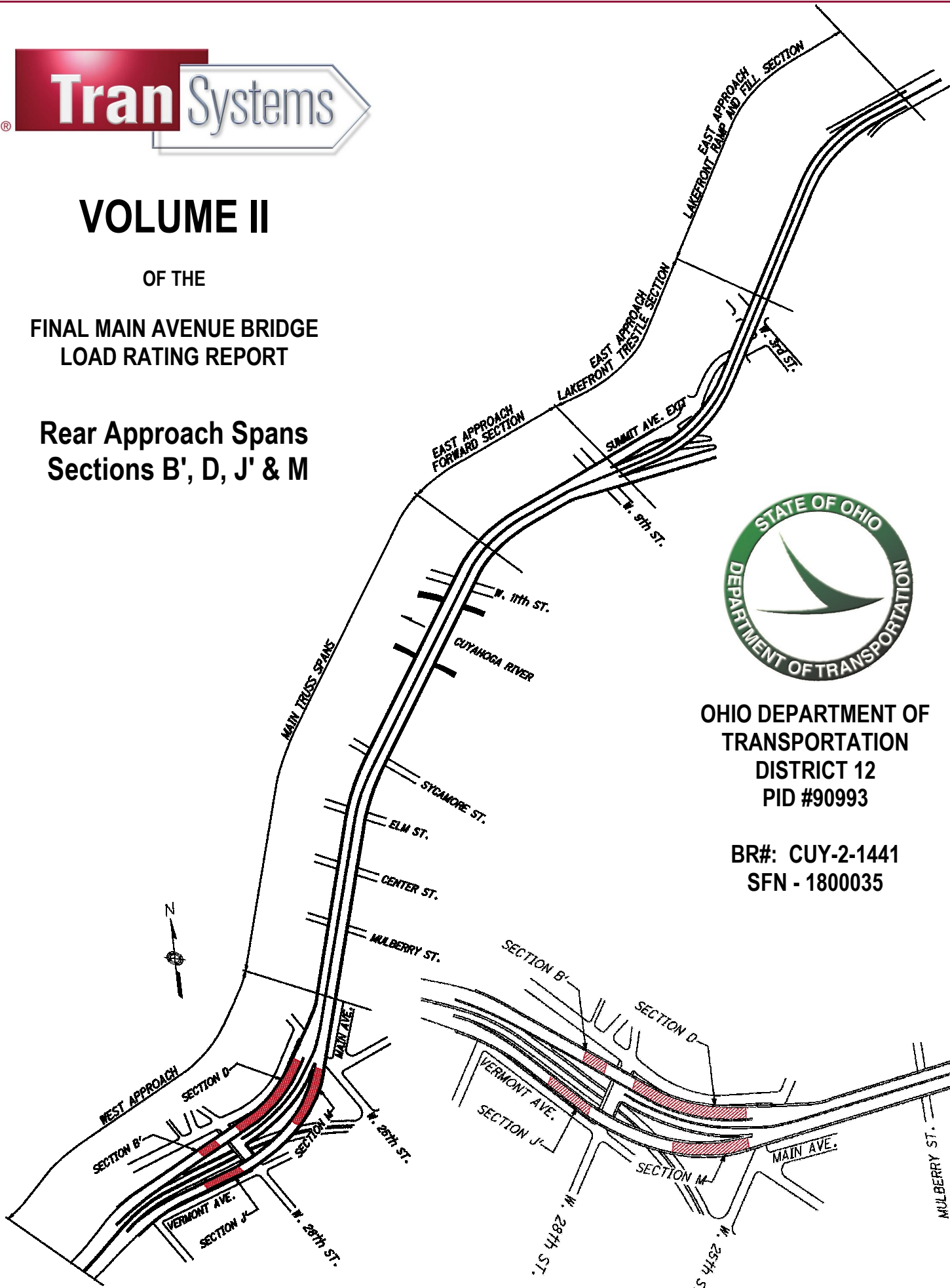




# VOLUME II

OF THE  
FINAL MAIN AVENUE BRIDGE  
LOAD RATING REPORT

Rear Approach Spans  
Sections B', D, J' & M



OHIO DEPARTMENT OF  
TRANSPORTATION  
DISTRICT 12  
PID #90993

BR#: CUY-2-1441  
SFN - 1800035

## Volume II - Section Description

The CUY-2-1441 (Main Avenue) Bridge carries four to six lanes of State Route 2 traffic for 6580 feet through downtown Cleveland, over numerous local streets, RTA railroad tracks, Norfolk Southern/CSX railroad tracks and the Cuyahoga River. The bridge was fabricated and erected from 1938 to 1940. The West Approach, Main Truss Spans, and East Approach – Forward sections were opened to traffic on October 6, 1939; and the Lakefront Trestle and Lakefront Ramp were opened to traffic in 1940. The bridge was closed for a major rehabilitation project from April 13, 1991 to October 6, 1992. Work included replacing and widening of the deck, updating safety features, improving the drainage system, installing new floor system members, and strengthening or replacing deteriorated sections. The Main Avenue Bridge consists of five distinct sections (West Approach, Main Truss Spans, East Approach – Forward Section, East Approach – Lakefront Trestle, East Approach – Lakefront Ramp Section) of varying structure types within each section.

The West Approach section consists of similar eastbound and westbound structures, each carrying three lanes of traffic from West 29<sup>th</sup> Street to 250' east of West 25<sup>th</sup> Street. These structures merge into one structure near West 25<sup>th</sup> Street. Sections J', M, B', and D make up part of the West Approach. These sections consist of transverse concrete rigid frames supporting a concrete deck slab. An integral curtain wall spans between the concrete frame columns. The frames are spaced longitudinally at approximately 10'-0". The frame caps typically span 40'-0" between the columns.



