     143
```

Stiffness at the connections is expected since the plates are the major contributing factor. The warning is considered but not a cause for concern in the design.

```
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     17 EQN.NO.     149


FOR LOADING -     2
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
     2 2.77000E-02 0.00000E+00-5.22000E-02-3.24000E-02 0.00000E+00-1.70000E-02
     6 2.77000E-02 0.00000E+00-5.22000E-02-3.24000E-02 0.00000E+00-1.70000E-02
     8 2.77000E-02 0.00000E+00-5.22000E-02-3.24000E-02 0.00000E+00-1.70000E-02
    11 2.77000E-02 0.00000E+00-5.22000E-02-3.24000E-02 0.00000E+00-1.70000E-02

          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     2
          LOADTYPE WIND  TITLE W1


           CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.100000003E+02
                        Y =  0.613718474E+00
                        Z = -0.200000006E+01

           CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.100000003E+02
                        Y =  0.620689705E+00
                        Z = -0.200000006E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     2 )
       SUMMATION FORCE-X =           0.11
       SUMMATION FORCE-Y =           0.00
       SUMMATION FORCE-Z =          -0.21

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=          -0.13  MY=           1.87  MZ=          -0.07


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     2 )
       SUMMATION FORCE-X =          -0.11
       SUMMATION FORCE-Y =          -0.00
       SUMMATION FORCE-Z =           0.21

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=           0.13  MY=          -1.87  MZ=           0.07


   MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      2)
             MAXIMUMS    AT NODE
      X =  3.06516E-03      29
      Y =  2.37086E-01       2
      Z = -5.05808E-02       6
      RX= -1.86232E-02       8
      RY=  1.49978E-04      25
      RZ= -3.07549E-03       2
```

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP FEET)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	SUPPORT=1
12	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.21	0.00	-0.07	-0.00	-0.00	0.00	111000
15	0.00	0.00	0.00	0.00	0.00	0.00	
	0.41	-0.00	-0.27	-0.00	0.00	0.00	111000
16	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.14	0.00	0.17	-0.00	0.00	-0.00	111000

FOR LOADING - 1
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
2	0.00000E+00	-2.33095E-02	0.00000E+00	0.00000E+00	0.00000E+00	-5.35938E-04
3	0.00000E+00	-3.69797E-02	0.00000E+00	-1.60781E-03	0.00000E+00	2.50551E-02
4	0.00000E+00	-2.96156E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
5	0.00000E+00	-3.69797E-02	0.00000E+00	-1.60781E-03	0.00000E+00	-2.50551E-02
6	0.00000E+00	-2.33095E-02	0.00000E+00	0.00000E+00	0.00000E+00	5.35938E-04
7	0.00000E+00	-3.69797E-02	0.00000E+00	2.14375E-03	0.00000E+00	2.50551E-02
8	0.00000E+00	-2.33095E-02	0.00000E+00	0.00000E+00	0.00000E+00	-5.35938E-04
9	0.00000E+00	-2.96156E-02	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
10	0.00000E+00	-3.69797E-02	0.00000E+00	2.14375E-03	0.00000E+00	-2.50551E-02
11	0.00000E+00	-2.33095E-02	0.00000E+00	0.00000E+00	0.00000E+00	5.35938E-04
12	0.00000E+00	-5.62734E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
13	0.00000E+00	-4.82344E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
14	0.00000E+00	-1.60781E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
15	0.00000E+00	-5.62734E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
16	0.00000E+00	-4.82344E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
17	0.00000E+00	-1.60781E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
18	0.00000E+00	-3.08189E-02	0.00000E+00	0.00000E+00	0.00000E+00	-2.57250E-02
19	0.00000E+00	-3.08189E-02	0.00000E+00	0.00000E+00	0.00000E+00	-2.57250E-02
20	0.00000E+00	-1.15252E-02	0.00000E+00	0.00000E+00	0.00000E+00	1.07188E-03
21	0.00000E+00	-1.15252E-02	0.00000E+00	0.00000E+00	0.00000E+00	1.07188E-03
22	0.00000E+00	-1.15252E-02	0.00000E+00	0.00000E+00	0.00000E+00	-1.07188E-03
23	0.00000E+00	-1.15252E-02	0.00000E+00	0.00000E+00	0.00000E+00	-1.07188E-03
24	0.00000E+00	-3.08189E-02	0.00000E+00	0.00000E+00	0.00000E+00	2.57250E-02
25	0.00000E+00	-3.08189E-02	0.00000E+00	0.00000E+00	0.00000E+00	2.57250E-02
26	0.00000E+00	-4.01953E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
27	0.00000E+00	-4.01953E-03	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00
28	0.00000E+00	-3.21562E-03	0.00000E+00	-5.35938E-04	0.00000E+00	0.00000E+00
29	0.00000E+00	-3.21562E-03	0.00000E+00	-5.35938E-04	0.00000E+00	0.00000E+00

STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO. 1
LOADTYPE DEAD TITLE DL

CENTER OF FORCE BASED ON Y FORCES ONLY (FEET).
(FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

X = 0.100000003E+02
Y = 0.113860572E+00
Z = -0.203795358E+01

```
   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     1 )
       SUMMATION FORCE-X =           0.00
       SUMMATION FORCE-Y =          -0.51
       SUMMATION FORCE-Z =           0.00

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=          -1.04  MY=           0.00  MZ=          -5.08


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     1 )
       SUMMATION FORCE-X =           0.00
       SUMMATION FORCE-Y =           0.51
       SUMMATION FORCE-Z =          -0.00

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=           1.04  MY=           0.00  MZ=           5.08


   MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      1)
            MAXIMUMS    AT NODE
      X = -1.68429E-04      10
      Y = -3.46242E-01       6
      Z = -4.86043E-03      11
      RX=  5.81508E-03      19
      RY=  7.43473E-06      29
      RZ=  4.14787E-03       2



   EXTERNAL AND INTERNAL JOINT LOAD SUMMARY ( KIP  FEET )-

   JT     EXT FX/   EXT FY/   EXT FZ/    EXT MX/    EXT MY/    EXT MZ/
          INT FX    INT FY    INT FZ     INT MX     INT MY     INT MZ

                                                                  SUPPORT=1
    12      0.00     -0.01      0.00       0.00       0.00       0.00
           -0.55     -0.24     -0.41      -0.00      -0.00      -0.00  111000

    13      0.00     -0.00      0.00       0.00       0.00       0.00
            0.17      0.00      0.49      -0.00      -0.00      -0.00  111000

    15      0.00     -0.01      0.00       0.00       0.00       0.00
            0.55     -0.24     -0.41      -0.00       0.00       0.00  111000

    16      0.00     -0.00      0.00       0.00       0.00       0.00
           -0.17      0.00      0.49      -0.00       0.00       0.00  111000

FOR LOADING -     3
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
     4 2.77000E-02 0.00000E+00-2.93000E-02-1.73000E-02 0.00000E+00-1.59000E-02
     9 2.77000E-02 0.00000E+00-2.93000E-02-1.73000E-02 0.00000E+00-1.59000E-02

          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     3
          LOADTYPE WIND  TITLE W2
```

```
       CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
     (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                    X =  0.100000003E+02
                    Y =  0.574007281E+00
                    Z = -0.200000006E+01

       CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
     (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                    X =  0.100000003E+02
                    Y =  0.590443686E+00
                    Z = -0.200000006E+01

 ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     3 )
     SUMMATION FORCE-X =  5.5399999E-02
     SUMMATION FORCE-Y =  0.0000000E+00
     SUMMATION FORCE-Z = -5.8600001E-02

    SUMMATION OF MOMENTS AROUND THE ORIGIN-
    MX=          -0.03  MY=           0.48  MZ=          -0.03


 ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     3 )
     SUMMATION FORCE-X = -5.5399999E-02
     SUMMATION FORCE-Y = -2.0912092E-15
     SUMMATION FORCE-Z =  5.8600001E-02

    SUMMATION OF MOMENTS AROUND THE ORIGIN-
    MX=           0.00  MY=          -0.48  MZ=           0.03


 MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      3)
          MAXIMUMS    AT NODE
    X =  8.99227E-04      28
    Y = -6.46038E-03       6
    Z = -1.97221E-03      11
    RX=  3.26410E-04      25
    RY=  2.16085E-05       7
    RZ= -6.07796E-05       4



 EXTERNAL AND INTERNAL JOINT LOAD SUMMARY ( KIP  FEET )-

 JT     EXT FX/   EXT FY/   EXT FZ/    EXT MX/    EXT MY/    EXT MZ/
        INT FX    INT FY    INT FZ     INT MX     INT MY     INT MZ

                                                                    SUPPORT=1
  15      0.00      0.00      0.00       0.00       0.00       0.00
          0.06     -0.00     -0.13      -0.00       0.00      -0.00  111000

  16      0.00      0.00      0.00       0.00       0.00       0.00
         -0.04      0.00      0.10      -0.00       0.00      -0.00  111000

FOR LOADING -     7
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
```

```
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
     2 2.10000E-02 0.00000E+00-3.90000E-02-2.40000E-02 0.00000E+00-1.30000E-02
     4 2.10000E-02 0.00000E+00-2.20000E-02-1.30000E-02 0.00000E+00-1.20000E-02
     6 2.10000E-02 0.00000E+00-3.90000E-02-2.40000E-02 0.00000E+00-1.30000E-02
     8 2.10000E-02 0.00000E+00-3.90000E-02-2.40000E-02 0.00000E+00-1.30000E-02
     9 2.10000E-02 0.00000E+00-2.20000E-02-1.30000E-02 0.00000E+00-1.20000E-02
    11 2.10000E-02 0.00000E+00-3.90000E-02-2.40000E-02 0.00000E+00-1.30000E-02

          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     7
          LOADTYPE WIND  TITLE 0.75W3


           CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                         X =  0.100000003E+02
                         Y =  0.603174630E+00
                         Z = -0.200000006E+01

           CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                         X =  0.100000003E+02
                         Y =  0.609999991E+00
                         Z = -0.200000006E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     7 )
       SUMMATION FORCE-X =           0.13
       SUMMATION FORCE-Y =           0.00
       SUMMATION FORCE-Z =          -0.20

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=          -0.12  MY=           1.75  MZ=          -0.08


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     7 )
       SUMMATION FORCE-X =          -0.13
       SUMMATION FORCE-Y =          -0.00
       SUMMATION FORCE-Z =           0.20

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=           0.10  MY=          -1.75  MZ=           0.08


   MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      7)
             MAXIMUMS    AT NODE
      X =  2.86116E-03      29
      Y =  1.79579E-01       2
      Z = -3.93397E-02       6
      RX= -1.39845E-02       8
      RY=  1.25526E-04      25
      RZ= -2.32052E-03       2
```

EXTERNAL AND INTERNAL JOINT LOAD SUMMARY (KIP FEET)-

JT	EXT FX/ INT FX	EXT FY/ INT FY	EXT FZ/ INT FZ	EXT MX/ INT MX	EXT MY/ INT MY	EXT MZ/ INT MZ	
							SUPPORT=1
12	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.11	0.01	-0.07	0.00	-0.00	0.00	111000
15	0.00	0.00	0.00	0.00	0.00	0.00	
	0.35	-0.01	-0.30	0.00	0.00	0.00	111000
16	0.00	0.00	0.00	0.00	0.00	0.00	
	-0.13	0.00	0.20	0.00	0.00	-0.00	111000

LOAD COMBINATION NO. 4
1.25DL

LOADING- 1.
FACTOR - 1.25

LOAD COMBINATION NO. 5
1.1DL+1.0W1

LOADING- 1. 2.
FACTOR - 1.10 1.00

LOAD COMBINATION NO. 6
1.1DL+1.0W2

LOADING- 1. 3.
FACTOR - 1.10 1.00

LOAD COMBINATION NO. 8
1.1DL+1.0W3

LOADING- 1. 7.
FACTOR - 1.10 1.00

************ END OF DATA FROM INTERNAL STORAGE ************

96. PARAMETER 1
97. CODE LRFD
98. CHECK CODE ALL

STAAD.Pro CODE CHECKING - (LRFD 3RD EDITION) v1.0
****

ALL UNITS ARE - KIP FEET (UNLESS OTHERWISE Noted)

```
MEMBER     TABLE       RESULT/   CRITICAL COND/     RATIO/     LOADING/
                         FX            MY             MZ       LOCATION
=======================================================================



     1  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.028         2
                        0.06 T          0.12         -0.03        1.00
     2  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.094         4
                        0.00 C         -0.00          0.50        0.00
     3  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.086         4
                        0.05 C          0.00          0.45        0.50
     4  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.094         4
                        0.00 C          0.00          0.50        0.00
     5  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.064         5
                        0.03 C          0.15          0.19        2.00
     6  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.067         5
                        0.06 C         -0.13          0.22        2.00
     7  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.027         5
                        0.11 C          0.12          0.02        1.00
     8  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.039         5
                        1.06 C         -0.03          0.13        0.00
     9  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.023         5
                        0.77 C         -0.02          0.07        0.00
    10  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.168         5
                        0.21 C         -0.18          0.70        0.00
    11  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.137         5
                        0.25 T         -0.19          0.53        0.00
    12  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.078         4
                        0.00 C         -0.31         -0.11        0.00
    13  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.019         4
                        0.00 C          0.08          0.03        0.00
    14  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.154         5
                        0.26 T         -0.22         -0.59        0.00
    15  ST   HSST3X3X0.188           (AISC SECTIONS)
                           PASS     HSS FLEX+AXL       0.100         8
                        0.00 C         -0.37          0.16        0.00
```

ALL UNITS ARE - KIP FEET (UNLESS OTHERWISE Noted)

MEMBER	TABLE	RESULT/ FX	CRITICAL COND/ MY	RATIO/ MZ	LOADING/ LOCATION
16 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.025	8
		0.00 C	0.09	-0.04	0.00
17 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.094	4
		0.00 C	0.00	0.50	7.00
18 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.162	5
		0.26 C	-0.18	0.66	7.00
19 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.086	4
		0.05 C	0.00	0.45	0.00
20 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.027	5
		0.77 C	-0.03	0.08	0.00
21 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.094	4
		0.00 C	-0.00	0.50	1.50
22 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.040	5
		1.09 C	-0.05	0.11	1.50
23 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.029	5
		0.11 T	0.12	0.03	0.00
24 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.033	5
		0.06 C	0.12	0.06	0.00
25 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS COMPRESS	0.000	4
		0.00 C	0.00	0.00	0.00
26 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS COMPRESS	0.000	4
		0.00 C	0.00	0.00	0.00
30 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS BEND Z	0.001	4
		0.00 C	0.00	0.00	0.00
31 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS BEND Z	0.001	4
		0.00 C	0.00	0.00	0.00

************** END OF TABULATED RESULT OF DESIGN **************

ALL UNITS ARE - KIP FEET (UNLESS OTHERWISE Noted)

MEMBER	TABLE	RESULT/ FX	CRITICAL COND/ MY	RATIO/ MZ	LOADING/ LOCATION

99. PERFORM ANALYSIS PRINT STATICS CHECK

```
*WARNING- ZERO STIFFNESS IN DIRECTION 6 AT JOINT     28 EQN.NO.      48
          LOADS APPLIED OR DISTRIBUTED HERE FROM ELEMENTS WILL BE IGNORED.
          THIS MAY BE DUE TO ALL MEMBERS AT THIS JOINT BEING RELEASED OR
          EFFECTIVELY RELEASED IN THIS DIRECTION.
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     12 EQN.NO.      56
*WARNING- ZERO STIFFNESS IN DIRECTION 4 AT JOINT      4 EQN.NO.      61
*WARNING- ZERO STIFFNESS IN DIRECTION 4 AT JOINT      9 EQN.NO.      79
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     13 EQN.NO.      83
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     26 EQN.NO.      98
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     15 EQN.NO.     107
*WARNING- ZERO STIFFNESS IN DIRECTION 6 AT JOINT     29 EQN.NO.     120
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     14 EQN.NO.     125
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     16 EQN.NO.     140
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     27 EQN.NO.     143
*WARNING- ZERO STIFFNESS IN DIRECTION 5 AT JOINT     17 EQN.NO.     149



          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     2
          LOADTYPE WIND  TITLE W1


           CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.100000003E+02
                        Y =  0.613718474E+00
                        Z = -0.200000006E+01

           CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.100000003E+02
                        Y =  0.620689705E+00
                        Z = -0.200000006E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     2 )
       SUMMATION FORCE-X =           0.11
       SUMMATION FORCE-Y =           0.00
       SUMMATION FORCE-Z =          -0.21

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=          -0.13  MY=           1.87  MZ=          -0.07


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     2 )
       SUMMATION FORCE-X =          -0.11
       SUMMATION FORCE-Y =          -0.00
       SUMMATION FORCE-Z =           0.21

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=           0.13  MY=          -1.87  MZ=           0.07
```

```
MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      2)
          MAXIMUMS    AT NODE
   X =  3.06516E-03      29
   Y =  2.37086E-01       2
   Z = -5.05808E-02       6
   RX= -1.86232E-02       8
   RY=  1.49978E-04      25
   RZ= -3.07549E-03       2


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     1
       LOADTYPE DEAD  TITLE DL


        CENTER OF FORCE BASED ON Y FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                    X =  0.100000003E+02
                    Y =  0.113860572E+00
                    Z = -0.203795358E+01

***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     1 )
    SUMMATION FORCE-X =           0.00
    SUMMATION FORCE-Y =          -0.51
    SUMMATION FORCE-Z =           0.00

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=          -1.04  MY=           0.00  MZ=          -5.08


***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     1 )
    SUMMATION FORCE-X =           0.00
    SUMMATION FORCE-Y =           0.51
    SUMMATION FORCE-Z =          -0.00

   SUMMATION OF MOMENTS AROUND THE ORIGIN-
   MX=           1.04  MY=           0.00  MZ=           5.08


MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      1)
          MAXIMUMS    AT NODE
   X = -1.68429E-04      10
   Y = -3.46242E-01       6
   Z = -4.86043E-03      11
   RX=  5.81508E-03      19
   RY=  7.43473E-06      29
   RZ=  4.14787E-03       2


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     3
       LOADTYPE WIND  TITLE W2
```

```
        CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                     X =  0.100000003E+02
                     Y =  0.574007281E+00
                     Z = -0.200000006E+01

        CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                     X =  0.100000003E+02
                     Y =  0.590443686E+00
                     Z = -0.200000006E+01

 ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     3 )
     SUMMATION FORCE-X =  5.5399999E-02
     SUMMATION FORCE-Y =  0.0000000E+00
     SUMMATION FORCE-Z = -5.8600001E-02

    SUMMATION OF MOMENTS AROUND THE ORIGIN-
    MX=          -0.03  MY=           0.48  MZ=          -0.03


 ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     3 )
     SUMMATION FORCE-X = -5.5399999E-02
     SUMMATION FORCE-Y = -2.0912092E-15
     SUMMATION FORCE-Z =  5.8600001E-02

    SUMMATION OF MOMENTS AROUND THE ORIGIN-
    MX=           0.00  MY=          -0.48  MZ=           0.03


 MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      3)
           MAXIMUMS    AT NODE
    X =  8.99227E-04      28
    Y = -6.46038E-03       6
    Z = -1.97221E-03      11
    RX=  3.26410E-04      25
    RY=  2.16085E-05       7
    RZ= -6.07796E-05       4


       STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     7
       LOADTYPE WIND  TITLE 0.75W3


        CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                     X =  0.100000003E+02
                     Y =  0.603174630E+00
                     Z = -0.200000006E+01
```

```
        CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
      (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                     X =  0.100000003E+02
                     Y =  0.609999991E+00
                     Z = -0.200000006E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     7 )
       SUMMATION FORCE-X =           0.13
       SUMMATION FORCE-Y =           0.00
       SUMMATION FORCE-Z =          -0.20

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=          -0.12  MY=           1.75  MZ=          -0.08


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     7 )
       SUMMATION FORCE-X =          -0.13
       SUMMATION FORCE-Y =          -0.00
       SUMMATION FORCE-Z =           0.20

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=           0.10  MY=          -1.75  MZ=           0.08


   MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      7)
             MAXIMUMS    AT NODE
      X =  2.86116E-03      29
      Y =  1.79579E-01       2
      Z = -3.93397E-02       6
      RX= -1.39845E-02       8
      RY=  1.25526E-04      25
      RZ= -2.32052E-03       2



   ************ END OF DATA FROM INTERNAL STORAGE ************


   100. FINISH
```

```
*********** END OF THE STAAD.Pro RUN ***********

  **** DATE= JUL 19,2018   TIME= 13: 7:39 ****

************************************************************
*   For technical assistance on STAAD.Pro, please visit    *
*   http://selectservices.bentley.com/en-US/               *
*                                                          *
*   Details about additional assistance from               *
*   Bentley and Partners can be found at program menu      *
*   Help->Technical Support                                *
*                                                          *
*      Copyright (c) 1997-2016 Bentley Systems, Inc.       *
*                http://www.bentley.com                    *
************************************************************
```

Job Information

	Engineer	Checked	Approved
Name:	IERM		
Date:	05-Jun-18		

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	28	Highest Node	29
Number of Elements	28	Highest Beam	31
Number of Plates	3	Highest Plate	34

Number of Basic Load Cases	4
Number of Combination Load Cases	4

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

Type	L/C	Name
Primary	2	W1
Primary	1	DL
Primary	3	W2
Primary	7	0.75W3
Combination	4	1.25DL
Combination	5	1.1DL+1.0W1
Combination	6	1.1DL+1.0W2
Combination	8	1.1DL+1.0W3

Beams

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	2	18	1.000	2	0
2	3	20	1.500	2	0
3	4	22	0.500	2	0
4	5	24	7.000	2	0
5	3	7	2.000	2	0
6	5	10	2.000	2	0
7	8	19	1.000	2	0
8	7	21	1.500	2	0
9	9	23	0.500	2	0
10	10	25	7.000	2	0
11	7	12	1.000	2	0

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
15	15	16	0.750	2	0
16	16	27	0.750	2	0
17	18	3	7.000	2	0
18	19	7	7.000	2	0
19	20	4	0.500	2	0
20	21	9	0.500	2	0
21	22	5	1.500	2	0
22	23	10	1.500	2	0
23	24	6	1.000	2	0
24	25	11	1.000	2	0
25	26	14	0.500	2	0
26	27	17	0.500	2	0
30	3	28	1.000	2	0
31	5	29	1.000	2	0

Plates

Plate	Node A	Node B	Node C	Node D	Property
32	2	8	19	18	1
33	20	21	23	22	1
34	24	25	11	6	1

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	A500-GR.B	29E+3	0.300	0.000	6E -6
2	STEEL	29E+3	0.300	0.000	6E -6
3	STAINLESSSTEEL	28E+3	0.300	0.000	10E -6
4	ALUMINUM	10E+3	0.330	0.000	13E -6
5	CONCRETE	3.15E+3	0.170	0.000	5E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip ft/deg)	rY (kip ft/deg)	rZ (kip ft/deg)
12	Fixed	Fixed	Fixed	-	-	-
13	Fixed	Fixed	Fixed	-	-	-
15	Fixed	Fixed	Fixed	-	-	-
16	Fixed	Fixed	Fixed	-	-	-
26	Fixed	Fixed	Fixed	-	-	-
27	Fixed	Fixed	Fixed	-	-	-

Primary Load Cases

Number	Name	Type
2	W1	Wind
1	DL	Dead
3	W2	Wind
7	0.75W3	Wind

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
4	1.25DL	1	DL	1.25
5	1.1DL+1.0W1	1	DL	1.10
		2	W1	1.00
6	1.1DL+1.0W2	1	DL	1.10
		3	W2	1.00
8	1.1DL+1.0W3	1	DL	1.10
		7	0.75W3	1.00

Node Displacement Summary

	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Max X	29	5:1.1DL+1.0W′	**0.003**	-0.039	-0.006	0.039	0.001	0.000	-0.000
Min X	11	5:1.1DL+1.0W′	**-0.000**	-0.362	-0.056	0.366	-0.011	0.000	-0.005
Max Y	2	2:W1	0.001	**0.237**	-0.043	0.241	-0.019	-0.000	-0.003
Min Y	2	4:1.25DL	0.000	**-0.433**	-0.006	0.433	0.007	-0.000	0.005
Max Z	2	3:W2	0.001	0.004	**0.002**	0.005	-0.000	0.000	-0.000
Min Z	6	5:1.1DL+1.0W′	0.002	-0.199	**-0.056**	0.207	-0.011	0.000	-0.002
Max rX	19	4:1.25DL	0.000	-0.208	-0.006	0.208	**0.007**	-0.000	0.004
Min rX	8	2:W1	0.001	-0.117	-0.043	0.125	**-0.019**	-0.000	0.002
Max rY	25	5:1.1DL+1.0W′	-0.000	-0.299	-0.055	0.304	-0.004	**0.000**	-0.005
Min rY	3	5:1.1DL+1.0W′	0.001	-0.020	-0.004	0.020	0.001	**-0.000**	0.001
Max rZ	2	4:1.25DL	0.000	-0.433	-0.006	0.433	0.007	-0.000	**0.005**
Min rZ	11	5:1.1DL+1.0W′	-0.000	-0.362	-0.056	0.366	-0.011	0.000	**-0.005**
Max Rst	2	4:1.25DL	0.000	-0.433	-0.006	**0.433**	0.007	-0.000	0.005

Beam Displacement Detail Summary

Displacements shown in italic indicate the presence of an offset

	Beam	L/C	d (ft)	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	31	5:1.1DL+1.0W´	1.000	**0.003**	-0.039	-0.006	0.039
Min X	24	5:1.1DL+1.0W´	0.900	**-0.001**	-0.356	-0.056	0.360
Max Y	1	2:W1	0.000	0.001	**0.237**	-0.043	0.241
Min Y	1	4:1.25DL	0.000	0.000	**-0.433**	-0.006	0.433
Max Z	1	3:W2	0.000	0.001	0.004	**0.002**	0.005
Min Z	23	5:1.1DL+1.0W´	1.000	0.002	-0.199	**-0.056**	0.207
Max Rst	1	4:1.25DL	0.000	0.000	-0.433	-0.006	**0.433**

Beam End Displacement Summary

Displacements shown in italic indicate the presence of an offset

	Beam	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	31	29	5:1.1DL+1.0W´	**0.003**	-0.039	-0.006	0.039
Min X	24	11	5:1.1DL+1.0W´	**-0.001**	-0.362	-0.056	0.366
Max Y	1	2	2:W1	0.001	**0.237**	-0.043	0.241
Min Y	1	2	4:1.25DL	0.000	**-0.433**	-0.006	0.433
Max Z	1	2	3:W2	0.001	0.004	**0.002**	0.005
Min Z	23	6	5:1.1DL+1.0W´	0.002	-0.199	**-0.056**	0.207
Max Rst	1	2	4:1.25DL	0.000	-0.433	-0.006	**0.433**

Beam End Force Summary

The signs of the forces at end B of each beam have been reversed. For example: this means that the Min Fx entry gives the largest tension value for an beam.

				Axial	Shear		Torsion	Bending	
	Beam	Node	L/C	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)
Max Fx	22	23	5:1.1DL+1.0W´	**1.094**	-0.019	-0.022	0.000	-0.195	0.891
Min Fx	21	22	2:W1	**-0.400**	-0.008	-0.010	0.000	-0.338	-2.777
Max Fy	11	7	5:1.1DL+1.0W´	-0.255	**0.640**	-0.077	-0.000	-2.248	6.385
Min Fy	14	10	5:1.1DL+1.0W´	-0.262	**-0.751**	-0.132	0.000	-2.652	-7.038
Max Fz	15	15	8:1.1DL+1.0W3	0.003	0.268	**0.619**	0.000	-4.455	1.930
Min Fz	24	25	2:W1	0.059	0.026	**-0.183**	0.000	1.432	0.346
Max Mx	24	25	5:1.1DL+1.0W´	0.059	0.057	-0.182	**0.000**	1.432	0.670
Min Mx	7	8	5:1.1DL+1.0W´	0.110	-0.049	0.183	**-0.000**	-0.778	-0.374
Max My	18	19	5:1.1DL+1.0W´	0.263	-0.067	-0.052	-0.000	**2.207**	0.226
Min My	14	15	8:1.1DL+1.0W3	-0.271	-0.696	-0.132	0.000	**-4.455**	1.930
Max Mz	10	10	5:1.1DL+1.0W´	0.207	0.117	0.052	0.000	-2.208	**8.360**
Min Mz	14	10	5:1.1DL+1.0W´	-0.262	-0.751	-0.132	0.000	-2.652	**-7.038**

Beam Force Detail Summary

Sign convention as diagrams:- positive above line, negative below line except Fx where positive is compression. Distance d is given from beam end A.

				Axial	Shear		Torsion	Bending	
	Beam	L/C	d (ft)	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)
Max Fx	22	5:1.1DL+1.0W'	0.000	**1.094**	-0.019	-0.022	0.000	-0.195	0.891
Min Fx	21	2:W1	0.000	**-0.400**	-0.008	-0.010	0.000	-0.338	-2.777
Max Fy	11	5:1.1DL+1.0W'	0.000	-0.255	**0.640**	-0.077	-0.000	-2.248	6.385
Min Fy	14	5:1.1DL+1.0W'	0.000	-0.262	**-0.751**	-0.132	0.000	-2.652	-7.038
Max Fz	15	8:1.1DL+1.0W3	0.000	0.003	0.268	**0.619**	0.000	-4.455	1.930
Min Fz	24	2:W1	0.000	0.059	0.026	**-0.183**	0.000	1.432	0.346
Max Mx	24	5:1.1DL+1.0W'	0.000	0.059	0.057	-0.182	**0.000**	1.432	0.670
Min Mx	7	5:1.1DL+1.0W'	0.000	0.110	-0.049	0.183	**-0.000**	-0.778	-0.374
Max My	18	5:1.1DL+1.0W'	0.000	0.263	-0.067	-0.052	-0.000	**2.207**	0.226
Min My	14	8:1.1DL+1.0W3	1.000	-0.271	-0.696	-0.132	0.000	**-4.455**	1.930
Max Mz	10	5:1.1DL+1.0W'	0.000	0.207	0.117	0.052	0.000	-2.208	**8.360**
Min Mz	14	5:1.1DL+1.0W'	0.000	-0.262	-0.751	-0.132	0.000	-2.652	**-7.038**

Beam Combined Axial and Bending Stresses Summary

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
1	2:W1	1.000	1.05E+3	1.000	2	-1.12E+3	1.000	4
	1:DL	1.000	160.776	1.000	3	-161.086	1.000	1
	3:W2	1.000	1.626	1.000	4	-1.565	1.000	2
	7:0.75W3	1.000	787.594	1.000	2	-834.897	1.000	4
	4:1.25DL	1.000	200.970	1.000	3	-201.358	1.000	1
	5:1.1DL+1.0W'	1.000	876.085	1.000	2	-940.197	1.000	1
	6:1.1DL+1.0W2	1.000	178.480	1.000	3	-178.759	1.000	1
	8:1.1DL+1.0W3	1.000	648.239	1.000	2	-695.884	1.000	1
2	2:W1	1.500	1.93E+3	1.500	1	-2.31E+3	1.500	3
	1:DL	1.500	2.94E+3	0.000	3	-2.94E+3	0.000	1
	3:W2	1.500	91.692	1.500	3	-86.137	1.500	1
	7:0.75W3	1.500	1.39E+3	0.000	1	-1.67E+3	0.000	3
	4:1.25DL	1.500	3.67E+3	0.000	3	-3.67E+3	0.000	1
	5:1.1DL+1.0W'	1.500	1.38E+3	1.500	4	-1.77E+3	1.500	2
	6:1.1DL+1.0W2	1.500	3.27E+3	0.000	3	-3.26E+3	0.000	1
	8:1.1DL+1.0W3	1.500	1.88E+3	0.000	3	-2.16E+3	0.000	1
3	2:W1	0.500	1.65E+3	0.000	1	-1.89E+3	0.000	3
	1:DL	0.500	2.68E+3	0.500	3	-2.64E+3	0.500	1
	3:W2	0.500	128.243	0.000	1	-108.643	0.000	4
	7:0.75W3	0.500	1.25E+3	0.500	2	-1.42E+3	0.500	4
	4:1.25DL	0.500	3.35E+3	0.500	3	-3.3E+3	0.500	1
	5:1.1DL+1.0W'	0.500	1.17E+3	0.500	3	-1.36E+3	0.500	1
	6:1.1DL+1.0W2	0.500	2.96E+3	0.500	3	-2.9E+3	0.500	1
	8:1.1DL+1.0W3	0.500	1.64E+3	0.500	3	-1.76E+3	0.500	1

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
4	2:W1	7.000	2.8E+3	0.000	1	-3.08E+3	0.000	3
	1:DL	7.000	2.94E+3	0.000	3	-2.94E+3	0.000	1
	3:W2	7.000	6.062	7.000	1	-5.352	7.000	3
	7:0.75W3	7.000	2.08E+3	0.000	1	-2.29E+3	0.000	3
	4:1.25DL	7.000	3.67E+3	0.000	3	-3.67E+3	0.000	1
	5:1.1DL+1.0W1	7.000	2.82E+3	0.000	3	-3.1E+3	0.000	1
	6:1.1DL+1.0W2	7.000	3.23E+3	0.000	3	-3.23E+3	0.000	1
	8:1.1DL+1.0W3	7.000	2.94E+3	0.000	3	-3.14E+3	0.000	1
5	2:W1	2.000	1.76E+3	2.000	2	-1.72E+3	2.000	4
	1:DL	2.000	1.81E+3	2.000	3	-1.81E+3	2.000	1
	3:W2	2.000	98.618	2.000	1	-90.611	2.000	3
	7:0.75W3	2.000	1.33E+3	2.000	2	-1.3E+3	2.000	4
	4:1.25DL	2.000	2.26E+3	2.000	3	-2.26E+3	2.000	1
	5:1.1DL+1.0W1	2.000	2.51E+3	2.000	3	-2.48E+3	2.000	1
	6:1.1DL+1.0W2	2.000	1.97E+3	2.000	3	-1.97E+3	2.000	1
	8:1.1DL+1.0W3	2.000	2.3E+3	2.000	3	-2.27E+3	2.000	1
6	2:W1	2.000	1.39E+3	2.000	1	-1.32E+3	2.000	3
	1:DL	2.000	1.81E+3	2.000	3	-1.81E+3	2.000	1
	3:W2	2.000	176.057	2.000	3	-153.567	2.000	1
	7:0.75W3	2.000	915.081	2.000	1	-848.599	2.000	3
	4:1.25DL	2.000	2.26E+3	2.000	3	-2.26E+3	2.000	1
	5:1.1DL+1.0W1	2.000	2.63E+3	2.000	4	-2.57E+3	2.000	2
	6:1.1DL+1.0W2	2.000	2.16E+3	2.000	3	-2.14E+3	2.000	1
	8:1.1DL+1.0W3	2.000	2.43E+3	2.000	4	-2.37E+3	2.000	2
7	2:W1	1.000	964.752	1.000	2	-847.752	1.000	1
	1:DL	1.000	179.603	1.000	3	-179.974	1.000	1
	3:W2	1.000	1.471	1.000	1	-1.592	1.000	3
	7:0.75W3	1.000	723.166	1.000	2	-635.542	1.000	1
	4:1.25DL	1.000	224.503	1.000	3	-224.967	1.000	1
	5:1.1DL+1.0W1	1.000	1.09E+3	1.000	3	-969.013	1.000	1
	6:1.1DL+1.0W2	1.000	198.106	1.000	3	-198.634	1.000	1
	8:1.1DL+1.0W3	1.000	857.234	1.000	3	-770.017	1.000	1
8	2:W1	1.500	903.879	1.500	4	-261.278	1.500	2
	1:DL	1.500	806.385	0.000	3	-372.389	0.000	1
	3:W2	1.500	89.999	1.500	3	-124.437	1.500	1
	7:0.75W3	1.500	692.976	0.000	1	-240.845	0.000	2
	4:1.25DL	1.500	1.01E+3	0.000	3	-465.487	0.000	1
	5:1.1DL+1.0W1	1.500	1.73E+3	0.000	3	-610.163	0.000	1
	6:1.1DL+1.0W2	1.500	974.857	0.000	3	-531.899	0.000	1
	8:1.1DL+1.0W3	1.500	1.58E+3	0.000	3	-650.473	0.000	1
9	2:W1	0.500	576.110	0.000	1	-124.477	0.000	2
	1:DL	0.500	467.898	0.500	4	-141.740	0.500	2
	3:W2	0.500	123.778	0.000	1	-115.078	0.000	4
	7:0.75W3	0.500	341.567	0.000	1			

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
	4:1.25DL	0.500	584.873	0.500	4	-177.175	0.500	2
	5:1.1DL+1.0W1	0.500	1.03E+3	0.000	1	-220.798	0.000	2
	6:1.1DL+1.0W2	0.500	430.391	0.500	3	-62.917	0.500	1
	8:1.1DL+1.0W3	0.500	796.663	0.000	1	-95.127	0.000	2
10	2:W1	7.000	3.3E+3	0.000	3	-3.08E+3	0.000	1
	1:DL	7.000	2.96E+3	0.000	3	-2.96E+3	0.000	1
	3:W2	7.000	5.576	0.000	1	-6.286	0.000	2
	7:0.75W3	7.000	2.46E+3	0.000	3	-2.3E+3	0.000	1
	4:1.25DL	7.000	3.7E+3	0.000	3	-3.7E+3	0.000	1
	5:1.1DL+1.0W1	7.000	6.55E+3	0.000	3	-6.33E+3	0.000	1
	6:1.1DL+1.0W2	7.000	3.26E+3	0.000	3	-3.26E+3	0.000	1
	8:1.1DL+1.0W3	7.000	5.71E+3	0.000	3	-5.55E+3	0.000	1
11	2:W1	1.000	1.87E+3	0.000	3	-1.86E+3	0.000	1
	1:DL	1.000	4.05E+3	0.000	3	-4.3E+3	0.000	1
	3:W2	1.000	190.471	1.000	4	-186.915	1.000	2
	7:0.75W3	1.000	1.38E+3	0.000	3	-1.37E+3	0.000	1
	4:1.25DL	1.000	5.06E+3	0.000	3	-5.37E+3	0.000	1
	5:1.1DL+1.0W1	1.000	5.13E+3	0.000	3	-5.4E+3	0.000	1
	6:1.1DL+1.0W2	1.000	4.33E+3	0.000	3	-4.6E+3	0.000	1
	8:1.1DL+1.0W3	1.000	4.86E+3	0.000	3	-5.12E+3	0.000	1
12	2:W1	0.750	134.805	0.000	1	-134.805	0.000	3
	1:DL	0.750	2.42E+3	0.000	1	-2.42E+3	0.000	2
	3:W2	0.750	188.693	0.000	3	-188.693	0.000	1
	7:0.75W3	0.750	44.078	0.000	3	-44.078	0.000	1
	4:1.25DL	0.750	3.02E+3	0.000	1	-3.02E+3	0.000	2
	5:1.1DL+1.0W1	0.750	2.72E+3	0.000	1	-2.72E+3	0.000	2
	6:1.1DL+1.0W2	0.750	2.58E+3	0.000	1	-2.58E+3	0.000	2
	8:1.1DL+1.0W3	0.750	2.64E+3	0.000	1	-2.64E+3	0.000	2
13	2:W1	0.750	33.701	0.000	3	-33.701	0.000	1
	1:DL	0.750	605.599	0.000	2	-603.047	0.000	1
	3:W2	0.750	47.173	0.000	1	-47.173	0.000	3
	7:0.75W3	0.750	11.020	0.000	1	-11.020	0.000	3
	4:1.25DL	0.750	756.999	0.000	2	-753.809	0.000	1
	5:1.1DL+1.0W1	0.750	681.865	0.000	2	-679.058	0.000	1
	6:1.1DL+1.0W2	0.750	646.730	0.000	2	-643.922	0.000	1
	8:1.1DL+1.0W3	0.750	661.363	0.000	2	-658.556	0.000	1
14	2:W1	1.000	2.02E+3	0.000	1	-2.02E+3	0.000	3
	1:DL	1.000	4.05E+3	0.000	1	-4.3E+3	0.000	3
	3:W2	1.000	509.331	1.000	4	-512.887	1.000	2
	7:0.75W3	1.000	1.5E+3	0.000	1	-1.51E+3	0.000	3
	4:1.25DL	1.000	5.06E+3	0.000	1	-5.37E+3	0.000	3
	5:1.1DL+1.0W1	1.000	5.77E+3	0.000	1	-6.05E+3	0.000	3
	6:1.1DL+1.0W2	1.000	4.58E+3	0.000	1	-4.86E+3	0.000	3
	8:1.1DL+1.0W3	1.000	5.53E+3	0.000	1	-5.81E+3	0.000	3

Beam Combined Axial and Bending Stresses Summary Cont...

Beam	L/C	Length (ft)	Max Comp Stress (psi)	Max Comp d (ft)	Max Comp Corner	Max Tens Stress (psi)	Max Tens d (ft)	Max Tens Corner
15	2:W1	0.750	1.13E+3	0.000	1	-1.13E+3	0.000	2
	1:DL	0.750	2.42E+3	0.000	1	-2.42E+3	0.000	2
	3:W2	0.750	511.109	0.000	1	-511.109	0.000	2
	7:0.75W3	0.750	1.23E+3	0.000	1	-1.23E+3	0.000	2
	4:1.25DL	0.750	3.02E+3	0.000	1	-3.02E+3	0.000	2
	5:1.1DL+1.0W1	0.750	3.79E+3	0.000	1	-3.78E+3	0.000	2
	6:1.1DL+1.0W2	0.750	3.17E+3	0.000	1	-3.17E+3	0.000	2
	8:1.1DL+1.0W3	0.750	3.9E+3	0.000	1	-3.89E+3	0.000	2
16	2:W1	0.750	281.823	0.000	2	-281.823	0.000	1
	1:DL	0.750	605.599	0.000	2	-603.047	0.000	1
	3:W2	0.750	127.777	0.000	2	-127.777	0.000	1
	7:0.75W3	0.750	308.700	0.000	2	-308.700	0.000	1
	4:1.25DL	0.750	756.999	0.000	2	-753.809	0.000	1
	5:1.1DL+1.0W1	0.750	947.983	0.000	2	-945.175	0.000	1
	6:1.1DL+1.0W2	0.750	793.937	0.000	2	-791.129	0.000	1
	8:1.1DL+1.0W3	0.750	974.859	0.000	2	-972.052	0.000	1
17	2:W1	7.000	3.07E+3	7.000	1	-3.29E+3	7.000	3
	1:DL	7.000	2.94E+3	7.000	3	-2.94E+3	7.000	1
	3:W2	7.000	2.401	0.000	1	-2.156	0.000	2
	7:0.75W3	7.000	2.28E+3	7.000	1	-2.45E+3	7.000	3
	4:1.25DL	7.000	3.67E+3	7.000	3	-3.67E+3	7.000	1
	5:1.1DL+1.0W1	7.000	2.59E+3	7.000	4	-2.81E+3	7.000	2
	6:1.1DL+1.0W2	7.000	3.23E+3	7.000	3	-3.23E+3	7.000	1
	8:1.1DL+1.0W3	7.000	2.76E+3	7.000	4	-2.93E+3	7.000	2
18	2:W1	7.000	3.07E+3	7.000	4	-2.8E+3	7.000	2
	1:DL	7.000	2.96E+3	7.000	3	-2.96E+3	7.000	1
	3:W2	7.000	2.257	7.000	1	-2.501	7.000	3
	7:0.75W3	7.000	2.28E+3	7.000	4	-2.08E+3	7.000	2
	4:1.25DL	7.000	3.7E+3	7.000	3	-3.7E+3	7.000	1
	5:1.1DL+1.0W1	7.000	6.33E+3	7.000	4	-6.05E+3	7.000	2
	6:1.1DL+1.0W2	7.000	3.25E+3	7.000	3	-3.25E+3	7.000	1
	8:1.1DL+1.0W3	7.000	5.54E+3	7.000	4	-5.33E+3	7.000	2
19	2:W1	0.500	1.76E+3	0.000	1	-2E+3	0.000	3
	1:DL	0.500	2.68E+3	0.000	3	-2.64E+3	0.000	1
	3:W2	0.500	113.584	0.500	3	-123.297	0.500	1
	7:0.75W3	0.500	1.3E+3	0.000	1	-1.48E+3	0.000	3
	4:1.25DL	0.500	3.35E+3	0.000	3	-3.3E+3	0.000	1
	5:1.1DL+1.0W1	0.500	1.16E+3	0.000	3	-1.35E+3	0.000	1
	6:1.1DL+1.0W2	0.500	3.01E+3	0.500	3	-2.97E+3	0.500	1
	8:1.1DL+1.0W3	0.500	1.66E+3	0.000	3	-1.8E+3	0.000	1
20	2:W1	0.500	673.976	0.000	1	-222.343	0.000	2
	1:DL	0.500	467.898	0.000	3	-141.740	0.000	1
	3:W2	0.500	107.802	0.500	3	-128.414	0.500	1
	7:0.75W3	0.500	564.360	0.000	1	-243.820	0.000	2

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
	4:1.25DL	0.500	584.873	0.000	3	-177.175	0.000	1
	5:1.1DL+1.0W'	0.500	1.19E+3	0.000	1	-378.256	0.000	2
	6:1.1DL+1.0W2	0.500	596.751	0.000	3	-258.589	0.000	1
	8:1.1DL+1.0W3	0.500	1.08E+3	0.000	3	-399.734	0.000	1
21	2:W1	1.500	1.71E+3	1.500	1	-2.13E+3	1.500	3
	1:DL	1.500	2.94E+3	1.500	3	-2.94E+3	1.500	1
	3:W2	1.500	175.035	0.000	2	-158.921	0.000	1
	7:0.75W3	1.500	1.35E+3	1.500	1	-1.66E+3	1.500	3
	4:1.25DL	1.500	3.67E+3	1.500	3	-3.67E+3	1.500	1
	5:1.1DL+1.0W'	1.500	1.74E+3	1.500	4	-2.16E+3	1.500	2
	6:1.1DL+1.0W2	1.500	3.35E+3	1.500	4	-3.33E+3	1.500	2
	8:1.1DL+1.0W3	1.500	2.22E+3	1.500	4	-2.52E+3	1.500	2
22	2:W1	1.500	861.628	1.500	4	-181.519	1.500	2
	1:DL	1.500	806.385	1.500	4	-372.389	1.500	2
	3:W2	1.500	195.310	0.000	2	-181.682	0.000	1
	7:0.75W3	1.500	680.939	1.500	4	-163.933	1.500	2
	4:1.25DL	1.500	1.01E+3	1.500	4	-465.487	1.500	2
	5:1.1DL+1.0W'	1.500	1.75E+3	1.500	4	-591.148	1.500	2
	6:1.1DL+1.0W2	1.500	939.182	1.500	4	-448.158	1.500	2
	8:1.1DL+1.0W3	1.500	1.57E+3	1.500	4	-573.561	1.500	2
23	2:W1	1.000	840.439	0.000	2	-957.853	0.000	1
	1:DL	1.000	160.776	0.000	3	-161.086	0.000	1
	3:W2	1.000	3.832	0.000	1	-3.640	0.000	2
	7:0.75W3	1.000	627.663	0.000	2	-715.535	0.000	1
	4:1.25DL	1.000	200.970	0.000	3	-201.358	0.000	1
	5:1.1DL+1.0W'	1.000	1.02E+3	0.000	2	-1.13E+3	0.000	1
	6:1.1DL+1.0W2	1.000	179.747	0.000	3	-179.895	0.000	1
	8:1.1DL+1.0W3	1.000	802.905	0.000	2	-891.118	0.000	1
24	2:W1	1.000	1.12E+3	0.000	2	-1.05E+3	0.000	1
	1:DL	1.000	179.603	0.000	3	-179.974	0.000	1
	3:W2	1.000	3.411	0.000	1	-3.748	0.000	2
	7:0.75W3	1.000	832.632	0.000	2	-786.365	0.000	1
	4:1.25DL	1.000	224.503	0.000	3	-224.967	0.000	1
	5:1.1DL+1.0W'	1.000	1.31E+3	0.000	2	-1.25E+3	0.000	1
	6:1.1DL+1.0W2	1.000	200.974	0.000	3	-201.719	0.000	1
	8:1.1DL+1.0W3	1.000	1.03E+3	0.000	2	-984.330	0.000	1
25	2:W1	0.500	0.000	0.000	3	-0.000	0.000	1
	1:DL	0.500	1.701	0.000	1	-0.000	0.500	3
	3:W2	0.500	0.000	0.000	3	-0.000	0.000	1
	7:0.75W3	0.500	0.000	0.000	3	-0.000	0.000	1
	4:1.25DL	0.500	2.127	0.000	1	-0.000	0.500	3
	5:1.1DL+1.0W'	0.500	1.872	0.000	1	-0.000	0.500	3
	6:1.1DL+1.0W2	0.500	1.872	0.000	1	-0.000	0.500	3
	8:1.1DL+1.0W3	0.500	1.872	0.000	1	-0.000	0.500	3

Beam Combined Axial and Bending Stresses Summary Cont...

			Max Comp			Max Tens		
Beam	L/C	Length (ft)	Stress (psi)	d (ft)	Corner	Stress (psi)	d (ft)	Corner
26	2:W1	0.500	0.000	0.458	3	-0.000	0.458	1
	1:DL	0.500	1.701	0.000	1	-0.000	0.500	2
	3:W2	0.500	0.000	0.500	2	-0.000	0.500	4
	7:0.75W3	0.500	0.000	0.500	3	-0.000	0.500	1
	4:1.25DL	0.500	2.127	0.000	1	-0.000	0.500	2
	5:1.1DL+1.0W1	0.500	1.872	0.000	1	-0.000	0.500	2
	6:1.1DL+1.0W2	0.500	1.872	0.000	1	-0.000	0.500	2
	8:1.1DL+1.0W3	0.500	1.872	0.000	1	-0.000	0.500	2
30	2:W1	1.000	0.000	0.000	1	-0.000	0.000	3
	1:DL	1.000	23.529	0.000	3	-23.529	0.000	1
	3:W2	1.000	0.000	0.000	1	-0.000	0.000	2
	7:0.75W3	1.000	0.000	0.917	4	-0.000	0.917	2
	4:1.25DL	1.000	29.411	0.000	3	-29.411	0.000	1
	5:1.1DL+1.0W1	1.000	25.882	0.000	3	-25.882	0.000	1
	6:1.1DL+1.0W2	1.000	25.882	0.000	3	-25.882	0.000	1
	8:1.1DL+1.0W3	1.000	25.882	0.000	3	-25.882	0.000	1
31	2:W1	1.000	0.000	1.000	1	-0.000	1.000	2
	1:DL	1.000	23.529	0.000	3	-23.529	0.000	1
	3:W2	1.000	0.000	0.917	1	-0.000	0.917	3
	7:0.75W3	1.000	0.000	1.000	1	-0.000	1.000	2
	4:1.25DL	1.000	29.411	0.000	3	-29.411	0.000	1
	5:1.1DL+1.0W1	1.000	25.882	0.000	3	-25.882	0.000	1
	6:1.1DL+1.0W2	1.000	25.882	0.000	3	-25.882	0.000	1
	8:1.1DL+1.0W3	1.000	25.882	0.000	3	-25.882	0.000	1

Plate Center Stress Summary

			Shear		Membrane			Bending		
	Plate	L/C	Qx (psi)	Qy (psi)	Sx (psi)	Sy (psi)	Sxy (psi)	Mx (lb-in/in)	My (lb-in/in)	Mxy (lb-in/in)
Max Qx	32	3:W2	**0.000**	0.000	-0.003	-0.009	0.077	0.000	0.000	0.030
Min Qx	32	2:W1	**-10.800**	0.000	-0.044	-0.850	-78.517	0.000	0.107	11.817
Max Qy	34	4:1.25DL	-0.000	**0.006**	-0.042	-0.134	-0.032	-0.000	-0.088	0.799
Min Qy	32	4:1.25DL	-0.000	**-0.006**	-0.042	-0.134	0.032	-0.000	-0.088	-0.799
Max Sx	32	3:W2	0.000	0.000	**-0.003**	-0.009	0.077	0.000	0.000	0.030
Min Sx	33	5:1.1DL+1.0W1	-0.000	-0.000	**-5.564**	-18.260	-11.815	-0.000	-0.727	0.044
Max Sy	34	2:W1	-10.800	-0.000	-0.026	**0.610**	78.225	0.000	-0.107	-11.680
Min Sy	33	5:1.1DL+1.0W1	-0.000	-0.000	-5.564	**-18.260**	-11.815	-0.000	-0.727	0.044
Max Sxy	34	2:W1	-10.800	-0.000	-0.026	0.610	**78.225**	0.000	-0.107	-11.680
Min Sxy	32	2:W1	-10.800	0.000	-0.044	-0.850	**-78.517**	0.000	0.107	11.817
Max Mx	33	2:W1	-0.000	-0.000	-2.284	-6.867	-11.815	**0.000**	0.633	0.044
Min Mx	33	4:1.25DL	-0.000	0.000	-3.728	-12.947	0.000	**-0.000**	-1.545	-0.000
Max My	33	2:W1	-0.000	-0.000	-2.284	-6.867	-11.815	0.000	**0.633**	0.044

Plate Center Stress Summary Cont...

			Shear		Membrane			Bending		
	Plate	L/C	Qx (psi)	Qy (psi)	Sx (psi)	Sy (psi)	Sxy (psi)	Mx (lb-in/in)	My (lb-in/in)	Mxy (lb-in/in)
Min My	33	4:1.25DL	-0.000	0.000	-3.728	-12.947	0.000	-0.000	**-1.545**	-0.000
Max Mxy	32	2:W1	-10.800	0.000	-0.044	-0.850	-78.517	0.000	0.107	**11.817**
Min Mxy	34	2:W1	-10.800	-0.000	-0.026	0.610	78.225	0.000	-0.107	**-11.680**

Reaction Summary

			Horizontal	Vertical	Horizontal	Moment		
	Node	L/C	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
Max FX	12	5:1.1DL+1.0W'	**0.820**	0.265	0.517	0.000	0.000	0.000
Min FX	15	5:1.1DL+1.0W'	**-1.025**	0.272	0.721	0.000	0.000	0.000
Max FY	12	4:1.25DL	0.694	**0.305**	0.509	0.000	0.000	0.000
Min FY	12	7:0.75W3	0.110	**-0.005**	0.071	0.000	0.000	0.000
Max FZ	15	8:1.1DL+1.0W3	-0.964	0.273	**0.750**	0.000	0.000	0.000
Min FZ	16	8:1.1DL+1.0W3	0.322	0.005	**-0.743**	0.000	0.000	0.000
Max MX	12	2:W1	0.209	-0.003	0.069	**0.000**	0.000	0.000
Min MX	12	2:W1	0.209	-0.003	0.069	**0.000**	0.000	0.000
Max MY	12	2:W1	0.209	-0.003	0.069	0.000	**0.000**	0.000
Min MY	12	2:W1	0.209	-0.003	0.069	0.000	**0.000**	0.000
Max MZ	12	2:W1	0.209	-0.003	0.069	0.000	0.000	**0.000**
Min MZ	12	2:W1	0.209	-0.003	0.069	0.000	0.000	**0.000**

Steel Design (Track 2) Beam 1 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES     |
|*************                                        |        IN INCH UNIT   |
|             *   |=============================|               ------------ |
|MEMBER    1  *   |  AISC SECTIONS              |               AX=0.1890E+1 |
|             *   | ST  HSST3X3X0.188           |        --Z   AY=0.1044E+1 |
|DESIGN CODE  *   |                             |               AZ=0.1044E+1 |
| LRFD 2001   *   ===============================               PY=0.1970E+1 |
|             *                                                 PZ=0.1970E+1 |
|             *   |<---LENGTH (FT)=    1.00 --->|               RY=0.1141E+1 |
|*************                                                  RZ=0.1141E+1 |
|                                                                            |
|                   0.0 (KIP-FEET)                                           |
|PARAMETER        |                                   L2      CAPACITIES     |
|IN KIP  INCH     |                               L2          IN KIP  INCH   |
|---------------  +                       L2  L2              -------------  |
| KL/R-Y=  10.52  |                   L2                      PNC=0.5750E+2 |
| KL/R-Z=  10.52  +                                           pnc=0.0000E+0 |
| UNL    = 12.00  |           L2  L2                          PNT=0.6124E+2 |
| CB     =  1.00  +                                           pnt=0.6026E-1 |
| PHIC   =  0.00  |       L2                                  MNZ=0.6383E+2 |
| PHIB   =  0.90  +   L2  L2                                  mnz=0.3425E+0 |
| FYLD   = 36.00  |L2                                         MNY=0.6383E+2 |
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.1437E+1 |
| DFF =     0.00   0.0                                        VN =0.2030E+2 |
| dff =     0.00              ABSOLUTE MZ ENVELOPE            vn =0.2578E-1 |
|                                (WITH LOAD NO.)                            |
|                                                                           |
|                       MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)              |
|                       -------------------------                           |
|                                                                           |
|               AXIAL      SHEAR-Y     SHEAR-Z    MOMENT-Y    MOMENT-Z      |
|                                                                           |
|     VALUE      -0.1         0.0         0.2         0.1         0.0       |
|   LOCATION      0.0         1.0         0.0         1.0         1.0       |
|    LOADING        5           4           2           2           2       |
|                                                                           |
|***************************************************************************|
|*                                                                         *|
|*                          DESIGN SUMMARY  (KIP-FEET)                     *|
|*                          --------------                                 *|
|*                                                                         *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/            *|
|         FX             MY             MZ          LOCATION              |
|        ===================================================                |
|          PASS        HSS FLEX+AXL      0.028            2                  |
|          0.06 T         0.12        -0.03            1.00                 |
|*                                                                         *|
|***************************************************************************|
|                                                                           |
|---------------------------------------------------------------------------|
     1  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 2 Check 1