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**BRIDGE LOAD RATING SUMMARY REPORT**

**CUY-2-1441**

**SECTION B'**

SFN	BRIDGE NUMBER	DISTRICT
1800035	CUY-2-1441	12
ORIGINAL CONSTRUCTION YEAR	REHABILITATION YEAR	OVERALL STRUCTURE LENGTH (FT)
1938 - 1940	1991 - 1992	6580
<b>FEATURE INTERSECTED:</b>	NUMEROUS LOCAL STREETS, RTA RAILROAD TRACKS AND THE CUYAHOGA RIVER	
<b>SPECIAL ASSUMPTIONS &amp; COMMENTS</b>		
<b>RATING &amp; ANALYSIS OPTION:</b>		
<b>LOAD RATING PURPOSE:</b>	LOAD RATING FOR FUTURE REHABILITATION RECOMMENDATIONS	
<b>RATING SOFTWARE:</b>	STAAD, CONSYS	
<b>BASIS OF ANALYSIS:</b>	EXISTING PLANS AND FIELD MEASUREMENTS	
<b>METHOD OF ANALYSIS:</b>	LOAD FACTOR	
<b>DESIGN LOADING (ORIGINAL):</b>	H20-33	
<b>STRUCTURE RATING SUMMARY</b>		
LOADING & RATING TYPE	RATING FACTOR - RF (ROUNDED TO 2 DECIMAL POINTS)	RATING LOAD
INVENTORY CURRENT DESIGN	1.07	HS21.4
OPERATING CURRENT DESIGN	1.78	
OHIO LEGAL - 2F1	2.62	<b>OHIO LEGAL LOADS OVERALL MINIMUM RATING FACTOR</b>
OHIO LEGAL - 3F1	2.03	1.9
OHIO LEGAL - 4F1	1.90	<b>OHIO LEGAL LOADS OVERALL CONTROLLING TRUCK</b>
OHIO LEGAL - 5C1	2.03	4F1
RATED BY, PE#	REVIEWED BY, PE#	REPORT DATE
Matt Johnson, PE	Jason Kemnitz, PE	3/2/2012
AGENCY/FIRM	PHONE NUMBER	EMAIL
TranSystems	216-861-1780	mjjohnson@transystems.com

**SFN: 1800035 BRIDGE NO.: CUY-2-1441**

# SUMMARY SHEET

## West Approach - Section B'

**CUY-2-1441 Load Rating Analysis  
Main Ave Bridge**

Calculated: MJJ 3/1/2012  
Checked: JMK 3/1/2012  
Revised: CTG 5/14/2012

### As-Built Controlling Rating Factor Summary

Item	Location/ Member	HS20 Inventory	HS20 Operating	2F1 Operating	3F1 Operating	4F1 Operating	5C1 Operating	
Frame Cap	Frame 1/Pos. Moment	1.07	1.78	2.62	2.03	2.06	2.03	
Frame Cap	Frame 9/Pos. Moment	1.19	1.99	3.12	2.11	1.90	2.11	
Deck	Deck	1.31	2.18	3.49	2.55	2.93	2.55	

### As-Inspected Controlling Rating Factor Summary

Item	Location/ Member	HS20 Inventory	HS20 Operating	2F1 Operating	3F1 Operating	4F1 Operating	5C1 Operating	
Frame Cap	Frame 1/Pos. Moment	1.07	1.78	2.62	2.03	2.06	2.03	
Frame Cap	Frame 9/Pos. Moment	1.19	1.99	3.12	2.11	1.90	2.11	
Deck	Deck	1.31	2.18	3.49	2.55	2.93	2.55	

### Overall Summary

Case	Rating Factor	Tonnage	HS equivalent or Ohio Legal Load %
HS20 Inventory	1.07	38.52	HS21.4
HS20 Operating	1.78	64.08	HS35.6
2F1	2.62	39.30	190%
3F1	2.03	46.69	
4F1	1.90	51.30	
5C1	2.03	81.20	



**Curve 1 Information**

At Beg. VPI <b>11+20.</b>	PI <sub>Curve</sub> (Station) <b>686.04</b>	At PI VPI <b>13+15.</b>	PI <sub>Curve</sub> (Station) <b>693.84</b>	At End VPI <b>15+10.</b>	PI <sub>Curve</sub> (Station) <b>688.9162</b>
	PI <sub>Elev</sub> (ft)		PI <sub>Elev</sub> (ft)		PI <sub>Elev</sub> (ft)
4.0000%	g <sub>1</sub> (%)	390.00	L <sub>c</sub> (feet)		
-2.5250%	g <sub>2</sub> (%)	-1.6730835	r (1/feet)		

**Curve 2 Information (If Applicable)**

At Beg. VPI	PI <sub>Curve</sub> (Station)	At PI VPI	PI <sub>Curve</sub> (Station)	At End VPI	PI <sub>Curve</sub> (Station)
	PI <sub>Elev</sub> (ft)		PI <sub>Elev</sub> (ft)		PI <sub>Elev</sub> (ft)
	g <sub>1</sub> (%)		L <sub>c</sub> (feet)		
	g <sub>2</sub> (%)		r (1/feet)		

**11+57.82** Station at beginning of section

Location	Distance	Station	New Profile Grade Elevation		Elev. from original plans	Cross Slope	Elevations after rehab	
			Rehab	Original			North Gutter Elevation	South Gutter Elevation
Frame 1	3.5313	11+61.35	687.45	112.65	111.887	1.56%	112.327	112.951
Frame 2	10.15	11+71.5	687.77	112.97	112.141	1.56%	112.654	113.278
Frame 3	10.15	11+81.65	688.08	113.28	112.443	1.56%	112.964	113.588
Frame 4	10.15	11+91.8	688.38	113.58	112.727	1.56%	113.257	113.881
Frame 5	10.15	12+01.95	688.65	113.85	112.995	1.56%	113.532	114.156
Frame 6	6.33	12+08.28	688.82	114.02	113.154	1.56%	113.695	114.319
Frame 7	10.15	12+18.43	689.06	114.26	113.393	1.56%	113.943	114.567
Frame 8	10.15	12+28.58	689.29	114.49	113.616	1.56%	114.173	114.797
Frame 9	10.15	12+38.73	689.51	114.71	113.822	1.56%	114.386	115.010
Frame 10	10.15	12+48.88	689.70	114.90	114.011	1.56%	114.582	115.206

Elevation Equation from rehab plans sheet G7/93 is (Rehab El. + 574.8 ft = Original El.)

From 118/991 of rehab plans, cross slope through Section B' is 1.56% down to the north.

North and south gutterline elevations after rehab are used to determine the haunch dead load to add on Staad model

**It appears that profile grade through this area was raised approximately 10" during the rehab.**

**Section B', North Ramp, West Approach - Frame Column Heights for Staad Analysis**

Frame No.	Rehab North Gutter El.	Rehab South Gutter El.	Original Grade El.	Orig. Bot of Foot. (North)	***Orig. Bot of Foot. (South)	**North Col. Height (Col 1)	**South Col. Height (Col 2)
1	112.327	112.951	111.887	88	84.75	19.64	22.89
2	112.654	113.278	112.141	88	84.75	19.89	23.14
3	112.964	113.588	112.443	88	84.75	20.19	23.44
4	113.257	113.881	112.727	88	87	20.48	21.48
5	113.532	114.156	112.995	88	87	20.75	21.75
6	113.695	114.319	113.154	88	89	20.90	19.90
7	113.943	114.567	113.393	88	89	21.14	20.14
8	114.173	114.797	113.616	86	89	23.37	20.37
9	114.386	115.010	113.822	86	89	23.57	20.57
10	114.582	115.206	114.011	86	89	23.76	20.76

\*Original grade elevations are from original plans, sheet 23/246.