```
|--------------------------------------------------------------------------|
|                                                     Y        PROPERTIES  |
|*************                                        |        IN INCH UNIT |
|            *  |=============================|                ------------ |
|MEMBER   2  *  | AISC SECTIONS               |                AX=0.1890E+1 |
|            *  | ST  HSST3X3X0.188           |           --Z  AY=0.1044E+1 |
|DESIGN CODE *  |                             |                AZ=0.1044E+1 |
| LRFD 2001  *  ===============================                PY=0.1970E+1 |
|            *                                                 PZ=0.1970E+1 |
|            *  |<---LENGTH (FT)=    1.50 --->|                RY=0.1141E+1 |
|*************                                                 RZ=0.1141E+1 |
|                                                                           |
|                  0.5 (KIP-FEET)                                           |
|PARAMETER       |L4                                           CAPACITIES   |
|IN KIP  INCH    |   L4                                        IN KIP  INCH |
|--------------- +       L4                                    -------------|
| KL/R-Y=  15.78 |           L4  L4                            PNC=0.5708E+2|
| KL/R-Z=  15.78 +                                             pnc=0.2195E-2|
| UNL    =  18.00 |                   L4                       PNT=0.6124E+2|
| CB     =   1.00 +                       L4                   pnt=0.0000E+0|
| PHIC   =   0.00 |                           L4               MNZ=0.6383E+2|
| PHIB   =   0.90 +                               L4  L4       mnz=0.6014E+1|
| FYLD   =  36.00 |                                       L4   MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|   mny=0.6016E-2|
| DFF =      0.00   0.4                                        VN =0.2030E+2|
| dff =      0.00               ABSOLUTE MZ ENVELOPE           vn =0.3895E-1|
|                                  (WITH LOAD NO.)                          |
|                                                                           |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                |
|                      -------------------------                            |
|                                                                           |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z      |
|                                                                           |
|      VALUE      -0.4        0.0        0.0         0.1         0.5        |
|   LOCATION       0.0        0.0        0.0         1.5         0.0        |
|    LOADING         2          4          5           5           4        |
|                                                                           |
|***************************************************************************|
|*                                                                         *|
|*                         DESIGN SUMMARY  (KIP-FEET)                      *|
|*                         --------------                                  *|
|*                                                                         *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/             *|
|         FX               MY            MZ          LOCATION              |
|        ======================================================            |
|          PASS        HSS FLEX+AXL     0.094              4               |
|          0.00 C         -0.00         0.50            0.00               |
|*                                                                         *|
|***************************************************************************|
|                                                                           |
|---------------------------------------------------------------------------|
     2  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 3 Check 1

```
|---------------------------------------------------------------------------|
|                                                    Y        PROPERTIES    |
|*************                                       |        IN INCH UNIT  |
|            *  |=============================|               ------------  |
|MEMBER   3  *  |  AISC SECTIONS              |               AX=0.1890E+1  |
|            *  | ST  HSST3X3X0.188          |          --Z  AY=0.1044E+1  |
|DESIGN CODE *  |                             |               AZ=0.1044E+1  |
| LRFD 2001  *  ===============================               PY=0.1970E+1  |
|            *                                                PZ=0.1970E+1  |
|            *  |<---LENGTH (FT)=    0.50 --->|               RY=0.1141E+1  |
|*************                                                RZ=0.1141E+1  |
|                                                                           |
|                 0.4 (KIP-FEET)                                            |
|PARAMETER        |                                      L4   CAPACITIES    |
|IN KIP  INCH     |                                  L4       IN KIP  INCH  |
|---------------  +                          L4  L4           ------------- |
| KL/R-Y=   5.26  |                      L4                   PNC=0.5775E+2 |
| KL/R-Z=   5.26  +                                           pnc=0.5190E-1 |
| UNL    =  6.00  |              L4  L4                       PNT=0.6124E+2 |
| CB     =  1.00  +                                           pnt=0.0000E+0 |
| PHIC   =  0.00  |          L4                               MNZ=0.6383E+2 |
| PHIB   =  0.90  +   L4  L4                                  mnz=0.5398E+1 |
| FYLD   = 36.00  |L4                                         MNY=0.6383E+2 |
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.5851E-1 |
| DFF =     0.00   0.4                                        VN =0.2030E+2 |
| dff =     0.00              ABSOLUTE MZ ENVELOPE            vn =0.2052E-1 |
|                                (WITH LOAD NO.)                            |
|                                                                           |
|                     MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                 |
|                     -------------------------                             |
|                                                                           |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z      |
|                                                                           |
|     VALUE      -0.2         0.0        0.0         0.0         0.4       |
|   LOCATION      0.0         0.5        0.0         0.0         0.5       |
|    LOADING        2           8          2           6           4       |
|                                                                           |
|***************************************************************************|
|*                                                                         *|
|*                        DESIGN SUMMARY  (KIP-FEET)                       *|
|*                        --------------                                   *|
|*                                                                         *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/             *|
|         FX             MY              MZ         LOCATION               |
|       ======================================================             |
|          PASS       HSS FLEX+AXL      0.086             4                 |
|          0.05 C        0.00           0.45           0.50                 |
|*                                                                         *|
|***************************************************************************|
|                                                                           |
|---------------------------------------------------------------------------|
    3  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 4 Check 1

```
|--------------------------------------------------------------------------|
|                                                    Y        PROPERTIES    |
|*************                                       |        IN INCH UNIT  |
|            *  |=============================|                ------------ |
|MEMBER   4  *  | AISC SECTIONS               |               AX=0.1890E+1 |
|            *  | ST  HSST3X3X0.188           |           --Z AY=0.1044E+1 |
|DESIGN CODE *  |                             |               AZ=0.1044E+1 |
| LRFD 2001  *  ===============================               PY=0.1970E+1 |
|            *                                                PZ=0.1970E+1 |
|            *  |<---LENGTH (FT)=    7.00 --->|               RY=0.1141E+1 |
|*************                                                RZ=0.1141E+1 |
|                                                                          |
|                  0.5 (KIP-FEET)                                          |
|PARAMETER        |L4                                         CAPACITIES   |
|IN KIP  INCH     |   L4                                      IN KIP  INCH |
|---------------  +       L4                                  -------------|
| KL/R-Y=  73.63  |           L4                              PNC=0.4348E+2|
| KL/R-Z=  73.63  +               L4                          pnc=0.0000E+0|
| UNL    =  84.00  |                  L4                      PNT=0.6124E+2|
| CB     =   1.00  +                      L4                  pnt=0.0000E+0|
| PHIC   =   0.00  |                                          MNZ=0.6383E+2|
| PHIB   =   0.90  +                          L4  L4          mnz=0.6014E+1|
| FYLD   =  36.00  |                                  L4  L5  MNY=0.6383E+2|
| NSF    =   1.00  +---+---+---+---+---+---+---+---+---+---|  mny=0.6085E-2|
| DFF =      0.00   0.0                                       VN =0.2030E+2|
| dff =      0.00             ABSOLUTE MZ ENVELOPE            vn =0.9580E-1|
|                                (WITH LOAD NO.)                           |
|                                                                          |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)               |
|                      -------------------------                           |
|                                                                          |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z     |
|                                                                          |
|     VALUE       -0.3        0.1        0.1        0.2         0.5        |
|   LOCATION       0.0        0.0        0.0        0.0         0.0        |
|    LOADING         2          4          2          2           4        |
|                                                                          |
|**************************************************************************|
|*                                                                        *|
|*                        DESIGN SUMMARY  (KIP-FEET)                      *|
|*                        --------------                                  *|
|*                                                                        *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/            *|
|         FX             MY              MZ          LOCATION             |
|        ======================================================           |
|          PASS        HSS FLEX+AXL      0.094             4              |
|          0.00 C         0.00           0.50           0.00              |
|*                                                                        *|
|**************************************************************************|
|                                                                          |
|--------------------------------------------------------------------------|
     4   ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 5 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES      |
|*************                                        |        IN INCH UNIT    |
|            *  |============================|                 ------------    |
|MEMBER   5  *  |  AISC SECTIONS             |                 AX=0.1890E+1    |
|            *  | ST  HSST3X3X0.188          |             --Z AY=0.1044E+1    |
|DESIGN CODE *  |                            |                 AZ=0.1044E+1    |
| LRFD 2001  *  ==============================                 PY=0.1970E+1    |
|            *                                                 PZ=0.1970E+1    |
|            *  |<---LENGTH (FT)=    2.00 --->|                RY=0.1141E+1    |
|*************                                                 RZ=0.1141E+1    |
|                                                                              |
|                 0.3 (KIP-FEET)                                               |
|PARAMETER        |                                       L4   CAPACITIES      |
|IN KIP  INCH     |                                   L4       IN KIP  INCH    |
|---------------  +                           L4  L4           -------------|
| KL/R-Y=  21.04  |                       L4                   PNC=0.5650E+2|
| KL/R-Z=  21.04  +                                            pnc=0.2987E-1|
| UNL    =  24.00 |               L4  L4                         PNT=0.6124E+2|
| CB     =   1.00 +                                            pnt=0.0000E+0|
| PHIC   =   0.00 |           L4                                 MNZ=0.6383E+2|
| PHIB   =   0.90 +   L4  L4                                   mnz=0.2248E+1|
| FYLD   =  36.00 |L4                                          MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|    mny=0.1843E+1|
| DFF =      0.00 -0.0                                         VN =0.2030E+2|
| dff =      0.00             ABSOLUTE MZ ENVELOPE             vn =0.9899E-1|
|                                (WITH LOAD NO.)                             |
|                                                                            |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                 |
|                      -------------------------                             |
|                                                                            |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z       |
|                                                                            |
|     VALUE        0.0         0.2        0.2        0.2         0.3         |
|   LOCATION       0.0         2.0        0.0        0.0         2.0         |
|    LOADING         2           4          2          2           4         |
|                                                                            |
|****************************************************************************|
|*                                                                          *|
|*                         DESIGN SUMMARY  (KIP-FEET)                       *|
|*                         --------------                                   *|
|*                                                                          *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/              *|
|         FX              MY             MZ          LOCATION               |
|        =====================================================               |
|          PASS        HSS FLEX+AXL     0.064              5                 |
|          0.03 C          0.15         0.19            2.00                 |
|*                                                                          *|
|****************************************************************************|
|                                                                            |
|----------------------------------------------------------------------------|
     5  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 6 Check 1

```
|--------------------------------------------------------------------------|
|                                                    Y        PROPERTIES    |
|*************                                       |        IN INCH UNIT  |
|            *  |============================|                ------------  |
|MEMBER   6  *  |  AISC SECTIONS             |                AX=0.1890E+1  |
|            *  | ST  HSST3X3X0.188          |            --Z AY=0.1044E+1  |
|DESIGN CODE *  |                            |                AZ=0.1044E+1  |
| LRFD 2001  *  ==============================                PY=0.1970E+1  |
|            *                                                PZ=0.1970E+1  |
|            *  |<---LENGTH (FT)=    2.00 --->|               RY=0.1141E+1  |
|*************                                                RZ=0.1141E+1  |
|                                                                           |
|                 0.3 (KIP-FEET)                                            |
|PARAMETER        |                                      L4   CAPACITIES    |
|IN KIP  INCH     |                                  L4       IN KIP  INCH  |
|---------------  +                              L4  L4       ------------- |
| KL/R-Y=  21.04  |                          L4                PNC=0.5650E+2|
| KL/R-Z=  21.04  +                                            pnc=0.5740E-1|
| UNL    =  24.00 |                  L4  L4                    PNT=0.6124E+2|
| CB     =   1.00 +                                            pnt=0.0000E+0|
| PHIC   =   0.00 |              L4                            MNZ=0.6383E+2|
| PHIB   =   0.90 +    L4  L4                                  mnz=0.2652E+1|
| FYLD   =  36.00 |L4                                          MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|    mny=0.1612E+1|
| DFF =      0.00 -0.0                                         VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE            vn =0.1158E+0|
|                                 (WITH LOAD NO.)                           |
|                                                                           |
|                     MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                 |
|                     -------------------------                             |
|                                                                           |
|                AXIAL      SHEAR-Y     SHEAR-Z    MOMENT-Y    MOMENT-Z     |
|                                                                           |
|     VALUE        0.1         0.2        0.1         0.1         0.3       |
|   LOCATION       0.0         2.0        0.0         0.0         2.0       |
|    LOADING         7           4          2           2           4       |
|                                                                           |
|***************************************************************************|
|*                                                                         *|
|*                        DESIGN SUMMARY  (KIP-FEET)                       *|
|*                        --------------                                   *|
|*                                                                         *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/             *|
|         FX              MY             MZ          LOCATION              |
|        ======================================================            |
|          PASS        HSS FLEX+AXL      0.067            5                |
|          0.06 C        -0.13           0.22           2.00               |
|*                                                                         *|
|***************************************************************************|
|                                                                           |
|---------------------------------------------------------------------------|
    6  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 7 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y         PROPERTIES     |
|*************                                       |         IN INCH UNIT   |
|            *   |============================|                ------------   |
|MEMBER   7  *   | AISC SECTIONS              |                AX=0.1890E+1   |
|            *   | ST  HSST3X3X0.188          |          --Z   AY=0.1044E+1   |
|DESIGN CODE *   |                            |                AZ=0.1044E+1   |
| LRFD 2001  *   ==============================                PY=0.1970E+1   |
|            *                                                 PZ=0.1970E+1   |
|            *   |<---LENGTH (FT)=    1.00 --->|                RY=0.1141E+1   |
|*************                                                 RZ=0.1141E+1   |
|                                                                             |
|                  0.0 (KIP-FEET)                                             |
|PARAMETER        |L5                                     L4   CAPACITIES     |
|IN KIP  INCH     |                                            IN KIP  INCH   |
|---------------  +   L2                               L4      -------------  |
| KL/R-Y=  10.52  |       L2                                   PNC=0.5750E+2  |
| KL/R-Z=  10.52  +                                L4          pnc=0.1102E+0  |
| UNL    =  12.00 |           L2                               PNT=0.6124E+2  |
| CB     =   1.00 +               L2          L4               pnt=0.0000E+0  |
| PHIC   =   0.00 |                                            MNZ=0.6383E+2  |
| PHIB   =   0.90 +                       L4                   mnz=0.2614E+0  |
| FYLD   =  36.00 |                   L2                         MNY=0.6383E+2  |
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|    mny=0.1423E+1  |
| DFF =      0.00   0.0                                        VN =0.2030E+2  |
| dff =      0.00             ABSOLUTE MZ ENVELOPE             vn =0.5649E-1  |
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.1          0.1        0.2        0.1         0.0         |
|   LOCATION       0.0          1.0        0.0        1.0         0.0         |
|    LOADING         2            5          2          2           5         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                        DESIGN SUMMARY  (KIP-FEET)                         *|
|*                        --------------                                     *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX             MY             MZ          LOCATION                 |
|       ======================================================               |
|          PASS        HSS FLEX+AXL      0.027             5                 |
|          0.11 C         0.12           0.02            1.00                |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     7  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 8 Check 1

```
|-----------------------------------------------------------------------------|
|                                                      Y         PROPERTIES   |
|*************                                         |         IN INCH UNIT |
|             *  |=============================|                 ------------ |
|MEMBER    8  *  |  AISC SECTIONS              |                 AX=0.1890E+1 |
|             *  | ST  HSST3X3X0.188           |          --Z    AY=0.1044E+1 |
|DESIGN CODE  *  |                             |                 AZ=0.1044E+1 |
| LRFD 2001   *  ===============================                 PY=0.1970E+1 |
|             *                                                  PZ=0.1970E+1 |
|             *  |<---LENGTH (FT)=    1.50 --->|                 RY=0.1141E+1 |
|*************                                                   RZ=0.1141E+1 |
|                                                                             |
|                  0.1 (KIP-FEET)                                             |
|PARAMETER        |L5                                            CAPACITIES   |
|IN KIP  INCH     |   L5                                         IN KIP  INCH |
|---------------  +       L5                                     -------------|
| KL/R-Y=  15.78  |           L5  L5                             PNC=0.5708E+2|
| KL/R-Z=  15.78  +                                              pnc=0.1058E+1|
| UNL   =  18.00  |                   L5                         PNT=0.6124E+2|
| CB    =   1.00  +                       L5                     pnt=0.0000E+0|
| PHIC  =   0.00  |                           L5                 MNZ=0.6383E+2|
| PHIB  =   0.90  +                               L5  L5         mnz=0.1564E+1|
| FYLD  =  36.00  |                                       L5     MNY=0.6383E+2|
| NSF   =   1.00  +---+---+---+---+---+---+---+---+---+---|      mny=0.3555E+0|
| DFF =     0.00   0.1                                           VN =0.2030E+2|
| dff =     0.00               ABSOLUTE MZ ENVELOPE              vn =0.3927E-1|
|                                  (WITH LOAD NO.)                            |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|     VALUE        1.1        0.0        0.0         0.0         0.1         |
|   LOCATION       0.0        0.0        0.0         1.5         0.0         |
|    LOADING         5          5          6           2           5         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                        DESIGN SUMMARY  (KIP-FEET)                         *|
|*                        --------------                                     *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX              MY            MZ          LOCATION                  |
|        ======================================================               |
|          PASS         HSS FLEX+AXL     0.039             5                  |
|          1.06 C         -0.03          0.13            0.00                 |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     8  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 9 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES    |
|*************                                        |         IN INCH UNIT  |
|            *  |=============================|                 ------------  |
|MEMBER    9 *  |  AISC SECTIONS              |                 AX=0.1890E+1  |
|            *  | ST  HSST3X3X0.188           |             --Z AY=0.1044E+1  |
|DESIGN CODE *  |                             |                 AZ=0.1044E+1  |
| LRFD 2001  *  ===============================                 PY=0.1970E+1  |
|            *                                                  PZ=0.1970E+1  |
|            *  |<---LENGTH (FT)=    0.50 --->|                 RY=0.1141E+1  |
|*************                                                  RZ=0.1141E+1  |
|                                                                             |
|                  0.1 (KIP-FEET)                                             |
|PARAMETER        |                                         L5  CAPACITIES    |
|IN KIP  INCH     |                                     L5      IN KIP  INCH  |
|---------------  +                                 L5          ------------- |
| KL/R-Y=   5.26  |                         L5  L5              PNC=0.5775E+2 |
| KL/R-Z=   5.26  +                     L5                      pnc=0.7658E+0 |
| UNL    =  6.00  |                 L5                          PNT=0.6124E+2 |
| CB     =  1.00  +             L5                              pnt=0.0000E+0 |
| PHIC   =  0.00  |         L5                                  MNZ=0.6383E+2 |
| PHIB   =  0.90  +   L5  L5                                    mnz=0.8163E+0 |
| FYLD   = 36.00  |L5                                           MNY=0.6383E+2 |
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|     mny=0.2103E+0 |
| DFF =     0.00   0.1                                          VN =0.2030E+2 |
| dff =     0.00              ABSOLUTE MZ ENVELOPE              vn =0.9438E-2 |
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.8         0.0        0.0         0.0         0.1         |
|   LOCATION       0.0         0.5        0.0         0.0         0.5         |
|    LOADING         5           4          2           5           5         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                          DESIGN SUMMARY  (KIP-FEET)                       *|
|*                          --------------                                   *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX               MY             MZ          LOCATION               |
|        =====================================================                |
|          PASS         HSS FLEX+AXL      0.023             5                 |
|          0.77 C          -0.02          0.07            0.00                |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     9  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 10 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y        PROPERTIES      |
|*************                                       |        IN INCH UNIT    |
|            *  |=============================|               ------------    |
|MEMBER  10  *  |  AISC SECTIONS              |               AX=0.1890E+1    |
|            *  | ST  HSST3X3X0.188           |           --Z AY=0.1044E+1    |
|DESIGN CODE *  |                             |               AZ=0.1044E+1    |
| LRFD 2001  *  ===============================               PY=0.1970E+1    |
|            *                                                PZ=0.1970E+1    |
|            *  |<---LENGTH (FT)=    7.00 --->|               RY=0.1141E+1    |
|*************                                                RZ=0.1141E+1    |
|                                                                             |
|                 0.7 (KIP-FEET)                                              |
|PARAMETER      |L5                                           CAPACITIES      |
|IN KIP  INCH   |   L5                                        IN KIP  INCH    |
|--------------- +       L5                                   -------------   |
| KL/R-Y=  73.63 |           L5                               PNC=0.4348E+2   |
| KL/R-Z=  73.63 +               L5                           pnc=0.2069E+0   |
| UNL    =  84.00 |                  L5                       PNT=0.6124E+2   |
| CB     =   1.00 +                      L5                   pnt=0.0000E+0   |
| PHIC   =   0.00 |                          L5               MNZ=0.6383E+2   |
| PHIB   =   0.90 +                              L5   L5      mnz=0.8360E+1   |
| FYLD   =  36.00 |                                      L5   MNY=0.6383E+2   |
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|  mny=0.2208E+1   |
| DFF =      0.00   0.0                                       VN =0.2030E+2   |
| dff =      0.00              ABSOLUTE MZ ENVELOPE           vn =0.1167E+0   |
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                     MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                   |
|                     -------------------------                               |
|                                                                             |
|               AXIAL      SHEAR-Y     SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE      0.2         0.1         0.1         0.2         0.7         |
|   LOCATION      0.0         0.0         0.0         0.0         0.0         |
|    LOADING        2           5           5           5           5         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX             MY             MZ           LOCATION                 |
|        ======================================================               |
|          PASS         HSS FLEX+AXL     0.168              5                 |
|          0.21 C          -0.18         0.70             0.00                |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    10  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 11 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y        PROPERTIES      |
|*************                                       |        IN INCH UNIT    |
|            *  |=============================|                ------------ |
|MEMBER  11  *  |  AISC SECTIONS              |                AX=0.1890E+1 |
|            *  | ST  HSST3X3X0.188           |          --Z   AY=0.1044E+1 |
|DESIGN CODE *  |                             |                AZ=0.1044E+1 |
| LRFD 2001  *  ===============================                PY=0.1970E+1 |
|            *                                                 PZ=0.1970E+1 |
|            *  |<---LENGTH (FT)=    1.00 --->|                RY=0.1141E+1 |
|*************                                                 RZ=0.1141E+1 |
|                                                                             |
|                  0.5 (KIP-FEET)                                             |
|PARAMETER        |L5                                          CAPACITIES    |
|IN KIP  INCH     |   L5                                       IN KIP  INCH |
|---------------  +       L5                                   -------------|
| KL/R-Y=  10.52  |           L5                               PNC=0.5750E+2|
| KL/R-Z=  10.52  +               L5                           pnc=0.0000E+0|
| UNL    =  12.00 |                   L5                       PNT=0.6124E+2|
| CB     =   1.00 +                       L5                   pnt=0.2550E+0|
| PHIC   =   0.00 |                           L5               MNZ=0.6383E+2|
| PHIB   =   0.90 +                               L8      L4  L5 mnz=0.6385E+1|
| FYLD   =  36.00 |                                   L7       MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|    mny=0.2248E+1|
| DFF =      0.00  -0.0                                        VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE            vn =0.6400E+0|
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|     VALUE      -0.3        0.6        0.1         0.3         0.5          |
|   LOCATION      1.0        0.0        0.0         0.0         0.0          |
|    LOADING        4          5          2           4           5          |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX               MY             MZ          LOCATION               |
|        ======================================================               |
|          PASS        HSS FLEX+AXL      0.137             5                  |
|          0.25 T         -0.19          0.53           0.00                  |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   11  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 12 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES     |
|*************                                        |        IN INCH UNIT   |
|             *  |=============================|             ------------    |
|MEMBER  12   *  |  AISC SECTIONS              |             AX=0.1890E+1    |
|             *  | ST  HSST3X3X0.188           |         --Z AY=0.1044E+1    |
|DESIGN CODE  *  |                             |             AZ=0.1044E+1    |
| LRFD 2001   *  ===============================             PY=0.1970E+1    |
|             *                                              PZ=0.1970E+1    |
|             *  |<---LENGTH (FT)=    0.75 --->|             RY=0.1141E+1    |
|*************                                               RZ=0.1141E+1    |
|                                                                             |
|                 0.1 (KIP-FEET)                                              |
|PARAMETER        |L5                                        CAPACITIES      |
|IN KIP  INCH     |   L5                                     IN KIP  INCH    |
|---------------  +       L5                                 -------------   |
| KL/R-Y=   7.89  |           L5                             PNC=0.5764E+2   |
| KL/R-Z=   7.89  +               L5                         pnc=0.3015E-2   |
| UNL    =  9.00  |                                          PNT=0.6124E+2   |
| CB     =  1.00  +                   L5                     pnt=0.0000E+0   |
| PHIC   =  0.00  |                       L5              L5 MNZ=0.6383E+2   |
| PHIB   =  0.90  +                                   L5     mnz=0.1288E+1   |
| FYLD   = 36.00  |                           L5  L5         MNY=0.6383E+2   |
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|  mny=0.3668E+1   |
| DFF =     0.00  -0.0                                       VN =0.2030E+2   |
| dff =     0.00                ABSOLUTE MZ ENVELOPE         vn =0.1788E+0   |
|                                  (WITH LOAD NO.)                            |
|                                                                             |
|                     MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                   |
|                     -------------------------                               |
|                                                                             |
|               AXIAL      SHEAR-Y     SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.0         0.2         0.5         0.3         0.1        |
|   LOCATION       0.0         0.0         0.0         0.0         0.0        |
|    LOADING         4           5           4           4           5        |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX               MY             MZ          LOCATION               |
|        ======================================================               |
|          PASS        HSS FLEX+AXL     0.078              4                  |
|          0.00 C         -0.31        -0.11            0.00                  |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    12  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 13 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES     |
|*************                                        |        IN INCH UNIT   |
|             *  |=============================|              ------------   |
|MEMBER  13  *  | AISC SECTIONS               |              AX=0.1890E+1   |
|             *  | ST  HSST3X3X0.188           |          --Z AY=0.1044E+1   |
|DESIGN CODE *  |                             |              AZ=0.1044E+1   |
| LRFD 2001  *  ===============================              PY=0.1970E+1   |
|             *                                              PZ=0.1970E+1   |
|             *  |<---LENGTH (FT)=    0.75 --->|              RY=0.1141E+1   |
|*************                                               RZ=0.1141E+1   |
|                                                                             |
|                  0.0 (KIP-FEET)                                             |
|PARAMETER        |L5                                        CAPACITIES     |
|IN KIP  INCH     |   L5                                     IN KIP  INCH   |
|---------------  +       L5  L5                             -------------  |
| KL/R-Y=   7.89  |               L5                         PNC=0.5764E+2|
| KL/R-Z=   7.89  +                   L5                     pnc=0.3015E-2|
| UNL    =  9.00  |                   L5  L5                 PNT=0.6124E+2|
| CB     =  1.00  +                                          pnt=0.0000E+0|
| PHIC   =  0.00  |                           L5  L5         MNZ=0.6383E+2|
| PHIB   =  0.90  +                               L5  L5     mnz=0.3219E+0|
| FYLD   = 36.00  |                                       L0 MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|  mny=0.9170E+0|
| DFF =     0.00  -0.0                                       VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE           vn =0.3576E-1|
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.0          0.0        0.1         0.1         0.0        |
|   LOCATION       0.0          0.0        0.0         0.0         0.0        |
|    LOADING         4            5          4           4           5        |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                          DESIGN SUMMARY  (KIP-FEET)                       *|
|*                          --------------                                   *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX              MY             MZ          LOCATION                 |
|        ======================================================               |
|          PASS        HSS FLEX+AXL      0.019              4                 |
|          0.00 C          0.08          0.03            0.00                 |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   13  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 14 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES     |
|*************                                        |         IN INCH UNIT   |
|             *   |============================|                ------------  |
|MEMBER  14  *   |  AISC SECTIONS              |                AX=0.1890E+1  |
|            *   | ST  HSST3X3X0.188           |          --Z   AY=0.1044E+1  |
|DESIGN CODE *   |                             |                AZ=0.1044E+1  |
| LRFD 2001  *   ===============================                PY=0.1970E+1  |
|            *                                                  PZ=0.1970E+1  |
|            *   |<---LENGTH (FT)=    1.00 --->|                RY=0.1141E+1  |
|*************                                                  RZ=0.1141E+1  |
|                                                                             |
|                  0.6 (KIP-FEET)                                             |
|PARAMETER        |L5                                          CAPACITIES     |
|IN KIP  INCH     |   L5                                       IN KIP  INCH   |
|---------------  +       L5                                   -------------|
| KL/R-Y=  10.52  |           L5                               PNC=0.5750E+2|
| KL/R-Z=  10.52  +               L5                           pnc=0.0000E+0|
| UNL    =  12.00 |                                            PNT=0.6124E+2|
| CB     =   1.00 +                   L5                       pnt=0.2618E+0|
| PHIC   =   0.00 |                       L5              L5   MNZ=0.6383E+2|
| PHIB   =   0.90 +                                   L8       mnz=0.7038E+1|
| FYLD   =  36.00 |                           L5  L8           MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|    mny=0.2652E+1|
| DFF =      0.00  -0.0                                        VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE            vn =0.7508E+0|
|                                 (WITH LOAD NO.)                           |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                 |
|                      -------------------------                             |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z       |
|                                                                             |
|      VALUE      -0.3        0.8        0.1        0.4         0.6          |
|   LOCATION       1.0        0.0        0.0        1.0         0.0          |
|    LOADING         4          5          2          8           5          |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX              MY             MZ          LOCATION                |
|       ======================================================               |
|          PASS        HSS FLEX+AXL     0.154             5                  |
|          0.26 T         -0.22        -0.59            0.00                 |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   14  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 15 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES    |
|*************                                        |         IN INCH UNIT  |
|            *  |=============================|                 ------------  |
|MEMBER  15  *  |  AISC SECTIONS              |                 AX=0.1890E+1  |
|            *  | ST  HSST3X3X0.188          |              --Z AY=0.1044E+1  |
|DESIGN CODE *  |                             |                 AZ=0.1044E+1  |
| LRFD 2001  *  ===============================                 PY=0.1970E+1  |
|            *                                                  PZ=0.1970E+1  |
|            *  |<---LENGTH (FT)=    0.75 --->|                 RY=0.1141E+1  |
|*************                                                  RZ=0.1141E+1  |
|                                                                             |
|                  0.2 (KIP-FEET)                                             |
|PARAMETER        |L5                                           CAPACITIES    |
|IN KIP  INCH     |   L5                                        IN KIP  INCH  |
|---------------  +       L5                                    ------------- |
| KL/R-Y=   7.89  |           L5                                PNC=0.5764E+2 |
| KL/R-Z=   7.89  +               L5                            pnc=0.2653E-2 |
| UNL    =  9.00  |                                             PNT=0.6124E+2 |
| CB     =  1.00  +                   L5                        pnt=0.0000E+0 |
| PHIC   =  0.00  |                       L5              L5    MNZ=0.6383E+2 |
| PHIB   =  0.90  +                                   L5        mnz=0.1930E+1 |
| FYLD   = 36.00  |                           L5  L5            MNY=0.6383E+2 |
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|     mny=0.4455E+1 |
| DFF =     0.00  -0.0                                          VN =0.2030E+2 |
| dff =     0.00               ABSOLUTE MZ ENVELOPE             vn =0.2681E+0 |
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                   |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.0         0.3        0.6         0.4         0.2         |
|   LOCATION       0.0         0.0        0.0         0.0         0.0         |
|    LOADING         4           5          8           8           5         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX              MY             MZ          LOCATION                 |
|        ======================================================               |
|           PASS        HSS FLEX+AXL      0.100            8                  |
|           0.00 C         -0.37          0.16           0.00                 |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   15  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 16 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES    |
|*************                                        |         IN INCH UNIT  |
|             *   |=============================|              ------------  |
|MEMBER  16   *   |  AISC SECTIONS              |              AX=0.1890E+1  |
|             *   | ST  HSST3X3X0.188           |          --Z AY=0.1044E+1  |
|DESIGN CODE  *   |                             |              AZ=0.1044E+1  |
| LRFD 2001   *   ===============================              PY=0.1970E+1  |
|             *                                                PZ=0.1970E+1  |
|             *   |<---LENGTH (FT)=    0.75 --->|              RY=0.1141E+1  |
|*************                                                 RZ=0.1141E+1  |
|                                                                             |
|                  0.0 (KIP-FEET)                                             |
|PARAMETER        |L5                                          CAPACITIES    |
|IN KIP  INCH     |   L5                                       IN KIP  INCH  |
|---------------  +       L5  L5                               ------------- |
| KL/R-Y=   7.89  |               L5                             PNC=0.5764E+2|
| KL/R-Z=   7.89  +                   L5                         pnc=0.2653E-2|
| UNL    =  9.00  |                   L5  L5                     PNT=0.6124E+2|
| CB     =  1.00  +                                              pnt=0.0000E+0|
| PHIC   =  0.00  |                           L5  L5             MNZ=0.6383E+2|
| PHIB   =  0.90  +                                   L5         mnz=0.4826E+0|
| FYLD   = 36.00  |                                       L0     MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|      mny=0.1114E+1|
| DFF =     0.00  -0.0                                           VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE               vn =0.5362E-1|
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                       MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                 |
|                       -------------------------                             |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.0        0.1        0.1         0.1         0.0          |
|   LOCATION       0.0        0.0        0.0         0.0         0.0          |
|    LOADING         4          5          8           8           5          |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX               MY            MZ          LOCATION                 |
|        ======================================================               |
|          PASS          HSS FLEX+AXL     0.025            8                  |
|          0.00 C           0.09        -0.04           0.00                  |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    16  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 17 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y        PROPERTIES      |
|*************                                       |        IN INCH UNIT    |
|            *  |=============================|              ------------    |
|MEMBER  17  *  | AISC SECTIONS               |              AX=0.1890E+1    |
|            *  | ST  HSST3X3X0.188           |          --Z AY=0.1044E+1    |
|DESIGN CODE *  |                             |              AZ=0.1044E+1    |
| LRFD 2001  *  ===============================              PY=0.1970E+1    |
|            *                                               PZ=0.1970E+1    |
|            *  |<---LENGTH (FT)=    7.00 --->|              RY=0.1141E+1    |
|*************                                               RZ=0.1141E+1    |
|                                                                             |
|                 0.5 (KIP-FEET)                                              |
|PARAMETER        |                                      L4  CAPACITIES      |
|IN KIP  INCH     |                                  L4      IN KIP  INCH    |
|---------------  +                              L4          -------------   |
| KL/R-Y=  73.63  |                          L4              PNC=0.4348E+2   |
| KL/R-Z=  73.63  +                      L4                  pnc=0.0000E+0   |
| UNL    =  84.00 |                  L4                      PNT=0.6124E+2   |
| CB     =   1.00 +              L4                          pnt=0.0000E+0   |
| PHIC   =   0.00 |          L4                              MNZ=0.6383E+2   |
| PHIB   =   0.90 +      L4                                  mnz=0.6014E+1   |
| FYLD   =  36.00 |L4 L4                                     MNY=0.6383E+2   |
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|  mny=0.6085E-2   |
| DFF =      0.00   0.0                                      VN =0.2030E+2   |
| dff =      0.00             ABSOLUTE MZ ENVELOPE           vn =0.9580E-1   |
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                     MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                   |
|                     -------------------------                               |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|     VALUE       -0.2         0.1        0.1         0.2         0.5         |
|   LOCATION       0.0         7.0        0.0         0.0         7.0         |
|    LOADING         2           4          2           2           4         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                        DESIGN SUMMARY  (KIP-FEET)                         *|
|*                        --------------                                     *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX            MY              MZ            LOCATION               |
|        ======================================================              |
|          PASS        HSS FLEX+AXL      0.094              4                |
|          0.00 C        0.00            0.50             7.00                |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   17  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 18 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES     |
|*************                                        |        IN INCH UNIT   |
|             *  |=============================|             ------------    |
|MEMBER   18  *  |  AISC SECTIONS              |             AX=0.1890E+1    |
|             *  | ST  HSST3X3X0.188           |         --Z AY=0.1044E+1    |
|DESIGN CODE *  |                             |             AZ=0.1044E+1    |
| LRFD 2001   *  ==============================             PY=0.1970E+1    |
|             *                                             PZ=0.1970E+1    |
|             *  |<---LENGTH (FT)=    7.00 --->|             RY=0.1141E+1    |
|*************                                             RZ=0.1141E+1    |
|                                                                             |
|                  0.7 (KIP-FEET)                                             |
|PARAMETER       |                                      L5   CAPACITIES     |
|IN KIP  INCH    |                                  L5       IN KIP  INCH   |
|--------------- +                              L5           -------------|
| KL/R-Y=  73.63 |                          L5               PNC=0.4348E+2|
| KL/R-Z=  73.63 +                      L5                   pnc=0.2632E+0|
| UNL    =  84.00 |                 L5                        PNT=0.6124E+2|
| CB     =   1.00 +             L5                            pnt=0.0000E+0|
| PHIC   =   0.00 |         L5                                MNZ=0.6383E+2|
| PHIB   =   0.90 +     L5                                    mnz=0.7949E+1|
| FYLD   =  36.00 |L4 L5                                      MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|   mny=0.2198E+1|
| DFF =      0.00  -0.0                                      VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE          vn =0.1167E+0|
|                                 (WITH LOAD NO.)                           |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                   |
|                      -------------------------                               |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z         |
|                                                                             |
|      VALUE       0.3         0.1        0.1         0.2         0.7          |
|   LOCATION       0.0         7.0        0.0         0.0         7.0          |
|    LOADING         2           5          5           5           5          |
|                                                                             |
|***************************************************************************|
|*                                                                         *|
|*                          DESIGN SUMMARY  (KIP-FEET)                     *|
|*                          --------------                                 *|
|*                                                                         *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/            *|
|         FX              MY             MZ          LOCATION              |
|        ======================================================            |
|          PASS        HSS FLEX+AXL     0.162             5                |
|          0.26 C         -0.18         0.66            7.00               |
|*                                                                         *|
|***************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    18  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 19 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES    |
|*************                                        |         IN INCH UNIT  |
|             *  |=============================|               ------------  |
|MEMBER  19  *  |  AISC SECTIONS              |               AX=0.1890E+1  |
|             *  | ST  HSST3X3X0.188           |          --Z  AY=0.1044E+1  |
|DESIGN CODE *  |                             |               AZ=0.1044E+1  |
| LRFD 2001  *  ===============================               PY=0.1970E+1  |
|             *                                               PZ=0.1970E+1  |
|             *  |<---LENGTH (FT)=    0.50 --->|               RY=0.1141E+1  |
|*************                                                RZ=0.1141E+1  |
|                                                                             |
|                  0.4 (KIP-FEET)                                             |
|PARAMETER        |L4                                         CAPACITIES    |
|IN KIP  INCH     |   L4                                      IN KIP  INCH  |
|---------------  +       L4  L4                              ------------- |
| KL/R-Y=   5.26  |               L4                          PNC=0.5775E+2|
| KL/R-Z=   5.26  +                                           pnc=0.5190E-1|
| UNL    =  6.00  |                   L4  L4                  PNT=0.6124E+2|
| CB     =  1.00  +                                           pnt=0.0000E+0|
| PHIC   =  0.00  |                           L4              MNZ=0.6383E+2|
| PHIB   =  0.90  +                               L4  L4      mnz=0.5398E+1|
| FYLD   = 36.00  |                                       L4  MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.5851E-1|
| DFF =     0.00   0.4                                        VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE            vn =0.2052E-1|
|                                (WITH LOAD NO.)                            |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE      -0.2         0.0        0.0         0.0         0.4         |
|   LOCATION      0.0          0.0        0.0         0.0         0.0         |
|    LOADING        2            4          7           2           4         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                          DESIGN SUMMARY  (KIP-FEET)                       *|
|*                          --------------                                   *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX                MY            MZ           LOCATION              |
|        ======================================================              |
|          PASS          HSS FLEX+AXL      0.086              4              |
|          0.05 C            0.00          0.45            0.00              |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    19  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 20 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y         PROPERTIES    |
|*************                                        |         IN INCH UNIT  |
|             *  |=============================|                ------------  |
|MEMBER  20   *  | AISC SECTIONS               |                AX=0.1890E+1  |
|             *  | ST  HSST3X3X0.188           |             --Z AY=0.1044E+1 |
|DESIGN CODE  *  |                             |                AZ=0.1044E+1  |
| LRFD 2001   *  ===============================                PY=0.1970E+1  |
|             *                                                 PZ=0.1970E+1  |
|             *  |<---LENGTH (FT)=    0.50 --->|                RY=0.1141E+1  |
|*************                                                  RZ=0.1141E+1  |
|                                                                             |
|                  0.1 (KIP-FEET)                                             |
|PARAMETER        |L5                                           CAPACITIES    |
|IN KIP  INCH     |   L5                                        IN KIP  INCH  |
|---------------  +       L5  L5                                ------------- |
| KL/R-Y=   5.26  |               L5                            PNC=0.5775E+2 |
| KL/R-Z=   5.26  +                                             pnc=0.7658E+0 |
| UNL    =  6.00  |                   L5  L5                    PNT=0.6124E+2 |
| CB     =  1.00  +                                             pnt=0.0000E+0 |
| PHIC   =  0.00  |                           L5                MNZ=0.6383E+2 |
| PHIB   =  0.90  +                               L5  L5        mnz=0.9446E+0 |
| FYLD   = 36.00  |                                       L5    MNY=0.6383E+2 |
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|     mny=0.3403E+0 |
| DFF =     0.00   0.1                                          VN =0.2030E+2 |
| dff =     0.00              ABSOLUTE MZ ENVELOPE              vn =0.2314E-1 |
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|     VALUE        0.8        0.0        0.0         0.0         0.1         |
|   LOCATION       0.0        0.0        0.0         0.0         0.0         |
|    LOADING         5          5          7           5           5         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/      CRITICAL COND/      RATIO/         LOADING/            *|
|         FX               MY               MZ           LOCATION            |
|        ======================================================              |
|          PASS         HSS FLEX+AXL      0.027              5               |
|          0.77 C          -0.03          0.08             0.00              |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   20  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 21 Check 1

```
|-----------------------------------------------------------------------------|
|                                                      Y         PROPERTIES    |
|*************                                         |         IN INCH UNIT  |
|            *  |=============================|                  ------------  |
|MEMBER  21  *  |  AISC SECTIONS              |                  AX=0.1890E+1  |
|            *  | ST  HSST3X3X0.188           |              --Z  AY=0.1044E+1  |
|DESIGN CODE *  |                             |                   AZ=0.1044E+1  |
| LRFD 2001  *  ===============================                   PY=0.1970E+1  |
|            *                                                    PZ=0.1970E+1  |
|            *  |<---LENGTH (FT)=    1.50 --->|                   RY=0.1141E+1  |
|*************                                                    RZ=0.1141E+1  |
|                                                                               |
|                  0.5 (KIP-FEET)                                               |
|PARAMETER        |                                        L4   CAPACITIES    |
|IN KIP  INCH     |                                    L4       IN KIP  INCH  |
|---------------  +                                L4           -------------|
| KL/R-Y=  15.78  |                        L4  L4               PNC=0.5708E+2|
| KL/R-Z=  15.78  +                                             pnc=0.2195E-2|
| UNL    =  18.00  |                    L4                       PNT=0.6124E+2|
| CB     =   1.00  +                L4                           pnt=0.0000E+0|
| PHIC   =   0.00  |            L4                               MNZ=0.6383E+2|
| PHIB   =   0.90  +   L4  L4                                    mnz=0.6014E+1|
| FYLD   =  36.00  |L4                                           MNY=0.6383E+2|
| NSF    =   1.00  +---+---+---+---+---+---+---+---+---+---|    mny=0.6016E-2|
| DFF =      0.00   0.4                                          VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE              vn =0.3895E-1|
|                                 (WITH LOAD NO.)                              |
|                                                                              |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                   |
|                      -------------------------                               |
|                                                                              |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z         |
|                                                                              |
|     VALUE      -0.4         0.0        0.0        0.0         0.5           |
|   LOCATION      0.0         1.5        0.0        1.5         1.5           |
|    LOADING        2           8          7          8           4           |
|                                                                              |
|******************************************************************************|
|*                                                                            *|
|*                         DESIGN SUMMARY  (KIP-FEET)                         *|
|*                         --------------                                     *|
|*                                                                            *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/               *|
|         FX              MY             MZ           LOCATION                |
|        ======================================================               |
|          PASS          HSS FLEX+AXL      0.094              4                |
|          0.00 C          -0.00          0.50             1.50               |
|*                                                                            *|
|******************************************************************************|
|                                                                              |
|------------------------------------------------------------------------------|
     21  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 22 Check 1

```
|-----------------------------------------------------------------------------|
|                                                      Y        PROPERTIES     |
|*************                                         |        IN INCH UNIT   |
|            *  |=============================|                 ------------  |
|MEMBER  22  *  |  AISC SECTIONS              |                 AX=0.1890E+1  |
|            *  | ST  HSST3X3X0.188           |             --Z AY=0.1044E+1  |
|DESIGN CODE *  |                             |                 AZ=0.1044E+1  |
| LRFD 2001  *  ===============================                 PY=0.1970E+1  |
|            *                                                  PZ=0.1970E+1  |
|            *  |<---LENGTH (FT)=    1.50 --->|                 RY=0.1141E+1  |
|*************                                                  RZ=0.1141E+1  |
|                                                                             |
|                  0.1 (KIP-FEET)                                             |
|PARAMETER        |                                        L5   CAPACITIES    |
|IN KIP  INCH     |                                    L5       IN KIP  INCH  |
|---------------  +                                L5           ------------- |
| KL/R-Y=  15.78  |                        L5  L5               PNC=0.5708E+2 |
| KL/R-Z=  15.78  +                                             pnc=0.1094E+1 |
| UNL    =  18.00 |                    L5                         PNT=0.6124E+2 |
| CB     =   1.00 +                L5                             pnt=0.0000E+0 |
| PHIC   =   0.00 |            L5                                 MNZ=0.6383E+2 |
| PHIB   =   0.90 +   L5  L5                                      mnz=0.1323E+1 |
| FYLD   =  36.00 |L5                                             MNY=0.6383E+2 |
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|       mny=0.5960E+0 |
| DFF =      0.00   0.1                                          VN =0.2030E+2 |
| dff =      0.00              ABSOLUTE MZ ENVELOPE              vn =0.2927E-1 |
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       1.1        0.0        0.0         0.0         0.1          |
|   LOCATION       0.0        1.5        0.0         1.5         1.5          |
|    LOADING         5          4          8           8           5          |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX               MY             MZ          LOCATION               |
|        ======================================================              |
|          PASS         HSS FLEX+AXL      0.040            5                  |
|          1.09 C          -0.05          0.11           1.50                 |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   22  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 23 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES     |
|*************                                        |        IN INCH UNIT   |
|            *  |=============================|                ------------   |
|MEMBER  23  *  | AISC SECTIONS               |                AX=0.1890E+1   |
|            *  | ST  HSST3X3X0.188           |           --Z  AY=0.1044E+1   |
|DESIGN CODE *  |                             |                AZ=0.1044E+1   |
| LRFD 2001  *  ===============================                PY=0.1970E+1   |
|            *                                                 PZ=0.1970E+1   |
|            *  |<---LENGTH (FT)=    1.00 --->|                RY=0.1141E+1   |
|*************                                                 RZ=0.1141E+1   |
|                                                                             |
|                 0.0 (KIP-FEET)                                              |
|PARAMETER        |                                       L5   CAPACITIES     |
|IN KIP  INCH     |                                            IN KIP  INCH   |
|---------------  +                                   L5       -------------  |
| KL/R-Y=  10.52  |                                 L5         PNC=0.5750E+2  |
| KL/R-Z=  10.52  +                                            pnc=0.0000E+0  |
| UNL    =  12.00 |                             L5             PNT=0.6124E+2  |
| CB     =   1.00 +                         L5                 pnt=0.1113E+0  |
| PHIC   =   0.00 |                                            MNZ=0.6383E+2  |
| PHIB   =   0.90 +L5             L5  L5                       mnz=0.3484E+0  |
| FYLD   =  36.00 |   L5  L5  L5                               MNY=0.6383E+2  |
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|     mny=0.1414E+1  |
| DFF =      0.00  0.0                                         VN =0.2030E+2  |
| dff =      0.00             ABSOLUTE MZ ENVELOPE             vn =0.1537E-2  |
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                     MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                   |
|                     -------------------------                               |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE      -0.1         0.0        0.2         0.1         0.0         |
|   LOCATION       0.0         0.0        0.0         0.0         1.0         |
|    LOADING         5           4          2           2           5         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX              MY             MZ          LOCATION                |
|        ======================================================               |
|          PASS        HSS FLEX+AXL     0.029            5                    |
|          0.11 T         0.12          0.03            0.00                  |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    23  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 24 Check 1

```
|-------------------------------------------------------------------------------|
|                                                    Y         PROPERTIES       |
|*************                                       |         IN INCH UNIT     |
|             *  |=============================|              ------------     |
|MEMBER  24  *  |  AISC SECTIONS               |              AX=0.1890E+1     |
|             *  | ST  HSST3X3X0.188           |         --Z  AY=0.1044E+1     |
|DESIGN CODE *  |                              |              AZ=0.1044E+1     |
| LRFD 2001  *  ==============================                PY=0.1970E+1     |
|             *                                               PZ=0.1970E+1     |
|             *  |<---LENGTH (FT)=    1.00 --->|               RY=0.1141E+1     |
|*************                                                RZ=0.1141E+1     |
|                                                                               |
|                  0.1 (KIP-FEET)                                               |
|PARAMETER        |L5                                          CAPACITIES       |
|IN KIP  INCH     |   L5                                       IN KIP  INCH     |
|---------------  +       L5  L5                               -------------    |
| KL/R-Y=  10.52  |               L5                           PNC=0.5750E+2    |
| KL/R-Z=  10.52  +                                            pnc=0.5883E-1    |
| UNL    =  12.00  |                  L5  L5                    PNT=0.6124E+2    |
| CB     =   1.00  +                                           pnt=0.0000E+0    |
| PHIC   =   0.00  |                          L5                 MNZ=0.6383E+2    |
| PHIB   =   0.90  +                              L5  L5       mnz=0.6703E+0    |
| FYLD   =  36.00  |                                      L2    MNY=0.6383E+2    |
| NSF    =   1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.1432E+1    |
| DFF =      0.00  -0.0                                        VN =0.2030E+2    |
| dff =      0.00              ABSOLUTE MZ ENVELOPE            vn =0.5679E-1    |
|                                 (WITH LOAD NO.)                               |
|                                                                               |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                    |
|                      -------------------------                                |
|                                                                               |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z          |
|                                                                               |
|      VALUE       0.1          0.1        0.2         0.1         0.1          |
|   LOCATION       0.0          0.0        0.0         0.0         0.0          |
|    LOADING         2            5          2           2           5          |
|                                                                               |
|*******************************************************************************|
|*                                                                             *|
|*                         DESIGN SUMMARY  (KIP-FEET)                          *|
|*                         --------------                                      *|
|*                                                                             *|
|*       RESULT/     CRITICAL COND/      RATIO/        LOADING/                *|
|         FX                MY               MZ          LOCATION               |
|        ======================================================                |
|          PASS          HSS FLEX+AXL     0.033              5                  |
|          0.06 C           0.12          0.06             0.00                 |
|*                                                                             *|
|*******************************************************************************|
|                                                                               |
|-------------------------------------------------------------------------------|
    24  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 25 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES      |
|*************                                        |        IN INCH UNIT    |
|             *  |=============================|              ------------    |
|MEMBER   25  *  |  AISC SECTIONS              |              AX=0.1890E+1    |
|             *  | ST  HSST3X3X0.188           |         --Z  AY=0.1044E+1    |
|DESIGN CODE  *  |                             |              AZ=0.1044E+1    |
| LRFD 2001   *  ===============================              PY=0.1970E+1    |
|             *                                               PZ=0.1970E+1    |
|             *  |<---LENGTH (FT)=    0.50 --->|              RY=0.1141E+1    |
|*************                                               RZ=0.1141E+1    |
|                                                                             |
|                  0.0 (KIP-FEET)                                             |
|PARAMETER        |L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  CAPACITIES      |
|IN KIP  INCH     |L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  IN KIP  INCH    |
|---------------  +L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  -------------   |
| KL/R-Y=    5.26 |L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  PNC=0.5775E+2   |
| KL/R-Z=    5.26 +L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  pnc=0.4020E-2   |
| UNL    =   6.00 |L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  PNT=0.6124E+2   |
| CB     =   1.00 +L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  pnt=0.0000E+0   |
| PHIC   =   0.00 |L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  MNZ=0.6383E+2   |
| PHIB   =   0.90 +L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  mnz=0.0000E+0   |
| FYLD   =  36.00 |L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  MNY=0.6383E+2   |
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|  mny=0.0000E+0   |
| DFF =      0.00   0.0                                       VN =0.2030E+2   |
| dff =      0.00              ABSOLUTE MZ ENVELOPE           vn =0.0000E+0   |
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.0          0.0        0.0         0.0         0.0        |
|   LOCATION       0.0          0.0        0.0         0.0         0.0        |
|    LOADING         4            0          0           0           0        |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/      RATIO/         LOADING/             *|
|         FX                MY           MZ            LOCATION              |
|        ======================================================              |
|          PASS          HSS COMPRESS      0.000              4              |
|          0.00 C           0.00           0.00            0.00              |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   25  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 26 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES      |
|*************                                        |        IN INCH UNIT    |
|            *  |=============================|                 ------------ |
|MEMBER  26  *  |  AISC SECTIONS              |               AX=0.1890E+1 |
|            *  | ST  HSST3X3X0.188           |          --Z  AY=0.1044E+1 |
|DESIGN CODE *  |                             |                AZ=0.1044E+1 |
| LRFD 2001  *  ===============================                PY=0.1970E+1 |
|            *                                                 PZ=0.1970E+1 |
|            *  |<---LENGTH (FT)=    0.50 --->|                 RY=0.1141E+1 |
|*************                                                 RZ=0.1141E+1 |
|                                                                             |
|                 0.0 (KIP-FEET)                                              |
|PARAMETER        |L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  CAPACITIES     |
|IN KIP  INCH     |L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  IN KIP  INCH   |
|---------------  +L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  --------------|
| KL/R-Y=   5.26  |L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  PNC=0.5775E+2|
| KL/R-Z=   5.26  +L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  pnc=0.4020E-2|
| UNL   =   6.00  |L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  PNT=0.6124E+2|
| CB    =   1.00  +L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  pnt=0.0000E+0|
| PHIC  =   0.00  |L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  MNZ=0.6383E+2|
| PHIB  =   0.90  +L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  mnz=0.0000E+0|
| FYLD  =  36.00  |L0 L0  L0  L0  L0  L0  L0  L0  L0  L0  L0  MNY=0.6383E+2|
| NSF   =   1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.0000E+0|
| DFF =     0.00   0.0                                        VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE            vn =0.0000E+0|
|                                (WITH LOAD NO.)                             |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.0         0.0        0.0         0.0         0.0         |
|   LOCATION       0.0         0.0        0.0         0.0         0.0         |
|    LOADING         4           0          0           0           0         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/      RATIO/         LOADING/             *|
|         FX            MY              MZ           LOCATION                |
|        ======================================================               |
|          PASS       HSS COMPRESS      0.000              4                  |
|          0.00 C        0.00           0.00             0.00                 |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    26  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 30 Check 1

```
|-----------------------------------------------------------------------------|
|                                                    Y        PROPERTIES      |
|*************                                       |        IN INCH UNIT    |
|            *  |=============================|               ------------    |
|MEMBER  30  *  |  AISC SECTIONS              |               AX=0.1890E+1    |
|            *  | ST  HSST3X3X0.188           |           --Z AY=0.1044E+1    |
|DESIGN CODE *  |                             |               AZ=0.1044E+1    |
| LRFD 2001  *  ===============================               PY=0.1970E+1    |
|            *                                                PZ=0.1970E+1    |
|            *  |<---LENGTH (FT)=    1.00 --->|               RY=0.1141E+1    |
|*************                                                RZ=0.1141E+1    |
|                                                                             |
|                  0.0 (KIP-FEET)                                             |
|PARAMETER        |L4                                         CAPACITIES      |
|IN KIP  INCH     |   L4                                      IN KIP  INCH    |
|---------------  +                                           -------------   |
| KL/R-Y=  10.52  |       L4                                  PNC=0.5750E+2   |
| KL/R-Z=  10.52  +           L4                              pnc=0.0000E+0   |
| UNL    =  12.00 |               L4                           PNT=0.6124E+2   |
| CB     =   1.00 +                                           pnt=0.0000E+0   |
| PHIC   =   0.00 |                   L4  L4                  MNZ=0.6383E+2   |
| PHIB   =   0.90 +                           L4              mnz=0.4823E-1   |
| FYLD   =  36.00 |                               L4  L4  L0  MNY=0.6383E+2   |
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|  mny=0.0000E+0   |
| DFF =      0.00 -0.0                                        VN =0.2030E+2   |
| dff =      0.00              ABSOLUTE MZ ENVELOPE           vn =0.8039E-2   |
|                                 (WITH LOAD NO.)                             |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|     VALUE       0.0         0.0        0.0         0.0         0.0          |
|   LOCATION      0.0         0.0        0.0         0.0         0.0          |
|    LOADING        0           4          0           0           4         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX              MY             MZ          LOCATION                |
|        ======================================================              |
|          PASS        HSS BEND Z       0.001            4                   |
|          0.00 C         0.00          0.00          0.00                   |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
   30  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 31 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES   |
|*************                                        |        IN INCH UNIT |
|            *  |=============================|                ------------ |
|MEMBER  31  *  | AISC SECTIONS               |                AX=0.1890E+1 |
|            *  | ST  HSST3X3X0.188           |            --Z AY=0.1044E+1 |
|DESIGN CODE *  |                             |                AZ=0.1044E+1 |
| LRFD 2001  *  ===============================                PY=0.1970E+1 |
|            *                                                 PZ=0.1970E+1 |
|            *  |<---LENGTH (FT)=    1.00 --->|                RY=0.1141E+1 |
|*************                                                 RZ=0.1141E+1 |
|                                                                           |
|                 0.0 (KIP-FEET)                                            |
|PARAMETER       |L4                                           CAPACITIES   |
|IN KIP  INCH    |   L4                                        IN KIP  INCH |
|---------------  +                                            -------------|
| KL/R-Y=  10.52  |       L4                                   PNC=0.5750E+2|
| KL/R-Z=  10.52  +           L4                               pnc=0.0000E+0|
| UNL    =  12.00 |               L4                           PNT=0.6124E+2|
| CB     =   1.00 +                                            pnt=0.0000E+0|
| PHIC   =   0.00 |                   L4  L4                   MNZ=0.6383E+2|
| PHIB   =   0.90 +                           L4               mnz=0.4823E-1|
| FYLD   =  36.00 |                               L4  L4  L0   MNY=0.6383E+2|
| NSF    =   1.00 +---+---+---+---+---+---+---+---+---+---|   mny=0.0000E+0|
| DFF =      0.00 -0.0                                         VN =0.2030E+2|
| dff =      0.00              ABSOLUTE MZ ENVELOPE            vn =0.8039E-2|
|                                 (WITH LOAD NO.)                           |
|                                                                           |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                |
|                      -------------------------                            |
|                                                                           |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z      |
|                                                                           |
|      VALUE       0.0         0.0        0.0         0.0         0.0       |
|   LOCATION       0.0         0.0        0.0         0.0         0.0       |
|    LOADING        0           4          0           0           4        |
|                                                                           |
|***************************************************************************|
|*                                                                         *|
|*                        DESIGN SUMMARY  (KIP-FEET)                       *|
|*                        --------------                                   *|
|*                                                                         *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/             *|
|         FX            MY              MZ          LOCATION               |
|        ======================================================            |
|          PASS       HSS BEND Z       0.001            4                   |
|          0.00 C        0.00          0.00           0.00                  |
|*                                                                         *|
|***************************************************************************|
|                                                                           |
|-----------------------------------------------------------------------------|
   31  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
1	HSST3X3X0	HSST3X3X0	0.028	1.000	0.028	HSS FLEX+A	2	1.890	2.460	2.460	4.030
2	HSST3X3X0	HSST3X3X0	0.094	1.000	0.094	HSS FLEX+A	4	1.890	2.460	2.460	4.030
3	HSST3X3X0	HSST3X3X0	0.086	1.000	0.086	HSS FLEX+A	4	1.890	2.460	2.460	4.030
4	HSST3X3X0	HSST3X3X0	0.094	1.000	0.094	HSS FLEX+A	4	1.890	2.460	2.460	4.030
5	HSST3X3X0	HSST3X3X0	0.064	1.000	0.064	HSS FLEX+A	5	1.890	2.460	2.460	4.030
6	HSST3X3X0	HSST3X3X0	0.067	1.000	0.067	HSS FLEX+A	5	1.890	2.460	2.460	4.030
7	HSST3X3X0	HSST3X3X0	0.027	1.000	0.027	HSS FLEX+A	5	1.890	2.460	2.460	4.030
8	HSST3X3X0	HSST3X3X0	0.039	1.000	0.039	HSS FLEX+A	5	1.890	2.460	2.460	4.030
9	HSST3X3X0	HSST3X3X0	0.023	1.000	0.023	HSS FLEX+A	5	1.890	2.460	2.460	4.030
10	HSST3X3X0	HSST3X3X0	0.168	1.000	0.168	HSS FLEX+A	5	1.890	2.460	2.460	4.030
11	HSST3X3X0	HSST3X3X0	0.137	1.000	0.137	HSS FLEX+A	5	1.890	2.460	2.460	4.030
12	HSST3X3X0	HSST3X3X0	0.078	1.000	0.078	HSS FLEX+A	4	1.890	2.460	2.460	4.030
13	HSST3X3X0	HSST3X3X0	0.019	1.000	0.019	HSS FLEX+A	4	1.890	2.460	2.460	4.030
14	HSST3X3X0	HSST3X3X0	0.154	1.000	0.154	HSS FLEX+A	5	1.890	2.460	2.460	4.030
15	HSST3X3X0	HSST3X3X0	0.100	1.000	0.100	HSS FLEX+A	8	1.890	2.460	2.460	4.030
16	HSST3X3X0	HSST3X3X0	0.025	1.000	0.025	HSS FLEX+A	8	1.890	2.460	2.460	4.030
17	HSST3X3X0	HSST3X3X0	0.094	1.000	0.094	HSS FLEX+A	4	1.890	2.460	2.460	4.030
18	HSST3X3X0	HSST3X3X0	0.162	1.000	0.162	HSS FLEX+A	5	1.890	2.460	2.460	4.030
19	HSST3X3X0	HSST3X3X0	0.086	1.000	0.086	HSS FLEX+A	4	1.890	2.460	2.460	4.030
20	HSST3X3X0	HSST3X3X0	0.027	1.000	0.027	HSS FLEX+A	5	1.890	2.460	2.460	4.030
21	HSST3X3X0	HSST3X3X0	0.094	1.000	0.094	HSS FLEX+A	4	1.890	2.460	2.460	4.030
22	HSST3X3X0	HSST3X3X0	0.040	1.000	0.040	HSS FLEX+A	5	1.890	2.460	2.460	4.030
23	HSST3X3X0	HSST3X3X0	0.029	1.000	0.029	HSS FLEX+A	5	1.890	2.460	2.460	4.030
24	HSST3X3X0	HSST3X3X0	0.033	1.000	0.033	HSS FLEX+A	5	1.890	2.460	2.460	4.030
25	HSST3X3X0	HSST3X3X0	0.000	1.000	0.000	HSS COMPR	4	1.890	2.460	2.460	4.030
26	HSST3X3X0	HSST3X3X0	0.000	1.000	0.000	HSS COMPR	4	1.890	2.460	2.460	4.030
30	HSST3X3X0	HSST3X3X0	0.001	1.000	0.001	HSS BEND Z	4	1.890	2.460	2.460	4.030
31	HSST3X3X0	HSST3X3X0	0.001	1.000	0.001	HSS BEND Z	4	1.890	2.460	2.460	4.030

Failed Members

There is no data of this type.

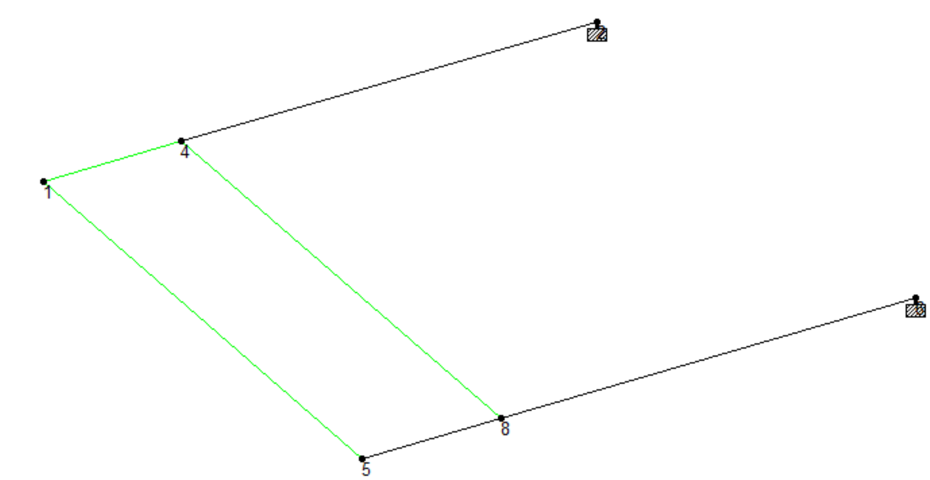
Statics Check Results

L/C		FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
2:W1	Loads	0.111	0.000	-0.209	-1.555	22.397	-0.816
2:W1	Reactions	-0.111	-0.000	0.209	1.555	-22.397	0.816
	Difference	0.000	-0.000	-0.000	0.000	-0.000	-0.000
1:DL	Loads	0.000	-0.508	0.000	-12.432	0.000	-61.002
1:DL	Reactions	0.000	0.508	-0.000	12.432	0.000	61.002
	Difference	0.000	0.000	-0.000	0.000	0.000	-0.000
3:W2	Loads	0.055	0.000	-0.059	-0.415	5.702	-0.382
3:W2	Reactions	-0.055	-0.000	0.059	0.000	-5.702	0.382
	Difference	0.000	-0.000	-0.000	-0.415	0.000	-0.000
7:0.75W3	Loads	0.126	0.000	-0.200	-1.464	20.976	-0.912
7:0.75W3	Reactions	-0.126	-0.000	0.200	1.152	-20.976	0.912
	Difference	0.000	-0.000	-0.000	-0.312	-0.000	-0.000

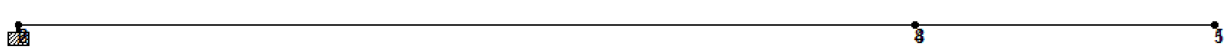
MSE Wall

The following structure spacing was accommodated from analyzing the THEA contract plans reinforcement for the retaining wall . It was concluded that the HSS arm would be welded to a square plate, with four bolts connecting the plate with the barrier. According to the structures index 5025 for the year 2000 the rebar spacing of 8" O.C will allow enough room for the plate connection.

3D View-Length:



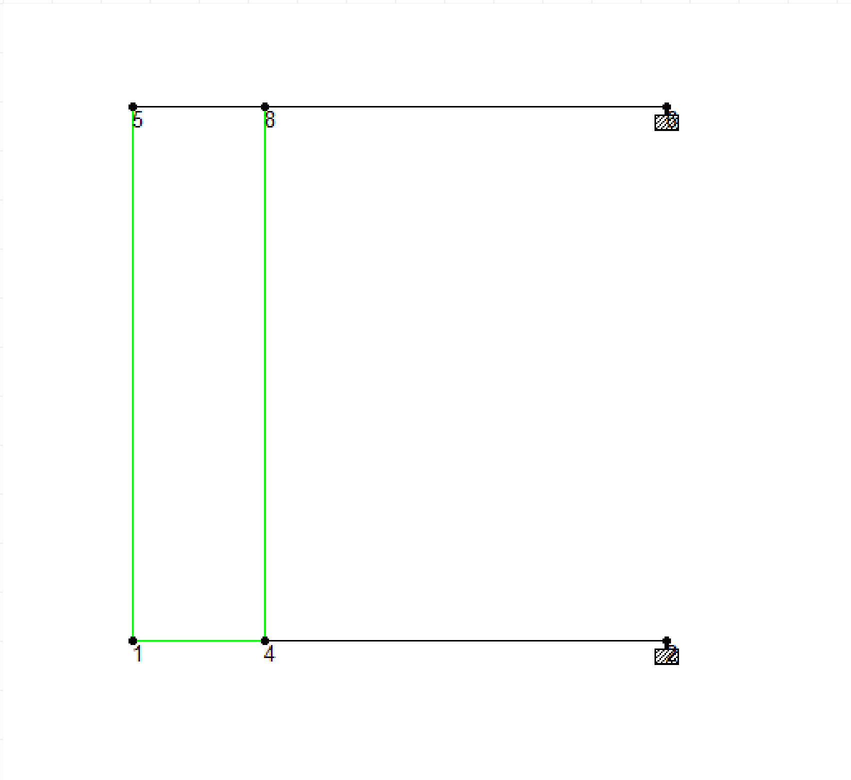
Side View:



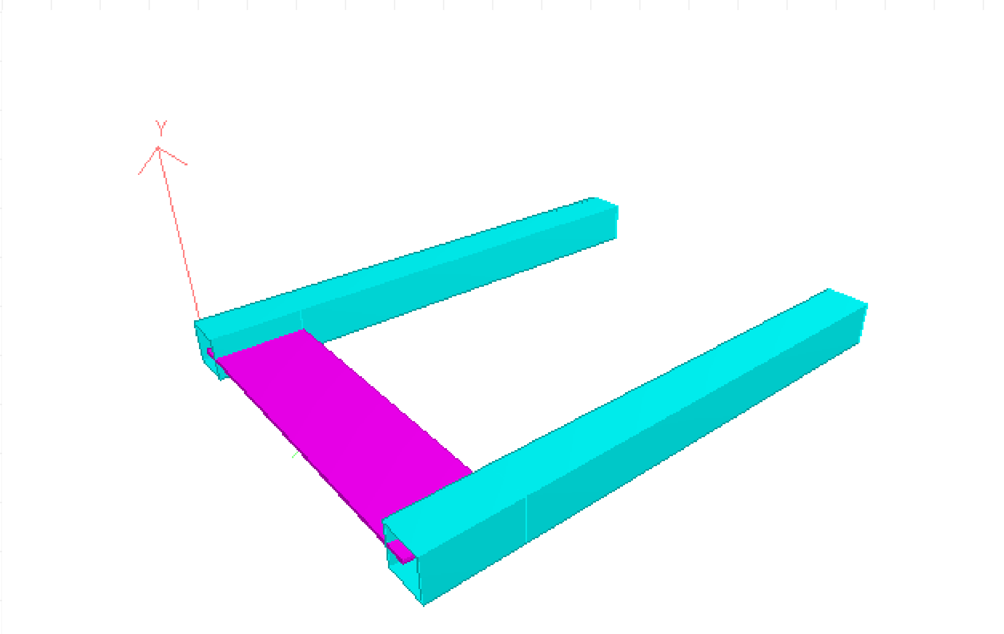
Kimley»Horn 189 South Orange Avenue
Orlando, FL 32801
Certificate of Authorization No. 00696

		Job No.	148872000	Sheet	of
Job	THEA Lighting Project	Design by	IERM	Date	7/19/18
Subject	Final Results	Checked by	JLP	Date	7/19/18

Plan View:



3D View:



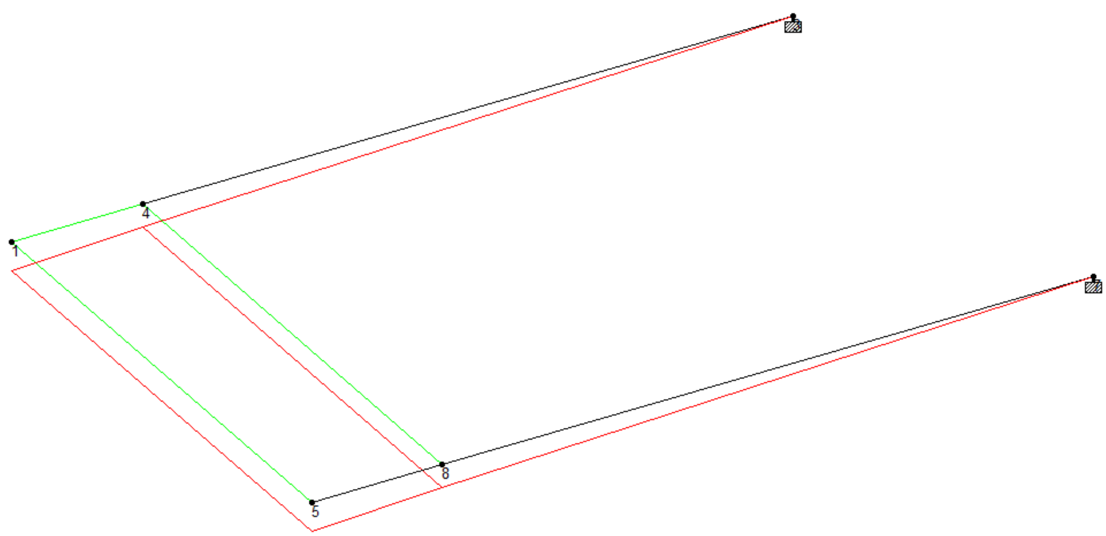
Kimley»Horn
189 South Orange Avenue
Orlando, FL 32801
Certificate of Authorization No. 00696

Job No. 148872000 Sheet ___ of ___

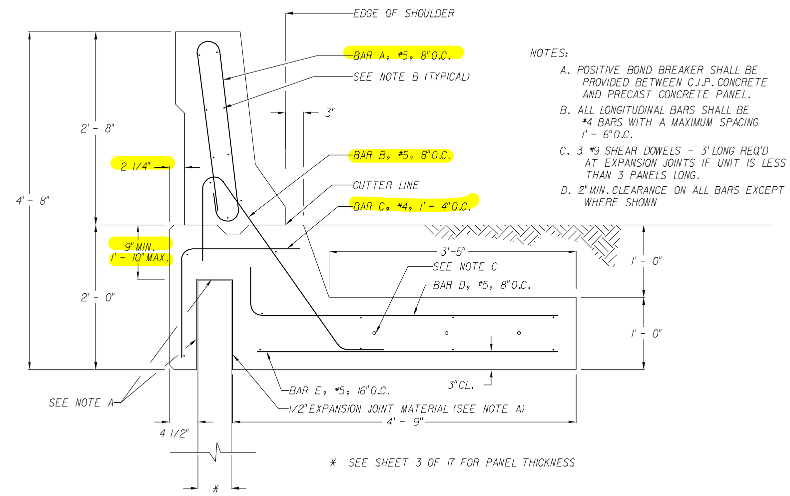
Job: THEA Lighting Project Design by: IERM Date: 7/19/18

Subject: Final Results Checked by: JLP Date: 7/19/18

Deflection:



Existing Structural Plans



NOTES:

A. POSITIVE BOND BREAKER SHALL BE PROVIDED BETWEEN C.I.P. CONCRETE AND PRECAST CONCRETE PANEL.

B. ALL LONGITUDINAL BARS SHALL BE #4 BARS WITH A MAXIMUM SPACING 1' - 6"O.C.

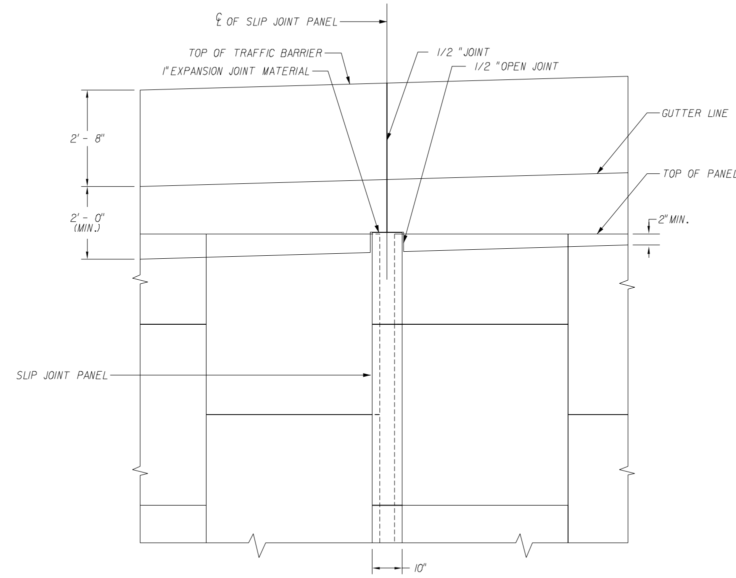
C. 3 #9 SHEAR DOWELS - 3' LONG REQ'D AT EXPANSION JOINTS IF UNIT IS LESS THAN 3 PANELS LONG.

D. 2" MIN. CLEARANCE ON ALL BARS EXCEPT WHERE SHOWN

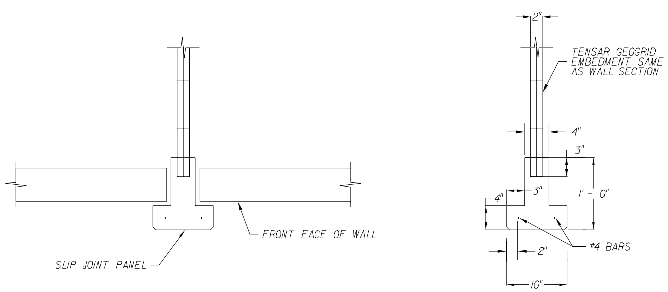
* SEE SHEET 3 OF 17 FOR PANEL THICKNESS

C.I.P. CONCRETE TRAFFIC BARRIER

NOT TO SCALE

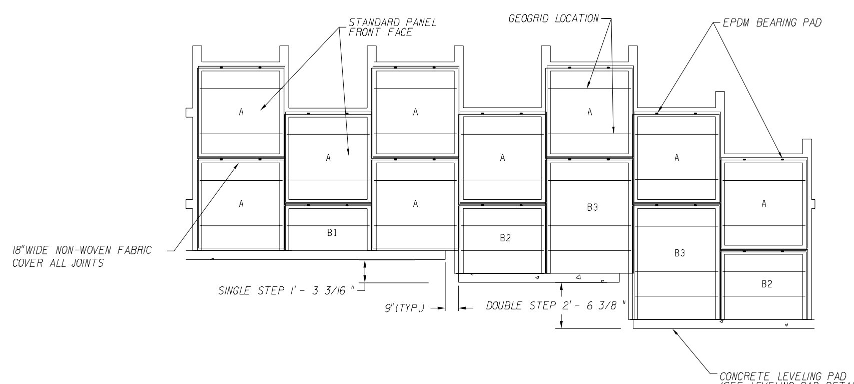


C.I.P. TRAFFIC BARRIER OVER SLIP JOINT PANEL



SLIP JOINT DETAIL

NOT TO SCALE



TYPICAL LEVELING PAD STEP DETAIL

NOT TO SCALE

THIS SYSTEM MAY BE USED IN ALL ENVIRONMENTS.