\*\*Heights are from top of footing to original center of cap. Cap is 4'-6" deep, this is the original cap depth including slab. The bottom of footing elevations are from original plans, sheet 23/246.

\*\*\*South Footing Elevation assumed, sheet 23/246 of original plans is not legible



Made by:	MJJ	Date:	1/30/2012	Job No:	P402110046
Checked by:	JMK	Date:	2/14/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	Dead Load Calculations for Frames (Section B')				

Slab, Haunch and Diaphragm Dead Loads are directly input into Staad for analysis. Concrete wearing surface and Live loads are input into Consys as continuous loads to determine reactions. The reactions determined by Consys are input into Staad for analysis. Frame self weight is directly calculated by Staad.

**Slab Dead Loads**      *Slab is 10" thick lightweight concrete (113 lbs/ft<sup>3</sup>).*

Slab Dead Load Frame 1:

$$\text{Slab}_{DL} = \boxed{0.807} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (10.15\text{ft}/2 + 3.5\text{ft}) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frames 2-4 and Frames 7-9:

$$\text{Slab}_{DL} = \boxed{0.956} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times 10.15\text{ft} \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frames 5 and 6:

$$\text{Slab}_{DL} = \boxed{0.776} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (10.15\text{ft}/2 + 6.33\text{ft}/2) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frame 10:

$$\text{Slab}_{DL} = \boxed{0.729} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (10.15\text{ft}/2 + 2.67\text{ft}) \times 113 \text{ lbs/ft}^3$$

**Beam Haunch Dead Loads:**

*Haunch Height varies across frames due to superelevation in deck.  
Haunch Heights are calculated in Section B' Elevations.xls*

Haunch Dead Load Frame 1:

$$\text{Haunch Height at North Column} = \boxed{0.440} \quad \text{Haunch Height at South Column} = \boxed{1.06}$$

$$\begin{aligned} \text{Hanch}_{DL\text{North}} &= \boxed{0.087} \text{ kips/ft} & \text{Hanch}_{DL} &= \text{Haunch Height} \times 21\text{in} \times 113 \text{ lbs/ft}^3 \\ \text{Hanch}_{DL\text{South}} &= \boxed{0.210} \text{ kips/ft} \end{aligned}$$

Haunch Dead Load Frame 2:

$$\text{Haunch Height at North Column} = \boxed{0.513} \quad \text{Haunch Height at South Column} = \boxed{1.14}$$

$$\begin{aligned} \text{Hanch}_{DL\text{North}} &= \boxed{0.101} \text{ kips/ft} & \text{Hanch}_{DL} &= \text{Haunch Height} \times 21\text{in} \times 113 \text{ lbs/ft}^3 \\ \text{Hanch}_{DL\text{South}} &= \boxed{0.225} \text{ kips/ft} \end{aligned}$$

Haunch Dead Load Frame 3:

$$\text{Haunch Height at North Column} = \boxed{0.521} \quad \text{Haunch Height at South Column} = \boxed{1.15}$$

$$\begin{aligned} \text{Hanch}_{DL\text{North}} &= \boxed{0.103} \text{ kips/ft} & \text{Hanch}_{DL} &= \text{Haunch Height} \times 21\text{in} \times 113 \text{ lbs/ft}^3 \\ \text{Hanch}_{DL\text{South}} &= \boxed{0.226} \text{ kips/ft} \end{aligned}$$





Haunch Dead Load Frame 4:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 5:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 6:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 7:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 8:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 9:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft



Made by:	MJJ	Date:	1/30/2012	Job No:	P402110046
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Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	Dead Load Calculations for Frames (Section B')				

Haunch Dead Load Frame 10:

Haunch Height at North Column =  Haunch Height at South Column =

$H_{DLNorth} =$  kips/ft       $H_{DL} = \text{Haunch Height} \times 21\text{in} \times 113 \text{ lbs/ft}^3$   
 $H_{DLSouth} =$  kips/ft

**Diaphragm Dead Loads:**

*Concrete diaphragms located between frames 1-5 and frames 6-10 at midframe. Diaphragm is assumed to be all 150 lb/ft<sup>3</sup> concrete*

Diaphragm Dead Load Frame 1, 5, 6 and 10:

$D_{DL} =$  kips       $D_{DL} = 1.5\text{ft} \times ((10.15\text{ft} - 1.75\text{ft}) / 2) \times 2.1667\text{ft} \times 150 \text{ lbs/ft}^3$

Diaphragm Dead Load Frame 2-4 and 7-9:

$D_{DL} =$  kips       $D_{DL} = 1.5\text{ft} \times (10.15\text{ft} - 1.75\text{ft}) \times 2.1667\text{ft} \times 150 \text{ lbs/ft}^3$

**NonComposite Dead Load Summary for Staad Input**

Frame No.	Slab DL (kips/ft)	Haunch DL (kips/ft)		Diap. DL (kips)
		North Col.	South Col.	
1	0.807	0.087	0.210	2.05
2	0.956	0.101	0.225	4.10
3	0.956	0.103	0.226	4.10
4	0.956	0.105	0.228	4.10
5	0.776	0.106	0.230	2.05
6	0.776	0.107	0.230	2.05
7	0.956	0.109	0.232	4.10
8	0.956	0.110	0.234	4.10
9	0.956	0.112	0.235	4.10
10	0.729	0.113	0.236	2.05



**Latex Modified Wearing Surface Dead Load**

*Wearing Surface Dead Load is applied to the composite section.  
Unit weight is assumed to be 150 lbs/ft<sup>3</sup>*

$WS_{DL} = 0.625$  kips/ft       $WS_{DL} = 1.25\text{in} \times 40\text{ft} \times 150\text{lbs/ft}^3$

**Live Loads**

*See Consys output for live load reactions per lane on each frame.*

live loads are HS20 Truck, HS20 Lane and Ohio Legal Loads shown in Table 1.  
live load positions are shown in table 2.

OHIO LEGAL LOADS		
Load Designation	Load Configuration	Gross Weight
2F1		15 Tons
3F1		23 Tons
4F1		27 Tons
5C1		40 Tons

Table 1

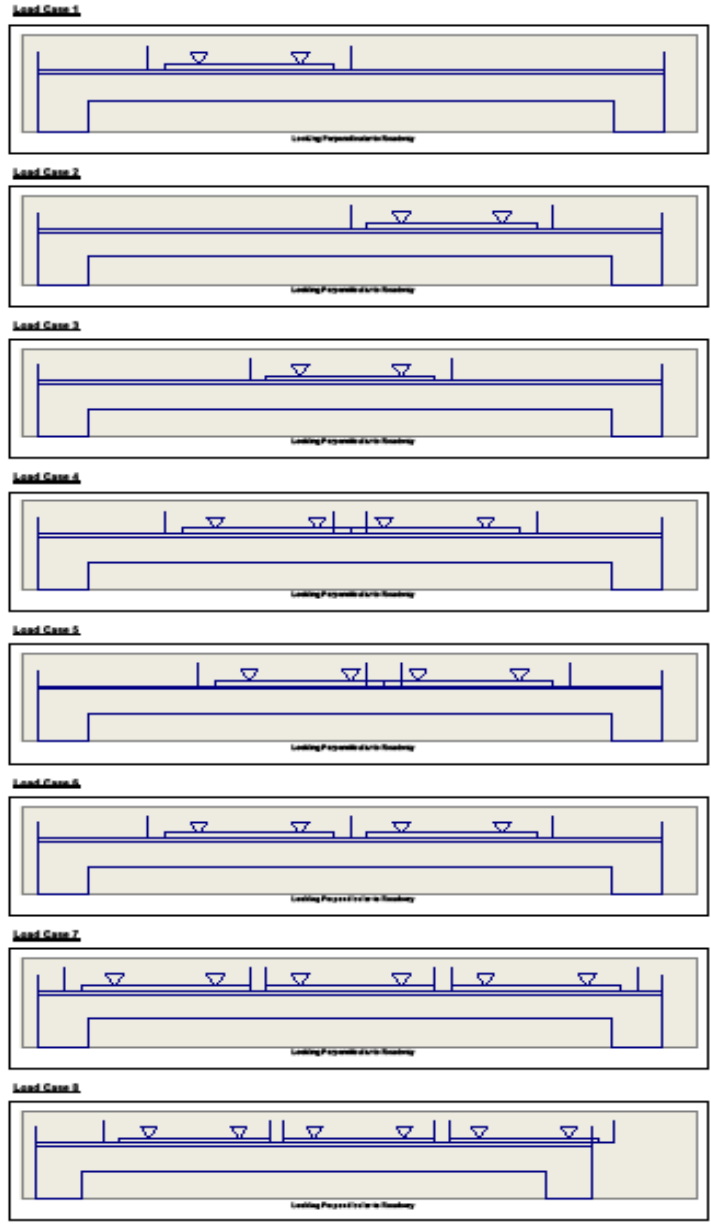


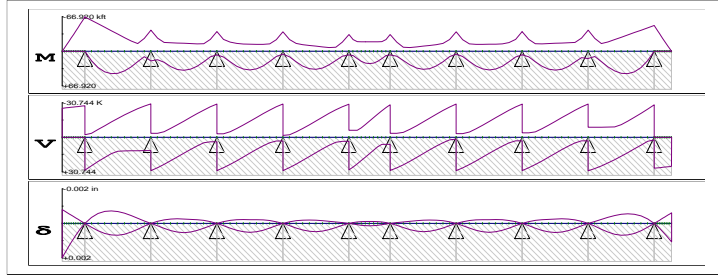
Table 2

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: HS20 Lane Load  
 Type: Lane Load