THIS DESIGN IS BASED UPON SPECIFIC PROPERTIES OF TENSAR PRODUCTS (GEOGRIDS, DRAINAGE COMPOSITES AND EROSION MEDIA), WHICH ARE PROPRIETARY TO THE TENSAR CORPORATION 1210 CITIZENS PARKWAY, MORROW GA. 30260. ANY SUBSTITUTION OF THE SPECIFIED PRODUCTS WILL INVALIDATE THIS DESIGN.

THIS DRAWING, DESIGN NOTES AND ASSOCIATED CALCULATIONS HAVE BEEN PREPARED BY TENSAR EARTH TECHNOLOGIES, INC. FOR PRELIMINARY DESIGN PURPOSES AND SHALL NOT BE USED FOR FINAL DESIGN OR CONSTRUCTION.

TENSAR
EARTH TECHNOLOGIES, INC.
5775-B Glenridge Drive
Lakeside Center Suite 450
Atlanta, GA 30328
(404) 250-1290

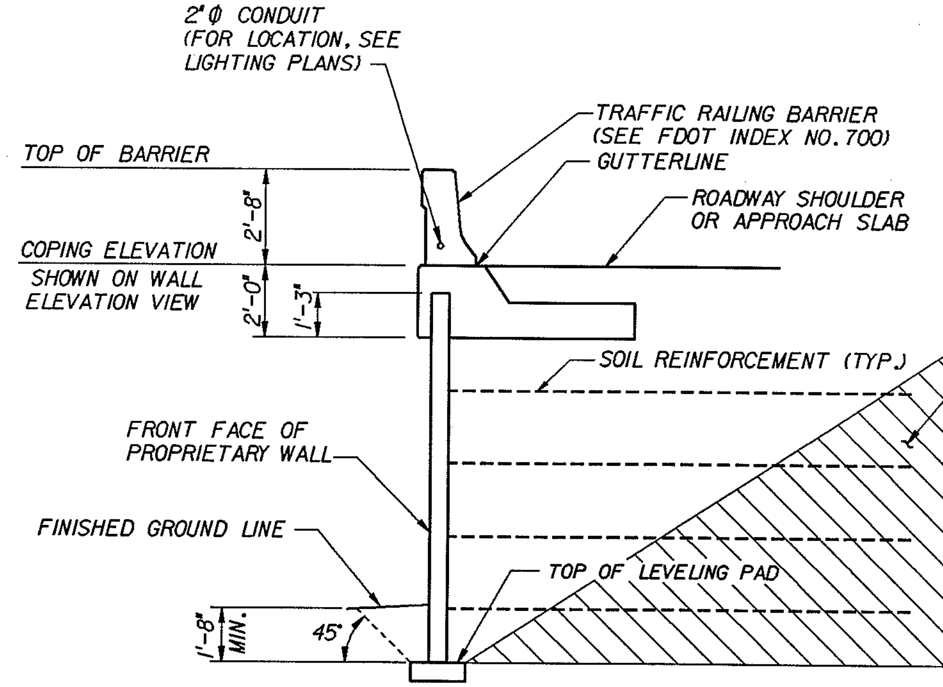
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

RETAINING WALL SYSTEM
TENSAR EARTH TECHNOLOGIES
MSE RETAINING WALL

	Names	Dates	Approved By		
Designed By			State Structures Design Engineer		
Drawn By	JMS	8/14/98	Revision	Sheet No.	Index No.
Checked By			00	13 of 17	5025

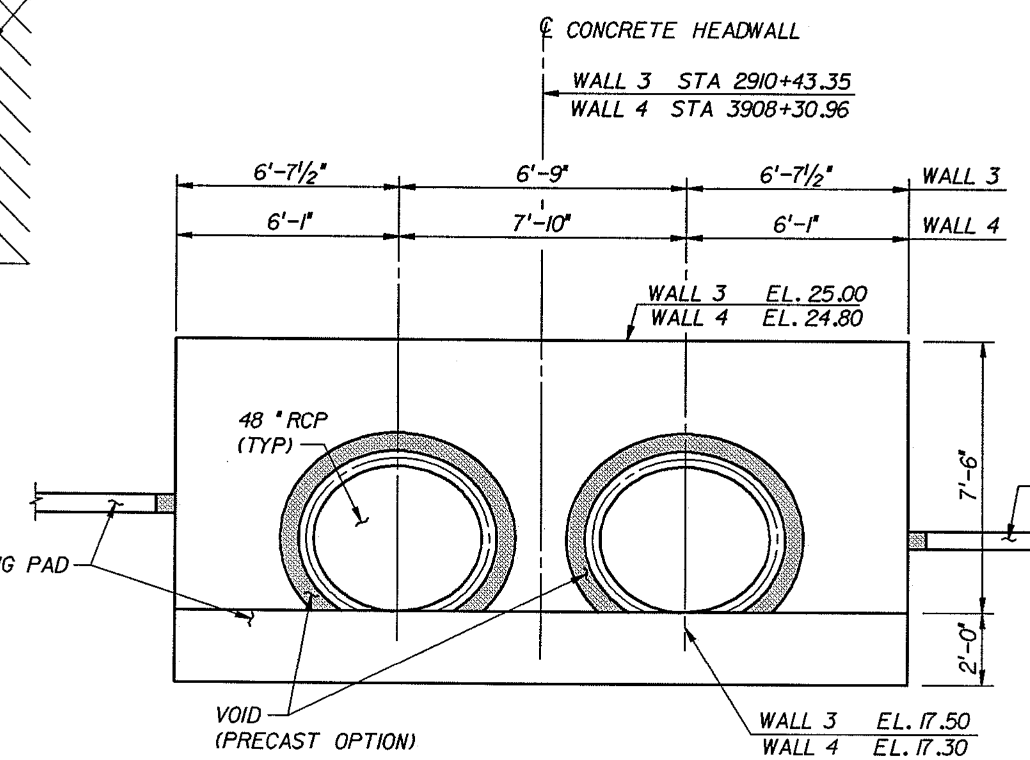
$$$$$$$DGNSPECIFICATION$$$$$$
$$$$$$SYTIME$$$$$$

From: As-Built



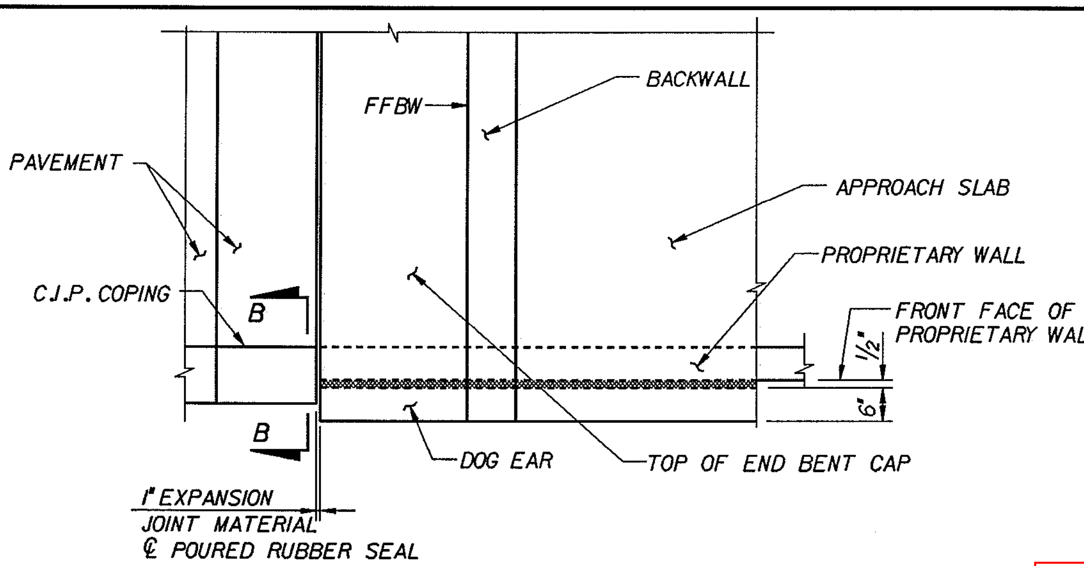
TYPICAL SECTION
(SHOWING TYPICAL COPING AND BARRIER DIMENSIONS)

NOTES:
1. TYPICAL WALL DETAILS SHOWN ON THESE DRAWINGS MAY BE MODIFIED TO SUIT THE INDIVIDUAL WALL COMPANY'S DETAILS.

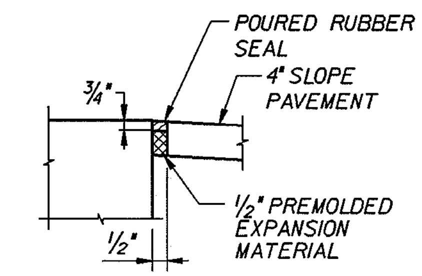


HEADWALL

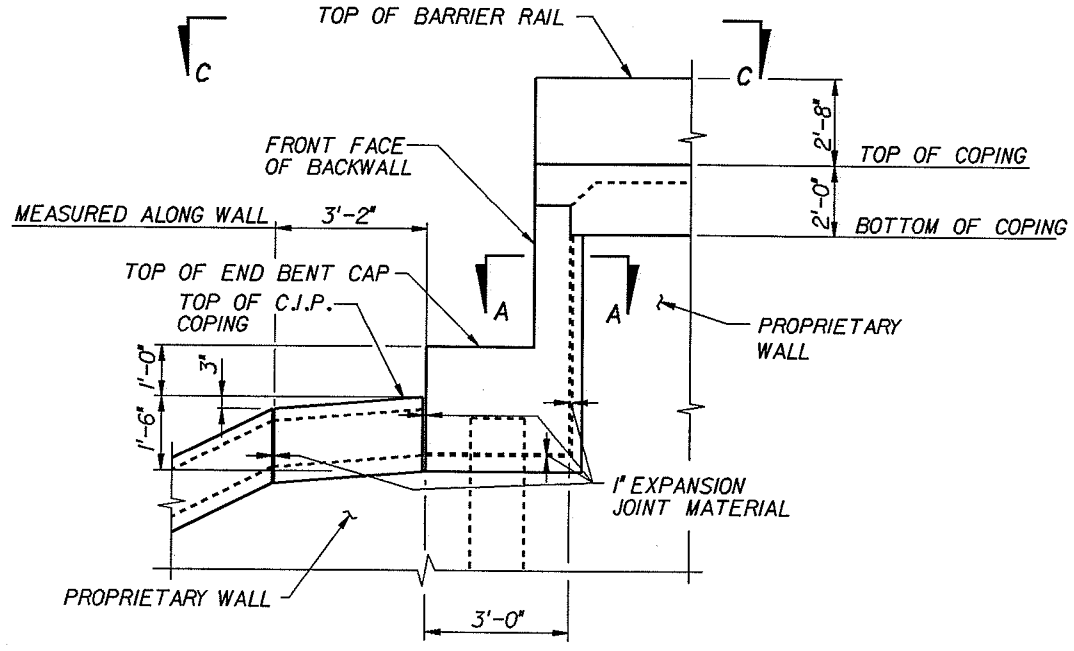
NOTES:
1. HEADWALL MAY BE PRECAST OR C.I.P. CONCRETE.
2. DESIGN AND DETAILS SHALL BE SUBMITTED WITH SHOP DRAWINGS FOR APPROVAL.
3. HEADWALL DETAILS SHALL BE SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
4. VOID SHALL BE FILLED WITH CLASS I CONCRETE.



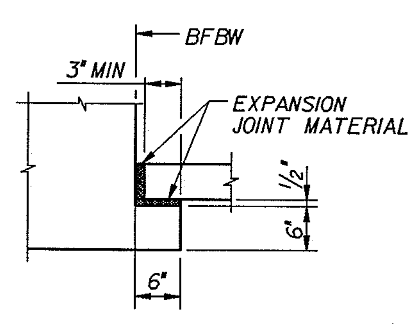
SECTION C-C
(BARRIER NOT SHOWN FOR CLARITY)



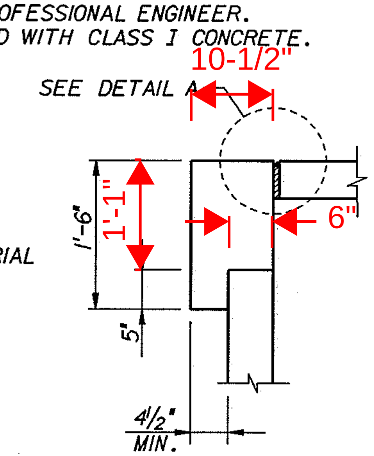
DETAIL A
NOTE: THIS DETAIL IS ALSO APPLICABLE BETWEEN SLOPE PAVEMENT AND END BENT CAP.



ELEVATION VIEW AT END BENT

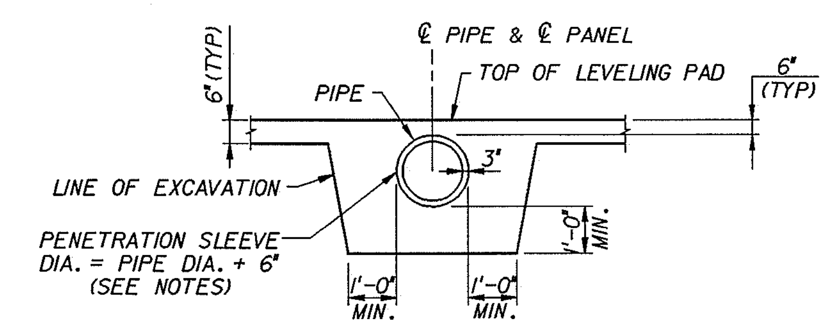


SECTION A-A



SECTION B-B

9/11/02



ENCASEMENT OF DRAINAGE PIPE IN LEVELING PAD CONCRETE
(WIDTH OF ENCASEMENT SAME AS WIDTH OF LEVELING PAD)

NOTES:
1. FILL PENETRATION SLEEVE WITH CONCRETE FILL AFTER PIPE HAS BEEN SET AND BLOCKED.
2. PIPE SHALL NOT BE PLACED DIRECTLY BENEATH THE JOINT OF A BOTTOM PANEL.
3. CONCRETE ENCASEMENT AND CONCRETE FILL SHALL BE INCLUDED IN THE UNIT BID PRICE FOR RETAINING WALLS.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAMES	DATES
DRAWN BY	KP	10/01
CHECKED BY	TPR	3/02
DESIGNED BY	TPR	10/01
CHECKED BY	JHP	10/01
APPROVED BY	JOHN H. POULSON	

ENGINEER OF RECORD:
Parsons Brinckerhoff Quade & Douglas, Inc.
5405 West Cypress St. Suite 300
Tampa, Florida 33607

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
SR 618	HILLSBOROUGH	51.40.02

SHEET TITLE: TYPICAL PROPRIEARY WALL DETAILS

PROJECT NAME: LEE ROY SELMON CROSSTOWN EXPRESSWAY OVER PALM RIVER ROAD

SHEET NO. W-3

STAAD Analysis

```
****************************************************
*                                                  *
*           STAAD.Pro V8i SELECTseries6            *
*           Version  20.07.11.70                   *
*           Proprietary Program of                 *
*           Bentley Systems, Inc.                  *
*           Date=    JUL 19, 2018                  *
*           Time=    13: 4:13                      *
*                                                  *
*      USER ID: Kimley-Horn and Associates         *
****************************************************
```

```
     1. STAAD SPACE
INPUT FILE: \\kimley-horn.com\FL_ORL\ORL_Structures\_Projects-Structures\148872000 THEA Lighting Proje.. .STD
     2. START JOB INFORMATION
     3. ENGINEER DATE 19-JUN-18
     4. JOB NAME RETAINING WALL 2
     5. JOB CLIENT THEA
     6. JOB NO 148872000
     7. JOB REV 3
     8. ENGINEER NAME IERM
     9. END JOB INFORMATION
    10. INPUT WIDTH 79
    11. UNIT FEET KIP
    12. JOINT COORDINATES
    13. 1 0 0 0; 2 2 0 0; 4 0.5 0 0; 5 0 0 2; 6 2 0 2; 8 0.5 0 2
    14. MEMBER INCIDENCES
    15. 1 1 4; 3 4 2; 4 5 8; 5 8 6
    16. ELEMENT INCIDENCES SHELL
    17. 6 8 4 1 5
    18. ELEMENT PROPERTY
    19. 6 THICKNESS 0.020833
    20. DEFINE MATERIAL START
    21. ISOTROPIC STEEL
    22. E 4.176E+006
    23. POISSON 0.3
    24. DENSITY 0.489024
    25. ALPHA 6E-006
    26. DAMP 0.03
    27. TYPE STEEL
    28. STRENGTH FY 5184 FU 8352 RY 1.5 RT 1.2
    29. ISOTROPIC CONCRETE
    30. E 453600
    31. POISSON 0.17
    32. DENSITY 0.150336
    33. ALPHA 5E-006
    34. DAMP 0.05
    35. TYPE CONCRETE
    36. STRENGTH FCU 576
    37. ISOTROPIC A500-GR.B
    38. E 4.176E+006
```

```
39. POISSON 0.3
40. DENSITY 0.49
41. ALPHA 6E-006
42. DAMP 0.03
43. G 1.6128E-006
44. TYPE STEEL
45. STRENGTH FY 6624 FU 8352 RY 1.1 RT 1.2
46. END DEFINE MATERIAL
47. MEMBER PROPERTY AMERICAN
48. 5 TABLE ST HSST3X3X0.188
49. 3 TABLE ST HSST3X3X0.188
50. 1 TABLE ST HSST3X3X0.188
51. 4 TABLE ST HSST3X3X0.188
52. CONSTANTS
53. MATERIAL STEEL MEMB 6
54. MATERIAL A500-GR.B MEMB 1 3 TO 5
55. SUPPORTS
56. 2 6 FIXED
57. LOAD 1 LOADTYPE DEAD  TITLE DL
58. SELFWEIGHT Y -1 LIST ALL
59. JOINT LOAD
60. 1 5 FY -0.015
61. LOAD 2 LOADTYPE WIND  TITLE W1
62. JOINT LOAD
63. 1 5 FZ -0.0261
64. 1 5 MX -0.0162
65. 1 5 FX 0.014
66. 1 5 MZ -0.008
67. LOAD 3 LOADTYPE WIND  TITLE 0.75W2
68. JOINT LOAD
69. 1 5 FZ -0.019
70. 1 5 MX -0.012
71. 1 5 FX 0.011
72. 1 5 MZ 0.006
73. LOAD COMB 4 1.25DL
74. 1 1.25
75. LOAD COMB 5 1.1DL+1.0W1
76. 1 1.1 2 1.0
77. LOAD COMB 6 1.1DL+1.0W2
78. 1 1.1 3 1.0
79. PERFORM ANALYSIS PRINT ALL
```

P R O B L E M   S T A T I S T I C S

NUMBER OF JOINTS	**6**	**NUMBER OF MEMBERS**	**4**
NUMBER OF PLATES	**1**	**NUMBER OF SOLIDS**	**0**
NUMBER OF SURFACES	**0**	**NUMBER OF SUPPORTS**	**2**

```
        SOLVER USED IS THE OUT-OF-CORE BASIC SOLVER

  ORIGINAL/FINAL BAND-WIDTH=     5/     5/     24 DOF
TOTAL      PRIMARY LOAD CASES =     3, TOTAL DEGREES OF FREEDOM =      24
TOTAL LOAD COMBINATION  CASES =     3  SO FAR.
  SIZE OF STIFFNESS MATRIX =        1 DOUBLE  KILO-WORDS
  REQRD/AVAIL. DISK SPACE  =     12.0/      0.0 MB
```

LOADING 1 LOADTYPE DEAD TITLE DL

SELFWEIGHT Y -1.000

ACTUAL WEIGHT OF THE STRUCTURE = 0.036 KIP

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00	-0.01	0.00	0.00	0.00	0.00
5	0.00	-0.01	0.00	0.00	0.00	0.00

LOADING 2 LOADTYPE WIND TITLE W1

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00	0.00	-0.03	0.00	0.00	0.00
5	0.00	0.00	-0.03	0.00	0.00	0.00
1	0.00	0.00	0.00	-0.02	0.00	0.00
5	0.00	0.00	0.00	-0.02	0.00	0.00
1	0.01	0.00	0.00	0.00	0.00	0.00
5	0.01	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	-0.01
5	0.00	0.00	0.00	0.00	0.00	-0.01

LOADING 3 LOADTYPE WIND TITLE 0.75W2

JOINT LOAD - UNIT KIP FEET

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z
1	0.00	0.00	-0.02	0.00	0.00	0.00
5	0.00	0.00	-0.02	0.00	0.00	0.00
1	0.00	0.00	0.00	-0.01	0.00	0.00
5	0.00	0.00	0.00	-0.01	0.00	0.00
1	0.01	0.00	0.00	0.00	0.00	0.00
5	0.01	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.01
5	0.00	0.00	0.00	0.00	0.00	0.01

FOR LOADING - 1
APPLIED JOINT EQUIVALENT LOADS

JOINT	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM-Z

```
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
     1 0.00000E+00-1.91548E-02 0.00000E+00 0.00000E+00 0.00000E+00-1.33984E-04
     2 0.00000E+00-4.82344E-03 0.00000E+00 0.00000E+00 0.00000E+00 1.20586E-03
     4 0.00000E+00-8.97821E-03 0.00000E+00 0.00000E+00 0.00000E+00-1.07188E-03
     5 0.00000E+00-1.91548E-02 0.00000E+00 0.00000E+00 0.00000E+00-1.33984E-04
     6 0.00000E+00-4.82344E-03 0.00000E+00 0.00000E+00 0.00000E+00 1.20586E-03
     8 0.00000E+00-8.97821E-03 0.00000E+00 0.00000E+00 0.00000E+00-1.07188E-03

          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     1
          LOADTYPE DEAD  TITLE DL


           CENTER OF FORCE BASED ON Y FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.428929498E+00
                        Y =  0.000000000E+00
                        Z =  0.100000003E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     1 )
       SUMMATION FORCE-X =  0.0000000E+00
       SUMMATION FORCE-Y = -6.5912836E-02
       SUMMATION FORCE-Z =  0.0000000E+00

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=  6.5912838E-02  MY=  0.0000000E+00  MZ= -2.8271960E-02


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     1 )
       SUMMATION FORCE-X =  0.0000000E+00
       SUMMATION FORCE-Y =  6.5912836E-02
       SUMMATION FORCE-Z =  0.0000000E+00

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX= -6.5912838E-02  MY=  0.0000000E+00  MZ=  2.8271960E-02


   MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      1)
             MAXIMUMS    AT NODE
      X =  0.00000E+00       0
      Y = -1.54897E-03       5
      Z =  0.00000E+00       0
      RX=  3.36931E-06       4
      RY=  0.00000E+00       0
      RZ=  9.38999E-05       5



   EXTERNAL AND INTERNAL JOINT LOAD SUMMARY ( KIP  FEET )-

   JT      EXT FX/   EXT FY/   EXT FZ/    EXT MX/    EXT MY/    EXT MZ/
           INT FX    INT FY    INT FZ     INT MX     INT MY     INT MZ

                                                                      SUPPORT=1
FOR LOADING -     2
```

```
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
     1 1.40000E-02 0.00000E+00-2.61000E-02-1.62000E-02 0.00000E+00-8.00000E-03
     5 1.40000E-02 0.00000E+00-2.61000E-02-1.62000E-02 0.00000E+00-8.00000E-03

          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     2
          LOADTYPE WIND  TITLE W1


           CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.000000000E+00
                        Y =  0.571428576E+00
                        Z =  0.100000003E+01

           CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.000000000E+00
                        Y =  0.620689705E+00
                        Z =  0.100000003E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     2 )
       SUMMATION FORCE-X =  2.8000001E-02
       SUMMATION FORCE-Y =  0.0000000E+00
       SUMMATION FORCE-Z = -5.2200001E-02

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX= -3.2400003E-02  MY=  2.8000002E-02  MZ= -1.6000001E-02


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     2 )
       SUMMATION FORCE-X = -2.8000001E-02
       SUMMATION FORCE-Y = -2.4286129E-17
       SUMMATION FORCE-Z =  5.2200001E-02

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=  3.2400003E-02  MY= -2.8000002E-02  MZ=  1.6000001E-02


   MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      2)
            MAXIMUMS    AT NODE
      X =  1.73499E-05      1
      Y =  1.10496E-03      5
      Z = -2.63671E-04      1
      RX= -1.94190E-03      1
      RY= -7.76191E-06      8
      RZ= -7.15585E-05      5
```

```
   EXTERNAL AND INTERNAL JOINT LOAD SUMMARY ( KIP  FEET )-

   JT     EXT FX/   EXT FY/   EXT FZ/    EXT MX/    EXT MY/    EXT MZ/
          INT FX    INT FY    INT FZ     INT MX     INT MY     INT MZ

                                                                         SUPPORT=1
FOR LOADING -     3
APPLIED JOINT EQUIVALENT LOADS
 JOINT   FORCE-X     FORCE-Y     FORCE-Z      MOM-X       MOM-Y       MOM-Z
     1 1.10000E-02 0.00000E+00-1.90000E-02-1.20000E-02 0.00000E+00 6.00000E-03
     5 1.10000E-02 0.00000E+00-1.90000E-02-1.20000E-02 0.00000E+00 6.00000E-03

          STATIC LOAD/REACTION/EQUILIBRIUM SUMMARY FOR CASE NO.     3
          LOADTYPE WIND  TITLE 0.75W2


           CENTER OF FORCE BASED ON X FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.000000000E+00
                        Y = -0.545454541E+00
                        Z =  0.100000003E+01

           CENTER OF FORCE BASED ON Z FORCES ONLY (FEET).
         (FORCES IN NON-GLOBAL DIRECTIONS WILL INVALIDATE RESULTS)

                        X =  0.000000000E+00
                        Y =  0.631578959E+00
                        Z =  0.100000003E+01

   ***TOTAL APPLIED LOAD ( KIP  FEET ) SUMMARY (LOADING     3 )
       SUMMATION FORCE-X =  2.2000000E-02
       SUMMATION FORCE-Y =  0.0000000E+00
       SUMMATION FORCE-Z = -3.7999999E-02

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX= -2.4000000E-02  MY=  2.2000001E-02  MZ=  1.2000000E-02


   ***TOTAL REACTION LOAD( KIP  FEET ) SUMMARY (LOADING     3 )
       SUMMATION FORCE-X = -2.2000000E-02
       SUMMATION FORCE-Y = -1.5612511E-16
       SUMMATION FORCE-Z =  3.7999999E-02

      SUMMATION OF MOMENTS AROUND THE ORIGIN-
      MX=  2.4000000E-02  MY= -2.2000001E-02  MZ= -1.2000000E-02
```

```
  MAXIMUM DISPLACEMENTS ( INCH /RADIANS) (LOADING      3)
           MAXIMUMS    AT NODE
     X =  1.29772E-05       1
     Y = -8.22073E-04       1
     Z = -1.91973E-04       1
     RX= -1.43849E-03       5
     RY= -5.65413E-06       8
     RZ=  5.33049E-05       1



  EXTERNAL AND INTERNAL JOINT LOAD SUMMARY ( KIP  FEET )-

  JT     EXT FX/   EXT FY/   EXT FZ/    EXT MX/    EXT MY/    EXT MZ/
         INT FX    INT FY    INT FZ     INT MX     INT MY     INT MZ

                                                                      SUPPORT=1

  LOAD COMBINATION NO.     4
  1.25DL

LOADING-     1.
FACTOR -   1.25

  LOAD COMBINATION NO.     5
  1.1DL+1.0W1

LOADING-     1.     2.
FACTOR -   1.10   1.00

  LOAD COMBINATION NO.     6
  1.1DL+1.0W2

LOADING-     1.     3.
FACTOR -   1.10   1.00


  ************ END OF DATA FROM INTERNAL STORAGE ************


   80. PARAMETER 2
   81. CODE LRFD
   82. CHECK CODE ALL
```

STAAD.Pro CODE CHECKING - (LRFD 3RD EDITION) v1.0
****

ALL UNITS ARE - KIP FEET (UNLESS OTHERWISE Noted)

MEMBER	TABLE	RESULT/ FX	CRITICAL COND/ MY	RATIO/ MZ	LOADING/ LOCATION
1 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.006	6
		0.02 C	0.01	0.02	0.50
3 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.019	6
		0.03 C	-0.02	0.08	1.50
4 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS FLEX+AXL	0.005	2
		0.00 T	0.02	-0.01	0.50
5 ST	HSST3X3X0.188		(AISC SECTIONS)		
		PASS	HSS BEND Z	0.012	4
		0.00 C	0.00	0.06	1.50

************** END OF TABULATED RESULT OF DESIGN **************

83. FINISH

```
          *********** END OF THE STAAD.Pro RUN ***********

            **** DATE= JUL 19,2018   TIME= 13: 4:15 ****

      ************************************************************
      *   For technical assistance on STAAD.Pro, please visit    *
      *   http://selectservices.bentley.com/en-US/               *
      *                                                          *
      *   Details about additional assistance from               *
      *   Bentley and Partners can be found at program menu      *
      *   Help->Technical Support                                *
      *                                                          *
      *      Copyright (c) 1997-2016 Bentley Systems, Inc.       *
      *                http://www.bentley.com                    *
      ************************************************************
```

Job Information

	Engineer	Checked	Approved
Name:	IERM		
Date:	19-Jun-18		

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	6	Highest Node	8
Number of Elements	4	Highest Beam	5
Number of Plates	1	Highest Plate	6

Number of Basic Load Cases	3
Number of Combination Load Cases	3

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

Type	L/C	Name
Primary	1	DL
Primary	2	W1
Primary	3	0.75W2
Combination	4	1.25DL
Combination	5	1.1DL+1.0W1
Combination	6	1.1DL+1.0W2

Beams

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	1	4	0.500	4	0
3	4	2	1.500	3	0
4	5	8	0.500	5	0
5	8	6	1.500	2	0

Plates

Plate	Node A	Node B	Node C	Node D	Property
6	8	4	1	5	1

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	A500-GR.B	29E+3	0.300	0.000	6E -6
2	STEEL	29E+3	0.300	0.000	6E -6
3	STAINLESSSTEEL	28E+3	0.300	0.000	10E -6
4	ALUMINUM	10E+3	0.330	0.000	13E -6
5	CONCRETE	3.15E+3	0.170	0.000	5E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip˙ft/deg)	rY (kip˙ft/deg)	rZ (kip˙ft/deg)
2	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
6	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

Primary Load Cases

Number	Name	Type
1	DL	Dead
2	W1	Wind
3	0.75W2	Wind

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
4	1.25DL	1	DL	1.25
5	1.1DL+1.0W1	1	DL	1.10
		2	W1	1.00
6	1.1DL+1.0W2	1	DL	1.10
		3	0.75W2	1.00

Node Displacement Summary

	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Max X	1	2:W1	**0.000**	-0.000	-0.000	0.000	-0.002	-0.000	0.000
Min X	5	2:W1	**-0.000**	0.001	-0.000	0.001	-0.002	-0.000	-0.000
Max Y	5	2:W1	-0.000	**0.001**	-0.000	0.001	-0.002	-0.000	-0.000
Min Y	1	6:1.1DL+1.0W2	0.000	**-0.003**	-0.000	0.003	-0.001	-0.000	0.000
Max Z	1	1:DL	0.000	-0.002	**0.000**	0.002	0.000	0.000	0.000
Min Z	1	2:W1	0.000	-0.000	**-0.000**	0.000	-0.002	-0.000	0.000
Max rX	8	2:W1	-0.000	0.001	-0.000	0.001	**0.001**	-0.000	-0.000
Min rX	1	2:W1	0.000	-0.000	-0.000	0.000	**-0.002**	-0.000	0.000
Max rY	1	1:DL	0.000	-0.002	0.000	0.002	0.000	**0.000**	0.000
Min rY	8	2:W1	-0.000	0.001	-0.000	0.001	0.001	**-0.000**	-0.000
Max rZ	1	6:1.1DL+1.0W2	0.000	-0.003	-0.000	0.003	-0.001	-0.000	**0.000**
Min rZ	5	2:W1	-0.000	0.001	-0.000	0.001	-0.002	-0.000	**-0.000**
Max Rst	1	6:1.1DL+1.0W2	0.000	-0.003	-0.000	**0.003**	-0.001	-0.000	0.000

Beam Displacement Detail Summary

Displacements shown in italic indicate the presence of an offset

	Beam	L/C	d (ft)	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	1	2:W1	0.000	**0.000**	-0.000	-0.000	0.000
Min X	4	2:W1	0.150	**-0.000**	0.001	-0.000	0.001
Max Y	4	2:W1	0.000	0.000	**0.001**	-0.000	0.001
Min Y	1	6:1.1DL+1.0W2	0.000	0.000	**-0.003**	-0.000	0.003
Max Z	1	1:DL	0.000	0.000	-0.002	**0.000**	0.002
Min Z	1	2:W1	0.000	0.000	-0.000	**-0.000**	0.000
Max Rst	1	6:1.1DL+1.0W2	0.000	0.000	-0.003	-0.000	**0.003**

Beam End Displacement Summary

Displacements shown in italic indicate the presence of an offset

	Beam	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)
Max X	1	1	2:W1	**0.000**	-0.000	-0.000	0.000
Min X	4	8	2:W1	**-0.000**	0.001	-0.000	0.001
Max Y	4	5	2:W1	0.000	**0.001**	-0.000	0.001
Min Y	1	1	6:1.1DL+1.0W2	0.000	**-0.003**	-0.000	0.003
Max Z	1	1	1:DL	0.000	-0.002	**0.000**	0.002
Min Z	1	1	2:W1	0.000	-0.000	**-0.000**	0.000
Max Rst	1	1	6:1.1DL+1.0W2	0.000	-0.003	-0.000	**0.003**

Beam End Force Summary

The signs of the forces at end B of each beam have been reversed. For example: this means that the Min Fx entry gives the largest tension value for an beam.

				Axial	Shear		Torsion	Bending	
	Beam	Node	L/C	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)
Max Fx	3	4	2:W1	**0.044**	-0.016	-0.026	0.000	0.205	-0.081
Min Fx	5	8	2:W1	**-0.016**	0.016	-0.026	0.000	0.204	-0.111
Max Fy	5	8	2:W1	-0.016	**0.016**	-0.026	0.000	0.204	-0.111
Min Fy	3	2	5:1.1DL+1.0W'	0.044	**-0.052**	-0.026	0.000	-0.266	0.894
Max Fz	1	1	2:W1	0.026	-0.015	**0.034**	-0.000	-0.021	-0.154
Min Fz	3	4	2:W1	0.044	-0.016	**-0.026**	0.000	0.205	-0.081
Max Mx	5	8	2:W1	-0.016	0.016	-0.026	**0.000**	0.204	-0.111
Min Mx	1	1	5:1.1DL+1.0W'	0.026	-0.034	0.034	**-0.000**	-0.021	-0.155
Max My	3	4	2:W1	0.044	-0.016	-0.026	0.000	**0.205**	-0.081
Min My	3	2	2:W1	0.044	-0.016	-0.026	0.000	**-0.266**	0.210
Max Mz	3	2	6:1.1DL+1.0W2	0.033	-0.048	-0.019	0.000	-0.194	**0.982**
Min Mz	5	6	2:W1	-0.016	0.016	-0.026	0.000	-0.265	**-0.402**

Beam Force Detail Summary

Sign convention as diagrams:- positive above line, negative below line except Fx where positive is compression. Distance d is given from beam end A.

				Axial	Shear		Torsion	Bending	
	Beam	L/C	d (ft)	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip-in)	My (kip-in)	Mz (kip-in)
Max Fx	3	2:W1	0.000	**0.044**	-0.016	-0.026	0.000	0.205	-0.081
Min Fx	5	2:W1	0.000	**-0.016**	0.016	-0.026	0.000	0.204	-0.111
Max Fy	5	2:W1	0.000	-0.016	**0.016**	-0.026	0.000	0.204	-0.111
Min Fy	3	5:1.1DL+1.0W'	1.500	0.044	**-0.052**	-0.026	0.000	-0.266	0.894
Max Fz	1	2:W1	0.000	0.026	-0.015	**0.034**	-0.000	-0.021	-0.154
Min Fz	3	2:W1	0.000	0.044	-0.016	**-0.026**	0.000	0.205	-0.081
Max Mx	5	2:W1	0.000	-0.016	0.016	-0.026	**0.000**	0.204	-0.111
Min Mx	1	5:1.1DL+1.0W'	0.000	0.026	-0.034	0.034	**-0.000**	-0.021	-0.155
Max My	3	2:W1	0.000	0.044	-0.016	-0.026	0.000	**0.205**	-0.081
Min My	3	2:W1	1.500	0.044	-0.016	-0.026	0.000	**-0.266**	0.210
Max Mz	3	6:1.1DL+1.0W2	1.500	0.033	-0.048	-0.019	0.000	-0.194	**0.982**
Min Mz	5	2:W1	1.500	-0.016	0.016	-0.026	0.000	-0.265	**-0.402**

Beam Combined Axial and Bending Stresses Summary

			Max Comp			Max Tens		
Beam	**L/C**	**Length** (ft)	**Stress** (psi)	**d** (ft)	**Corner**	**Stress** (psi)	**d** (ft)	**Corner**
1	1:DL	0.500	69.858	0.500	3	-69.858	0.500	1
	2:W1	0.500	164.766	0.500	2	-136.995	0.500	4
	3:0.75W2	0.500	149.820	0.500	3	-128.816	0.500	1
	4:1.25DL	0.500	87.323	0.500	3	-87.323	0.500	1
	5:1.1DL+1.0W1	0.500	163.855	0.500	3	-136.084	0.500	1
	6:1.1DL+1.0W2	0.500	226.664	0.500	3	-205.660	0.500	1
3	1:DL	1.500	378.855	1.500	3	-378.855	1.500	1
	2:W1	1.500	313.516	1.500	4	-266.867	1.500	2
	3:0.75W2	1.500	317.570	1.500	4	-282.756	1.500	2
	4:1.25DL	1.500	473.569	1.500	3	-473.569	1.500	1
	5:1.1DL+1.0W1	1.500	730.256	1.500	4	-683.608	1.500	2
	6:1.1DL+1.0W2	1.500	734.310	1.500	4	-699.496	1.500	2
4	1:DL	0.500	69.858	0.500	3	-69.858	0.500	1
	2:W1	0.500	193.742	0.500	2	-194.237	0.500	4
	3:0.75W2	0.500	114.514	0.500	3	-114.086	0.500	1
	4:1.25DL	0.500	87.323	0.500	3	-87.323	0.500	1
	5:1.1DL+1.0W1	0.500	116.898	0.500	2	-117.393	0.500	1
	6:1.1DL+1.0W2	0.500	191.358	0.500	3	-190.930	0.500	1
5	1:DL	1.500	378.855	1.500	3	-378.855	1.500	1
	2:W1	1.500	398.303	1.500	1	-415.322	1.500	3
	3:0.75W2	1.500	206.236	1.500	1	-217.769	1.500	3
	4:1.25DL	1.500	473.569	1.500	3	-473.569	1.500	1
	5:1.1DL+1.0W1	1.500	324.636	1.500	4	-341.655	1.500	2
	6:1.1DL+1.0W2	1.500	434.237	1.500	4	-445.771	1.500	2

Plate Center Stress Summary

			Shear		Membrane			Bending		
	Plate	**L/C**	**Qx** (psi)	**Qy** (psi)	**Sx** (psi)	**Sy** (psi)	**Sxy** (psi)	**Mx** (lb-in/in)	**My** (lb-in/in)	**Mxy** (lb-in/in)
Max Qx	6	2:W1	**10.800**	0.000	-0.046	-0.371	20.055	-0.000	-0.050	6.889
Min Qx	6	4:1.25DL	**-0.000**	-0.001	0.000	0.000	0.000	0.000	0.037	-0.000
Max Qy	6	2:W1	10.800	**0.000**	-0.046	-0.371	20.055	-0.000	-0.050	6.889
Min Qy	6	4:1.25DL	-0.000	**-0.001**	0.000	0.000	0.000	0.000	0.037	-0.000
Max Sx	6	1:DL	-0.000	-0.001	**0.000**	0.000	0.000	0.000	0.029	-0.000
Min Sx	6	2:W1	10.800	0.000	**-0.046**	-0.371	20.055	-0.000	-0.050	6.889
Max Sy	6	1:DL	-0.000	-0.001	0.000	**0.000**	0.000	0.000	0.029	-0.000
Min Sy	6	2:W1	10.800	0.000	-0.046	**-0.371**	20.055	-0.000	-0.050	6.889
Max Sxy	6	2:W1	10.800	0.000	-0.046	-0.371	**20.055**	-0.000	-0.050	6.889
Min Sxy	6	1:DL	-0.000	-0.001	0.000	0.000	**0.000**	0.000	0.029	-0.000
Max Mx	6	6:1.1DL+1.0W2	8.000	-0.001	-0.036	-0.291	14.600	**0.000**	0.070	5.103
Min Mx	6	2:W1	10.800	0.000	-0.046	-0.371	20.055	**-0.000**	-0.050	6.889
Max My	6	6:1.1DL+1.0W2	8.000	-0.001	-0.036	-0.291	14.600	0.000	**0.070**	5.103

Plate Center Stress Summary Cont...