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+/-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+/-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	0.00
		-0.000	0.000	0.000	-18.000	-26.000	0.000	-0.000	-0.000	-0.000	-0.00
	0.350	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00
		-6.339	0.000	0.000	-18.224	-26.224	0.000	-0.039	0.000	-0.039	-0.00
	0.700	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00
		-12.757	0.000	0.000	-18.448	-26.448	0.000	-0.157	0.000	-0.157	-0.00
	1.050	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00
		-19.253	0.000	0.000	-18.672	-26.672	0.000	-0.353	0.000	-0.353	-0.00
	1.400	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00
		-25.827	0.000	0.000	-18.896	-26.896	0.000	-0.627	0.000	-0.627	-0.00
	1.750	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00
		-32.480	0.000	0.000	-19.120	-27.120	0.000	-0.980	0.000	-0.980	-0.00
	2.100	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00
		-39.211	0.000	0.000	-19.344	-27.344	0.000	-1.411	0.000	-1.411	-0.00
2.450	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-46.021	0.000	0.000	-19.568	-27.568	0.000	-1.921	0.000	-1.921	-0.00	
2.800	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-52.909	0.000	0.000	-19.792	-27.792	0.000	-2.509	0.000	-2.509	-0.00	
3.150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-59.875	0.000	0.000	-20.016	-28.016	0.000	-3.175	0.000	-3.175	-0.00	
3.500											
2	0.000	0.000	0.000	-1.417	29.356	0.000	-3.920	0.000	-3.920	0.00	
		-66.920	17.539	-20.238	-28.581	0.000	-4.011	0.000	-4.011	0.00	
	1.015	18.572	17.972	-0.028	25.491	21.953	-1.097	0.000	-1.097	0.00	
		-60.220	6.601	0.000	-3.672	22.992	-0.059	-0.000	-0.059	-0.00	
	2.030	31.920	15.075	-2.925	21.716	40.164	0.000	0.000	0.000	0.00	
		-53.520	6.601	0.000	-7.043	39.801	0.000	-0.000	0.000	-0.00	
	3.045	40.221	12.235	-5.765	18.106	51.211	0.000	0.000	0.000	0.00	
		-46.820	6.601	0.000	-10.411	50.437	0.000	-0.000	0.000	-0.00	
	4.060	43.768	9.481	-8.519	14.698	55.753	0.000	0.000	0.000	0.00	
		-40.121	6.601	0.000	-13.730	55.090	0.000	-0.000	0.000	-0.00	
	5.075	42.972	6.843	-11.157	12.512	1.884	-31.423	0.000	-31.423	0.00	
		-33.421	6.601	0.000	-16.956	54.138	0.000	0.000	0.000	-0.00	
	6.090	38.362	4.350	-13.650	12.286	1.670	-20.099	0.000	-20.099	0.00	
		-26.721	6.601	0.000	-20.043	48.146	0.000	0.000	0.000	-0.00	
7.105	30.584	2.031	-15.969	12.124	1.448	-8.782	0.000	-8.782	0.00		
	-20.022	6.601	0.000	-22.942	37.880	0.000	0.000	0.000	-0.00		
8.120	20.473	0.771	-17.229	12.018	2.666	0.000	0.000	0.000	0.00		
	-15.087	0.000	-2.223	-25.605	24.303	-1.628	-0.000	-1.628	-0.00		
9.135	10.602	0.976	-17.024	11.961	14.346	0.000	0.000	0.000	0.00		
	-24.917	0.000	-13.037	-27.983	8.587	-4.280	-0.000	-4.280	-0.00		
10.150											
3	0.000	18.819	8.447	-2.677	30.442	0.000	-6.075	0.000	-6.075	0.00	
		-41.072	17.202	-18.088	-30.580	0.000	-6.087	0.000	-6.087	0.00	
	1.015	16.552	0.000	-1.627	27.244	9.690	-4.441	0.000	-4.441	0.00	
		-25.672	11.304	0.000	-3.639	22.822	0.000	-0.000	0.000	-0.00	
	2.030	21.471	16.706	-1.294	24.239	25.077	-1.946	0.000	-1.946	0.00	
		-17.328	3.387	0.000	-5.121	28.435	0.000	-0.000	0.000	-0.00	
	3.045	30.109	14.270	-3.730	20.988	36.901	-0.288	0.000	-0.288	0.00	
		-16.748	0.571	0.000	-8.013	38.660	0.000	-0.000	0.000	-0.00	
4.060	35.477	11.578	-6.422	17.604	44.268	0.000	0.000	0.000	0.00		
	-16.169	0.571	0.000	-11.180	45.139	0.000	-0.000	0.000	-0.00		