	Plate	L/C	Shear		Membrane			Bending		
			Qx (psi)	Qy (psi)	Sx (psi)	Sy (psi)	Sxy (psi)	Mx (lb-in/in)	My (lb-in/in)	Mxy (lb-in/in)
Min My	6	2:W1	10.800	0.000	-0.046	-0.371	20.055	-0.000	**-0.050**	6.889
Max Mxy	6	2:W1	10.800	0.000	-0.046	-0.371	20.055	-0.000	-0.050	**6.889**
Min Mxy	6	4:1.25DL	-0.000	-0.001	0.000	0.000	0.000	0.000	0.037	**-0.000**

Reaction Summary

	Node	L/C	Horizontal	Vertical	Horizontal	Moment		
			FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
Max FX	6	2:W1	**0.016**	-0.016	0.026	-0.000	0.265	0.402
Min FX	2	2:W1	**-0.044**	0.016	0.026	-0.000	0.266	-0.210
Max FY	2	5:1.1DL+1.0W'	-0.044	**0.052**	0.026	-0.000	0.266	-0.894
Min FY	6	2:W1	0.016	**-0.016**	0.026	-0.000	0.265	0.402
Max FZ	2	2:W1	-0.044	0.016	**0.026**	-0.000	0.266	-0.210
Min FZ	2	1:DL	0.000	0.033	**0.000**	-0.000	0.000	-0.621
Max MX	6	4:1.25DL	0.000	0.041	0.000	**0.000**	0.000	-0.777
Min MX	6	2:W1	0.016	-0.016	0.026	**-0.000**	0.265	0.402
Max MY	2	2:W1	-0.044	0.016	0.026	-0.000	**0.266**	-0.210
Min MY	2	1:DL	0.000	0.033	0.000	-0.000	**0.000**	-0.621
Max MZ	6	2:W1	0.016	-0.016	0.026	-0.000	0.265	**0.402**
Min MZ	2	6:1.1DL+1.0W2	-0.033	0.048	0.019	-0.000	0.194	**-0.982**

Reactions

Node	L/C	Horizontal	Vertical	Horizontal	Moment		
		FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
2	1:DL	0.000	0.033	0.000	-0.000	0.000	-0.621
	2:W1	-0.044	0.016	0.026	-0.000	0.266	-0.210
	3:0.75W2	-0.033	0.012	0.019	-0.000	0.194	-0.299
	4:1.25DL	0.000	0.041	0.000	-0.000	0.000	-0.777
	5:1.1DL+1.0W'	-0.044	0.052	0.026	-0.000	0.266	-0.894
	6:1.1DL+1.0W2	-0.033	0.048	0.019	-0.000	0.194	-0.982
6	1:DL	0.000	0.033	0.000	0.000	0.000	-0.621
	2:W1	0.016	-0.016	0.026	-0.000	0.265	0.402
	3:0.75W2	0.011	-0.012	0.019	-0.000	0.193	0.155
	4:1.25DL	0.000	0.041	0.000	0.000	0.000	-0.777
	5:1.1DL+1.0W'	0.016	0.020	0.026	-0.000	0.265	-0.281
	6:1.1DL+1.0W2	0.011	0.024	0.019	-0.000	0.193	-0.529

Steel Design (Track 2) Beam 1 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES     |
|*************                                        |        IN INCH UNIT   |
|            *  |=============================|                ------------   |
|MEMBER   1  *  |  AISC SECTIONS              |                AX=0.1890E+1   |
|            *  | ST  HSST3X3X0.188          |           --Z  AY=0.1044E+1   |
|DESIGN CODE *  |                             |                AZ=0.1044E+1   |
| LRFD 2001  *  ===============================                PY=0.1970E+1   |
|            *                                                 PZ=0.1970E+1   |
|            *  |<---LENGTH (FT)=    0.50 --->|                RY=0.1141E+1   |
|*************                                                 RZ=0.1141E+1   |
|                                                                             |
|                 0.0 (KIP-FEET)                                              |
|PARAMETER        |                                      L6    CAPACITIES    |
|IN KIP  INCH     |                                            IN KIP  INCH  |
|---------------  +                                  L6        ------------- |
| KL/R-Y=   5.26  |                                L6          PNC=0.5775E+2|
| KL/R-Z=   5.26  +                                            pnc=0.1985E-1|
| UNL    =  6.00  |                            L6              PNT=0.6124E+2|
| CB     =  1.00  +L5                      L6                  pnt=0.0000E+0|
| PHIC   =  0.00  |   L2  L2                                   MNZ=0.6383E+2|
| PHIB   =  0.90  +           L2                               mnz=0.2210E+0|
| FYLD   = 36.00  |               L2  L6                       MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|    mny=0.1335E+0|
| DFF =     0.00   0.0                                         VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE             vn =0.3400E-1|
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.0         0.0        0.0         0.0         0.0         |
|   LOCATION       0.0         0.5        0.0         0.5         0.5         |
|    LOADING         2           5          2           2           6         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                          DESIGN SUMMARY  (KIP-FEET)                       *|
|*                          --------------                                   *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/              *|
|         FX              MY              MZ           LOCATION              |
|        ======================================================              |
|          PASS         HSS FLEX+AXL     0.006              6                |
|          0.02 C          0.01          0.02             0.50               |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
    1  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 3 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES     |
|*************                                        |        IN INCH UNIT   |
|             *  |=============================|                ------------ |
|MEMBER   3  *  |  AISC SECTIONS              |                AX=0.1890E+1 |
|             *  | ST  HSST3X3X0.188          |            --Z AY=0.1044E+1 |
|DESIGN CODE *  |                             |                AZ=0.1044E+1 |
| LRFD 2001  *  ===============================                PY=0.1970E+1 |
|             *                                                PZ=0.1970E+1 |
|             *  |<---LENGTH (FT)=    1.50 --->|               RY=0.1141E+1 |
|*************                                                 RZ=0.1141E+1 |
|                                                                             |
|                  0.1 (KIP-FEET)                                             |
|PARAMETER        |                                      L6    CAPACITIES     |
|IN KIP  INCH     |                                  L6        IN KIP  INCH   |
|---------------  +                             L6  L6         -------------|
| KL/R-Y=  15.78  |                         L6                 PNC=0.5708E+2|
| KL/R-Z=  15.78  +                                            pnc=0.3290E-1|
| UNL    = 18.00  |                     L6                     PNT=0.6124E+2|
| CB     =  1.00  +                 L6                         pnt=0.0000E+0|
| PHIC   =  0.00  |             L6                             MNZ=0.6383E+2|
| PHIB   =  0.90  +   L6  L6                                   mnz=0.9822E+0|
| FYLD   = 36.00  |L6                                          MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|    mny=0.1935E+0|
| DFF =     0.00   0.0                                         VN =0.2030E+2|
| dff =     0.00               ABSOLUTE MZ ENVELOPE            vn =0.4825E-1|
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE       0.0          0.1        0.0         0.0         0.1        |
|   LOCATION       0.0          1.5        0.0         1.5         1.5        |
|    LOADING         2            5          2           2           6        |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX              MY             MZ          LOCATION                 |
|        ======================================================               |
|          PASS         HSS FLEX+AXL      0.019            6                  |
|          0.03 C          -0.02          0.08          1.50                  |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     3  ST   HSST3X3X0.188           (AISC SECTIONS)
```

Steel Design (Track 2) Beam 4 Check 1

```
|-----------------------------------------------------------------------------|
|                                                     Y        PROPERTIES     |
|*************                                        |        IN INCH UNIT   |
|            *  |=============================|               ------------    |
|MEMBER   4  *  |  AISC SECTIONS              |               AX=0.1890E+1   |
|            *  | ST  HSST3X3X0.188           |           --Z AY=0.1044E+1   |
|DESIGN CODE *  |                             |               AZ=0.1044E+1   |
| LRFD 2001  *  ===============================               PY=0.1970E+1   |
|            *                                                PZ=0.1970E+1   |
|            *  |<---LENGTH (FT)=    0.50 --->|               RY=0.1141E+1   |
|*************                                                RZ=0.1141E+1   |
|                                                                             |
|                  0.0 (KIP-FEET)                                             |
|PARAMETER        |                                     L6    CAPACITIES     |
|IN KIP  INCH     |                                 L6        IN KIP  INCH   |
|---------------  +                             L6            -------------  |
| KL/R-Y=   5.26  |                     L6  L6                PNC=0.5775E+2|
| KL/R-Z=   5.26  +                                           pnc=0.0000E+0|
| UNL    =  6.00  |                 L6                        PNT=0.6124E+2|
| CB     =  1.00  +             L6                            pnt=0.4678E-3|
| PHIC   =  0.00  |         L6                                MNZ=0.6383E+2|
| PHIB   =  0.90  +   L6  L6                                  mnz=0.1270E+0|
| FYLD   = 36.00  |L3                                         MNY=0.6383E+2|
| NSF    =  1.00  +---+---+---+---+---+---+---+---+---+---|   mny=0.1911E+0|
| DFF =     0.00   0.0                                        VN =0.2030E+2|
| dff =     0.00              ABSOLUTE MZ ENVELOPE            vn =0.1507E-1|
|                                (WITH LOAD NO.)                            |
|                                                                           |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                 |
|                      -------------------------                            |
|                                                                           |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z      |
|                                                                           |
|     VALUE      -0.0         0.0        0.0         0.0         0.0       |
|   LOCATION      0.0         0.5        0.0         0.5         0.5       |
|    LOADING        2           4          2           2           6       |
|                                                                           |
|***************************************************************************|
|*                                                                         *|
|*                         DESIGN SUMMARY  (KIP-FEET)                      *|
|*                         --------------                                  *|
|*                                                                         *|
|*       RESULT/     CRITICAL COND/     RATIO/         LOADING/            *|
|         FX              MY             MZ          LOCATION              |
|        ===================================================               |
|          PASS        HSS FLEX+AXL     0.005             2                |
|          0.00 T          0.02        -0.01            0.50               |
|*                                                                         *|
|***************************************************************************|
|                                                                           |
|---------------------------------------------------------------------------|
     4  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Steel Design (Track 2) Beam 5 Check 1

```
|-----------------------------------------------------------------------------|
|                                                      Y        PROPERTIES    |
|*************                                         |        IN INCH UNIT  |
|            *  |=============================|                 ------------  |
|MEMBER   5  *  | AISC SECTIONS               |                 AX=0.1890E+1  |
|            *  | ST  HSST3X3X0.188           |             --Z AY=0.1044E+1  |
|DESIGN CODE *  |                             |                 AZ=0.1044E+1  |
| LRFD 2001  *  ===============================                 PY=0.1970E+1  |
|            *                                                  PZ=0.1970E+1  |
|            *  |<---LENGTH (FT)=    1.50 --->|                 RY=0.1141E+1  |
|*************                                                  RZ=0.1141E+1  |
|                                                                             |
|                 0.1 (KIP-FEET)                                              |
|PARAMETER        |                                         L4  CAPACITIES    |
|IN KIP  INCH     |                                     L4      IN KIP  INCH  |
|---------------  +                                 L4          ------------- |
| KL/R-Y=  15.78  |                               L4            PNC=0.5708E+2 |
| KL/R-Z=  15.78  +                           L4                pnc=0.0000E+0 |
| UNL   =  18.00  |                       L4                    PNT=0.6124E+2 |
| CB    =   1.00  +                   L4                        pnt=0.0000E+0 |
| PHIC  =   0.00  |                                             MNZ=0.6383E+2 |
| PHIB  =   0.90  +       L4  L4                                mnz=0.7767E+0 |
| FYLD  =  36.00  |L6 L6                                        MNY=0.6383E+2 |
| NSF   =   1.00  +---+---+---+---+---+---+---+---+---+---|     mny=0.0000E+0 |
| DFF =     0.00   0.0                                          VN =0.2030E+2 |
| dff =     0.00              ABSOLUTE MZ ENVELOPE              vn =0.4120E-1 |
|                                (WITH LOAD NO.)                              |
|                                                                             |
|                      MAX FORCE/ MOMENT SUMMARY  (KIP-FEET)                  |
|                      -------------------------                              |
|                                                                             |
|                AXIAL      SHEAR-Y    SHEAR-Z    MOMENT-Y    MOMENT-Z        |
|                                                                             |
|      VALUE      -0.0         0.0        0.0         0.0         0.1         |
|   LOCATION       0.0         1.5        0.0         1.5         1.5         |
|    LOADING         2           4          2           2           4         |
|                                                                             |
|*****************************************************************************|
|*                                                                           *|
|*                         DESIGN SUMMARY  (KIP-FEET)                        *|
|*                         --------------                                    *|
|*                                                                           *|
|*       RESULT/     CRITICAL COND/     RATIO/        LOADING/               *|
|         FX              MY             MZ          LOCATION                |
|        ======================================================              |
|          PASS        HSS BEND Z       0.012            4                   |
|          0.00 C         0.00          0.06           1.50                  |
|*                                                                           *|
|*****************************************************************************|
|                                                                             |
|-----------------------------------------------------------------------------|
     5  ST   HSST3X3X0.188            (AISC SECTIONS)
```

Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
1	HSST3X3X0	HSST3X3X0	0.006	1.000	0.006	HSS FLEX+A	6	1.890	2.460	2.460	4.030
3	HSST3X3X0	HSST3X3X0	0.019	1.000	0.019	HSS FLEX+A	6	1.890	2.460	2.460	4.030
4	HSST3X3X0	HSST3X3X0	0.005	1.000	0.005	HSS FLEX+A	2	1.890	2.460	2.460	4.030
5	HSST3X3X0	HSST3X3X0	0.012	1.000	0.012	HSS BEND Z	4	1.890	2.460	2.460	4.030

Failed Members

There is no data of this type.

Statics Check Results

L/C		FX (kip)	FY (kip)	FZ (kip)	MX (kip`in)	MY (kip`in)	MZ (kip`in)
1:DL	Loads	0.000	-0.066	0.000	0.791	0.000	-0.339
1:DL	Reactions	0.000	0.066	0.000	-0.791	0.000	0.339
	Difference	0.000	-0.000	0.000	0.000	0.000	-0.000
2:W1	Loads	0.028	0.000	-0.052	-0.389	0.336	-0.192
2:W1	Reactions	-0.028	-0.000	0.052	0.389	-0.336	0.192
	Difference	0.000	-0.000	-0.000	-0.000	0.000	0.000
3:0.75W2	Loads	0.022	0.000	-0.038	-0.288	0.264	0.144
3:0.75W2	Reactions	-0.022	-0.000	0.038	0.288	-0.264	-0.144
	Difference	0.000	-0.000	-0.000	-0.000	0.000	-0.000

Deflection

From the LTS 2017 Interim Revisions 10.4.2.2 the deflection allowed for a horizontal support is L/150. From Table 3 the greatest service load deflection, DL, is lower then the allowable, LTS.

Table 3:

Component	Beam	Span (ft)	Service (in)	LTS (L/150)	Check
MSE Wall	3	1.5	0	0.12	OK

STAAD
Deflections

Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
10	0.052	2.917	5	1630	-0.000	-0.075	-0.026
21	0.047	4.083	5	1803	0.001	-0.073	-0.022
10	0.046	2.917	8	1821	0.000	-0.067	-0.022
21	0.042	4.083	8	1984	0.001	-0.067	-0.017
21	0.035	4.083	4	2425	0.000	-0.054	-0.007
10	0.035	2.917	4	2425	-0.000	-0.054	-0.007
20	0.034	4.083	4	2457	0.000	-0.138	-0.007
4	0.034	2.917	4	2457	-0.000	-0.138	-0.007
10	0.030	2.917	6	2755	0.000	-0.046	-0.007
21	0.030	4.083	6	2757	0.001	-0.048	-0.005
20	0.030	4.083	6	2791	0.001	-0.120	-0.005
4	0.030	2.917	6	2793	0.001	-0.126	-0.007
4	0.018	2.917	8	4608	0.002	-0.091	-0.022
10	0.016	2.917	7	5355	0.000	-0.020	-0.016
20	0.016	4.083	7	5376	0.002	0.050	-0.011
20	0.015	4.083	8	5782	0.002	-0.071	-0.017
4	0.014	2.917	5	5984	0.002	-0.075	-0.027
4	0.012	2.917	7	7031	0.002	0.031	-0.017
21	0.012	4.083	7	7067	0.001	-0.020	-0.011
20	0.009	4.667	5	8886	0.001	-0.047	-0.017
2	0.003	0.750	4	5566	0.000	-0.016	-0.006
24	0.003	0.750	4	5566	-0.000	-0.016	-0.006
2	0.003	0.750	6	6280	0.001	-0.014	-0.006
24	0.003	0.750	6	6371	0.001	-0.016	-0.007
14	0.002	0.665	8	8253	0.001	-0.000	-0.002
14	0.002	0.665	5	8393	0.001	-0.000	-0.002
6	0.002	1.167	4	12746	-0.000	-0.010	-0.007
5	0.002	1.167	4	12746	0.000	-0.010	-0.007
11	0.002	0.665	4	9031	-0.001	-0.000	-0.002
14	0.002	0.665	4	9046	0.001	-0.000	-0.002
14	0.002	0.665	6	9219	0.001	-0.000	-0.002
24	0.002	0.750	8	10544	0.002	-0.021	-0.007
6	0.002	1.167	6	14069	0.000	-0.010	-0.007
2	0.002	0.750	8	11046	0.002	-0.017	-0.005
11	0.002	0.554	5	9909	-0.001	-0.000	-0.002
5	0.002	1.167	6	14924	0.001	-0.009	-0.006
11	0.002	0.665	8	9986	-0.000	-0.000	-0.001
11	0.002	0.665	6	10075	-0.000	-0.000	-0.001
6	0.001	1.167	8	16262	0.001	-0.011	-0.008
6	0.001	1.167	5	17639	0.001	-0.010	-0.007
24	0.001	0.750	5	13452	0.002	-0.021	-0.006
5	0.001	1.167	8	19297	0.001	-0.008	-0.006
2	0.001	0.750	7	14490	0.002	-0.003	0.000
2	0.001	0.750	5	15018	0.002	-0.018	-0.005
24	0.001	0.750	7	15474	0.002	-0.007	-0.001

Cont...

Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
5	0.001	1.167	5	20815	0.001	-0.008	-0.005
8	0.001	0.750	5	20967	0.001	0.003	-0.005
8	0.001	0.750	8	22173	0.001	0.003	-0.005
25	0.001	0.750	5	24726	0.000	0.003	-0.006
25	0.001	0.750	8	29743	0.000	0.002	-0.007
8	0.001	0.750	6	32121	0.000	0.002	-0.006
8	0.001	0.750	4	32493	0.000	0.002	-0.007
25	0.001	0.750	4	32493	-0.000	0.002	-0.007
5	0.000	1.167	7	57186	0.001	0.001	0.000
25	0.000	0.750	6	43511	0.000	0.002	-0.007
14	0.000	0.665	7	41340	0.000	-0.000	-0.001
8	0.000	0.750	7	51121	0.001	0.001	0.000
22	0.000	0.250	4	17812	0.000	-0.008	-0.006
3	0.000	0.250	4	17812	-0.000	-0.008	-0.006
11	0.000	0.554	7	47987	0.000	0.000	-0.000
22	0.000	0.250	6	19887	0.001	-0.008	-0.006
3	0.000	0.250	6	20601	0.001	-0.008	-0.007
6	0.000	1.333	7	113942	0.001	-0.001	-0.002
25	0.000	0.875	7	94232	0.001	0.001	-0.001
22	0.000	0.250	8	35808	0.002	-0.014	-0.006
3	0.000	0.250	8	37011	0.002	-0.015	-0.006
27	0.000	0.333	5	88692	-0.000	-0.324	-0.057
3	0.000	0.250	7	44638	0.002	-0.008	-0.000
22	0.000	0.250	7	46495	0.002	-0.008	-0.000
26	0.000	0.417	5	94446	0.002	-0.187	-0.058
3	0.000	0.250	5	49869	0.002	-0.017	-0.005
22	0.000	0.250	5	51145	0.002	-0.016	-0.005
27	0.000	0.417	8	113327	0.000	-0.295	-0.047
1	0.000	0.667	5	115401	0.001	-0.132	-0.048
26	0.000	0.417	8	118347	0.002	-0.235	-0.047
7	0.000	0.667	5	120711	0.001	-0.306	-0.048
1	0.000	0.667	7	141000	0.002	0.162	-0.030
27	0.000	0.333	7	142572	0.000	-0.092	-0.040
7	0.000	0.667	7	147374	0.001	-0.080	-0.030
26	0.000	0.333	7	147779	0.002	0.114	-0.040
1	0.000	0.667	8	155976	0.002	-0.184	-0.036
7	0.000	0.667	8	157097	0.001	-0.279	-0.036
23	0.000	0.250	5	86846	0.001	0.005	-0.005
23	0.000	0.250	8	92990	0.001	0.004	-0.006
9	0.000	0.250	5	93200	0.000	0.005	-0.005
9	0.000	0.250	8	116422	0.001	0.004	-0.006
15	0.000	0.105	5	110100	-0.000	-0.000	0.000
15	0.000	0.105	8	110100	-0.000	-0.000	0.000
7	0.000	0.583	4	266605	0.000	-0.230	-0.007
27	0.000	0.417	4	266693	-0.000	-0.230	-0.007

Cont...

Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
23	0.000	0.250	6	144893	0.000	0.003	-0.006
23	0.000	0.250	4	149434	0.000	0.003	-0.006
1	0.000	0.583	4	298962	0.000	-0.398	-0.007
26	0.000	0.417	4	298962	-0.000	-0.398	-0.007
27	0.000	0.417	6	301463	0.000	-0.200	-0.009
9	0.000	0.250	4	150801	-0.000	0.003	-0.006
7	0.000	0.583	6	303984	0.000	-0.204	-0.004
12	0.000	0.175	5	132120	0.000	-0.000	0.000
1	0.000	0.583	6	338634	0.001	-0.346	-0.004
26	0.000	0.417	6	340674	0.001	-0.358	-0.009
15	0.000	0.070	4	165150	-0.000	-0.000	0.000
16	0.000	0.125	8	294912	0.000	-0.000	0.000
12	0.000	0.140	8	165150	0.000	-0.000	0.000
15	0.000	0.070	6	165150	-0.000	-0.000	0.000
16	0.000	0.125	5	294912	0.000	-0.000	0.000
16	0.000	0.250	6	294912	0.000	-0.000	0.000
12	0.000	0.105	4	165150	0.000	-0.000	0.000
23	0.000	0.250	7	199474	0.001	0.001	-0.000
9	0.000	0.250	6	210266	0.000	0.003	-0.007
13	0.000	0.188	4	393216	-0.000	-0.000	0.000
13	0.000	0.313	8	393216	-0.000	-0.000	0.000
12	0.000	0.105	6	220200	0.000	-0.000	0.000
13	0.000	0.188	5	393216	-0.000	-0.000	0.000
9	0.000	0.250	7	363007	0.001	0.001	-0.000
31	0.000	0.750	8	781218	0.003	-0.041	-0.008
16	0.000	0.125	7	589824	0.000	-0.000	0.000
16	0.000	0.063	4	589824	0.000	-0.000	0.000
15	0.000	0.035	7	330301	-0.000	-0.000	0.000
13	0.000	0.188	6	589824	-0.000	-0.000	0.000
31	0.000	0.833	4	938431	0.000	-0.044	-0.007
29	0.000	0.458	4	524288	-0.000	-0.000	0.000
29	0.000	0.458	6	524288	-0.000	-0.000	0.000
31	0.000	0.417	7	1048576	0.003	-0.003	-0.002
29	0.000	0.417	7	589823	-0.000	-0.000	0.000
31	0.000	0.500	6	1454716	0.001	-0.037	-0.007
31	0.000	0.333	5	1968286	0.002	-0.032	-0.007
30	0.000	0.667	6	2149366	0.001	-0.036	-0.006
28	0.000	0.292	8	1179647	0.000	-0.000	0.000
29	0.000	0.042	8	1179647	0.000	-0.000	0.000
28	0.000	0.333	6	1179647	0.000	-0.000	0.000
28	0.000	0.333	5	1179647	0.000	-0.000	0.000
29	0.000	0.042	5	1179647	0.000	-0.000	0.000
30	0.000	0.500	8	2430079	0.002	-0.029	-0.006
30	0.000	0.333	4	3141637	-0.000	-0.035	-0.007
28	0.000	0.250	4	1572864	0.000	-0.000	0.000

Cont...

Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
30	0.000	0.500	7	3145728	0.002	0.005	0.000
30	0.000	0.333	5	3571863	0.001	-0.025	-0.005
12	0.000	0.000	7	0	0.000	0.000	0.000
28	0.000	0.000	7	0	0.000	0.000	0.000
13	0.000	0.000	7	0	0.000	0.000	0.000

Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
9	0.002	1.458	4	12090	0.000	-0.003	0.000
8	0.002	1.458	4	12090	0.000	-0.003	0.000
8	0.002	1.458	5	13193	0.000	-0.003	-0.001
8	0.002	1.458	6	13323	0.000	-0.003	-0.001
9	0.002	1.458	6	17928	-0.000	-0.002	-0.001
9	0.002	1.458	5	19877	-0.000	-0.002	-0.001
9	0.001	1.458	3	56483	-0.000	0.000	-0.001
8	0.000	1.875	3	145781	0.000	-0.000	-0.000
4	0.000	0.292	5	277563	-0.000	-0.009	-0.002
1	0.000	0.292	5	306942	0.000	-0.013	-0.002
4	0.000	0.292	3	325401	-0.000	0.003	-0.002
1	0.000	0.292	3	341911	0.000	-0.001	-0.002
4	0.000	0.333	6	357166	-0.000	-0.009	-0.002
1	0.000	0.292	6	402637	0.000	-0.013	-0.002
1	0.000	0.292	4	469010	0.000	-0.014	0.000
4	0.000	0.292	4	469010	0.000	-0.014	0.000

Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
12	0.051	2.917	6	1641	0.006	-0.154	-0.021
20	0.046	4.083	6	1815	0.006	-0.149	-0.021
19	0.034	4.083	5	2441	0.000	-0.111	0.000
20	0.034	4.083	5	2441	0.000	-0.111	0.000
4	0.034	2.917	5	2441	-0.000	-0.111	0.000
12	0.034	2.917	5	2441	-0.000	-0.111	0.000
12	0.030	2.917	7	2773	0.002	-0.097	-0.000
20	0.030	4.083	7	2773	0.002	-0.097	-0.000
19	0.030	4.083	7	2774	0.002	-0.098	-0.000
4	0.030	2.917	7	2774	0.002	-0.098	-0.000
12	0.016	2.917	4	5391	0.006	-0.042	-0.016
19	0.016	4.083	4	5392	0.006	0.042	-0.016
4	0.014	2.917	6	5851	0.006	-0.046	-0.021
20	0.012	4.083	4	7101	0.006	-0.037	-0.016
4	0.012	2.917	4	7101	0.006	0.037	-0.016
19	0.010	4.667	6	8618	0.006	-0.031	-0.016
24	0.005	0.750	6	3936	0.006	0.019	-0.003
10	0.004	0.750	6	4063	0.006	0.019	-0.003
24	0.003	0.750	5	5470	-0.000	0.014	0.000
22	0.003	0.750	5	5470	-0.000	0.014	0.000
10	0.003	0.750	5	5470	-0.000	0.014	0.000
2	0.003	0.750	5	5470	-0.000	0.014	0.000
2	0.003	0.750	7	6149	0.002	0.012	-0.001
22	0.003	0.750	7	6191	0.002	0.012	-0.001
10	0.003	0.750	7	6242	0.002	0.012	-0.001
24	0.003	0.750	7	6286	0.002	0.012	-0.001
22	0.001	0.750	6	12955	0.006	0.005	-0.003
2	0.001	0.750	4	14495	0.006	-0.005	-0.002
24	0.001	0.750	4	14496	0.006	0.005	-0.002
2	0.001	0.750	6	14499	0.006	0.005	-0.003
15	0.001	1.250	6	29013	0.001	-0.000	-0.001
14	0.001	1.750	6	30220	0.001	-0.000	-0.001
16	0.001	1.250	6	30346	0.001	-0.000	-0.001
13	0.001	1.750	6	31546	0.001	-0.000	-0.001
15	0.001	1.250	4	31709	0.001	-0.000	-0.001
14	0.001	1.750	4	31924	0.001	0.000	-0.001
10	0.001	0.750	4	16050	0.006	0.005	-0.002
22	0.001	0.750	4	16050	0.006	-0.005	-0.002
16	0.001	1.250	4	32656	0.001	-0.000	-0.001
13	0.001	1.750	4	32890	0.001	0.000	-0.001
11	0.000	0.250	6	12302	0.006	0.031	-0.002
23	0.000	0.250	6	12384	0.006	0.031	-0.002
11	0.000	0.250	5	17111	-0.000	0.022	0.000
3	0.000	0.250	5	17111	-0.000	0.022	0.000
23	0.000	0.250	5	17111	-0.000	0.022	0.000

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Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
21	0.000	0.250	5	17111	-0.000	0.022	0.000
16	0.000	1.250	7	107760	0.000	-0.000	-0.000
15	0.000	1.250	7	109416	0.000	-0.000	-0.000
3	0.000	0.250	7	19050	0.002	0.020	-0.001
21	0.000	0.250	7	19096	0.002	0.020	-0.001
13	0.000	1.250	7	116348	0.001	-0.000	-0.000
14	0.000	1.250	7	116557	0.001	-0.000	-0.000
11	0.000	0.250	7	19806	0.002	0.019	-0.001
23	0.000	0.250	7	19854	0.002	0.019	-0.001
15	0.000	2.000	5	176395	0.000	-0.000	0.000
16	0.000	2.000	5	176395	0.000	-0.000	0.000
13	0.000	1.000	5	176947	0.000	-0.000	-0.000
14	0.000	1.000	5	176947	0.000	-0.000	-0.000
3	0.000	0.250	6	45136	0.006	0.008	-0.002
26	0.000	0.333	6	91851	0.006	-0.522	-0.049
25	0.000	0.417	6	92494	0.007	-0.155	-0.049
21	0.000	0.250	6	46247	0.006	0.008	-0.002
11	0.000	0.250	4	46884	0.006	0.008	-0.002
21	0.000	0.250	4	46886	0.006	-0.008	-0.002
3	0.000	0.250	4	47593	0.006	-0.008	-0.002
23	0.000	0.250	4	47610	0.006	0.008	-0.002
17	0.000	0.333	6	100576	0.006	0.000	-0.003
17	0.000	0.500	5	104895	0.000	0.000	0.000
18	0.000	0.500	5	104895	0.000	0.000	0.000
1	0.000	0.667	6	115917	0.006	-0.127	-0.049
17	0.000	0.500	7	117090	0.002	0.000	-0.000
18	0.000	0.417	6	120112	0.006	0.000	-0.003
9	0.000	0.667	6	120414	0.007	-0.496	-0.049
18	0.000	0.500	7	121024	0.002	0.000	-0.000
8	0.000	0.250	6	62501	0.006	-0.000	-0.003
6	0.000	0.292	6	67412	0.006	-0.000	-0.003
5	0.000	0.292	6	69526	0.006	-0.000	-0.003
1	0.000	0.667	4	142208	0.005	0.146	-0.037
26	0.000	0.333	4	144340	0.005	-0.146	-0.037
7	0.000	0.167	6	72788	0.006	-0.000	-0.003
9	0.000	0.667	4	145921	0.006	-0.125	-0.037
25	0.000	0.333	4	146412	0.006	0.125	-0.037
7	0.000	0.250	4	87217	0.006	-0.000	-0.003
5	0.000	0.292	4	91206	0.006	-0.000	-0.003
6	0.000	0.208	4	91424	0.006	0.000	-0.003
8	0.000	0.208	4	97790	0.006	0.000	-0.003
17	0.000	0.250	4	258043	0.006	0.000	-0.003
25	0.000	0.417	5	281970	-0.000	-0.374	0.000
9	0.000	0.583	5	281970	0.000	-0.374	0.000
1	0.000	0.583	5	281970	0.000	-0.374	0.000

Cont...

Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
26	0.000	0.417	5	281970	-0.000	-0.374	0.000
18	0.000	0.750	4	296433	0.006	0.000	-0.003
9	0.000	0.583	7	319705	0.002	-0.328	-0.000
26	0.000	0.417	7	319832	0.002	-0.327	-0.000
1	0.000	0.583	7	320838	0.002	-0.331	-0.000
25	0.000	0.417	7	320964	0.002	-0.331	-0.000
5	0.000	0.292	5	243337	0.000	-0.000	-0.000
7	0.000	0.292	5	243337	0.000	-0.000	-0.000
6	0.000	0.208	5	243337	0.000	-0.000	0.000
8	0.000	0.208	5	243337	0.000	-0.000	0.000
8	0.000	0.208	7	243986	0.002	-0.000	-0.000
7	0.000	0.292	7	260488	0.002	-0.000	-0.000
6	0.000	0.208	7	270853	0.002	-0.000	-0.000
5	0.000	0.292	7	282259	0.002	-0.000	-0.000

Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
9	0.001	1.458	4	29971	0.000	-0.001	0.000
8	0.001	1.458	4	29971	0.000	-0.001	0.000
8	0.001	1.458	5	31926	0.000	-0.001	-0.000
8	0.001	1.458	6	32764	0.000	-0.001	-0.000
9	0.001	1.458	6	49301	-0.000	-0.001	-0.000
9	0.001	1.458	5	56551	-0.000	-0.001	-0.000
9	0.000	1.458	3	108890	-0.000	0.000	-0.000
8	0.000	1.875	3	486952	0.000	-0.000	-0.000
4	0.000	0.292	5	826150	-0.000	-0.003	-0.001
4	0.000	0.292	3	915293	-0.000	0.001	-0.000
1	0.000	0.250	3	932096	0.000	-0.000	-0.000
1	0.000	0.250	5	1061605	0.000	-0.006	-0.001
4	0.000	0.208	6	1218797	-0.000	-0.004	-0.000
1	0.000	0.292	6	1429995	0.000	-0.005	-0.000
1	0.000	0.292	4	1486562	0.000	-0.006	0.000
4	0.000	0.292	4	1486562	0.000	-0.006	0.000

Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
10	0.052	2.917	5	1630	-0.000	-0.073	-0.025
18	0.047	4.083	5	1803	0.001	-0.070	-0.021
10	0.046	2.917	8	1820	-0.000	-0.065	-0.020
18	0.042	4.083	8	1984	0.001	-0.064	-0.016
18	0.035	4.083	4	2425	0.000	-0.052	-0.006
10	0.035	2.917	4	2425	-0.000	-0.052	-0.006
17	0.034	4.083	4	2457	0.000	-0.137	-0.006
4	0.034	2.917	4	2457	-0.000	-0.137	-0.006
10	0.030	2.917	6	2755	0.000	-0.045	-0.006
18	0.030	4.083	6	2756	0.000	-0.046	-0.004
17	0.030	4.083	6	2792	0.001	-0.118	-0.004
4	0.030	2.917	6	2793	0.001	-0.124	-0.006
4	0.018	2.917	8	4609	0.002	-0.088	-0.020
10	0.016	2.917	7	5355	0.000	-0.020	-0.015
17	0.016	4.083	7	5374	0.001	0.050	-0.012
17	0.015	4.083	8	5786	0.001	-0.070	-0.016
4	0.014	2.917	5	5986	0.001	-0.072	-0.025
4	0.012	2.917	7	7032	0.002	0.032	-0.016
18	0.012	4.083	7	7063	0.001	-0.019	-0.012
17	0.009	4.667	5	8895	0.001	-0.046	-0.016
2	0.003	0.750	4	5566	0.000	-0.014	-0.005
21	0.003	0.750	4	5566	-0.000	-0.014	-0.005
2	0.003	0.750	6	6280	0.001	-0.013	-0.005
21	0.003	0.750	6	6372	0.001	-0.014	-0.005
5	0.002	1.167	4	12746	0.000	-0.010	-0.005
6	0.002	1.167	4	12746	-0.000	-0.010	-0.005
21	0.002	0.750	8	10539	0.001	-0.019	-0.005
6	0.002	1.167	6	14066	0.000	-0.009	-0.005
2	0.002	0.750	8	11042	0.001	-0.015	-0.004
5	0.002	1.167	6	14924	0.001	-0.009	-0.005
6	0.001	1.167	8	16258	0.001	-0.010	-0.006
6	0.001	1.167	5	17650	0.000	-0.009	-0.006
21	0.001	0.750	5	13438	0.001	-0.019	-0.005
5	0.001	1.167	8	19309	0.001	-0.007	-0.004
2	0.001	0.750	7	14485	0.001	-0.003	0.001
2	0.001	0.750	5	14999	0.001	-0.016	-0.004
21	0.001	0.750	7	15467	0.001	-0.006	-0.000
5	0.001	1.167	5	20827	0.001	-0.007	-0.004
14	0.001	0.500	5	11060	0.001	-0.000	-0.002
14	0.001	0.500	8	11079	0.001	-0.000	-0.002
11	0.001	0.500	4	11626	-0.000	-0.000	-0.002
14	0.001	0.500	4	11626	0.000	-0.000	-0.002
14	0.001	0.500	6	12251	0.000	-0.000	-0.002
11	0.001	0.417	5	12709	-0.000	-0.000	-0.002
11	0.001	0.417	8	12933	-0.000	-0.000	-0.002

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Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
11	0.001	0.500	6	13147	-0.000	-0.000	-0.002
8	0.001	0.750	5	24349	0.001	0.003	-0.004
8	0.001	0.750	8	25886	0.001	0.002	-0.004
22	0.001	0.750	5	27400	0.000	0.002	-0.005
22	0.001	0.750	8	33037	0.000	0.002	-0.005
8	0.000	0.750	6	37522	0.000	0.002	-0.005
22	0.000	0.750	4	37615	-0.000	0.002	-0.005
8	0.000	0.750	4	37617	0.000	0.002	-0.005
5	0.000	1.333	7	57128	0.001	0.001	0.000
22	0.000	0.750	6	49819	0.000	0.001	-0.005
3	0.000	0.250	4	17812	-0.000	-0.006	-0.005
19	0.000	0.250	4	17812	0.000	-0.006	-0.005
8	0.000	0.750	7	58670	0.000	0.001	0.001
19	0.000	0.250	6	19886	0.001	-0.006	-0.005
3	0.000	0.250	6	20599	0.001	-0.007	-0.005
15	0.000	0.313	8	32907	-0.000	-0.000	0.000
15	0.000	0.313	5	34221	-0.000	-0.000	0.000
15	0.000	0.313	6	39056	-0.000	-0.000	0.000
15	0.000	0.250	4	40970	-0.000	-0.000	0.000
12	0.000	0.313	4	40970	0.000	-0.000	0.000
11	0.000	0.417	7	55397	0.000	0.000	0.000
6	0.000	1.500	7	115652	0.001	-0.001	-0.001
14	0.000	0.417	7	57959	0.000	-0.000	-0.001
12	0.000	0.250	5	46189	0.000	-0.000	0.000
12	0.000	0.250	6	46296	0.000	-0.000	0.000
22	0.000	0.750	7	93130	0.000	0.001	-0.000
12	0.000	0.250	8	46629	0.000	-0.000	0.000
19	0.000	0.250	8	35814	0.001	-0.012	-0.004
3	0.000	0.250	8	37005	0.001	-0.013	-0.005
3	0.000	0.250	7	44640	0.001	-0.008	0.000
24	0.000	0.417	5	89898	-0.000	-0.325	-0.055
19	0.000	0.250	7	46485	0.001	-0.007	0.000
23	0.000	0.417	5	94338	0.002	-0.183	-0.055
3	0.000	0.250	5	49871	0.001	-0.015	-0.004
19	0.000	0.250	5	51163	0.001	-0.014	-0.004
24	0.000	0.417	8	113768	-0.000	-0.291	-0.044
1	0.000	0.667	5	116090	0.001	-0.132	-0.048
23	0.000	0.417	8	117509	0.002	-0.232	-0.044
7	0.000	0.667	5	120720	0.001	-0.300	-0.048
16	0.000	0.313	8	104987	0.000	-0.000	-0.000
1	0.000	0.667	7	140482	0.001	0.161	-0.031
24	0.000	0.333	7	140654	-0.000	-0.091	-0.039
7	0.000	0.667	7	145351	0.001	-0.078	-0.031
15	0.000	0.250	7	109058	-0.000	-0.000	0.000
16	0.000	0.313	5	109527	0.000	-0.000	-0.000

Cont...

Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
23	0.000	0.333	7	148287	0.002	0.116	-0.039
1	0.000	0.667	8	157273	0.001	-0.183	-0.036
16	0.000	0.313	4	119775	0.000	-0.000	-0.000
16	0.000	0.250	6	119775	0.000	-0.000	-0.000
7	0.000	0.667	8	159738	0.001	-0.274	-0.036
13	0.000	0.313	4	124345	-0.000	-0.000	-0.000
13	0.000	0.313	8	138067	-0.000	-0.000	-0.000
13	0.000	0.313	6	143053	-0.000	-0.000	-0.000
13	0.000	0.250	5	146036	-0.000	-0.000	-0.000
20	0.000	0.250	5	101285	0.000	0.004	-0.004
9	0.000	0.250	5	110458	0.000	0.004	-0.004
20	0.000	0.250	8	111048	0.000	0.003	-0.004
7	0.000	0.583	4	266230	0.000	-0.226	-0.006
24	0.000	0.417	4	266230	-0.000	-0.226	-0.006
9	0.000	0.250	8	141945	0.000	0.003	-0.005
23	0.000	0.417	4	299312	-0.000	-0.397	-0.006
1	0.000	0.583	4	299312	0.000	-0.397	-0.006
24	0.000	0.417	6	301951	0.000	-0.197	-0.007
7	0.000	0.583	6	303230	0.000	-0.200	-0.004
1	0.000	0.583	6	339229	0.001	-0.345	-0.004
23	0.000	0.417	6	341089	0.001	-0.355	-0.007
20	0.000	0.250	6	176973	0.000	0.002	-0.005
9	0.000	0.250	4	188035	-0.000	0.002	-0.005
20	0.000	0.250	4	190781	0.000	0.002	-0.005
16	0.000	0.250	7	327175	0.000	-0.000	-0.000
20	0.000	0.250	7	228047	0.000	0.001	0.000
9	0.000	0.250	6	280054	0.000	0.002	-0.005
9	0.000	0.250	7	414572	0.000	0.001	0.000
31	0.000	0.583	8	1019079	0.002	-0.035	-0.006
26	0.000	0.458	4	517154	-0.000	-0.000	0.000
31	0.000	0.750	6	1036299	0.001	-0.039	-0.005
31	0.000	0.917	5	1047133	0.003	-0.038	-0.006
26	0.000	0.417	7	585269	-0.000	-0.000	0.000
31	0.000	0.917	4	1344250	0.000	-0.043	-0.005
26	0.000	0.417	6	746074	-0.000	-0.000	0.000
30	0.000	0.833	8	1855076	0.001	-0.031	-0.004
30	0.000	0.833	5	1855109	0.000	-0.029	-0.004
30	0.000	0.917	4	2082490	-0.000	-0.043	-0.005
30	0.000	0.750	7	2097152	0.001	0.006	0.000
26	0.000	0.292	8	1080743	-0.000	-0.000	0.000
25	0.000	0.417	8	1104538	0.000	-0.000	0.000
26	0.000	0.208	5	1125950	-0.000	-0.000	0.000
25	0.000	0.333	5	1144426	0.000	-0.000	0.000
25	0.000	0.458	6	1159443	0.000	-0.000	0.000
25	0.000	0.333	4	1179647	0.000	-0.000	0.000

Cont...

Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
31	0.000	0.083	7	2359295	0.002	-0.002	-0.001
30	0.000	0.500	6	2429788	0.001	-0.032	-0.005
12	0.000	0.000	7	0	0.000	0.000	0.000
13	0.000	0.000	7	0	0.000	0.000	0.000
25	0.000	0.000	7	0	0.000	0.000	0.000

Beam	Max Disp (in)	Location (ft)	L/C	L/Displ	Global X (in)	Global Y (in)	Global Z (in)
3	0.000	0.875	6	54505	0.000	-0.000	-0.000
3	0.000	0.875	5	68636	0.000	-0.000	-0.000
5	0.000	0.875	4	71615	-0.000	-0.000	0.000
3	0.000	0.875	4	71615	-0.000	-0.000	0.000
5	0.000	0.875	6	93336	-0.000	-0.000	-0.000
3	0.000	0.875	3	163654	0.000	-0.000	-0.000
5	0.000	0.875	5	226956	-0.000	-0.000	-0.000
5	0.000	1.250	3	481906	-0.000	0.000	-0.000
4	0.000	0.292	6	598223	-0.000	-0.001	-0.000
1	0.000	0.292	6	687820	0.000	-0.002	-0.000
4	0.000	0.208	3	857749	-0.000	0.000	-0.000
4	0.000	0.208	5	922813	-0.000	-0.001	-0.000
1	0.000	0.250	5	1006317	0.000	-0.002	-0.000
1	0.000	0.292	3	1094606	0.000	-0.001	-0.000
1	0.000	0.292	4	1342177	0.000	-0.002	0.000
4	0.000	0.292	4	1342177	0.000	-0.002	0.000

Weld Connection Design

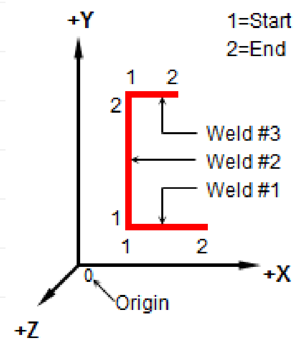
Summary:

The following calculation demonstrates the AISC 14th edition check for the welds at the plates and the HSS member check. The weld was checked for the Dyno Drum HO since it has a higher load than the SO.

Kimley»Horn
3660 Maguire Blvd. Ste 200
Orlando, FL 32803
Certificate of Authorization No. 00696

The following weld calculations are based on:

1. AISC LRFD Manual 14th edition
2. Analyzed as a simply supported beam with fixed connections at both ends
3. The loads orientation are based off the weld



Load Combinations:

1. 1.4DL
4. 1.2DL+1.0W

Luminaire (Dyno Drum HO):

Fz: $1.4(30\text{ lb}) = 42\text{ lb}$

Fx: $1.0(52.2\text{ lb}) = 52.2\text{ lb}$

Fy: $1.0*(27.7\text{ lb}) = 27.7\text{ lb}$

$M = PL/8$ $L = 3\text{ft}$ (From Pier) AISC (Table 3-23)

My: $((42\text{ lb})*(3\text{ft}))/8+(1.24'/2*12")*(52.2\text{lb}) = -404.1\text{ lb*in} = -0.404\text{ kip*in}$

Mx: $-(1.24'/2*12")*(27.7\text{lb}) = -206.08\text{ lb*in} = 0.206\text{ kip*in}$

Mz: None

Flexure Check:

Plate A36 Fy=36 ksi t=1/4"

$f = Mc/I$ $P = 42\text{ lb}$

$I = bh^3/12 = 12"*(0.25")^3/12 = 0.01562\text{ in}^4$

$c = 0.25"/2 = 0.125"$

$f = (0.404\text{ kip*in})*(0.125")/(0.1562\text{ in}^4) = 0.323\text{ ksi} < 36\text{ ksi}$ OK

Assumed: Weld design for HO Dyno Drum is used for SO of a less weight.

Available Strength of Weld: AISC (EQ 8-1)

Estimating that the weld is 3/16" since the HSS thickness is 3/16". AISC(J2-2b-a)

$0.75*R_n = 1.392*D*L$ L=4" (Length of weld estimated)

$R_n = 1.392*(3")*(4")= 16.7\text{ kips}$

$0.75*16.7\text{ kip}= 12.5\text{ kips} > P_u = 0.042\text{ lb}, P_u = 0.0522\text{ lb}$ OK

Connection Design
Straddle Bent Middle
Abutment Sides
MSE Wall

GENERAL NOTES - REVERSIBLE AND GATEWAY BRIDGES

FED. ROAD DIV. NO.	STATE	DESIGN PROJECT NO.	FISCAL YEAR	SHEET NO.
X	FLA.	50.30.001 & 51.30.01		

A. SPECIFICATIONS :

1. GENERAL SPECIFICATIONS:
   a. Florida Department of Transportation Standard Specifications for Road and Bridge Construction (2000 Edition) and Supplements Thereto.
   b. Brandon Parkway, Project Specific, Special Provisions.
2. DESIGN SPECIFICATIONS:
   a. AASHTO Standard Specifications for Highway Bridges, Sixteenth Edition, 1996 thru 1998 Interims.
   b. AASHTO Guide Specifications for Design and Construction of Segmental Concrete Bridges, Second Edition, 1999.
   c. CEB-FIP "Model Code for Concrete Structures", Third Edition, 1978, Appendix E: Time Dependent Behavior of Concrete, Creep and Shrinkage.

B. DESIGN LOADINGS :

1. DEAD LOADS :
   a. Unit weight of reinforced concrete: 150 pcf.
   b. Future wearing surface: 15 psf.
   c. Exterior Concrete Barriers: 620 p.l.f. (Each)
   d. Utilities : 150 plf (Longitudinal)
      20 plf (Transverse)
2. LIVE LOADS : (Per AASHTO)
   a. HS20-44 with impact:
      47'-0" Wide Box - Three (3) Design Lanes
      59'-0" Wide Box - Four (4) Design Lanes
   b. Alternate Military Loading (Single Vehicle)
   c. Design Speed: 65 mph
3. WIND LOADS : As Per AASHTO
4. THERMAL FORCES : Ambient Temperature = 70 °F
   - For Design:
     Temperature Rise = 30 °F
     Temperature Fall = -40 °F
     For sizing bearings and joints: Temperature Rise and Fall as per AASHTO.

   Differential Temperature for Continuous Structures:
   In Accordance With AASHTO Guide Specifications for Thermal Effects in Concrete Bridge Superstructure and AASHTO Guide Specifications for Concrete Segmental Bridges.