5.075	37.157	8.821	-9.179	14.202	46.752	0.000	0.000	0.000	0.00		
	-15.590	0.571	0.000	-14.515	47.092	0.000	-0.000	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
3	6.090	35.039	6.075	-11.925	10.891	44.385	0.000	0.00
		-15.011	0.571	0.000	-17.911	44.170	0.000	-0.00
	7.105	29.319	3.415	-14.585	7.779	37.635	0.000	0.00
		-14.432	0.571	0.000	-21.258	36.469	0.000	-0.00
	8.120	20.586	1.703	-16.297	4.970	27.401	0.000	0.00
		-14.632	0.000	-2.634	-24.441	24.544	-1.489	-0.00
9.135	11.099	0.904	-17.096	4.083	5.445	0.000	0.00	
	-23.145	0.000	-13.160	-27.343	9.423	-3.965	-0.00	
4	10.150							
	0.000	7.170	3.017	-1.221	30.416	0.000	-5.391	0.00
		-38.516	16.816	-16.963	-30.421	0.000	-5.387	0.00
	1.015	11.266	17.132	-0.868	27.209	9.446	-4.053	0.00
		-23.285	12.995	0.000	-3.278	4.680	0.000	-0.00
	2.030	20.830	16.267	-1.733	24.251	24.467	-1.661	0.00
		-17.996	3.162	0.000	-5.005	27.661	0.000	-0.00
	3.045	29.331	14.313	-3.687	21.017	36.168	-0.107	0.00
		-15.319	2.582	0.000	-7.872	37.827	0.000	-0.00
	4.060	34.716	11.620	-6.380	17.628	43.544	0.000	0.00
		-14.024	0.169	0.000	-11.035	44.390	0.000	-0.00
	5.075	36.452	8.851	-9.149	14.205	46.089	0.000	0.00
		-13.852	0.169	0.000	-14.385	46.493	0.000	-0.00
	6.090	34.392	6.085	-11.915	10.862	43.775	0.000	0.00
		-13.681	0.169	0.000	-17.807	43.731	0.000	-0.00
	7.105	28.709	3.401	-14.599	7.714	37.042	0.000	0.00
-13.510		0.169	0.000	-21.185	36.167	0.000	-0.00	
8.120	19.995	1.608	-16.392	4.870	26.781	0.000	0.00	
	-14.499	0.000	-2.667	-24.400	24.345	-1.503	-0.00	
9.135	10.447	0.774	-17.226	3.401	4.322	0.000	0.00	
	-22.662	0.000	-13.018	-27.329	9.306	-3.982	-0.00	
5	10.150							
	0.000	5.692	2.501	-0.864	30.284	0.000	-6.123	0.00
		-37.949	16.604	-16.840	-30.137	0.000	-6.124	0.00
	1.015	10.892	17.338	-0.662	27.126	9.509	-4.059	0.00
		-22.876	12.740	0.000	-2.355	14.826	0.000	-0.00
	2.030	20.656	16.334	-1.666	24.058	24.435	-1.655	0.00
		-15.468	2.934	0.000	-4.935	27.476	0.000	-0.00
	3.045	28.950	14.089	-3.911	20.714	35.829	-0.077	0.00
		-12.883	1.406	0.000	-7.926	37.587	0.000	-0.00
	4.060	33.964	11.323	-6.677	17.229	42.712	0.000	0.00
		-11.457	1.406	0.000	-11.205	43.870	0.000	-0.00
	5.075	35.240	8.498	-9.502	13.737	44.659	0.000	0.00
		-10.030	1.406	0.000	-14.646	45.535	0.000	-0.00
	6.090	32.723	5.705	-12.295	10.369	41.782	0.000	0.00
		-8.603	1.406	0.000	-18.121	42.312	0.000	-0.00
	7.105	26.722	3.033	-14.967	7.251	34.716	0.000	0.00
-7.176		1.406	0.000	-21.496	34.458	0.000	-0.00	
8.120	18.294	1.685	-16.315	4.507	24.598	0.000	0.00	
	-8.048	0.000	-6.858	-24.635	22.785	-0.367	-0.00	
9.135	9.704	1.178	-16.822	3.603	5.990	0.000	0.00	
	-17.746	0.000	-12.804	-27.400	8.667	-2.697	-0.00	
6	10.150							
	0.000	7.251	2.673	-2.074	29.738	0.000	-3.813	0.00
		-32.618	17.762	-16.155	-30.744	0.000	-3.904	0.00
	0.633	8.442	16.087	-1.913	26.642	5.555	-4.156	0.00
		-22.846	12.652	0.000	-6.327	3.973	0.000	-0.00
	1.266	14.551	16.072	-1.928	23.853	15.490	-2.752	0.00
		-18.949	3.869	0.000	-6.378	1.060	0.000	-0.00
	1.899	19.772	13.811	-4.189	20.857	23.179	-1.677	0.00
		-18.520	0.002	0.000	-8.488	25.485	0.000	-0.00
	2.532	23.049	11.434	-6.566	17.739	28.162	-0.872	0.00
		-18.519	0.002	0.000	-11.471	29.244	0.000	-0.00
	3.165	24.166	9.000	-9.000	14.583	30.194	-0.269	0.00
		-18.517	0.002	-7.202	-14.581	30.198	-0.265	-0.00
	3.798	23.049	6.566	-11.434	11.473	29.242	0.000	0.00
		-18.516	0.002	0.000	-17.737	28.168	-0.867	-0.00