   Load Combinations as Follows:
   (1) Dead load + full differential temperature
   (2) Dead load + live load + half differential temperature
6. CREEP AND SHRINKAGE : Strains are calculated in accordance with the CEB-FIP Model Code
   1. Mean Annual Relative Humidity for Design: 75%.
   2. Minimum Age of Precast Elements at Erection: 28 Days.
7. EARTHQUAKE : Seismic Performance Category A - in accordance with AASHTO.
8. ERECTION LOADS : In Accordance With AASHTO Guide Specification for Segmental Concrete Bridges. See erection drawings and specifications.

C. ENVIRONMENT :

1. SUBSTRUCTURE: Moderately Aggressive.
2. SUPERSTRUCTURE: (A) Slightly Aggressive.
   (B) PT Tendon Grouting Shall be Based on an Aggressive Exposure. Contractor to use an Enhanced Grout as Described in The Specifications.

D. MATERIALS :

1. CONCRETE : (28 Day Specified Compressive Strength, f'c) :
   a. Drilled Shafts: Class IV Drilled Shafts (4,500 psi).
   b. CIP Substructure (End Bents, Footings, Abutments and Piers): Class IV (5,500 psi). (Piers 152 to 161 use Class VI 8,500 psi concrete).
   c. Superstructure and Straddle Bent Beam - Box Girder, Straddle Bent Beam and C.I.P Joints: Class V (Special) (6,000 psi).
   d. CIP Barriers and Parapets: Class II(a) (3,500 psi).
   e. ¾" Chamfers are to be provided on all exposed concrete edges (Unless Otherwise Noted).
   f. ⅜" maximum aggregate size shall be used for all precast components.
2. REINFORCING STEEL : ASTM A615, Grade 60, unless otherwise noted.
   All bar bends shall be in accordance with ACI standard practice for detailing bar bends. Special fabrication is required for some bars to meet required clearances shown on the plans. Concrete cover shall be:
   a. Precast Superstructure: 2½" top of top slab, (1/2" To Be Milled After Erection, If Required)
      2" external
      ½" internal
   b. CIP Superstructure: 2" (Without Milling)
   c. Substructure (Piers): 2"
   d. Substructure (Footings and Abutments): 3"
   e. Drilled Shafts: 6"
      Concrete Cover Shown in the Plans Does not Include Reinforcement Placement and Fabrication Tolerances Unless Shown as "Minimum Cover". See FDOT Standard Specifications For Allowable Reinforcement Placement Tolerances.
3. PRESTRESSING STEEL :
   a. Strand: ASTM A416 Seven Wire, Grade 270, low relaxation.
   b. Prestressing parameters (strand):

• Friction Coefficient :	0.25
• Wobble Coefficient :	0.0 (external) 0.0002 (internal)
• Anchor set :	0.375"
• Apparent modulus (for calculation of elongations) :	27,500 ksi
• Maximum jacking stress :	216 ksi (80% ultimate)
• Maximum Anchoring stress at End of Seating Zone:	189 ksi (70% ultimate)
• Maximum stress after anchor set :	200 ksi (74% ultimate)
• Strand diameter :	0.6" post-tensioning

   c. Tendon ducts :

• Transverse Deck Tendons :	Polyethylene Flat Duct
• Longitudinal Internal Tendons :	Corrugated Steel Duct (Galvanized)
• Longitudinal External Tendon Deviators :	Rigid Steel Duct (Schedule 40) (Galvanized)
• Bars :	Corrugated Steel Duct (Galvanized)

   d. Bars : ASTM A722, Grade 150, Type II.

• Apparent Modulus :	29,000 ksi
• Anchor Set :	0 in.
• Friction Coefficient :	0.30 (Galvanized Steel Duct)
• Wobble Coefficient :	0.0002 (Galvanized Steel Duct)

4. ELASTOMERIC BEARINGS : Durometer 50, steel laminated
5. EPOXY JOINTS : Epoxy Material Shall be in Accordance With the Specifications. Epoxy Joints to be Used Between All Typical Segments including Deviation Segments and for Split Pier Segment Match Cast Face.
6. UTILITY SUPPORTS : All Utility Supports Shall Be Galvanized Steel. All Connection Inserts Shall Be Precast into the Segments. Drilling of Inserts After Precasting is Not Allowed..

E. ALLOWABLE STRESSES / LOADS :

1. REINFORCED CONCRETE : As per AASHTO
2. PRESTRESSED CONCRETE :

a. Transverse concrete stress :		$3\sqrt{f'c}$, tension 0.40f'c, compression
b. Longitudinal concrete stress :	• Minimum	0 psi, compression (Type A Epoxy Joints)
	• Maximum	0.60f'c, compression (All Service Load Combinations) 0.45f'c, compression (Dead Load & Post-tensioning)
c. Principal concrete stress :		$4\sqrt{f'c}$, tension

3. ELASTOMERIC BEARINGS : Design Per AASHTO Method B
   a. 1,600 psi, compression
4. SEGMENT CASTING AND ERECTION :

a. Minimum concrete strength prior to lifting segments or lowering forms :	2,500 psi
b. Partial prestressing of transverse tendons prior to lowering wing forms (See Note 9 on Dwg. T-440 and T-441) :	2 of 4 strands per tendon
c. Minimum concrete strength prior to stressing vertical and all four strands of the transverse post-tensioning :	4,000 psi
d. Minimum age of segments at time of erection :	14 days
e. Minimum concrete strength prior to stressing longitudinal post-tensioning :	6,000 psi (precast elements) 2,500 psi (CIP closure joints)

5. FOUNDATION ELEMENTS :
   Type
   4'-0", 6'-0" and 8'-0" Diameter Drilled Shafts

F. CONSTRUCTION :

1. All construction schematic drawings are represented as an aid to the Contractor in developing a segmental construction procedure and are not to be considered working drawings. All details of contractor's erection scheme shall be presented to the Engineers for review and approval prior to implementation.
2. The contractors shall be solely responsible for the means and Methods of Construction.
3. Protection of Existing I-75 Loop Ramp 'D' Structure shall be Provided in Accordance with FDOT Specifications, Section 455-1.1.

G. PAY ITEM NOTES :

1. Item No. 110-3 includes the removal and disposal of existing Eastbound structure over 39th St. Pay Item includes removal of entire superstructure and substructure including but not limited to bridge deck, barriers, approach slabs, wingwalls, and slope pavement. Refer to General Plan and Elevation drawing of the Lee Roy Selmon Crosstown Expressway Reversible Lanes over 39th St. and the existing Eastbound bridge over 39th St. plans for limits. Existing Lee Roy Selmon Expressway Eastbound over 39th St. bridge (Bridge #100452) approximate deck area to be removed 9180 sq. ft.
2. Removal and replacement of existing Slope Pavement, Barriers and Walls at Cross Streets and Railroads, including, but not limited to: barricading (specifically related to slope pavements and barriers of cross streets and not included in overall MOT Plan), temporary signage (if required), replacement of Slope Pavement, Barriers, Walls and clean-up shall not be paid for separately and shall be incidental to the cost of the Drilled Shafts.
3. Removal and replacement of existing surfaces and elements that are disturbed due to construction of Piers including, but not limited to: protection of surfaces and elements not affected, barricading (specifically related to areas disturbed by piers and not included in overall MOT Plan), temporary signage (if required), restoration of surfaces and elements to their original condition and cleanup; shall not be paid for separately and shall be incidental to the cost of the Drilled Shafts.
4. Temporary containment and channeling of drainage runoff from new elevated roadway to prevent spillage to active lanes below shall be provided until permanent barrier wall is constructed. Materials and methods used shall be at Contractor's option subject to review and approval of Engineer. Temporary containment materials, installation and subsequent removal/disposal shall not be paid for separately and shall be incidental to the overall cost of the Project.

ABBREVIATIONS :

Abut.	Abutment	L.S.	Lump Sum
B.F.	Back Face	Max.	Maximum
℄	Baseline	Min.	Minimum
Bott.	Bottom	M.H.W.	Mean High Water
Brg.	Bearing	M.L.W.	Mean Low Water
C.J.	Closure Joint	O.F.	Outside Face
Cl.	Clear	P.C.	Point of Curve
℄	Centerline	P.G.L.	Profile Grade Line
Cts.	Centers	P.I.	Point of Intersection
Cu. Yds.	Cubic Yards	P.T.	Point of Tangent
D	Degree	P.V.C.	Point of Vertical Curve
Δ	Delta	P.V.I.	Point of Vertical Intersection
E	Expansion Bearing		
Ea.	Each	P.V.T.	Point of Vertical Tangent
E.E.	Each End	P.R.C.T.	Point of Reverse Curve Tangent
E.F.	Each Face		
E.J.	Expansion Joint	R	Radius
El.	Elevation	Rdwy.	Roadway
E.W.	Each Way	Sht.	Sheet
F	Fixed Bearing	Spa.	Space
F.F.	Front Face	Sq.Yds.	Square Yards
F.F.B.W.	Front Face Back Wall	Sta.	Station
I.F.	Inside Face	Symm.	Symmetrical
L	Curve Length	T	Tangent Length
Lbs.	Pounds	Typ.	Typical
L.F.	Linear Foot		

H. STRUCTURE NUMBERS :

1. Structure No. 100800 includes Abutment 124 through Abutment 173.
2. Structure No. 100806 includes Abutment 1 through Abutment 123.
3. Structure No. 100812 includes Abutment 201 through Abutment 225.

STRUCTURE NOS. 100800, 100806 & 100812

REVISIONS

Date	By	Description	Date	By	Description

	Names	Dates
Drawn by	JMF	12-13-02
Checked by	AKK	12-13-02
Designed by	WDP	12-13-02
Checked by	AKK	12-13-02
Approved by	J.Rodriguez	

ENGINEER OF RECORD:
Figg Bridge Engineers
424 No. Calhoun Street
Tallahassee, Florida 32301
Florida Certificate of Authorization No. 5618
Jose M. Rodriguez, P.E. - P.E. No. 52532
• Tallahassee, Fl. • Denver, Co. • Philadelphia, Pa •

LOGO:

SEAL:

TAMPA - HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	CONSTRUCTION PROJECT NO.
S.R. 618	HILLSBOROUGH	THCEA 51.40.01

SHEET TITLE: GENERAL NOTES

PROJECT NAME: SEGMENTAL BRIDGES BETWEEN TWIGGS ST & 78TH ST AND GATEWAY BRIDGE

Drawing No. T-8

Index No.

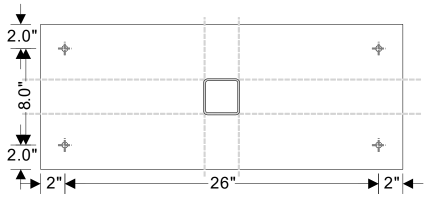
13 DEC 2002 15:21:47

Undercut Anchor Tedds Design

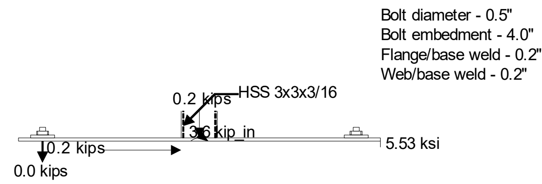
COLUMN BASE PLATE DESIGN

In accordance with AISC Steel Design Guide 1 and AISC 360-10

Tedds calculation version 2.1.02



Plan on baseplate



Elevation on baseplate

Design forces and moments

Axial force	P_u = **0.2** kips (Compression)
Bending moment	M_u = **3.6** kip_in
Shear force	F_v = **0.2** kips
Eccentricity	e = ABS(M_u / P_u) = **23.571** in
Anchor bolt to center of plate	f = N/2 - e_1 = **13.000** in

Column details

Column section	HSS 3x3x3/16
Depth	d = **3.000** in
Breadth	b_f = **3.000** in
Thickness	t = **0.174** in

Baseplate details

Depth	N = **30.000** in
Breadth	B = **12.000** in
Thickness	t_p = **0.250** in
Design strength	F_y = **36.0** ksi

Foundation geometry

Member thickness	h_a = **36.000** in
Dist center of baseplate to left edge foundation	x_{ce1} = **24.000** in
Dist center of baseplate to right edge foundation	x_{ce2} = **24.000** in
Dist center of baseplate to bot edge foundation	y_{ce1} = **30.000** in
Dist center of baseplate to top edge foundation	y_{ce2} = **15.000** in

Holding down bolt and anchor plate details

Total number of bolts	N_{bolt} = **4**
Bolt diameter	d_o = **0.500** in
Bolt spacing	s_{bolt} = **8.000** in
Edge distance	e_1 = **2.000** in
Minimum tensile strength, base plate	F_y = **36** ksi
Minimum tensile strength, column	F_{yCol} = **50** ksi
Compressive strength of concrete	f'_c = **5** ksi

Strength reduction factors

Compression	ϕ_c = **0.65**
Flexure	ϕ_b = **0.90**

Weld shear ϕ_v = **0.75**

Plate cantilever dimensions

Area of base plate $A_1 = B \times N$ = **360.000** in^2

Maximum area of supporting surface $A_2 = (N + 2 \times l_{min}) \times (B + 2 \times l_{min})$ = **1440.000** in^2

Nominal strength of concrete under base plate $P_p = 0.85 \times f'_c \times A_1 \times \min(\sqrt{(A_2 / A_1)}, 2)$ = **3060.0** kips

Bending line cantilever distance m $m = (N - 0.95 \times d) / 2$ = **13.575** in

Bending line cantilever distance n $n = (B - 0.95 \times b_f) / 2$ = **4.575** in

Maximum bending line cantilever $l = \max(m, n)$ = **13.575** in

Check eccentricity

Maximum bearing stress $f_{p,max} = 0.85 \times f'_c \times \phi_c \times \min(\sqrt{(A_2 / A_1)}, 2)$ = **5.52** ksi

Maximum bearing pressure $q_{max} = f_{p,max} \times B$ = **66.3** kips/in

Critical eccentricity $e_{crit} = N / 2 - P_u / (2 \times q_{max})$ = **14.999** in

$e > e_{crit}$ so loads cannot be resisted by bearing alone. Therefore consider as a large moment

Plate dimensions adequate as $(f + N/2)^2 >= (2 \times P_u \times (e + f))/q_{max}$ and a real solution for bearing length exists

Bearing length - quadratic solution 1 $Y_1 = (f + N/2) + \sqrt{((f + N/2)^2 - (2 \times P_u \times (e + f))/q_{max})}$ = **55.997** in

Bearing length - quadratic solution 2 $Y_2 = (f + N/2) - \sqrt{((f + N/2)^2 - (2 \times P_u \times (e + f))/q_{max})}$ = **0.003** in

Bearing length $Y = \min(Y_1, Y_2)$ = **0.003** in

Tension force in bolts $T_u = q_{max} \times Y - P_u$ = **0.0** kips

Max tension in single bolt $T_{rod} = T_u / (N_{bolt}/2)$ = **0.0** kips

Base plate yielding limit at bearing interface

Required plate thickness $t_{p,req} = \sqrt{((4 \times f_{p,max} \times Y \times (l - Y/2))/(\phi_b \times F_y))}$ = **0.168** in

PASS - Thickness of plate exceeds required thickness

Base plate yielding limit at tension interface

Distance from bolt CL to plate bending lines $x = \mathrm{abs}(m - e_1)$ = **11.575** in

Plate thickness required $t_{p,req} = 2.11 \times \sqrt{((T_u \times x)/(B \times F_y))}$ = **0.075** in

PASS - Thickness of plate exceeds required thickness

Combined tension and bending in anchor bolts

Gross cross sectional area of anchor $A_{bolt} = \pi \times d_a^2 / 4$ = **0.196** in^2

Thickness of washer t_{wash} = **0.250** in

Shear stress in anchor $f_v = F_v / (N_{boltV} \times A_{bolt})$ = **0.45** ksi

Lever arm $z = t_p + t_{wash} / 2$ = **0.375** in

Bending in anchor $M_l = F_v \times z / N_{boltV}$ = **0.00** kips_ft

Plastic modulus of anchor $Z_{bolt} = d_a^3 / 6$ = **0.021** in^3

Stress in anchor due to bending $f_{tb} = M_l / Z_{bolt}$ = **1.6** ksi

Axial stress in anchor $f_{ta} = T_{rod} / A_{bolt}$ = **0.1** ksi

Tensile stress in anchor $f_t = f_{tb} + f_{ta}$ = **1.7** ksi

Nominal tensile stress of anchor (Table J3.2) $F_{nt} = 0.75 \times f_{uta}$ = **43.5** ksi

Nominal shear stress of anchor (Table J3.2) $F_{nv} = 0.45 \times f_{uta}$ = **26.1** ksi

Tensile stress of anchor $\phi F_{nt} = \phi \times F_{nt}$ = **32.6** ksi

Modified tensile stress (Eqn J3-3a) $\phi F'_{nt} = \min(\phi \times (1.3 \times F_{nt} - (F_{nt} / (\phi \times F_{nv})) \times f_v), \phi F_{nt})$ = **32.6** ksi

PASS - Combined shear and bending resistance of rods exceed tensile stress in rods

Tension weld

Tension flange weld leg length — t_{wf} = **0.1875** in

Effective flange weld width — $l_{Tweld,eff} = l_{Tweld,eff\_ud}$ = **2** in

Tensile load per inch — $R_{wf} = T_{rod} / l_{Tweld,eff}$ = **0.0** kips/in

Electrode classification number — F_{EXX} = **70.0** ksi

Design weld stress — $\phi F_{nw} = \phi_v \times 0.60 \times F_{EXX} \times (1.0 + 0.5 \times (\sin(90deg))^{1.5})$ = **47.250**ksi

Design strength of weld per in — $\phi R_{nf} = \phi F_{nw} \times t_{wf} / \sqrt{(2)}$ = **6.3** kips/in

PASS - Available strength of weld exceeds force in tension weld

Local stress on flange — $f_{T,local} = (T_{rod}) / (l_{Tweld,eff} \times t_f)$ = **0.068** ksi

Column flange allowable stress — $F_{yCol} / 1.67$ = **29.940** ksi

PASS - Local column capacity exceeds local column stress

Shear weld

Shear web weld leg length — t_{ww} = **0.1875** in

Shear web weld force per in — $R_{wl} = F_v / (2 \times (d - 2 \times t))$ = **0.033** kips/in

Electrode classification number — F_{EXX} = **70.0** ksi

Design weld stress — $\phi F_{nw} = \phi_v \times 0.60 \times F_{EXX} \times (1.0 + 0.5 \times (\sin(0deg))^{1.5})$ = **31.500**ksi

Design strength of weld per in — $\phi R_{nl} = \phi F_{nw} \times t_{ww} / \sqrt{(2)}$ = **4.2** kips/in

PASS - Available strength of shear weld exceeds force in shear weld

ANCHOR BOLT DESIGN

In accordance with ACI318-11

Tedds calculation version 2.1.02

Anchor bolt geometry

Type of anchor bolt — Cast-in headed end bolt anchor

Diameter of anchor bolt — d_a = **0.5** in

Number of bolts in x direction — N_{boltx} = **2**

Number of bolts in y direction — N_{bolty} = **2**

Total number of bolts — $n_{total} = (N_{boltx} \times 2) + (N_{bolty} - 2) \times 2$ = **4**

Total number of bolts in tension — $n_{tens} = (N_{boltN} \times 2) + (N_{bolty} - 2)$ = **2**

Spacing of bolts in x direction — s_{boltx} = **26** in

Spacing of bolts in y direction — s_{bolty} = **8** in

Number of threads per inch — n_t = **13**

Effective cross-sectional area of anchor — $A_{se} = \pi / 4 \times (d_a - 0.9743 \text{ in} / n_t)^2$ = **0.142** in^2

Embedded depth of each anchor bolt — h_{ef} = **4** in

Material details

Minimum yield strength of steel — f_{ya} = **36** ksi

Nominal tensile strength of steel — f_{uta} = **58** ksi

Compressive strength of concrete — f'_c = **5** ksi

Concrete modification factor — λ = **1.00**

Modification factor for cast-in anchor concrete failure

$\lambda_a = 1.0 \times \lambda$= **1.00**

Strength reduction factors

Tension of steel element — $\phi_{t,s}$ = **0.75**

Shear of steel element — $\phi_{v,s}$ = **0.65**

Concrete tension	$\phi_{t,c}$ = **0.65**
Concrete shear	$\phi_{v,c}$ = **0.70**
Concrete tension for pullout	$\phi_{t,cB}$ = **0.70**
Concrete shear for pryout	$\phi_{v,cB}$ = **0.70**

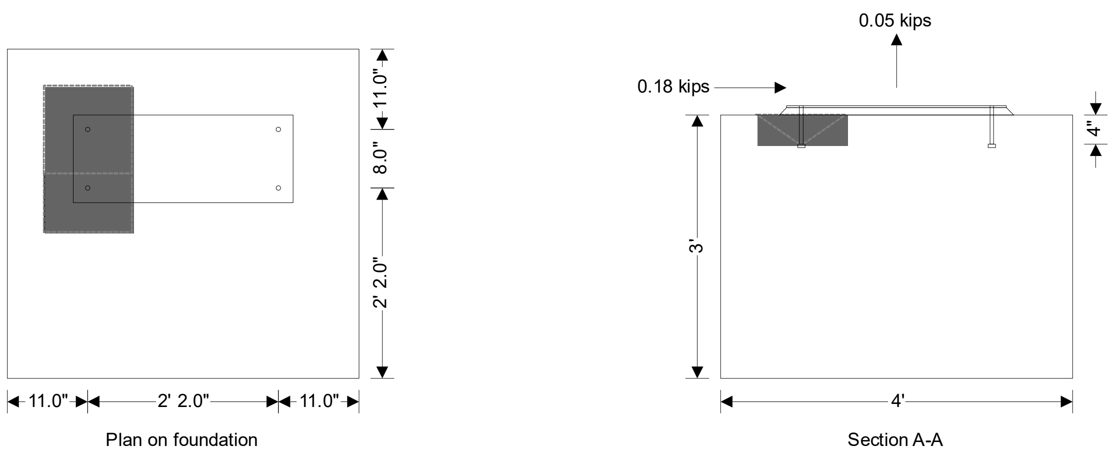
Steel strength of anchor in tension (D.5.1)

Nominal strength of anchor in tension	$N_{sa} = A_{se} \times f_{uta}$ = **8.23** kips
Steel strength of anchor in tension	$\phi N_{sa} = \phi_{t,s} \times N_{sa}$ = **6.17** kips

PASS - Steel strength of anchor exceeds max tension in single bolt

Check concrete breakout strength of anchor bolt in tension (D.5.2)

The spacing and embedded depth of the bolts/anchors are such that the projected area of all the anchors do not overlap. The concrete breakout strength of the anchors will therefore be based on a single anchor with the maximum axial force to a single anchor



Concrete breakout - tension

Single anchor

Applied axial force	$N_s = N_{max,s}$ = **0.02** kips
Eccentricity	e'_N = **0** in
Coeff for basic breakout strength in tension	k_c = **24**
Breakout strength for single anchor in tension	$N_b = k_c \times \lambda_a \times \sqrt{(f'_c \times 1\ psi)} \times h_{ef}^{1.5} \times 1\ in^{0.5}$ = **13.58** kips
Projected area for groups of anchors	A_{Nc} = **144** in^2
Projected area of a single anchor	$A_{Nco} = 9 \times h_{ef}^2$ = **144** in^2
Min dist center of anchor to edge of concrete	$c_{a,min}$ = **11** in
Mod factor for groups loaded eccentrically	$\psi_{ec,N} = \min(1 / (1 + ((2 \times e'_N) / (3 \times h_{ef}))), 1)$ = **1.000**
Modification factor for edge effects	$\psi_{ed,N}$ = 1.0 = **1.000**
Modification factor for no cracking at service loads	$\psi_{c,N}$ = **1.000**
Modification factor for cracked concrete	$\psi_{cp,N}$ = **1.000**
Nominal concrete breakout strength	$N_{cb} = A_{Nc} / A_{Nco} \times \psi_{ed,N} \times \psi_{c,N} \times \psi_{cp,N} \times N_b$ = **13.58** kips
Concrete breakout strength	$\phi N_{cb} = \phi_{t,c} \times N_{cb}$ = **8.82** kips

PASS - Breakout strength exceeds tension in bolts

Pullout strength (D.5.3)

Net bearing area of the head of anchor	A_{brg} = **1** in^2

Mod factor for no cracking at service loads	$\psi_{c,P}$ = **1.000**
Pullout strength for single anchor	$N_p = 8 \times A_{brg} \times f'_c$ = **40.00** kips
Nominal pullout strength of single anchor	$N_{pn} = \psi_{c,P} \times N_p$ = **40.00** kips
Pullout strength of single anchor	$\phi N_{pn} = \phi_{t,cB} \times N_{pn}$ = **28.00** kips

PASS - Pullout strength of single anchor exceeds maximum axial force in single bolt

Side face blowout strength (D.5.4)

As h_{ef} <= 2.5 × min(c_{a1}, c_{a2}) the edge distance is considered to be far from an edge and blowout strength need not be considered

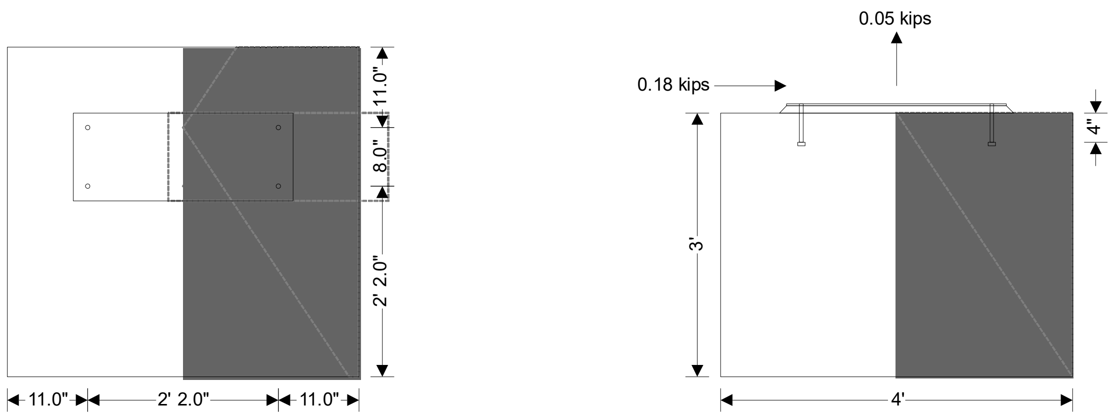
Steel strength of anchor in shear (D.6.1)

Built-up grout pads are used so nominal strength will be multiplied by 0.8 (D.6.1.3)

Effective number of anchors in shear	N_{boltV} = **2**
Nom strength of anchor in shear	$V_{sa} = 0.8 \times N_{boltV} \times 0.6 \times A_{se} \times f_{uta}$ = **7.90** kips
Steel strength of anchor in shear	$\phi V_{sa} = \phi_{v,s} \times V_{sa}$ = **5.14** kips

PASS - Steel strength of anchor exceeds shear in bolts

Concrete breakout strength in shear perpendicular to edge - Case 2. All shear resisted by rear bolts (D.6.3)



Plan on foundation

Section A-A

Concrete breakout - shear

The anchors are influenced by three or more edges where any edge distance is less than 1.5c_{a1} so value of c_{a1} is limited to c'_{a1} (D.6.2.4).

Bolt offset for limiting shear	$x_{V,r}$ = **13.00** in
Limiting edge distance	c'_{a1} = **24** in
Applied shear	V_{app} = V = **0.18** kips
Edge distance x for shear near corner	c_{a1} = **37** in
Edge distance y for shear near corner	$c_{a2} = \min(y_{ce1}, y_{ce2}) - (((N_{bolty} - 1)/2) \times s_{bolty})$ = **11** in
Load bearing length of anchor	$l_e = \min(h_{ef}, 8 \times d_a)$ = **4** in
Basic concrete breakout strength	$V_{b1} = 7 \times (l_e / d_a)^{0.2} \times \sqrt{(d_a)} \times \lambda_a \times \sqrt{(f'_c \times 1psi)} \times (c'_{a1})^{1.5}$ = **62.37** kips
	$V_{b2} = 9 \times \lambda_a \times \sqrt{(f'_c \times 1psi \times 1\ in)} \times (c'_{a1})^{1.5}$ = **74.82** kips
Basic concrete breakout strength	$V_b = \min(V_{b1}, V_{b2})$ = **62.37** kips
Projected area of a single anchor	$A_{Vco} = 4.5 \times c'^2_{a1}$ = **2592** in^2
Projected area of a group of anchors	A_{Vc} = **1620** in^2
Mod factor for edge effect	$\psi_{ed.V} = 0.7 + 0.3 \times c_{a2} / (1.5 \times c'_{a1})$ = **0.792**

Eccentricity of loading $e'_V = \mathbf{0}$ in

Modification factor of eccentric loading $\psi_{ec,V} = \min(1, 1 / (1 + ((2 \times e'_V) / (3 \times c'_{a1})))) = \mathbf{1.000}$

Modification factor for cracking $\psi_{c,V} = \mathbf{1.000}$

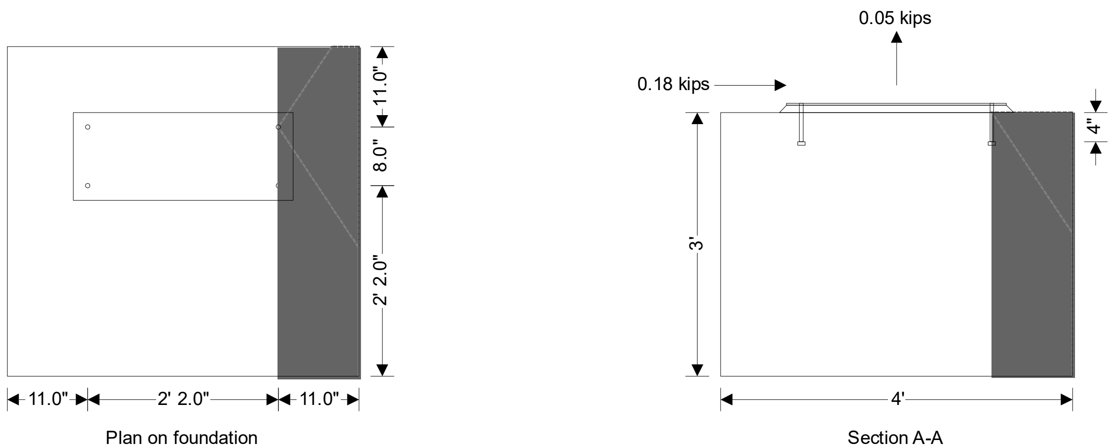
Modification factor for edge distance $\psi_{h,V} = 1.0 = \mathbf{1.000}$

Nominal concrete break out strength in shear $V_{cbg} = A_{Vc} / A_{Vco} \times \psi_{ec,V} \times \psi_{ed,V} \times \psi_{c,V} \times \psi_{h,V} \times V_b = \mathbf{30.86}$ kips

Concrete break out strength in shear $\phi V_{cbg} = \phi_{v,c} \times V_{cbg} = \mathbf{21.60}$ kips

PASS - Shear breakout perpendicular to edge strength exceeds shear in bolts

Concrete breakout strength in shear - Case 1. Half of shear resisted by front bolts (D.6.3)



Concrete breakout - shear

Applied shear $V_{app} = V / 2 = \mathbf{0.09}$ kips

Edge distance x for shear near corner $c_{a1} = \mathbf{11}$ in

Edge distance y for shear near corner $c_{a2} = \min(y_{ce1}, y_{ce2}) - (((N_{bolty} - 1)/2) \times s_{bolty}) = \mathbf{11}$ in

Load bearing length of anchor $l_e = \min(h_{ef}, 8 \times d_a) = \mathbf{4}$ in

Basic concrete breakout strength $V_{b1} = 7 \times (l_e / d_a)^{0.2} \times \sqrt{(d_a)} \times \lambda_a \times \sqrt{(f'_c \times 1\text{psi})} \times (c_{a1})^{1.5} = \mathbf{19.35}$ kips

$V_{b2} = 9 \times \lambda_a \times \sqrt{(f'_c \times 1\text{psi} \times 1\text{ in})} \times (c_{a1})^{1.5} = \mathbf{23.22}$ kips

Basic concrete breakout strength $V_b = \text{Min}(V_{b1}, V_{b2}) = \mathbf{19.35}$ kips

Projected area of a single anchor $A_{Vco} = 4.5 \times c_{a1}^2 = \mathbf{544.5}$ in^2

Projected area of a group of anchors $A_{Vc} = \mathbf{585.7}$ in^2

Mod factor for edge effect $\psi_{ed.V} = 0.7 + 0.3 \times c_{a2} / (1.5 \times c_{a1}) = \mathbf{0.900}$

Eccentricity of loading $e'_V = \mathbf{0}$ in

Modification factor of eccentric loading $\psi_{ec,V} = \min(1, 1 / (1 + ((2 \times e'_V) / (3 \times c_{a1})))) = \mathbf{1.000}$

Modification factor for cracking $\psi_{c,V} = \mathbf{1.000}$

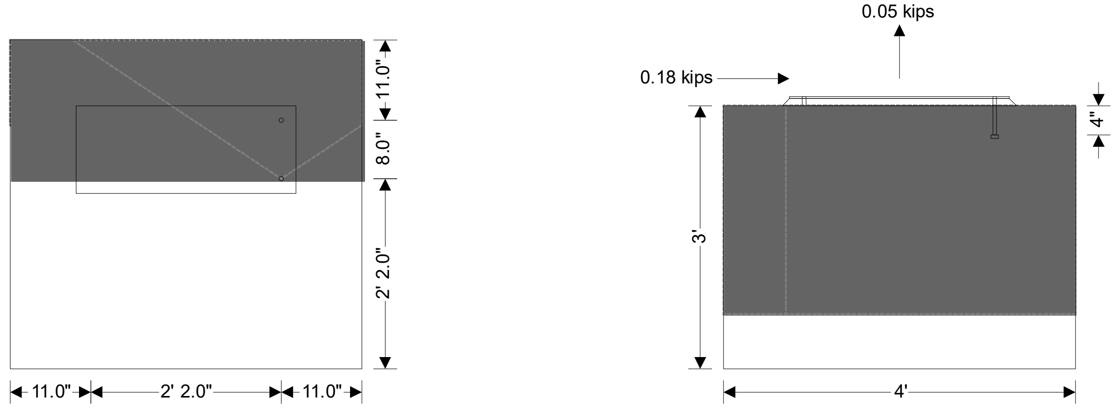
Modification factor for edge distance $\psi_{h,V} = 1.0 = \mathbf{1.000}$

Nominal concrete break out strength in shear $V_{cbg} = A_{Vc} / A_{Vco} \times \psi_{ec,V} \times \psi_{ed,V} \times \psi_{c,V} \times \psi_{h,V} \times V_b = \mathbf{18.74}$ kips

Concrete break out strength in shear $\phi V_{cbg} = \phi_{v,c} \times V_{cbg} = \mathbf{13.12}$ kips

PASS - Shear breakout perpendicular to edge strength exceeds shear in bolts

Concrete breakout strength in shear parallel to edge - Case 2. All shear resisted by rear bolts (parallel to edge - Case 2. All shear resisted by rear bolts)



Concrete breakout - side shear

Applied shear $V_{app} = V = \mathbf{0.18}$ kips

Edge distance x for shear near corner $c_{a1,p} = \mathbf{19}$ in

Edge distance y for shear near corner $c_{a2,p} = \min(x_{ce1}, x_{ce2}) - (((N_{boltx} - 1)/2) \times s_{boltx}) = \mathbf{11}$ in

Load bearing length of anchor $l_e = \min(h_{ef}, 8 \times d_a) = \mathbf{4}$ in

Basic concrete breakout strength $V_{b,p1} = 7 \times (l_e / d_a)^{0.2} \times \sqrt{(d_a)} \times \lambda_a \times \sqrt{(f'_c \times 1psi)} \times (c_{a1,p})^{1.5} = \mathbf{43.94}$ kips

$V_{b,p2} = 9 \times \lambda_a \times \sqrt{(f'_c \times 1psi \times 1in)} \times (c_{a1,p})^{1.5} = \mathbf{52.71}$ kips

Basic concrete breakout strength $V_{b,p} = \mathrm{Min}(V_{b,p1}, V_{b,p2}) = \mathbf{43.94}$ kips

Projected area of a single anchor $A_{Vco,p} = 4.5 \times c_{a1,p}^2 = \mathbf{1624.5}$ in^2

Projected area of a group of anchors $A_{Vc,p} = \mathbf{1368}$ in^2

Mod factor for edge effect $\psi_{ed,V,p} = \mathbf{1.000}$

Eccentricity of loading $e'_{V,p} = \mathbf{0}$ in

Modification factor of eccentric loading $\psi_{ec,V,p} = \min(1, 1 / (1 + ((2 \times e'_{V,p}) / (3 \times c_{a1,p})))) = \mathbf{1.000}$

Modification factor for cracking $\psi_{c,V} = \mathbf{1.000}$

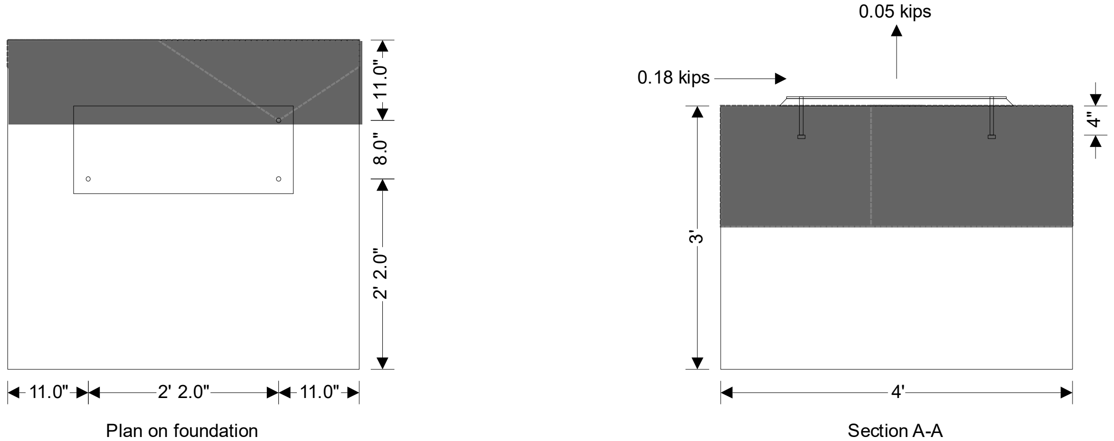
Modification factor for edge distance $\psi_{h,V,p} = 1.0 = \mathbf{1.000}$

Nominal concrete break out strength in shear $V_{cbg,p} = 2 \times A_{Vc,p} / A_{Vco,p} \times \psi_{ec,V,p} \times \psi_{ed,V,p} \times \psi_{c,V} \times \psi_{h,V,p} \times V_{b,p} = \mathbf{74.00}$ kips

Concrete break out strength in shear $\phi V_{cbg,p} = \phi_{v,c} \times V_{cbg,p} = \mathbf{51.80}$ kips

PASS - Shear breakout strength parallel to edge exceeds shear in bolts

Concrete breakout strength in shear parallel to edge - Case 3. All shear resisted by front bolts (parallel to edge - Case 3. All shear resisted by front bolts)



Concrete breakout - side shear

Applied shear	$V_{app} = V = \mathbf{0.18}$ kips
Edge distance x for shear near corner	$c_{a1,p} = \mathbf{11}$ in
Edge distance y for shear near corner	$c_{a2,p} = \min(x_{ce1}, x_{ce2}) - (((N_{boltx} - 1)/2) \times s_{boltx}) = \mathbf{11}$ in
Load bearing length of anchor	$l_e = \min(h_{ef}, 8 \times d_a) = \mathbf{4}$ in
Basic concrete breakout strength	$V_{b,p1} = 7 \times (l_e / d_a)^{0.2} \times \sqrt{(d_a)} \times \lambda_a \times \sqrt{(f'_c \times 1psi)} \times (c_{a1,p})^{1.5} = \mathbf{19.35}$ kips
	$V_{b,p2} = 9 \times \lambda_a \times \sqrt{(f'_c \times 1psi \times 1in)} \times (c_{a1,p})^{1.5} = \mathbf{23.22}$ kips
Basic concrete breakout strength	$V_{b,p} = \mathrm{Min}(V_{b,p1}, V_{b,p2}) = \mathbf{19.35}$ kips
Projected area of a single anchor	$A_{Vco,p} = 4.5 \times c_{a1,p}^2 = \mathbf{544.5}$ in^2
Projected area of a group of anchors	$A_{Vc,p} = \mathbf{792}$ in^2
Mod factor for edge effect	$\psi_{ed,V,p} = \mathbf{1.000}$
Eccentricity of loading	$e'_{V,p} = \mathbf{0}$ in
Modification factor of eccentric loading	$\psi_{ec,V,p} = \min(1, 1 / (1 + ((2 \times e'_{V,p}) / (3 \times c_{a1,p})))) = \mathbf{1.000}$
Modification factor for cracking	$\psi_{c,V} = \mathbf{1.000}$
Modification factor for edge distance	$\psi_{h,V,p} = 1.0 = \mathbf{1.000}$
Nominal concrete break out strength in shear	$V_{cbg,p} = 2 \times A_{Vc,p} / A_{Vco,p} \times \psi_{ec,V,p} \times \psi_{ed,V,p} \times \psi_{c,V} \times \psi_{h,V,p} \times V_{b,p} = \mathbf{56.30}$ kips
Concrete break out strength in shear	$\phi V_{cbg,p} = \phi_{v,c} \times V_{cbg,p} = \mathbf{39.41}$ kips

PASS - Shear breakout strength parallel to edge exceeds shear in bolts

Pryout strength of anchor in shear (D.6.3)

Coefficient of pryout strength	$k_{cp} = \mathbf{2.0}$
Nominal pryout strength of anchor in shear	$V_{cp} = k_{cp} \times N_{cb} \times N_{boltV} = \mathbf{54.31}$ kips
Pryout strength of anchor in shear	$\phi V_{cp} = \phi_{v,cB} \times V_{cp} = \mathbf{38.01}$ kips

PASS - Pryout strength of anchor exceeds shear in bolts

Interaction of tensile and shear forces

Critical design strength in tension	$\phi N_n = \phi N_{sa} = \mathbf{6.17}$ kips
Critical applied tensile force	$N_{ua} = N_{max,s} = \mathbf{0.02}$ kips
	$N_{ua} / \phi N_n = \mathbf{0.004}$
Critical design strength in shear	$\phi V_n = \phi V_{sa} = \mathbf{5.14}$ kips

Critical applied shear force V_{ua} = abs(V) = **0.18** kips

$V_{ua} / \phi V_n$ = **0.034**

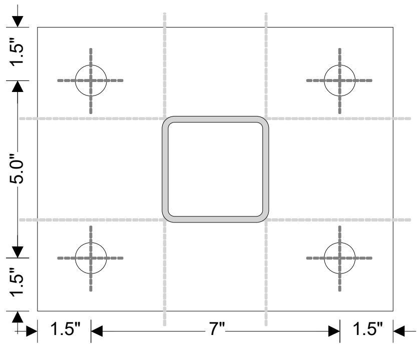
Full strength in both shear and tension are permitted

PASS - Applied tension and shear are less than tension and shear capacities

COLUMN BASE PLATE DESIGN

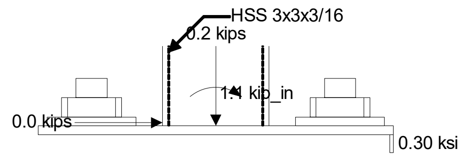
In accordance with AISC Steel Design Guide 1 and AISC 360-10

Tedds calculation version 2.1.02



Plan on baseplate

Bolt diameter - 0.9"
Bolt embedment - 6.0"
Flange/base weld - 0.2"
Web/base weld - 0.2"



Elevation on baseplate

Design forces and moments

Axial force	P_u = **0.2** kips (Compression)
Bending moment	M_u = **1.1** kip_in
Shear force	F_v = **0.0** kips
Eccentricity	e = ABS(M_u / P_u) = **4.952** in
Anchor bolt to center of plate	f = N/2 - e_1 = **3.500** in

Column details

Column section	HSS 3x3x3/16
Depth	d = **3.000** in
Breadth	b_f = **3.000** in
Thickness	t = **0.174** in

Baseplate details

Depth	N = **10.000** in
Breadth	B = **8.000** in
Thickness	t_p = **0.250** in
Design strength	F_y = **36.0** ksi

Foundation geometry

Member thickness	h_a = **9.500** in
Dist center of baseplate to left edge foundation	x_{ce1} = **17.000** in
Dist center of baseplate to right edge foundation	x_{ce2} = **17.000** in
Dist center of baseplate to bot edge foundation	y_{ce1} = **6.000** in
Dist center of baseplate to top edge foundation	y_{ce2} = **16.000** in

Holding down bolt and anchor plate details

Total number of bolts	N_{bolt} = **4**
Bolt diameter	d_o = **0.875** in
Bolt spacing	s_{bolt} = **5.000** in
Edge distance	e_1 = **1.500** in
Minimum tensile strength, base plate	F_y = **36** ksi
Minimum tensile strength, column	F_{yCol} = **50** ksi

Compressive strength of concrete f'_c = **5** ksi

Strength reduction factors

Compression ϕ_c = **0.65**

Flexure ϕ_b = **0.90**

Weld shear ϕ_v = **0.75**

Plate cantilever dimensions

Area of base plate $A_1 = B \times N$ = **80.000** in^2

Maximum area of supporting surface $A_2 = (N + 2 \times l_{min}) \times (B + 2 \times l_{min})$ = **168.000** in^2

Nominal strength of concrete under base plate $P_p = 0.85 \times f'_c \times A_1 \times \min(\sqrt{(A_2 / A_1)}, 2)$ = **492.7** kips

Bending line cantilever distance m $m = (N - 0.95 \times d) / 2$ = **3.575** in

Bending line cantilever distance n $n = (B - 0.95 \times b_f) / 2$ = **2.575** in

Maximum bending line cantilever $l = \max(m, n)$ = **3.575** in

Check eccentricity

Maximum bearing stress $f_{p,max} = 0.85 \times f'_c \times \phi_c \times \min(\sqrt{(A_2 / A_1)}, 2)$ = **4** ksi

Maximum bearing pressure $q_{max} = f_{p,max} \times B$ = **32.03** kips/in

Critical eccentricity $e_{crit} = N / 2 - P_u / (2 \times q_{max})$ = **4.996** in

e <= e_{crit} so loads can be resisted by bearing alone. Therefore consider as a small moment

Bearing length $Y = N - 2 \times e$ = **0.096** in

Bearing pressure $q = P_u / Y$ = **2.4** kips/in

PASS - Maximum allowable bearing stress exceeds actual

Base plate yielding limit at bearing interface

Required plate thickness $t_{p,req} = \sqrt{((4 \times f_p \times Y \times (l - Y/2))/(\phi_b \times F_y))}$ = **0.112** in

PASS - Thickness of plate exceeds required thickness

Flange weld

Flange weld leg length t_{wf} = **0.1875** in

Tension capacity of flange $P_{tf} = b_f \times t \times F_{yCol}$ = **26.1** kips

Force in tension flange $F_{tf} = M_u / (d - t) - P_u \times (b_f \times t) / A_{col}$ = **0.3** kips

Critical force in flange $F_f = \min(P_{tf}, \max(F_{tf}, 0kips))$ = **0.3** kips

Flange weld force per in $R_{wf} = F_f / b_f$ = **0.1** kips/in

Electrode classification number F_{EXX} = **70.0** ksi

Design weld stress $\phi F_{nw} = \phi_v \times 0.60 \times F_{EXX} \times (1.0 + 0.5 \times (\sin(90deg))^{1.5})$ = **47.250**ksi

Design strength of weld per in $\phi R_{nf} = \phi F_{nw} \times t_{wf} / \sqrt{(2)}$ = **6.3** kips/in

PASS - Available strength of flange weld exceeds force in flange weld

Shear weld

Shear web weld leg length t_{ww} = **0.1875** in

Shear web weld force per in $R_{wl} = F_v / (2 \times (d - 2 \times t))$ = **0.005** kips/in

Electrode classification number F_{EXX} = **70.0** ksi

Design weld stress $\phi F_{nw} = \phi_v \times 0.60 \times F_{EXX} \times (1.0 + 0.5 \times (\sin(0deg))^{1.5})$ = **31.500**ksi

Design strength of weld per in $\phi R_{nl} = \phi F_{nw} \times t_{ww} / \sqrt{(2)}$ = **4.2** kips/in

PASS - Available strength of shear weld exceeds force in shear weld

ANCHOR BOLT DESIGN

In accordance with ACI318-11

Tedds calculation version 2.1.02

Anchor bolt geometry

Type of anchor bolt — Cast-in headed end bolt anchor

Diameter of anchor bolt — d_a = **0.875** in

Number of bolts in x direction — N_{boltx} = **2**

Number of bolts in y direction — N_{bolty} = **2**

Total number of bolts — $n_{total} = (N_{boltx} \times 2) + (N_{bolty} - 2) \times 2 = \mathbf{4}$

Total number of bolts in tension — $n_{tens} = N_{boltN} = \mathbf{0}$

Spacing of bolts in x direction — s_{boltx} = **7** in

Spacing of bolts in y direction — s_{bolty} = **5** in

Number of threads per inch — n_t = **9**

Effective cross-sectional area of anchor — $A_{se} = \pi / 4 \times (d_a - 0.9743 \text{ in} / n_t)^2 = \mathbf{0.462} \text{ in}^2$

Embedded depth of each anchor bolt — h_{ef} = **6** in

Material details

Minimum yield strength of steel — f_{ya} = **36** ksi

Nominal tensile strength of steel — f_{uta} = **58** ksi

Compressive strength of concrete — f'_c = **5** ksi

Concrete modification factor — λ = **1.00**

Modification factor for cast-in anchor concrete failure

$\lambda_a = 1.0 \times \lambda = \mathbf{1.00}$

Strength reduction factors

Tension of steel element — $\phi_{t,s}$ = **0.75**

Shear of steel element — $\phi_{v,s}$ = **0.65**

Concrete tension — $\phi_{t,c}$ = **0.65**

Concrete shear — $\phi_{v,c}$ = **0.70**

Concrete tension for pullout — $\phi_{t,cB}$ = **0.70**

Concrete shear for pryout — $\phi_{v,cB}$ = **0.70**

Shear force applied to bolt group — V = **0.03** kips

Steel strength of anchor in shear (D.6.1)

Built-up grout pads are used so nominal strength will be multiplied by 0.8 (D.6.1.3)

Effective number of anchors in shear — N_{boltV} = **2**

Nom strength of anchor in shear — $V_{sa} = 0.8 \times N_{boltV} \times 0.6 \times A_{se} \times f_{uta} = \mathbf{25.71}$ kips

Steel strength of anchor in shear — $\phi V_{sa} = \phi_{v,s} \times V_{sa} = \mathbf{16.71}$ kips

PASS - Steel strength of anchor exceeds shear in bolts

Concrete breakout strength in shear perpendicular to edge - Case 2. All shear resisted by rear bolts (D.6.3)

Plan on foundation | Section A-A

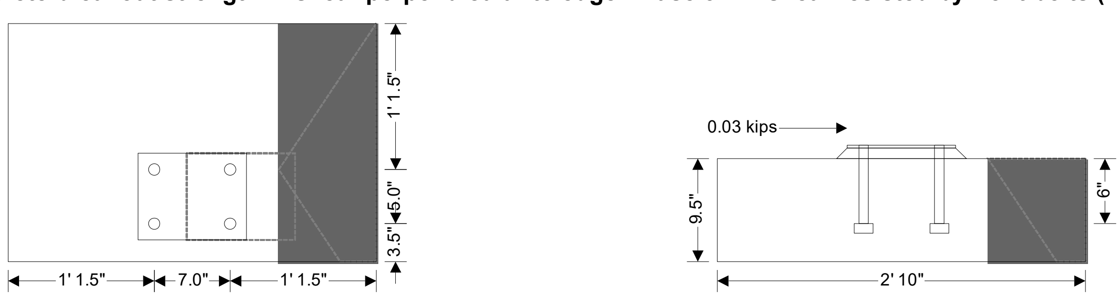
Concrete breakout - shear

The anchors are influenced by three or more edges where any edge distance is less than 1.5c_{a1} so value of c_{a1} is limited to c'_{a1} (D.6.2.4).

Bolt offset for limiting shear	$x_{V,r}$ = **11.50** in
Limiting edge distance	c'_{a1} = **9** in
Applied shear	V_{app} = V = **0.03** kips
Edge distance x for shear near corner	c_{a1} = **20.5** in
Edge distance y for shear near corner	c_{a2} = min(y_{ce1}, y_{ce2}) - (((N_{bolty} - 1)/2) × s_{bolty}) = **3.5** in
Load bearing length of anchor	l_e = min(h_{ef}, 8 × d_a) = **6** in
Basic concrete breakout strength	V_{b1} = 7 × (l_e / d_a)$^{0.2}$ × √(d_a) × λ_a × √(f'$_c$ × 1psi) × (c'_{a1})$^{1.5}$ = **18.37** kips
	V_{b2} = 9 × λ_a × √(f'$_c$ × 1psi × 1 in) × (c'_{a1})$^{1.5}$ = **17.18** kips
Basic concrete breakout strength	V_b = Min(V_{b1}, V_{b2}) = **17.18** kips
Projected area of a single anchor	A_{Vco} = 4.5 × c'^2_{a1} = **364.5** in^2
Projected area of a group of anchors	A_{Vc} = **209** in^2
Mod factor for edge effect	$\psi_{ed.V}$ = 0.7 + 0.3 × c_{a2} / (1.5 × c'_{a1}) = **0.778**
Eccentricity of loading	e'_V = **0** in
Modification factor of eccentric loading	$\psi_{ec,V}$ = min(1, 1 / (1 + ((2 × e'_V) / (3 × c'_{a1})))) = **1.000**
Modification factor for cracking	$\psi_{c,V}$ = **1.000**
Modification factor for edge distance	$\psi_{h,V}$ = max(√(1.5 × c'_{a1} / h_a), 1) = **1.192**
Nominal concrete break out strength in shear	V_{cbg} = A_{Vc} / A_{Vco} × $\psi_{ec,V}$ × $\psi_{ed,V}$ × $\psi_{c,V}$ × $\psi_{h,V}$ × V_b = **9.13** kips
Concrete break out strength in shear	ϕV_{cbg} = $\phi_{v,c}$ × V_{cbg} = **6.39** kips

PASS - Shear breakout perpendicular to edge strength exceeds shear in bolts

Concrete breakout strength in shear perpendicular to edge - Case 3. All shear resisted by front bolts (D.6.3)



Plan on foundation | Section A-A

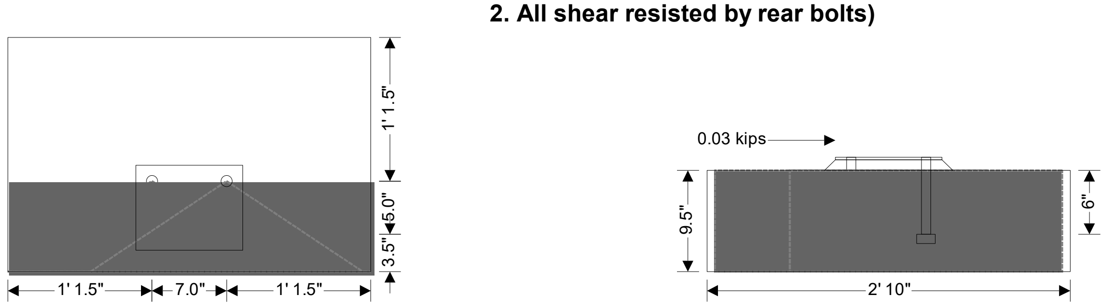
Concrete breakout - shear

The anchors are influenced by three or more edges where any edge distance is less than 1.5c_{a1} so value of c_{a1} is limited to c'_{a1} (D.6.2.4).

Bolt offset for limiting shear	$x_{V,f}$ = **4.50** in
Limiting edge distance	c'_{a1} = **9** in
Applied shear	V_{app} = V = **0.03** kips
Edge distance x for shear near corner	c_{a1} = **13.5** in
Edge distance y for shear near corner	$c_{a2} = \min(y_{ce1}, y_{ce2}) - (((N_{bolty} - 1)/2) \times s_{bolty})$ = **3.5** in
Load bearing length of anchor	$l_e = \min(h_{ef}, 8 \times d_a)$ = **6** in
Basic concrete breakout strength	$V_{b1} = 7 \times (l_e / d_a)^{0.2} \times \sqrt{(d_a)} \times \lambda_a \times \sqrt{(f'_c \times 1psi)} \times (c'_{a1})^{1.5}$ = **18.37** kips
	$V_{b2} = 9 \times \lambda_a \times \sqrt{(f'_c \times 1psi \times 1\ in)} \times (c'_{a1})^{1.5}$ = **17.18** kips
Basic concrete breakout strength	$V_b = \mathrm{Min}(V_{b1}, V_{b2})$ = **17.18** kips
Projected area of a single anchor	$A_{Vco} = 4.5 \times c'^{2}_{a1}$ = **364.5** in^2
Projected area of a group of anchors	A_{Vc} = **209** in^2
Mod factor for edge effect	$\psi_{ed.V} = 0.7 + 0.3 \times c_{a2} / (1.5 \times c'_{a1})$ = **0.778**
Eccentricity of loading	e'_V = **0** in
Modification factor of eccentric loading	$\psi_{ec,V} = \min(1, 1 / (1 + ((2 \times e'_V) / (3 \times c'_{a1}))))$ = **1.000**
Modification factor for cracking	$\psi_{c,V}$ = **1.000**
Modification factor for edge distance	$\psi_{h,V} = \max(\sqrt{(1.5 \times c'_{a1} / h_a)}, 1)$ = **1.192**
Nominal concrete break out strength in shear	$V_{cbg} = A_{Vc} / A_{Vco} \times \psi_{ec,V} \times \psi_{ed,V} \times \psi_{c,V} \times \psi_{h,V} \times V_b$ = **9.13** kips
Concrete break out strength in shear	$\phi V_{cbg} = \phi_{v,c} \times V_{cbg}$ = **6.39** kips

PASS - Shear breakout perpendicular to edge strength exceeds shear in bolts

Concrete breakout strength in shear parallel to edge - Case 2. All shear resisted by rear bolts (parallel to edge - Case 2. All shear resisted by rear bolts)



Plan on foundation

Section A-A

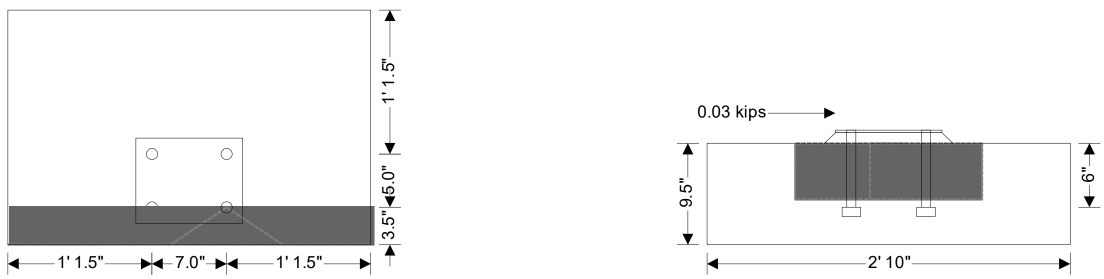
Concrete breakout - side shear

Applied shear	V_{app} = V = **0.03** kips
Edge distance x for shear near corner	$c_{a1,p}$ = **8.5** in
Edge distance y for shear near corner	$c_{a2,p} = \min(x_{ce1}, x_{ce2}) - (((N_{boltx} - 1)/2) \times s_{boltx})$ = **13.5** in
Load bearing length of anchor	$l_e = \min(h_{ef}, 8 \times d_a)$ = **6** in
Basic concrete breakout strength	$V_{b,p1} = 7 \times (l_e / d_a)^{0.2} \times \sqrt{(d_a)} \times \lambda_a \times \sqrt{(f'_c \times 1psi)} \times (c_{a1,p})^{1.5}$ = **16.86** kips
	$V_{b,p2} = 9 \times \lambda_a \times \sqrt{(f'_c \times 1psi \times 1in)} \times (c_{a1,p})^{1.5}$ = **15.77** kips
Basic concrete breakout strength	$V_{b,p} = \mathrm{Min}(V_{b,p1}, V_{b,p2})$ = **15.77** kips
Projected area of a single anchor	$A_{Vco,p} = 4.5 \times c_{a1,p}^2$ = **325.1** in^2
Projected area of a group of anchors	$A_{Vc,p}$ = **308.8** in^2
Mod factor for edge effect	$\psi_{ed,V,p}$ = **1.000**

Eccentricity of loading	$e'_{V,p}$ = **0** in
Modification factor of eccentric loading	$\psi_{ec,V,p}$ = min(1, 1 / (1 + ((2 × $e'_{V,p}$) / (3 × $c_{a1,p}$)))) = **1.000**
Modification factor for cracking	$\psi_{c,V}$ = **1.000**
Modification factor for edge distance	$\psi_{h,V,p}$ = max(√(1.5 × $c_{a1,p}$ / h_a), 1) = **1.158**
Nominal concrete break out strength in shear	$V_{cbg,p}$ = 2 × $A_{Vc,p}$ / $A_{Vco,p}$ × $\psi_{ec,V,p}$ × $\psi_{ed,V,p}$ × $\psi_{c,V}$ × $\psi_{h,V,p}$ × $V_{b,p}$ = **34.70** kips
Concrete break out strength in shear	$\phi V_{cbg,p}$ = $\phi_{v,c}$ × $V_{cbg,p}$ = **24.29** kips

PASS - Shear breakout strength parallel to edge exceeds shear in bolts

Concrete breakout strength in shear parallel to edge - Case 1. Half of shear resisted by front bolts (parallel to edge - Case 1. Half of shear resisted by front bolts)



Plan on foundation

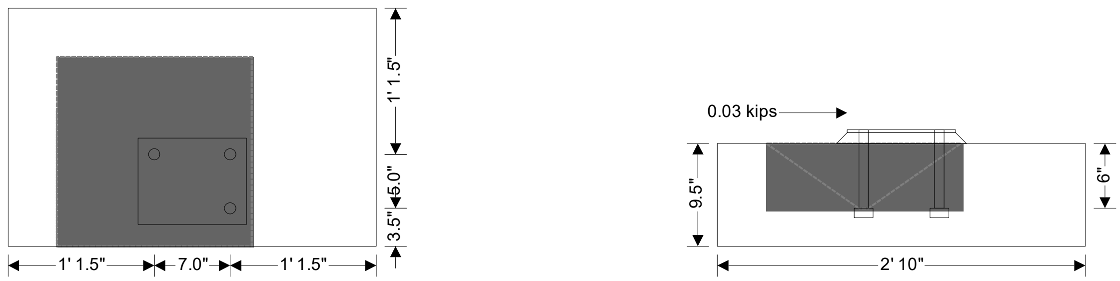
Section A-A

Concrete breakout - side shear

Applied shear	V_{app} = V / 2 = **0.01** kips
Edge distance x for shear near corner	$c_{a1,p}$ = **3.5** in
Edge distance y for shear near corner	$c_{a2,p}$ = min(x_{ce1}, x_{ce2}) - (((N_{boltx} - 1)/2) × s_{boltx}) = **13.5** in
Load bearing length of anchor	l_e = min(h_{ef}, 8 × d_a) = **6** in
Basic concrete breakout strength	$V_{b,p1}$ = 7 × (l_e / d_a)$^{0.2}$ × √(d_a) × λ_a × √(f'_c × 1psi) × ($c_{a1,p}$)$^{1.5}$ = **4.46** kips
	$V_{b,p2}$ = 9 × λ_a × √(f'_c × 1psi× 1in) × ($c_{a1,p}$)$^{1.5}$ = **4.17** kips
Basic concrete breakout strength	$V_{b,p}$ = Min($V_{b,p1}$, $V_{b,p2}$) = **4.17** kips
Projected area of a single anchor	$A_{Vco,p}$ = 4.5 × $c_{a1,p}^2$ = **55.1** in^2
Projected area of a group of anchors	$A_{Vc,p}$ = **91.9** in^2
Mod factor for edge effect	$\psi_{ed,V,p}$ = **1.000**
Eccentricity of loading	$e'_{V,p}$ = **0** in
Modification factor of eccentric loading	$\psi_{ec,V,p}$ = min(1, 1 / (1 + ((2 × $e'_{V,p}$) / (3 × $c_{a1,p}$)))) = **1.000**
Modification factor for cracking	$\psi_{c,V}$ = **1.000**
Modification factor for edge distance	$\psi_{h,V,p}$ = 1.0 = **1.000**
Nominal concrete break out strength in shear	$V_{cbg,p}$ = 2 × $A_{Vc,p}$ / $A_{Vco,p}$ × $\psi_{ec,V,p}$ × $\psi_{ed,V,p}$ × $\psi_{c,V}$ × $\psi_{h,V,p}$ × $V_{b,p}$ = **13.89** kips
Concrete break out strength in shear	$\phi V_{cbg,p}$ = $\phi_{v,c}$ × $V_{cbg,p}$ = **9.72** kips

PASS - Shear breakout strength parallel to edge exceeds shear in bolts

Pryout strength of anchor in shear (D.6.3)



Plan on foundation

Section A-A

Concrete breakout - tension

Coeff for basic breakout strength in tension — k_c = **24**

Breakout strength for single anchor in tension — $N_b = k_c \times \lambda_a \times \sqrt{(f'_c \times 1\text{ psi})} \times h_{ef}^{1.5} \times 1\text{ in}^{0.5}$ = **24.94** kips

Projected area for groups of anchors — A_{Nc} = **315** in^2

Projected area of a single anchor — $A_{Nco} = 9 \times h_{ef}^2$ = **324** in^2

Min dist center of anchor to edge of concrete — $c_{a,min}$ = **3.5** in

Mod factor for groups loaded eccentrically — $\psi_{ec,N} = \min(1 / (1 + ((2 \times e'_N) / (3 \times h_{ef}))), 1)$ = **1.000**

Modification factor for edge effects — $\psi_{ed,N} = 0.7 + 0.3 \times (c_{a,min} / (1.5 \times h_{ef}))$ = **0.817**

Modification factor for no cracking at service loads — $\psi_{c,N}$ = **1.000**

Modification factor for cracked concrete — $\psi_{cp,N}$ = **1.000**

Nominal concrete breakout strength — $N_{cbg} = A_{Nc} / A_{Nco} \times \psi_{ed,N} \times \psi_{c,N} \times \psi_{cp,N} \times N_b$ = **19.80** kips

Concrete breakout strength — $\phi N_{cbg} = \phi_{t,c} \times N_{cbg}$ = **12.87** kips

Coefficient of pryout strength — k_{cp} = **2.0**

Nominal pryout strength of anchor in shear — $V_{cpg} = k_{cp} \times N_{cbg}$ = **39.61** kips

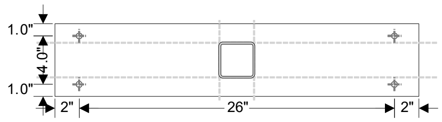
Pryout strength of anchor in shear — $\phi V_{cpg} = \phi_{v,cB} \times V_{cpg}$ = **27.72** kips

PASS - Pryout strength of anchor exceeds shear in bolts

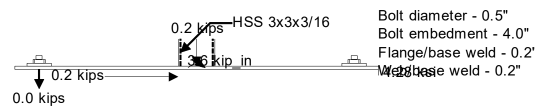
COLUMN BASE PLATE DESIGN

In accordance with AISC Steel Design Guide 1 and AISC 360-10

Tedds calculation version 2.1.02



Plan on baseplate



Elevation on baseplate

Design forces and moments

Axial force	P_u = **0.2** kips (Compression)
Bending moment	M_u = **3.6** kip_in
Shear force	F_v = **0.2** kips
Eccentricity	e = ABS(M_u / P_u) = **23.571** in
Anchor bolt to center of plate	f = N/2 - e_1 = **13.000** in

Column details

Column section	HSS 3x3x3/16
Depth	d = **3.000** in
Breadth	b_f = **3.000** in
Thickness	t = **0.174** in

Baseplate details

Depth	N = **30.000** in
Breadth	B = **6.000** in
Thickness	t_p = **0.250** in
Design strength	F_y = **36.0** ksi

Foundation geometry

Member thickness	h_a = **10.000** in
Dist center of baseplate to left edge foundation	x_{ce1} = **24.000** in
Dist center of baseplate to right edge foundation	x_{ce2} = **24.000** in
Dist center of baseplate to bot edge foundation	y_{ce1} = **6.000** in
Dist center of baseplate to top edge foundation	y_{ce2} = **7.000** in

Holding down bolt and anchor plate details

Total number of bolts	N_{bolt} = **4**
Bolt diameter	d_o = **0.500** in
Bolt spacing	s_{bolt} = **4.000** in
Edge distance	e_1 = **2.000** in
Minimum tensile strength, base plate	F_y = **36** ksi
Minimum tensile strength, column	F_{yCol} = **50** ksi
Compressive strength of concrete	f'_c = **5** ksi

Strength reduction factors

Compression	ϕ_c = **0.65**
Flexure	ϕ_b = **0.90**
Weld shear	ϕ_v = **0.75**

Plate cantilever dimensions

Area of base plate $A_1 = B \times N =$ **180.000** in^2

Maximum area of supporting surface $A_2 = (N + 2 \times l_{min}) \times (B + 2 \times l_{min}) =$ **432.000** in^2

Nominal strength of concrete under base plate $P_p = 0.85 \times f'_c \times A_1 \times \min(\sqrt{(A_2 / A_1)}, 2) =$ **1185.1** kips

Bending line cantilever distance m $m = (N - 0.95 \times d) / 2 =$ **13.575** in

Bending line cantilever distance n $n = (B - 0.95 \times b_f) / 2 =$ **1.575** in

Maximum bending line cantilever $l = \max(m, n) =$ **13.575** in

Check eccentricity

Maximum bearing stress $f_{p,max} = 0.85 \times f'_c \times \phi_c \times \min(\sqrt{(A_2 / A_1)}, 2) =$ **4.28** ksi

Maximum bearing pressure $q_{max} = f_{p,max} \times B =$ **25.68** kips/in

Critical eccentricity $e_{crit} = N / 2 - P_u / (2 \times q_{max}) =$ **14.997** in

e > e_{crit} so loads cannot be resisted by bearing alone. Therefore consider as a large moment

Plate dimensions adequate as $(f + N/2)^2 >= (2 \times P_u \times (e + f))/q_{max}$ and a real solution for bearing length exists

Bearing length - quadratic solution 1 $Y_1 = (f + N/2) + \sqrt{((f + N/2)^2 - (2 \times P_u \times (e + f))/q_{max})} =$ **55.992** in

Bearing length - quadratic solution 2 $Y_2 = (f + N/2) - \sqrt{((f + N/2)^2 - (2 \times P_u \times (e + f))/q_{max})} =$ **0.008** in

Bearing length $Y = \min(Y_1, Y_2) =$ **0.008** in

Tension force in bolts $T_u = q_{max} \times Y - P_u =$ **0.0** kips

Max tension in single bolt $T_{rod} = T_u / (N_{bolt}/2) =$ **0.0** kips

Base plate yielding limit at bearing interface

Required plate thickness $t_{p,req} = \sqrt{((4 \times f_{p,max} \times Y \times (l - Y/2))/(\phi_b \times F_y))} =$ **0.237** in

PASS - Thickness of plate exceeds required thickness

Base plate yielding limit at tension interface

Distance from bolt CL to plate bending lines $x = \mathrm{abs}(m - e_1) =$ **11.575** in

Plate thickness required $t_{p,req} = 2.11 \times \sqrt{((T_u \times x)/(B \times F_y))} =$ **0.106** in

PASS - Thickness of plate exceeds required thickness

Combined tension and bending in anchor bolts

Gross cross sectional area of anchor $A_{bolt} = \pi \times d_a^2 / 4 =$ **0.196** in^2

Thickness of washer $t_{wash} =$ **0.250** in

Shear stress in anchor $f_v = F_v / (N_{boltV} \times A_{bolt}) =$ **0.45** ksi

Lever arm $z = t_p + t_{wash} / 2 =$ **0.375** in

Bending in anchor $M_l = F_v \times z / N_{boltV} =$ **0.00** kips_ft

Plastic modulus of anchor $Z_{bolt} = d_a^3 / 6 =$ **0.021** in^3

Stress in anchor due to bending $f_{tb} = M_l / Z_{bolt} =$ **1.6** ksi

Axial stress in anchor $f_{ta} = T_{rod} / A_{bolt} =$ **0.1** ksi

Tensile stress in anchor $f_t = f_{tb} + f_{ta} =$ **1.7** ksi

Nominal tensile stress of anchor (Table J3.2) $F_{nt} = 0.75 \times f_{uta} =$ **43.5** ksi

Nominal shear stress of anchor (Table J3.2) $F_{nv} = 0.45 \times f_{uta} =$ **26.1** ksi

Tensile stress of anchor $\phi F_{nt} = \phi \times F_{nt} =$ **32.6** ksi

Modified tensile stress (Eqn J3-3a) $\phi F'_{nt} = \min(\phi \times (1.3 \times F_{nt} - (F_{nt} / (\phi \times F_{nv})) \times f_v), \phi F_{nt}) =$ **32.6** ksi

PASS - Combined shear and bending resistance of rods exceed tensile stress in rods

Tension weld

Tension flange weld leg length $t_{wf} =$ **0.1875** in

Effective flange weld width $l_{Tweld,eff} = l_{Tweld,eff\_ud}$ = **2** in

Tensile load per inch $R_{wf} = T_{rod} / l_{Tweld,eff}$ = **0.0** kips/in

Electrode classification number F_{EXX} = **70.0** ksi

Design weld stress $\phi F_{nw} = \phi_v \times 0.60 \times F_{EXX} \times (1.0 + 0.5 \times (\sin(90deg))^{1.5})$ = **47.250**ksi

Design strength of weld per in $\phi R_{nf} = \phi F_{nw} \times t_{wf} / \sqrt{(2)}$ = **6.3** kips/in

PASS - Available strength of weld exceeds force in tension weld

Local stress on flange $f_{T,local} = (T_{rod}) / (l_{Tweld,eff} \times t_f)$ = **0.068** ksi

Column flange allowable stress $F_{yCol} / 1.67$ = **29.940** ksi

PASS - Local column capacity exceeds local column stress

Shear weld

Shear web weld leg length t_{ww} = **0.1875** in

Shear web weld force per in $R_{wl} = F_v / (2 \times (d - 2 \times t))$ = **0.033** kips/in

Electrode classification number F_{EXX} = **70.0** ksi

Design weld stress $\phi F_{nw} = \phi_v \times 0.60 \times F_{EXX} \times (1.0 + 0.5 \times (\sin(0deg))^{1.5})$ = **31.500**ksi

Design strength of weld per in $\phi R_{nl} = \phi F_{nw} \times t_{ww} / \sqrt{(2)}$ = **4.2** kips/in

PASS - Available strength of shear weld exceeds force in shear weld

ANCHOR BOLT DESIGN

In accordance with ACI318-11

Tedds calculation version 2.1.02

Anchor bolt geometry

Type of anchor bolt Cast-in headed end bolt anchor

Diameter of anchor bolt d_a = **0.5** in

Number of bolts in x direction N_{boltx} = **2**

Number of bolts in y direction N_{bolty} = **2**

Total number of bolts $n_{total} = (N_{boltx} \times 2) + (N_{bolty} - 2) \times 2$ = **4**

Total number of bolts in tension $n_{tens} = (N_{boltN} \times 2) + (N_{bolty} - 2)$ = **2**

Spacing of bolts in x direction s_{boltx} = **26** in

Spacing of bolts in y direction s_{bolty} = **4** in

Number of threads per inch n_t = **13**

Effective cross-sectional area of anchor $A_{se} = \pi / 4 \times (d_a - 0.9743 \text{ in} / n_t)^2$ = **0.142** in^2

Embedded depth of each anchor bolt h_{ef} = **4** in

Material details

Minimum yield strength of steel f_{ya} = **36** ksi

Nominal tensile strength of steel f_{uta} = **58** ksi

Compressive strength of concrete f'_c = **5** ksi

Concrete modification factor λ = **1.00**

Modification factor for cast-in anchor concrete failure

$\lambda_a = 1.0 \times \lambda$= **1.00**

Strength reduction factors

Tension of steel element $\phi_{t,s}$ = **0.75**

Shear of steel element $\phi_{v,s}$ = **0.65**

Concrete tension $\phi_{t,c}$ = **0.65**

Concrete shear $\phi_{v,c}$ = **0.70**

Concrete tension for pullout $\phi_{t,cB}$ = **0.70**

Concrete shear for pryout $\phi_{v,cB}$ = **0.70**

Steel strength of anchor in tension (D.5.1)

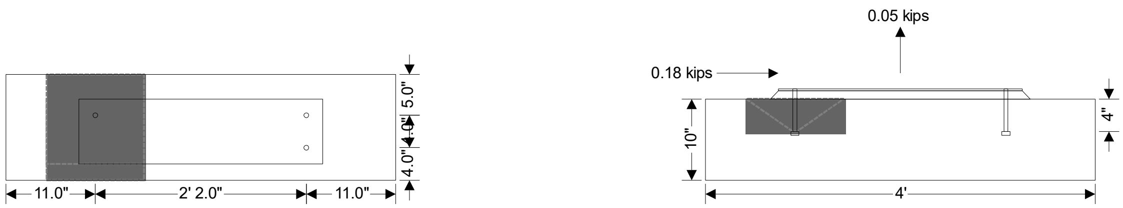
Nominal strength of anchor in tension $N_{sa} = A_{se} \times f_{uta}$ = **8.23** kips

Steel strength of anchor in tension $\phi N_{sa} = \phi_{t,s} \times N_{sa}$ = **6.17** kips

PASS - Steel strength of anchor exceeds max tension in single bolt

Check concrete breakout strength of anchor bolt in tension (D.5.2)

The spacing and embedded depth of the bolts/anchors are such that the projected area of all the anchors do not overlap. The concrete breakout strength of the anchors will therefore be based on a single anchor with the maximum axial force to a single anchor



Plan on foundation Section A-A

Concrete breakout - tension

Single anchor

Applied axial force $N_s = N_{max,s}$ = **0.02** kips

Eccentricity e'_N = **0** in

Coeff for basic breakout strength in tension k_c = **24**

Breakout strength for single anchor in tension $N_b = k_c \times \lambda_a \times \sqrt{(f'_c \times 1 \text{ psi})} \times h_{ef}^{1.5} \times 1 \text{ in}^{0.5}$ = **13.58** kips

Projected area for groups of anchors A_{Nc} = **120** in^2

Projected area of a single anchor $A_{Nco} = 9 \times h_{ef}^2$ = **144** in^2

Min dist center of anchor to edge of concrete $c_{a,min}$ = **4** in

Mod factor for groups loaded eccentrically $\psi_{ec,N} = \min(1 / (1 + ((2 \times e'_N) / (3 \times h_{ef}))), 1)$ = **1.000**

Modification factor for edge effects $\psi_{ed,N} = 0.7 + 0.3 \times (c_{a,min} / (1.5 \times h_{ef}))$ = **0.900**

Modification factor for no cracking at service loads $\psi_{c,N}$ = **1.000**

Modification factor for cracked concrete $\psi_{cp,N}$ = **1.000**

Nominal concrete breakout strength $N_{cb} = A_{Nc} / A_{Nco} \times \psi_{ed,N} \times \psi_{c,N} \times \psi_{cp,N} \times N_b$ = **10.18** kips

Concrete breakout strength $\phi N_{cb} = \phi_{t,c} \times N_{cb}$ = **6.62** kips

PASS - Breakout strength exceeds tension in bolts

Pullout strength (D.5.3)

Net bearing area of the head of anchor A_{brg} = **1** in^2

Mod factor for no cracking at service loads $\psi_{c,P}$ = **1.000**

Pullout strength for single anchor $N_p = 8 \times A_{brg} \times f'_c$ = **40.00** kips

Nominal pullout strength of single anchor $N_{pn} = \psi_{c,P} \times N_p$ = **40.00** kips

Pullout strength of single anchor $\phi N_{pn} = \phi_{t,cB} \times N_{pn}$ = **28.00** kips

PASS - Pullout strength of single anchor exceeds maximum axial force in single bolt

Side face blowout strength (D.5.4)

As $h_{ef} <= 2.5 \times \min(c_{a1}, c_{a2})$ the edge distance is considered to be far from an edge and blowout strength need not be considered

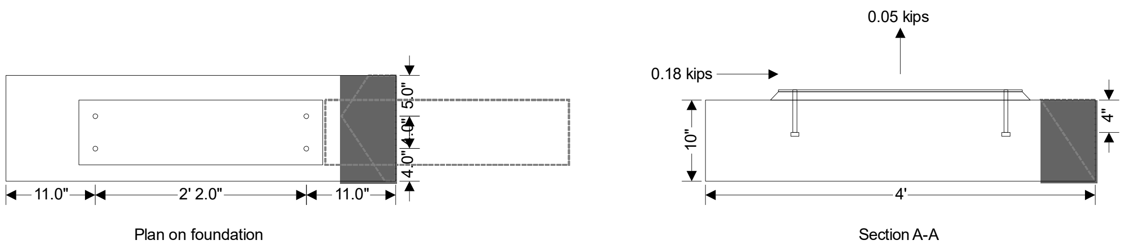
Steel strength of anchor in shear (D.6.1)

Built-up grout pads are used so nominal strength will be multiplied by 0.8 (D.6.1.3)

Effective number of anchors in shear	N_{boltV} = **2**
Nom strength of anchor in shear	$V_{sa} = 0.8 \times N_{boltV} \times 0.6 \times A_{se} \times f_{uta}$ = **7.90** kips
Steel strength of anchor in shear	$\phi V_{sa} = \phi_{v,s} \times V_{sa}$ = **5.14** kips

PASS - Steel strength of anchor exceeds shear in bolts

Concrete breakout strength in shear perpendicular to edge - Case 2. All shear resisted by rear bolts (D.6.3)



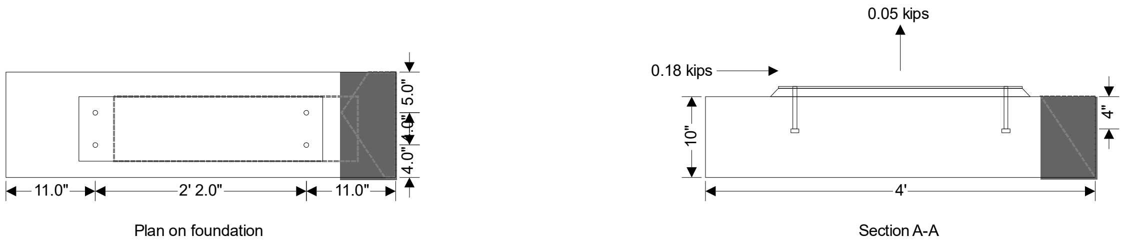
Concrete breakout - shear

The anchors are influenced by three or more edges where any edge distance is less than $1.5c_{a1}$ so value of c_{a1} is limited to c'_{a1} (D.6.2.4).

Bolt offset for limiting shear	$x_{V,r}$ = **30.33** in
Limiting edge distance	c'_{a1} = **6.67** in
Applied shear	$V_{app} = V$ = **0.18** kips
Edge distance x for shear near corner	c_{a1} = **37** in
Edge distance y for shear near corner	$c_{a2} = \min(y_{ce1}, y_{ce2}) - (((N_{bolty} - 1)/2) \times s_{bolty})$ = **4** in
Load bearing length of anchor	$l_e = \min(h_{ef}, 8 \times d_a)$ = **4** in
Basic concrete breakout strength	$V_{b1} = 7 \times (l_e / d_a)^{0.2} \times \sqrt{(d_a)} \times \lambda_a \times \sqrt{(f'_c \times 1psi)} \times (c'_{a1})^{1.5}$ = **9.13** kips
	$V_{b2} = 9 \times \lambda_a \times \sqrt{(f'_c \times 1psi \times 1 in)} \times (c'_{a1})^{1.5}$ = **10.95** kips
Basic concrete breakout strength	$V_b = \mathrm{Min}(V_{b1}, V_{b2})$ = **9.13** kips
Projected area of a single anchor	$A_{Vco} = 4.5 \times c'^2_{a1}$ = **200** in^2
Projected area of a group of anchors	A_{Vc} = **130** in^2
Mod factor for edge effect	$\psi_{ed.V} = 0.7 + 0.3 \times c_{a2} / (1.5 \times c'_{a1})$ = **0.820**
Eccentricity of loading	e'_V = **0** in
Modification factor of eccentric loading	$\psi_{ec,V} = \min(1, 1 / (1 + ((2 \times e'_V) / (3 \times c'_{a1}))))$ = **1.000**
Modification factor for cracking	$\psi_{c,V}$ = **1.000**
Modification factor for edge distance	$\psi_{h,V} = 1.0$ = **1.000**
Nominal concrete break out strength in shear	$V_{cbg} = A_{Vc} / A_{Vco} \times \psi_{ec,V} \times \psi_{ed,V} \times \psi_{c,V} \times \psi_{h,V} \times V_b$ = **4.87** kips
Concrete break out strength in shear	$\phi V_{cbg} = \phi_{v,c} \times V_{cbg}$ = **3.41** kips

PASS - Shear breakout perpendicular to edge strength exceeds shear in bolts

Concrete breakout strength in shear - Case 1. Half of shear resisted by front bolts (D.6.3)



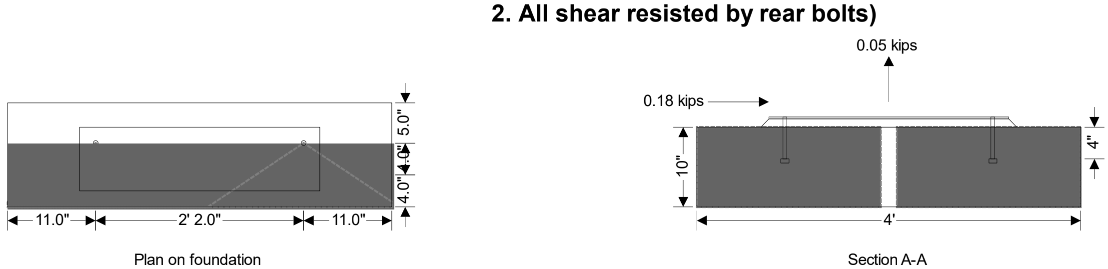
Concrete breakout - shear

The anchors are influenced by three or more edges where any edge distance is less than 1.5c_{a1} so value of c_{a1} is limited to c'_{a1} (D.6.2.4).