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear(+/-) (K)		SHEAR (max/min) (K)		Corresponding Moment(+/-) (kft)		DEFLECT (max/min) (in)
6	4.431	19.772	4.189	-13.811	8.491	25.483	0.000	0.00		
		-18.515	0.002	0.000	-20.855	23.186	-1.670	-0.00		
	5.064	14.551	1.928	-16.072	6.380	1.060	0.000	0.00		
		-18.942	0.000	-3.864	-23.851	15.498	-2.744	-0.00		
5.697	8.443	1.915	-16.085	6.329	3.974	0.000	0.00			
	-22.837	0.000	-12.650	-26.640	5.565	-4.147	-0.00			
7	6.330									
	0.000	7.254	2.076	-2.673	30.742	0.000	-3.892	0.00		
		-32.607	16.151	-17.760	-29.736	0.000	-3.800	0.00		
	1.015	9.706	16.822	-1.178	27.396	8.673	-2.691	0.00		
		-17.740	12.800	0.000	-3.604	5.992	0.000	-0.00		
	2.030	18.296	16.315	-1.685	24.631	22.787	-0.365	0.00		
		-8.046	6.854	0.000	-4.507	24.600	0.000	-0.00		
	3.045	26.721	14.963	-3.037	21.491	34.456	0.000	0.00		
		-7.176	0.000	-1.406	-7.251	34.717	0.000	-0.00		
	4.060	32.718	12.291	-5.709	18.117	42.305	0.000	0.00		
		-8.603	0.000	-1.406	-10.369	41.783	0.000	-0.00		
	5.075	35.230	9.498	-8.503	14.642	45.525	0.000	0.00		
		-10.030	0.000	-1.406	-13.737	44.660	0.000	-0.00		
	6.090	33.950	6.673	-11.327	11.201	43.855	0.000	0.00		
		-11.457	0.000	-1.406	-17.229	42.713	0.000	-0.00		
	7.105	28.931	3.907	-14.093	7.922	37.568	0.000	0.00		
-12.883		0.000	-1.406	-20.714	35.829	-0.076	-0.00			
8.120	20.632	1.662	-16.338	4.931	27.453	0.000	0.00			
	-15.468	0.000	-2.934	-24.058	24.435	-1.655	-0.00			
9.135	10.864	0.658	-17.342	2.351	14.799	0.000	0.00			
	-22.877	0.000	-12.740	-27.126	9.508	-4.059	-0.00			
8	10.150									
	0.000	5.660	0.860	-2.486	30.133	0.000	-6.156	0.00		
		-37.950	16.840	-16.605	-30.270	0.000	-6.156	0.00		
	1.015	10.430	17.241	-0.759	27.329	9.306	-3.982	0.00		
		-22.663	13.018	0.000	-3.386	4.305	0.000	-0.00		
	2.030	19.992	16.407	-1.593	24.400	24.345	-1.503	0.00		
		-14.500	2.667	0.000	-4.855	26.779	0.000	-0.00		
	3.045	28.709	14.599	-3.401	21.185	36.167	0.000	0.00		
		-13.498	0.000	-0.154	-7.699	37.055	0.000	-0.00		
	4.060	34.392	11.915	-6.085	17.807	43.731	0.000	0.00		
		-13.654	0.000	-0.154	-10.847	43.803	0.000	-0.00		
	5.075	36.452	9.149	-8.851	14.385	46.493	0.000	0.00		
		-13.809	0.000	-0.154	-14.190	46.132	0.000	-0.00		
	6.090	34.716	6.380	-11.620	11.035	44.390	0.000	0.00		
		-13.966	0.000	-0.154	-17.614	43.602	0.000	-0.00		
	7.105	29.331	3.687	-14.313	7.872	37.827	0.000	0.00		
-14.577		0.000	-2.431	-21.002	36.241	-0.034	-0.00			
8.120	20.830	1.733	-16.267	5.005	27.661	0.000	0.00			
	-17.101	0.000	-3.012	-24.236	24.555	-1.573	-0.00			
9.135	11.266	0.868	-17.132	3.278	4.680	0.000	0.00			
	-23.182	0.000	-12.980	-27.194	9.549	-3.950	-0.00			
9	10.150									
	0.000	7.170	1.221	-3.017	30.366	0.000	-5.269	0.00		
		-38.398	16.908	-16.801	-30.401	0.000	-5.273	0.00		
	1.015	11.099	17.096	-0.904	27.288	9.485	-3.903	0.00		
		-23.083	13.105	0.000	-4.083	5.445	0.000	-0.00		
	2.030	20.586	16.297	-1.703	24.385	24.551	-1.483	0.00		
		-14.626	2.579	0.000	-4.970	27.401	0.000	-0.00		
	3.045	29.270	14.530	-3.470	21.203	36.420	0.000	0.00		
		-14.432	0.000	-0.571	-7.779	37.635	0.000	-0.00		
	4.060	34.934	11.870	-6.130	17.856	44.064	0.000	0.00		
		-15.011	0.000	-0.571	-10.891	44.385	0.000	-0.00		
	5.075	36.996	9.124	-8.876	14.460	46.930	0.000	0.00		
		-15.590	0.000	-0.571	-14.202	46.752	0.000	-0.00		
	6.090	35.260	6.367	-11.633	11.125	44.922	0.000	0.00		
		-16.169	0.000	-0.571	-17.604	44.268	0.000	-0.00		
	7.105	29.836	3.675	-14.325	7.958	38.387	0.000	0.00		
-16.748		0.000	-0.571	-20.988	36.901	-0.288	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		9	8.120	21.142	1.239	-16.761	5.066	28.106	0.000	0.00
		-17.328	0.000	-3.387	-24.239	25.077	-1.946	-0.00		
	9.135	12.646	1.068	0.000	3.272	3.921	0.000	0.00		
		-25.672	0.000	-11.304	-27.244	9.690	-4.441	-0.00		
	10.150									
10	0.000	14.346	2.119	-6.362	30.525	0.000	-6.527	0.00		
		-41.072	18.088	-17.202	-30.237	0.000	-6.516	0.00		
	1.015	10.370	17.229	-0.771	27.983	8.587	-4.280	0.00		
		-24.917	13.037	0.000	-9.041	11.045	0.000	-0.00		
	2.030	20.449	17.435	-0.565	25.605	24.303	-1.628	0.00		
		-15.087	2.223	0.000	-9.097	2.330	0.000	-0.00		
	3.045	30.584	15.969	-2.031	22.942	37.880	0.000	0.00		
		-18.145	0.000	-4.516	-9.203	1.633	-6.154	-0.00		
	4.060	38.362	13.650	-4.350	20.043	48.146	0.000	0.00		
		-22.728	0.000	-4.516	-9.365	2.063	-14.506	-0.00		
	5.075	42.972	11.157	-6.843	16.956	54.138	0.000	0.00		
		-27.311	0.000	-4.516	-11.326	55.201	0.000	-0.00		
	6.090	43.768	8.519	-9.481	13.730	55.090	0.000	0.00		
		-31.895	0.000	-4.516	-14.492	56.563	0.000	-0.00		
	7.105	40.221	5.765	-12.235	10.411	50.437	0.000	0.00		
		-36.478	0.000	-4.516	-17.900	52.230	0.000	-0.00		
	8.120	31.920	2.925	-15.075	7.043	39.801	0.000	0.00		
		-41.061	0.000	-4.516	-21.511	41.392	0.000	-0.00		
	9.135	18.572	0.028	-17.972	3.672	22.992	-0.059	0.00		
		-45.645	0.000	-4.516	-25.286	23.389	0.000	-0.00		
	10.150									
11	0.000	0.000	1.417	-0.000	28.048	0.000	-2.345	0.00		
		-50.228	19.705	-15.454	-29.151	0.000	-2.276	0.00		
	0.267	0.000	0.000	-0.000	27.536	0.000	-1.843	0.00		
		-44.996	19.536	0.000	-0.000	0.000	0.000	-0.00		
	0.533	0.000	18.000	-0.000	27.365	0.000	-1.456	0.00		
		-39.809	19.365	0.000	-0.000	0.000	0.000	-0.00		
	0.800	0.000	18.000	-0.000	27.195	0.000	-1.115	0.00		
		-34.667	19.195	0.000	-0.000	0.000	0.000	-0.00		
	1.067	0.000	18.000	-0.000	27.024	0.000	-0.819	0.00		
		-29.572	19.024	0.000	-0.000	0.000	0.000	-0.00		
	1.333	0.000	18.000	-0.000	26.853	0.000	-0.569	0.00		
		-24.521	18.853	0.000	-0.000	0.000	0.000	-0.00		
	1.600	0.000	18.000	-0.000	26.683	0.000	-0.364	0.00		
		-19.516	18.683	0.000	-0.000	0.000	0.000	-0.00		
	1.867	0.000	18.000	-0.000	26.512	0.000	-0.205	0.00		
		-14.557	18.512	0.000	-0.000	0.000	0.000	-0.00		
	2.133	0.000	18.000	-0.000	26.341	0.000	-0.091	0.00		
		-9.643	18.341	0.000	-0.000	0.000	0.000	-0.00		
	2.400	0.000	18.000	-0.000	26.171	0.000	-0.023	0.00		
		-4.775	18.171	0.000	-0.000	0.000	0.000	-0.00		
	2.667	0.000	0.000	-0.000	0.000	0.000	0.000	0.00		
		-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00		