Bolt offset for limiting shear	$x_{V,f}$ = **4.33** in
Limiting edge distance	c'_{a1} = **6.67** in
Applied shear	V_{app} = V / 2 = **0.09** kips
Edge distance x for shear near corner	c_{a1} = **11** in
Edge distance y for shear near corner	c_{a2} = min(y_{ce1}, y_{ce2}) - (((N_{bolty} - 1)/2) × s_{bolty}) = **4** in
Load bearing length of anchor	l_e = min(h_{ef}, 8 × d_a) = **4** in
Basic concrete breakout strength	$V_{b1} = 7 \times (l_e / d_a)^{0.2} \times \sqrt{(d_a)} \times \lambda_a \times \sqrt{(f'_c \times 1psi)} \times (c'_{a1})^{1.5}$ = **9.13** kips
	$V_{b2} = 9 \times \lambda_a \times \sqrt{(f'_c \times 1psi \times 1 in)} \times (c'_{a1})^{1.5}$ = **10.95** kips
Basic concrete breakout strength	V_b = Min(V_{b1}, V_{b2}) = **9.13** kips
Projected area of a single anchor	$A_{Vco} = 4.5 \times c'^2_{a1}$ = **200** in^2
Projected area of a group of anchors	A_{Vc} = **130** in^2
Mod factor for edge effect	$\psi_{ed.V} = 0.7 + 0.3 \times c_{a2} / (1.5 \times c'_{a1})$ = **0.820**
Eccentricity of loading	e'_V = **0** in
Modification factor of eccentric loading	$\psi_{ec,V}$ = min(1, 1 / (1 + ((2 × e'_V) / (3 × c'_{a1})))) = **1.000**
Modification factor for cracking	$\psi_{c,V}$ = **1.000**
Modification factor for edge distance	$\psi_{h,V}$ = 1.0 = **1.000**
Nominal concrete break out strength in shear	$V_{cbg} = A_{Vc} / A_{Vco} \times \psi_{ec,V} \times \psi_{ed,V} \times \psi_{c,V} \times \psi_{h,V} \times V_b$ = **4.87** kips
Concrete break out strength in shear	$\phi V_{cbg} = \phi_{v,c} \times V_{cbg}$ = **3.41** kips

PASS - Shear breakout perpendicular to edge strength exceeds shear in bolts

Concrete breakout strength in shear parallel to edge - Case 2. All shear resisted by rear bolts (parallel to edge - Case 2. All shear resisted by rear bolts)



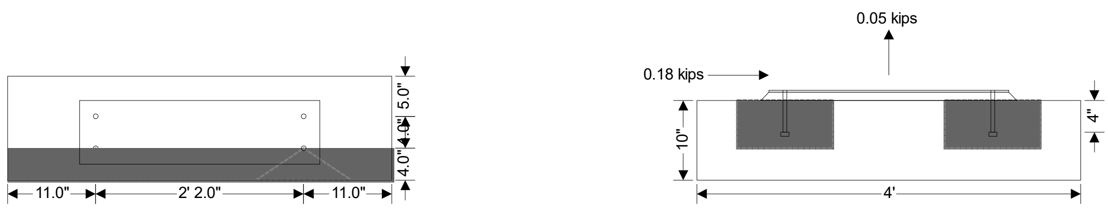
Concrete breakout - side shear

Applied shear	V_{app} = V = **0.18** kips
Edge distance x for shear near corner	$c_{a1,p}$ = **8** in
Edge distance y for shear near corner	$c_{a2,p}$ = min(x_{ce1}, x_{ce2}) - (((N_{boltx} - 1)/2) × s_{boltx}) = **11** in

Load bearing length of anchor	$l_e = \min(h_{ef}, 8 \times d_a) = \mathbf{4}$ in
Basic concrete breakout strength	$V_{b,p1} = 7 \times (l_e / d_a)^{0.2} \times \sqrt{(d_a)} \times \lambda_a \times \sqrt{(f'_c \times 1psi)} \times (c'_{a1,p})^{1.5} = \mathbf{13.54}$ kips
	$V_{b,p2} = 9 \times \lambda_a \times \sqrt{(f'_c \times 1psi \times 1in)} \times (c'_{a1,p})^{1.5} = \mathbf{16.24}$ kips
Basic concrete breakout strength	$V_{b,p} = \mathrm{Min}(V_{b,p1}, V_{b,p2}) = \mathbf{13.54}$ kips
Projected area of a single anchor	$A_{Vco,p} = 4.5 \times c'_{a1,p}{}^2 = \mathbf{338}$ in^2
Projected area of a group of anchors	$A_{Vc,p} = \mathbf{480}$ in^2
Mod factor for edge effect	$\psi_{ed,V,p} = \mathbf{1.000}$
Eccentricity of loading	$e'_{V,p} = \mathbf{0}$ in
Modification factor of eccentric loading	$\psi_{ec,V,p} = \min(1, 1 / (1 + ((2 \times e'_{V,p}) / (3 \times c'_{a1,p})))) = \mathbf{1.000}$
Modification factor for cracking	$\psi_{c,V} = \mathbf{1.000}$
Modification factor for edge distance	$\psi_{h,V,p} = \max(\sqrt{(1.5 \times c'_{a1,p} / h_a)}, 1) = \mathbf{1.140}$
Nominal concrete break out strength in shear	$V_{cb,p} = 2 \times A_{Vc,p} / A_{Vco,p} \times \psi_{ed,V,p} \times \psi_{c,V} \times \psi_{h,V,p} \times V_{b,p} = \mathbf{43.83}$ kips
Concrete break out strength in shear	$\phi V_{cb,p} = \phi_{v,c} \times V_{cb,p} = \mathbf{30.68}$ kips

PASS - Shear breakout strength parallel to edge exceeds shear in bolts

Concrete breakout strength in shear parallel to edge - Case 1. Half of shear resisted by front bolts (parallel to edge - Case 1. Half of shear resisted by front bolts)



Plan on foundation

Section A-A

Concrete breakout - side shear

Applied shear	$V_{app} = V / 2 = \mathbf{0.09}$ kips
Edge distance x for shear near corner	$c_{a1,p} = \mathbf{4}$ in
Edge distance y for shear near corner	$c_{a2,p} = \min(x_{ce1}, x_{ce2}) - (((N_{boltx} - 1)/2) \times s_{boltx}) = \mathbf{11}$ in
Load bearing length of anchor	$l_e = \min(h_{ef}, 8 \times d_a) = \mathbf{4}$ in
Basic concrete breakout strength	$V_{b,p1} = 7 \times (l_e / d_a)^{0.2} \times \sqrt{(d_a)} \times \lambda_a \times \sqrt{(f'_c \times 1psi)} \times (c_{a1,p})^{1.5} = \mathbf{4.24}$ kips
	$V_{b,p2} = 9 \times \lambda_a \times \sqrt{(f'_c \times 1psi \times 1in)} \times (c_{a1,p})^{1.5} = \mathbf{5.09}$ kips
Basic concrete breakout strength	$V_{b,p} = \mathrm{Min}(V_{b,p1}, V_{b,p2}) = \mathbf{4.24}$ kips
Projected area of a single anchor	$A_{Vco,p} = 4.5 \times c_{a1,p}{}^2 = \mathbf{72}$ in^2
Projected area of a group of anchors	$A_{Vc,p} = \mathbf{144}$ in^2
Mod factor for edge effect	$\psi_{ed,V,p} = \mathbf{1.000}$
Eccentricity of loading	$e'_{V,p} = \mathbf{0}$ in
Modification factor of eccentric loading	$\psi_{ec,V,p} = \min(1, 1 / (1 + ((2 \times e'_{V,p}) / (3 \times c_{a1,p})))) = \mathbf{1.000}$
Modification factor for cracking	$\psi_{c,V} = \mathbf{1.000}$
Modification factor for edge distance	$\psi_{h,V,p} = 1.0 = \mathbf{1.000}$
Nominal concrete break out strength in shear	$V_{cb,p} = 2 \times A_{Vc,p} / A_{Vco,p} \times \psi_{ed,V,p} \times \psi_{c,V} \times \psi_{h,V,p} \times V_{b,p} = \mathbf{16.98}$ kips
Concrete break out strength in shear	$\phi V_{cb,p} = \phi_{v,c} \times V_{cb,p} = \mathbf{11.88}$ kips

PASS - Shear breakout strength parallel to edge exceeds shear in bolts

Pryout strength of anchor in shear (D.6.3)

Coefficient of pryout strength $k_{cp} = \mathbf{2.0}$

Nominal pryout strength of anchor in shear $V_{cp} = k_{cp} \times N_{cb} \times N_{boltV}$ = **40.73** kips

Pryout strength of anchor in shear $\phi V_{cp} = \phi_{v,cB} \times V_{cp}$ = **28.51** kips

PASS - Pryout strength of anchor exceeds shear in bolts

Interaction of tensile and shear forces

Critical design strength in tension $\phi N_n = \phi N_{sa}$ = **6.17** kips

Critical applied tensile force $N_{ua} = N_{max,s}$ = **0.02** kips

$N_{ua} / \phi N_n$ = **0.004**

Critical design strength in shear $\phi V_n = \phi V_{cbg,r}$ = **3.41** kips

Critical applied shear force V_{ua} = abs(V) = **0.18** kips

$V_{ua} / \phi V_n$ = **0.052**

Full strength in both shear and tension are permitted

PASS - Applied tension and shear are less than tension and shear capacities

Hilti Design

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Company:		Page:	1
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Redesign - Abutment and Straddle bent	Date:	3/2/2020
Fastening point:			

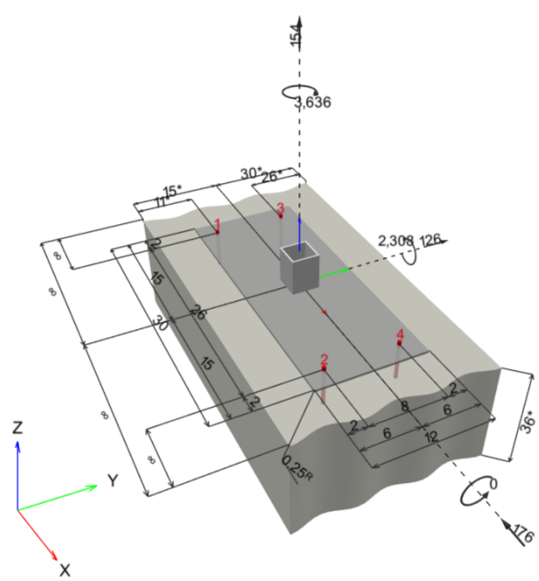
Specifier's comments: Abutment & Straddle Bent Sides

1 Input data

Anchor type and diameter:	**HDA-PR M10x100/20**
Item number:	339346 HDA-PR M10x100/20
Effective embedment depth:	h_{ef} = 3.937 in., h_{nom} = 3.937 in.
Material:	1.4401, 1.4404, 1.4571
Evaluation Service Report:	ESR-1546
Issued I Valid:	3/1/2018 | 3/1/2020
Proof:	Design Method ACI 318 / AC193
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.250 in.
Anchor plate[R] :	l_x x l_y x t = 30.000 in. x 12.000 in. x 0.250 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS3X3X.1875; (L x W x T) = 3.000 in. x 3.000 in. x 0.188 in.
Base material:	cracked concrete, 5000, f_c' = 5,000 psi; h = 36.000 in.
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present
	edge reinforcement: none or < No. 4 bar
Seismic loads (cat. C, D, E, or F)	no

[R] - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, in.lb]



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Address:		Specifier:	
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Design:	Redesign - Abutment and Straddle bent	Date:	3/2/2020
Fastening point:			

1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	$N = 154; V_x = -176; V_y = 126;$ $M_x = 0; M_y = -2{,}308; M_z = -3{,}636;$	no	3

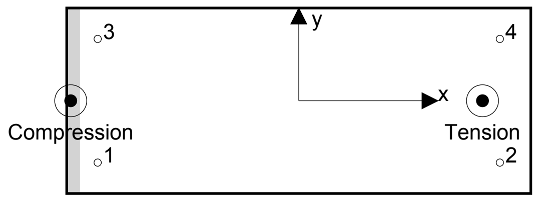
2 Load case/Resulting anchor forces

Load case: Design loads

Anchor reactions [lb]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	4	115	-64	95
2	82	71	-64	-32
3	4	98	-24	95
4	82	41	-24	-32



max. concrete compressive strain: 0.00 [‰]
max. concrete compressive stress: 4 [psi]
resulting tension force in (x/y)=(11.877/0.000): 172 [lb]
resulting compression force in (x/y)=(-14.743/0.000): 18 [lb]

Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

	Load N_{ua} [lb]	Capacity ϕ N_n [lb]	Utilization $\beta_N = N_{ua}/\phi N_n$	Status
Steel Strength*	82	7,830	2	OK
Pullout Strength*	82	8,266	1	OK
Concrete Breakout Failure**	172	9,602	2	OK

* highest loaded anchor **anchor group (anchors in tension)

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Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	Redesign - Abutment and Straddle bent	Date:	3/2/2020
Fastening point:			

3.1 Steel Strength

N_{sa} = ESR value — refer to ICC-ES ESR-1546

$\phi\ N_{sa} \geq N_{ua}$ — ACI 318-08 Eq. (D-1)

Variables

$A_{se,N}$ [in.^{2}]	f_{uta} [psi]
0.09	116,000

Calculations

N_{sa} [lb]
10,440

Results

N_{sa} [lb]	ϕ_{steel}	$\phi\ N_{sa}$ [lb]	N_{ua} [lb]
10,440	0.750	7,830	82

3.2 Pullout Strength

$N_{pn,f'_c} = N_{p,2500}\ (f_c'/2500)^{0.5}$ — refer to ICC-ES ESR-1546

$\phi\ N_{pn,f'_c} \geq N_{ua}$ — ACI 318-08 Eq. (D-1)

Variables

f'_c [psi]	$N_{p,2500}$ [lb]
5,000	8,992

Calculations

$(f_c'/2500)^{0.5}$
1.414

Results

N_{pn,f'_c} [lb]	$\phi_{concrete}$	$\phi\ N_{pn,f'_c}$ [lb]	N_{ua} [lb]
12,717	0.650	8,266	82

3.3 Concrete Breakout Failure

$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nc0}}\right) \psi_{ec,N}\ \psi_{ed,N}\ \psi_{c,N}\ \psi_{cp,N}\ N_b$ ACI 318-08 Eq. (D-5)

$\phi\ N_{cbg} \geq N_{ua}$ ACI 318-08 Eq. (D-1)

A_{Nc} see ACI 318-08, Part D.5.2.1, Fig. RD.5.2.1(b)

$A_{Nc0} = 9\ h_{ef}^2$ ACI 318-08 Eq. (D-6)

$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2\ e_N'}{3\ h_{ef}}}\right) \leq 1.0$ ACI 318-08 Eq. (D-9)

$\psi_{ed,N} = 0.7 + 0.3\left(\frac{c_{a,min}}{1.5h_{ef}}\right) \leq 1.0$ ACI 318-08 Eq. (D-11)

$\psi_{cp,N} = \text{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5h_{ef}}{c_{ac}}\right) \leq 1.0$ ACI 318-08 Eq. (D-13)

$N_b = k_c\ \lambda\ \sqrt{f_c'}\ h_{ef}^{1.5}$ ACI 318-08 Eq. (D-7)

Variables

h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]	$\psi_{c,N}$
3.937	11.877	0.000	11.000	1.000

c_{ac} [in.]	k_c	λ	f_c' [psi]
0.000	24	1	5,000

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
468.54	139.71	0.332	1.000	1.000	1.000	13,257

Results

N_{cbg} [lb]	$\phi_{concrete}$	$\phi\ N_{cbg}$ [lb]	N_{ua} [lb]
14,772	0.650	9,602	172

4 Shear load

	Load V_{ua} [lb]	Capacity ϕ V_n [lb]	Utilization $\beta_V = V_{ua}/\phi V_n$	Status
Steel Strength*	115	3,945	3	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength*	115	15,561	1	OK
Concrete edge failure in direction y-**	188	21,440	1	OK

* highest loaded anchor **anchor group (relevant anchors)

4.1 Steel Strength

V_{sa} = ESR value refer to ICC-ES ESR-1546

$\phi\ V_{steel} \geq V_{ua}$ ACI 318-08 Eq. (D-2)

Variables

$A_{se,V}$ [in.^{2}]	f_{uta} [psi]	$\alpha_{V,seis}$
0.09	116,000	0.926

Calculations

V_{sa} [lb]
6,070

Results

V_{sa} [lb]	ϕ_{steel}	$\phi\ V_{sa}$ [lb]	V_{ua} [lb]
6,070	0.650	3,945	115

4.2 Pryout Strength

$V_{cp} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}}\right) \psi_{ed,N}\ \psi_{c,N}\ \psi_{cp,N}\ N_b\right]$ ACI 318-08 Eq. (D-30)

$\phi\ V_{cp} \geq V_{ua}$ ACI 318-08 Eq. (D-2)

A_{Nc} see ACI 318-08, Part D.5.2.1, Fig. RD.5.2.1(b)

$A_{Nc0} = 9\ h_{ef}^2$ ACI 318-08 Eq. (D-6)

$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2\ e_N'}{3\ h_{ef}}}\right) \leq 1.0$ ACI 318-08 Eq. (D-9)

$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5h_{ef}}\right) \leq 1.0$ ACI 318-08 Eq. (D-11)

$\psi_{cp,N} = \mathrm{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5h_{ef}}{c_{ac}}\right) \leq 1.0$ ACI 318-08 Eq. (D-13)

$N_b = k_c\ \lambda\ \sqrt{f_c'}\ h_{ef}^{1.5}$ ACI 318-08 Eq. (D-7)

Variables

k_{cp}	h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]
2	3.937	0.000	0.000	11.000

$\psi_{c,N}$	c_{ac} [in.]	k_c	λ	f_c' [psi]
1.000	-	24	1	5,000

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
117.14	139.71	1.000	1.000	1.000	1.000	13,257

Results

V_{cp} [lb]	$\phi_{concrete}$	$\phi\ V_{cp}$ [lb]	V_{ua} [lb]
22,230	0.700	15,561	115

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4.3 Concrete edge failure in direction y-

$V_{cbg} = \left(\frac{A_{Vc}}{A_{Vc0}}\right) \psi_{ec,V} \; \psi_{ed,V} \; \psi_{c,V} \; \psi_{h,V} \; \psi_{parallel,V} \; V_b$ ACI 318-08 Eq. (D-22)

$\phi \; V_{cbg} \geq V_{ua}$ ACI 318-08 Eq. (D-2)

A_{Vc} see ACI 318-08, Part D.6.2.1, Fig. RD.6.2.1(b)

$A_{Vc0} = 4.5 \; c_{a1}^2$ ACI 318-08 Eq. (D-23)

$\psi_{ec,V} = \left(\frac{1}{1 + \frac{2e_V'}{3c_{a1}}}\right) \leq 1.0$ ACI 318-08 Eq. (D-26)

$\psi_{ed,V} = 0.7 + 0.3\left(\frac{c_{a2}}{1.5c_{a1}}\right) \leq 1.0$ ACI 318-08 Eq. (D-28)

$\psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0$ ACI 318-08 Eq. (D-29)

$V_b = \left(7 \left(\frac{l_e}{d_a}\right)^{0.2} \sqrt{d_a}\right) \lambda \; \sqrt{f_c'} \; c_{a1}^{1.5}$ ACI 318-08 Eq. (D-24)

Variables

c_{a1} [in.]	c_{a2} [in.]	e_{cV} [in.]	$\psi_{c,V}$	h_a [in.]
11.000	-	4.489	1.000	36.000

l_e [in.]	λ	d_a [in.]	f_c' [psi]	$\psi_{parallel,V}$
3.940	1.000	0.750	5,000	1.000

Calculations

A_{Vc} [in.^{2}]	A_{Vc0} [in.^{2}]	$\psi_{ec,V}$	$\psi_{ed,V}$	$\psi_{h,V}$	V_b [lb]
973.50	544.50	0.786	1.000	1.000	21,792

Results

V_{cbg} [lb]	$\phi_{concrete}$	$\phi \; V_{cbg}$ [lb]	V_{ua} [lb]
30,629	0.700	21,440	188

5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.018	0.029	5/3	1	OK

$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} <= 1$

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6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2018, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- Refer to the manufacturer's product literature for cleaning and installation instructions.
- For additional information about ACI 318 strength design provisions, please go to https://submittals.us.hilti.com/PROFISAnchorDesignGuide/

Fastening meets the design criteria!

7 Installation data

Profile: Square HSS (AISC), HSS3X3X.1875; (L x W x T) = 3.000 in. x 3.000 in. x 0.188 in.

Hole diameter in the fixture: d_f = 0.472 in.

Plate thickness (input): 0.250 in.

Recommended plate thickness: not calculated

Drilling method: Hammer drilled

Cleaning: Manual cleaning of the drilled hole according to instructions for use is required.

Anchor type and diameter: HDA-PR M10x100/20

Item number: 339346 HDA-PR M10x100/20

Installation torque: 443 in.lb

Hole diameter in the base material: 0.787 in.

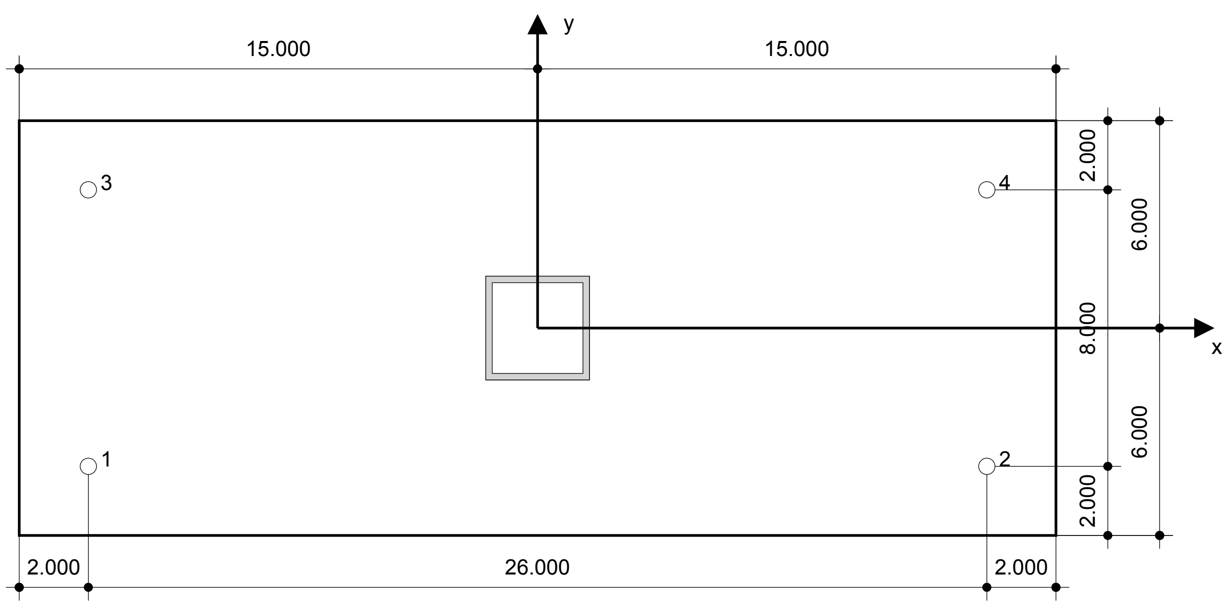
Hole depth in the base material: 4.213 in.

Minimum thickness of the base material: 7.100 in.

Hilti HDA undercut anchor with 3.937008 in embedment, M10x100/20, Stainless steel, installation per ESR-1546

7.1 Recommended accessories

Drilling	Cleaning	Setting
• Suitable Rotary Hammer • Properly sized stop drill bit for specific drill depth	• Manual blow-out pump	• HDA-ST setting tool • Torque wrench



Coordinates Anchor in.

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-13.000	-4.000	-	-	11.000	34.000
2	13.000	-4.000	-	-	11.000	34.000
3	-13.000	4.000	-	-	19.000	26.000
4	13.000	4.000	-	-	19.000	26.000

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8 Remarks; Your Cooperation Duties

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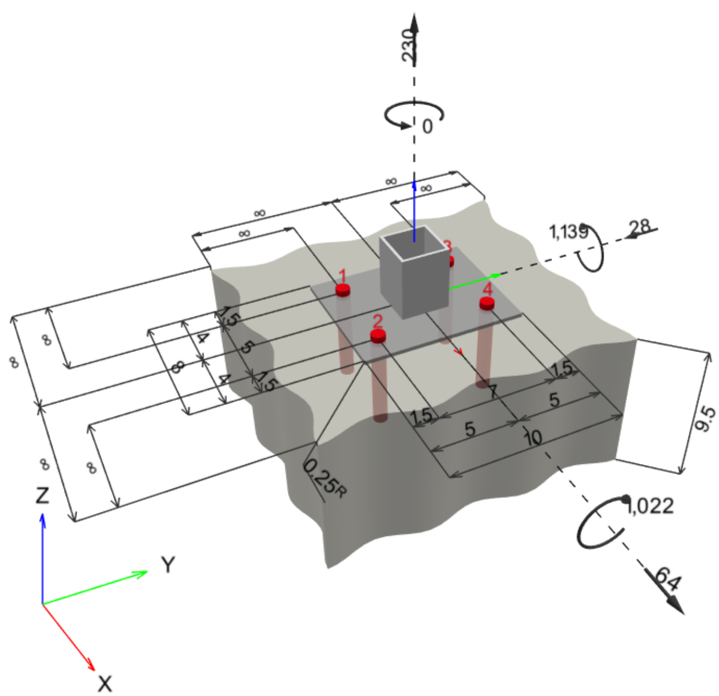
Specifier's comments: Straddle Bent Middle

1 Input data

Anchor type and diameter:	**Hex Head ASTM F 1554 GR. 36 7/8**
Item number:	not available
Effective embedment depth:	h_{ef} = 5.724 in.
Material:	ASTM F 1554
Proof:	Design Method ACI 318-08 / CIP
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.250 in.
Anchor plate[R] :	l_x x l_y x t = 8.000 in. x 10.000 in. x 0.250 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS3X3X.1875; (L x W x T) = 3.000 in. x 3.000 in. x 0.188 in.
Base material:	cracked concrete, 5000, f_c' = 5,000 psi; h = 9.500 in.
Reinforcement:	tension: condition B, shear: condition B;
	edge reinforcement: none or < No. 4 bar
Seismic loads (cat. C, D, E, or F)	no

[R] - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, in.lb]



1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	$N = 230$; $V_x = 64$; $V_y = -28$; $M_x = -1{,}022$; $M_y = -1{,}139$; $M_z = 0$;	no	2

2 Load case/Resulting anchor forces

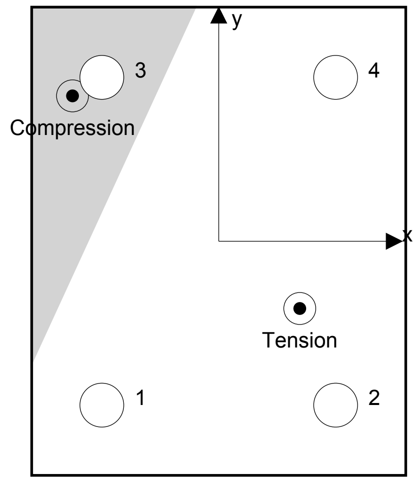
Load case: Design loads

Anchor reactions [lb]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	59	17	16	-7
2	211	17	16	-7
3	0	17	16	-7
4	113	17	16	-7

max. concrete compressive strain: 0.01 [‰]
max. concrete compressive stress: 35 [psi]
resulting tension force in (x/y)=(1.733/-1.436): 382 [lb]
resulting compression force in (x/y)=(-3.127/3.105): 152 [lb]



Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

	Load N_{ua} [lb]	Capacity ϕ N_n [lb]	Utilization $\beta_N = N_{ua}/\phi N_n$	Status
Steel Strength*	211	20,097	2	OK
Pullout Strength*	211	24,948	1	OK
Concrete Breakout Failure**	382	24,254	2	OK
Concrete Side-Face Blowout, direction **	N/A	N/A	N/A	N/A

* highest loaded anchor **anchor group (anchors in tension)

3.1 Steel Strength

$N_{sa} = A_{se,N}\, f_{uta}$ ACI 318-08 Eq. (D-3)

$\phi\, N_{sa} \geq N_{ua}$ ACI 318-08 Eq. (D-1)

Variables

$A_{se,N}$ [in.^{2}]	f_{uta} [psi]
0.46	58,000

Calculations

N_{sa} [lb]
26,796

Results

N_{sa} [lb]	ϕ_{steel}	$\phi\, N_{sa}$ [lb]	N_{ua} [lb]
26,796	0.750	20,097	211

3.2 Pullout Strength

$N_{pN} = \psi_{c,p}\, N_p$ ACI 318-08 Eq. (D-14)

$N_p = 8\, A_{brg}\, f'_c$ ACI 318-08 Eq. (D-15)

$\phi\, N_{pN} \geq N_{ua}$ ACI 318-08 Eq. (D-1)

Variables

$\psi_{c,p}$	A_{brg} [in.^{2}]	f'_c [psi]
1.000	0.89	5,000

Calculations

N_p [lb]
35,640

Results

N_{pn} [lb]	$\phi_{concrete}$	$\phi\, N_{pn}$ [lb]	N_{ua} [lb]
35,640	0.700	24,948	211

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3.3 Concrete Breakout Failure

$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nc0}}\right) \psi_{ec,N}\ \psi_{ed,N}\ \psi_{c,N}\ \psi_{cp,N}\ N_b$ ACI 318-08 Eq. (D-5)

$\phi\ N_{cbg} \geq N_{ua}$ ACI 318-08 Eq. (D-1)

A_{Nc} see ACI 318-08, Part D.5.2.1, Fig. RD.5.2.1(b)

$A_{Nc0} = 9\ h_{ef}^2$ ACI 318-08 Eq. (D-6)

$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2\ e_N'}{3\ h_{ef}}}\right) \leq 1.0$ ACI 318-08 Eq. (D-9)

$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5h_{ef}}\right) \leq 1.0$ ACI 318-08 Eq. (D-11)

$\psi_{cp,N} = \text{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5h_{ef}}{c_{ac}}\right) \leq 1.0$ ACI 318-08 Eq. (D-13)

$N_b = k_c\ \lambda\ \sqrt{f_c'}\ h_{ef}^{1.5}$ ACI 318-08 Eq. (D-7)

Variables

h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]	$\psi_{c,N}$
5.724	0.900	0.269	∞	1.000

c_{ac} [in.]	k_c	λ	f_c' [psi]
0.000	24	1	5,000

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
500.94	294.88	0.905	0.970	1.000	1.000	23,241

Results

N_{cbg} [lb]	$\phi_{concrete}$	$\phi\ N_{cbg}$ [lb]	N_{ua} [lb]
34,649	0.700	24,254	382

4 Shear load

	Load V_{ua} [lb]	Capacity ϕ V_n [lb]	Utilization $\beta_V = V_{ua}/\phi V_n$	Status
Steel Strength*	17	10,450	1	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength**	70	59,136	1	OK
Concrete edge failure in direction **	N/A	N/A	N/A	N/A

* highest loaded anchor   **anchor group (relevant anchors)

4.1 Steel Strength

$V_{sa} = 0.6\ A_{se,V}\ f_{uta}$ ACI 318-08 Eq. (D-20)

$\phi\ V_{steel} \geq V_{ua}$ ACI 318-08 Eq. (D-2)

Variables

$A_{se,V}$ [in.^{2}]	f_{uta} [psi]
0.46	58,000

Calculations

V_{sa} [lb]
16,078

Results

V_{sa} [lb]	ϕ_{steel}	ϕ V_{sa} [lb]	V_{ua} [lb]
16,078	0.650	10,450	17

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4.2 Pryout Strength

$V_{cpg} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}}\right) \psi_{ec,N}\ \psi_{ed,N}\ \psi_{c,N}\ \psi_{cp,N}\ N_b\right]$ ACI 318-08 Eq. (D-31)

$\phi\ V_{cpg} \geq V_{ua}$ ACI 318-08 Eq. (D-2)

A_{Nc} see ACI 318-08, Part D.5.2.1, Fig. RD.5.2.1(b)

$A_{Nc0} = 9\ h_{ef}^2$ ACI 318-08 Eq. (D-6)

$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2\ e_N'}{3\ h_{ef}}}\right) \leq 1.0$ ACI 318-08 Eq. (D-9)

$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5h_{ef}}\right) \leq 1.0$ ACI 318-08 Eq. (D-11)

$\psi_{cp,N} = \text{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5h_{ef}}{c_{ac}}\right) \leq 1.0$ ACI 318-08 Eq. (D-13)

$N_b = k_c\ \lambda\ \sqrt{f_c'}\ h_{ef}^{1.5}$ ACI 318-08 Eq. (D-7)

Variables

k_{cp}	h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]
2	5.724	0.000	0.000	∞

$\psi_{c,N}$	c_{ac} [in.]	k_c	λ	f_c' [psi]
1.000	-	24	1	5,000

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
535.94	294.88	1.000	1.000	1.000	1.000	23,241

Results

V_{cpg} [lb]	$\phi_{concrete}$	$\phi\ V_{cpg}$ [lb]	V_{ua} [lb]
84,479	0.700	59,136	70

5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.016	0.002	5/3	1	OK

$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} <= 1$

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6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2018, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- For additional information about ACI 318 strength design provisions, please go to https://submittals.us.hilti.com/PROFISAnchorDesignGuide/

Fastening meets the design criteria!

7 Installation data

Profile: Square HSS (AISC), HSS3X3X.1875; (L x W x T) = 3.000 in. x 3.000 in. x 0.188 in.

Hole diameter in the fixture: d_f = 0.938 in.

Plate thickness (input): 0.250 in.

Recommended plate thickness: not calculated

Anchor type and diameter: Hex Head ASTM F 1554 GR. 36 7/8

Item number: not available

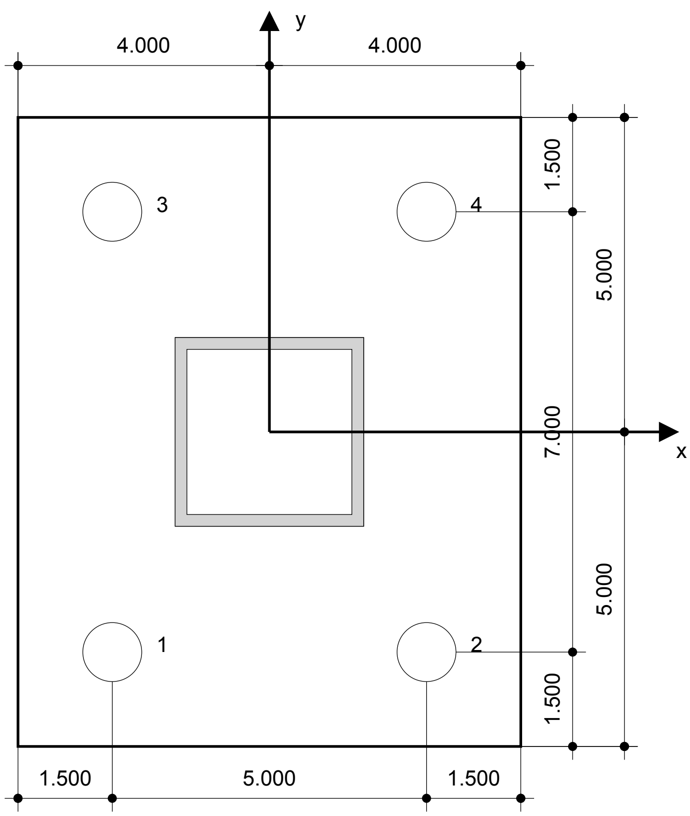
Installation torque: -

Hole diameter in the base material: - in.

Hole depth in the base material: 5.724 in.

Minimum thickness of the base material: 6.776 in.

Hilti Hex Head headed stud anchor with 5.724 in embedment, 7/8, Steel galvanized, installation per instruction for use



Coordinates Anchor in.

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-2.500	-3.500	-	-	-	-
2	2.500	-3.500	-	-	-	-
3	-2.500	3.500	-	-	-	-
4	2.500	3.500	-	-	-	-

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8 Remarks; Your Cooperation Duties

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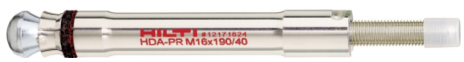
Design:	Redesign-MSE Wall- Concrete - Baseplate (part B)	Date:	3/2/2020
Fastening point:			

Specifier's comments: MSE Wall

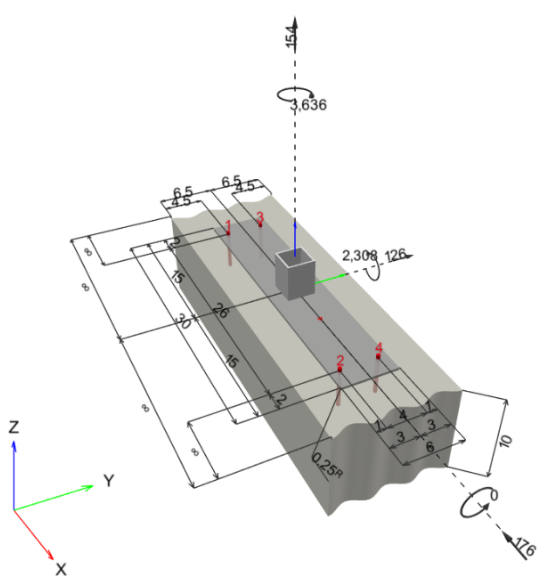
1 Input data



Anchor type and diameter:	**HDA-PR M10x100/20**
Item number:	339346 HDA-PR M10x100/20
Effective embedment depth:	h_{ef} = 3.937 in., h_{nom} = 3.937 in.
Material:	1.4401, 1.4404, 1.4571
Evaluation Service Report:	ESR-1546
Issued I Valid:	3/1/2018 | 3/1/2020
Proof:	Design Method ACI 318 / AC193
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.250 in.
Anchor plate[R] :	l_x x l_y x t = 30.000 in. x 6.000 in. x 0.250 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC), HSS3X3X.1875; (L x W x T) = 3.000 in. x 3.000 in. x 0.188 in.
Base material:	cracked concrete, 5000, f_c' = 5,000 psi; h = 10.000 in.
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present
	edge reinforcement: none or < No. 4 bar
Seismic loads (cat. C, D, E, or F)	no

[R] - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [in.] & Loading [lb, in.lb]



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1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 154; V_x = -176; V_y = 126; M_x = 0; M_y = -2,308; M_z = -3,636;	no	9

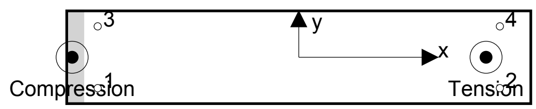
2 Load case/Resulting anchor forces

Load case: Design loads

Anchor reactions [lb]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	3	114	-55	100
2	82	66	-55	-37
3	3	105	-33	100
4	82	50	-33	-37



max. concrete compressive strain: 0.00 [‰]
max. concrete compressive stress: 5 [psi]
resulting tension force in (x/y)=(12.107/0.000): 171 [lb]
resulting compression force in (x/y)=(-14.653/0.000): 17 [lb]

Anchor forces are calculated based on the assumption of a rigid anchor plate.

3 Tension load

	Load N_{ua} [lb]	Capacity ϕ N_n [lb]	Utilization $\beta_N = N_{ua}/\phi N_n$	Status
Steel Strength*	82	7,830	2	OK
Pullout Strength*	82	8,266	1	OK
Concrete Breakout Failure**	171	5,773	3	OK

* highest loaded anchor **anchor group (anchors in tension)

3.1 Steel Strength

N_{sa} = ESR value — refer to ICC-ES ESR-1546

$\phi\ N_{sa} \geq N_{ua}$ — ACI 318-08 Eq. (D-1)

Variables

$A_{se,N}$ [in.^{2}]	f_{uta} [psi]
0.09	116,000

Calculations

N_{sa} [lb]
10,440

Results

N_{sa} [lb]	ϕ_{steel}	$\phi\ N_{sa}$ [lb]	N_{ua} [lb]
10,440	0.750	7,830	82

3.2 Pullout Strength

$N_{pn,f_c'} = N_{p,2500}\ (f_c'/2500)^{0.5}$ — refer to ICC-ES ESR-1546

$\phi\ N_{pn,f_c'} \geq N_{ua}$ — ACI 318-08 Eq. (D-1)

Variables

f_c' [psi]	$N_{p,2500}$ [lb]
5,000	8,992

Calculations

$(f_c'/2500)^{0.5}$
1.414

Results

$N_{pn,f_c'}$ [lb]	$\phi_{concrete}$	$\phi\ N_{pn,f_c'}$ [lb]	N_{ua} [lb]
12,717	0.650	8,266	82

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3.3 Concrete Breakout Failure

$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nc0}}\right) \psi_{ec,N}\ \psi_{ed,N}\ \psi_{c,N}\ \psi_{cp,N}\ N_b$ — ACI 318-08 Eq. (D-5)

$\phi\ N_{cbg} \geq N_{ua}$ — ACI 318-08 Eq. (D-1)

A_{Nc} see ACI 318-08, Part D.5.2.1, Fig. RD.5.2.1(b)

$A_{Nc0} = 9\ h_{ef}^2$ — ACI 318-08 Eq. (D-6)

$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2\ e_N'}{3\ h_{ef}}}\right) \leq 1.0$ — ACI 318-08 Eq. (D-9)

$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5h_{ef}}\right) \leq 1.0$ — ACI 318-08 Eq. (D-11)

$\psi_{cp,N} = \text{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5h_{ef}}{c_{ac}}\right) \leq 1.0$ — ACI 318-08 Eq. (D-13)

$N_b = k_c\ \lambda\ \sqrt{f_c'}\ h_{ef}^{1.5}$ — ACI 318-08 Eq. (D-7)

Variables

h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]	$\psi_{c,N}$
3.937	12.107	0.000	4.500	1.000

c_{ac} [in.]	k_c	λ	f_c' [psi]
0.000	24	1	5,000

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
307.32	139.71	0.328	1.000	0.928	1.000	13,257

Results

N_{cbg} [lb]	$\phi_{concrete}$	$\phi\ N_{cbg}$ [lb]	N_{ua} [lb]
8,881	0.650	5,773	171

4 Shear load

	Load V_{ua} [lb]	Capacity ϕ V_n [lb]	Utilization $\beta_V = V_{ua}/\phi V_n$	Status
Steel Strength*	114	3,945	3	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength*	114	9,476	2	OK
Concrete edge failure in direction y+**	266	3,265	9	OK

* highest loaded anchor **anchor group (relevant anchors)

4.1 Steel Strength

V_{sa} = ESR value	refer to ICC-ES ESR-1546
$\phi\ V_{steel} \geq V_{ua}$	ACI 318-08 Eq. (D-2)

Variables

$A_{se,V}$ [in.^{2}]	f_{uta} [psi]	$\alpha_{V,seis}$
0.09	116,000	0.926

Calculations

V_{sa} [lb]
6,070

Results

V_{sa} [lb]	ϕ_{steel}	$\phi\ V_{sa}$ [lb]	V_{ua} [lb]
6,070	0.650	3,945	114

4.2 Pryout Strength

$V_{cp} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ed,N} \, \psi_{c,N} \, \psi_{cp,N} \, N_b \right]$ ACI 318-08 Eq. (D-30)

$\phi \; V_{cp} \geq V_{ua}$ ACI 318-08 Eq. (D-2)

A_{Nc} see ACI 318-08, Part D.5.2.1, Fig. RD.5.2.1(b)

$A_{Nc0} = 9 \, h_{ef}^2$ ACI 318-08 Eq. (D-6)

$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 \, e_N'}{3 \, h_{ef}}} \right) \leq 1.0$ ACI 318-08 Eq. (D-9)

$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0$ ACI 318-08 Eq. (D-11)

$\psi_{cp,N} = \mathrm{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0$ ACI 318-08 Eq. (D-13)

$N_b = k_c \; \lambda \; \sqrt{f_c'} \; h_{ef}^{1.5}$ ACI 318-08 Eq. (D-7)

Variables

k_{cp}	h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]
2	3.937	0.000	0.000	4.500

$\psi_{c,N}$	c_{ac} [in.]	k_c	λ	f_c' [psi]
1.000	-	24	1	5,000

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
76.83	139.71	1.000	1.000	0.928	1.000	13,257

Results

V_{cp} [lb]	$\phi_{concrete}$	$\phi \; V_{cp}$ [lb]	V_{ua} [lb]
13,537	0.700	9,476	114

4.3 Concrete edge failure in direction y+

$V_{cbg} = \left(\frac{A_{Vc}}{A_{Vc0}}\right) \psi_{ec,V}\ \psi_{ed,V}\ \psi_{c,V}\ \psi_{h,V}\ \psi_{parallel,V}\ V_b$ ACI 318-08 Eq. (D-22)

$\phi\ V_{cbg} \geq V_{ua}$ ACI 318-08 Eq. (D-2)

A_{Vc} see ACI 318-08, Part D.6.2.1, Fig. RD.6.2.1(b)

$A_{Vc0} = 4.5\ c_{a1}^2$ ACI 318-08 Eq. (D-23)

$\psi_{ec,V} = \left(\frac{1}{1 + \frac{2e'_V}{3c_{a1}}}\right) \leq 1.0$ ACI 318-08 Eq. (D-26)

$\psi_{ed,V} = 0.7 + 0.3\left(\frac{c_{a2}}{1.5c_{a1}}\right) \leq 1.0$ ACI 318-08 Eq. (D-28)

$\psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0$ ACI 318-08 Eq. (D-29)

$V_b = \left(7\left(\frac{l_e}{d_a}\right)^{0.2} \sqrt{d_a}\right) \lambda\ \sqrt{f'_c}\ c_{a1}^{1.5}$ ACI 318-08 Eq. (D-24)

Variables

c_{a1} [in.]	c_{a2} [in.]	e_{cV} [in.]	$\psi_{c,V}$	h_a [in.]
4.500	-	9.751	1.000	10.000

l_e [in.]	λ	d_a [in.]	f'_c [psi]	$\psi_{parallel,V}$
3.940	1.000	0.750	5,000	1.000

Calculations

A_{Vc} [in.^{2}]	A_{Vc0} [in.^{2}]	$\psi_{ec,V}$	$\psi_{ed,V}$	$\psi_{h,V}$	V_b [lb]
182.25	91.13	0.409	1.000	1.000	5,702

Results

V_{cbg} [lb]	$\phi_{concrete}$	$\phi\ V_{cbg}$ [lb]	V_{ua} [lb]
4,665	0.700	3,265	266

5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.030	0.081	5/3	2	OK

$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} <= 1$

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6 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2018, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- Refer to the manufacturer's product literature for cleaning and installation instructions.
- For additional information about ACI 318 strength design provisions, please go to https://submittals.us.hilti.com/PROFISAnchorDesignGuide/

Fastening meets the design criteria!

7 Installation data

Profile: Square HSS (AISC), HSS3X3X.1875; (L x W x T) = 3.000 in. x 3.000 in. x 0.188 in.

Hole diameter in the fixture: d_f = 0.472 in.

Plate thickness (input): 0.250 in.

Recommended plate thickness: not calculated

Drilling method: Hammer drilled

Cleaning: Manual cleaning of the drilled hole according to instructions for use is required.

Anchor type and diameter: HDA-PR M10x100/20

Item number: 339346 HDA-PR M10x100/20

Installation torque: 443 in.lb

Hole diameter in the base material: 0.787 in.

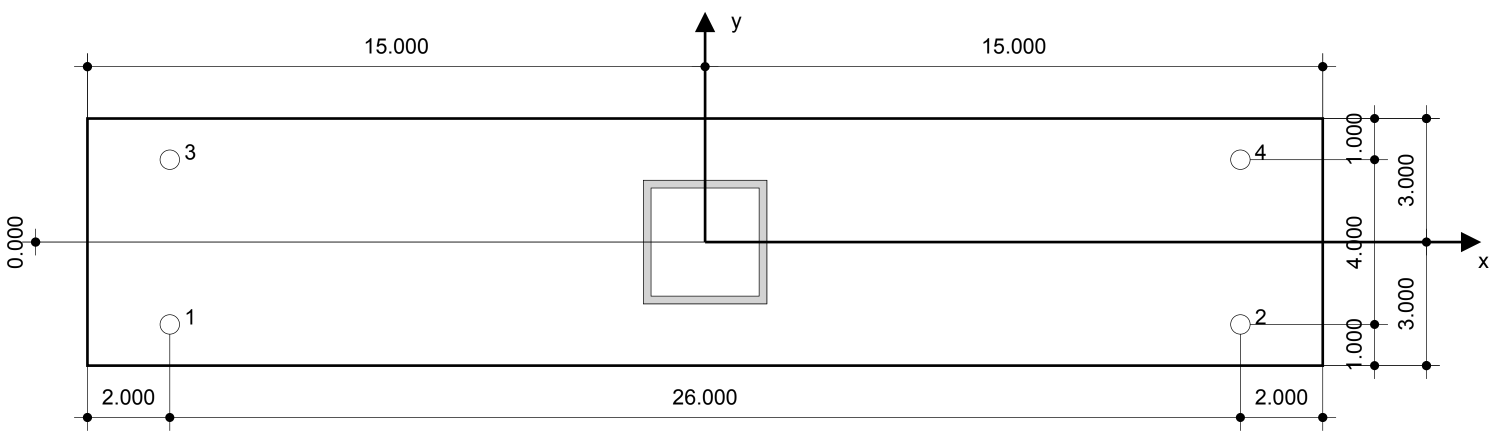
Hole depth in the base material: 4.213 in.

Minimum thickness of the base material: 7.100 in.

Hilti HDA undercut anchor with 3.937008 in embedment, M10x100/20, Stainless steel, installation per ESR-1546

7.1 Recommended accessories

Drilling	Cleaning	Setting
• Suitable Rotary Hammer • Properly sized stop drill bit for specific drill depth	• Manual blow-out pump	• HDA-ST setting tool • Torque wrench



Coordinates Anchor in.

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-13.000	-2.000	-	-	4.500	8.500
2	13.000	-2.000	-	-	4.500	8.500
3	-13.000	2.000	-	-	8.500	4.500
4	13.000	2.000	-	-	8.500	4.500

8 Remarks; Your Cooperation Duties

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