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.389	-42.997
3	15.560	-34.011
4	5.563	-33.614
5	4.490	-33.623
6	7.645	-33.724
7	7.647	-33.718
8	4.471	-33.624
9	5.563	-33.544
10	11.857	-34.011
11	2.389	-39.543
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



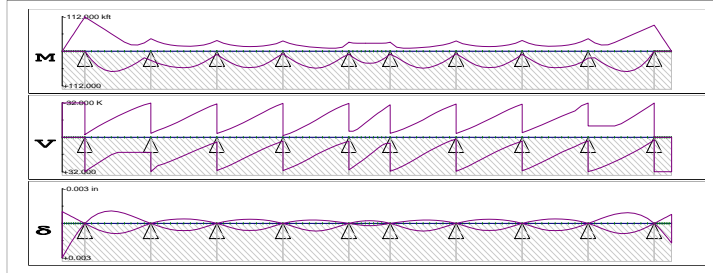
Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: HS20

Type: Truck

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (kft)		Corresponding Shear (K)		SHEAR (K)		Corresponding Moment (kft)		DEFLECT (in)	
		(max)	(min)	(+)	(-)	(max)	(min)	(+)	(-)	(max)	(min)
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	0.350	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-11.200	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	0.700	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-22.400	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	1.050	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-33.600	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	1.400	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-44.800	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	1.750	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-56.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	2.100	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-67.200	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
2.450	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-78.400	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00	
2.800	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-89.600	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00	
3.150	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-100.800	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00	
3.500	0.000	0.000	0.000	-2.525	31.959	0.000	-0.000	0.000	0.00	0.00	
2	0.000	-112.000	13.991	-32.000	-32.000	0.000	-0.112	0.000	0.00	0.00	
	1.015	28.370	27.951	-4.049	27.951	28.370	0.000	0.000	0.00	0.00	
		-98.288	13.509	0.000	-6.454	25.929	0.000	0.000	-0.00	-0.00	
	2.030	48.626	23.954	-8.046	23.954	48.626	0.000	0.000	0.00	0.00	
		-84.576	13.509	0.000	-10.130	44.396	0.000	0.000	-0.00	-0.00	
	3.045	61.080	20.059	-11.941	20.059	61.080	0.000	0.000	0.00	0.00	
		-70.864	13.509	0.000	-13.580	56.087	0.000	0.000	-0.00	-0.00	
	4.060	66.254	16.319	-15.681	16.319	66.254	0.000	0.000	0.00	0.00	
		-57.152	13.509	0.000	-16.808	61.678	0.000	0.000	-0.00	-0.00	
	5.075	64.881	12.784	-19.216	13.991	0.000	-40.994	0.000	0.00	0.00	
		-43.439	13.509	0.000	-19.817	61.830	0.000	0.000	-0.00	-0.00	
	6.090	57.899	9.507	-22.493	13.991	0.000	-26.792	0.000	0.00	0.00	
		-29.728	13.491	0.000	-22.621	57.117	0.000	0.000	-0.00	-0.00	
	7.105	48.399	6.812	-25.188	13.991	0.000	-12.591	0.000	0.00	0.00	
	-20.985	4.928	0.000	-25.461	46.458	0.000	0.000	-0.00	-0.00		
8.120	36.038	4.438	-27.562	13.991	1.610	0.000	0.000	0.00	0.00		
	-20.558	0.000	-3.359	-28.070	31.915	0.000	0.000	-0.00	-0.00		
9.135	21.644	2.369	-29.631	13.991	15.811	0.000	0.000	0.00	0.00		
	-27.579	0.000	-10.130	-30.266	15.837	0.000	0.000	-0.00	-0.00		
10.150	30.013	13.991	-3.750	31.978	0.000	-0.150	0.000	0.00	0.00		
3	0.000	-40.798	11.144	-14.944	-31.985	0.000	-0.174	0.000	0.00	0.00	
	1.015	39.434	25.681	-6.319	26.484	38.619	0.000	0.000	0.00	0.00	
		-31.493	7.140	0.000	-6.449	25.957	0.000	0.000	-0.00	-0.00	
	2.030	44.908	24.574	-7.426	24.574	44.908	0.000	0.000	0.00	0.00	
		-24.945	4.176	0.000	-8.742	36.172	0.000	0.000	-0.00	-0.00	
	3.045	50.048	22.280	-9.720	22.280	50.048	0.000	0.000	0.00	0.00	
		-20.706	4.176	0.000	-11.238	44.643	0.000	0.000	-0.00	-0.00	
	4.060	52.754	19.737	-12.263	19.737	52.754	0.000	0.000	0.00	0.00	
		-18.217	2.110	0.000	-13.973	50.626	0.000	0.000	-0.00	-0.00	
	5.075	53.767	14.991	-17.009	17.059	52.339	0.000	0.000	0.00	0.00	
	-16.902	0.593	0.000	-17.009	53.767	0.000	0.000	-0.00	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR(max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT(max) (min) (in)
3	6.090	52.469	11.899	-20.101	14.321	48.663	0.000	0.00		
		-16.585	0.202	0.000	-20.101	52.469	0.000	-0.00		
	7.105	46.442	8.806	-23.194	11.682	42.350	0.000	0.00		
		-17.875	0.000	-1.727	-23.194	46.442	0.000	-0.00		
	8.120	36.191	6.781	-25.219	9.107	33.491	0.000	0.00		
-20.618		0.000	-5.078	-26.167	36.042	0.000	-0.00			
9.135	23.503	4.166	-27.834	6.644	22.613	0.000	0.00			
	-26.452	0.000	-6.904	-28.863	22.357	0.000	-0.00			
4	10.150									
	0.000	10.668	4.366	-1.940	30.864	8.743	0.000	0.00		
		-35.244	12.198	-10.620	-31.103	6.955	0.000	0.00		
	1.015	24.541	27.836	-4.164	28.612	23.671	0.000	0.00		
		-26.185	6.512	0.000	-5.729	21.857	0.000	-0.00		
	2.030	36.893	25.244	-6.756	25.906	36.822	0.000	0.00		
		-20.944	4.037	0.000	-8.152	33.607	0.000	-0.00		
	3.045	46.670	22.924	-9.076	22.924	46.670	0.000	0.00		
		-17.857	2.488	0.000	-10.791	43.314	0.000	-0.00		
	4.060	52.171	19.827	-12.173	19.827	52.171	0.000	0.00		
		-16.137	1.353	0.000	-13.678	50.007	0.000	-0.00		
	5.075	53.319	15.238	-16.762	16.931	52.465	0.000	0.00		
		-15.502	0.266	0.000	-16.762	53.319	0.000	-0.00		
	6.090	51.998	12.046	-19.954	13.848	49.316	0.000	0.00		
		-15.844	0.000	-0.832	-19.954	51.998	0.000	-0.00		
7.105	45.589	8.805	-23.195	10.918	42.667	0.000	0.00			
	-17.220	0.000	-1.807	-23.195	45.589	0.000	-0.00			
8.120	34.536	6.395	-25.605	8.261	32.876	0.000	0.00			
	-20.606	0.000	-3.551	-26.343	34.395	0.000	-0.00			
9.135	21.035	5.802	-26.198	5.802	21.035	0.000	0.00			
	-24.817	0.000	-6.020	-29.212	19.580	0.000	-0.00			
5	10.150									
	0.000	8.371	3.608	-1.340	31.033	7.102	0.000	0.00		
		-33.638	10.466	-11.338	-31.596	2.909	0.000	0.00		
	1.015	23.150	28.365	-3.635	28.639	22.495	0.000	0.00		
		-25.595	6.061	0.000	-3.635	23.150	0.000	-0.00		
	2.030	36.311	25.630	-6.370	26.131	32.145	0.000	0.00		
		-20.673	3.776	0.000	-6.370	36.311	0.000	-0.00		
	3.045	46.098	22.601	-9.399	23.136	44.374	0.000	0.00		
		-17.249	2.816	0.000	-9.399	46.098	0.000	-0.00		
	4.060	52.598	19.720	-12.280	19.803	52.587	0.000	0.00		
		-14.556	1.992	0.000	-12.627	50.816	0.000	-0.00		
	5.075	55.644	16.060	-15.940	16.318	51.889	0.000	0.00		
		-12.587	1.748	0.000	-15.940	55.644	0.000	-0.00		
	6.090	53.069	12.337	-19.663	13.301	48.068	0.000	0.00		
		-11.039	1.321	0.000	-19.663	53.069	0.000	-0.00		
7.105	45.170	8.732	-23.268	10.466	40.722	0.000	0.00			
	-9.937	0.534	0.000	-23.268	45.170	0.000	-0.00			
8.120	33.343	6.187	-25.813	7.883	30.939	0.000	0.00			
	-10.396	0.000	-1.740	-26.574	32.975	0.000	-0.00			
9.135	20.096	5.624	-26.376	5.624	20.096	0.000	0.00			
	-13.432	0.000	-14.507	-29.400	18.246	0.000	-0.00			
6	10.150									
	0.000	9.860	3.760	-2.499	30.313	8.629	0.000	0.00		
		-29.696	5.673	-17.623	-31.546	3.307	0.000	0.00		
	0.633	19.954	27.164	-4.836	27.800	19.360	0.000	0.00		
		-26.612	0.236	0.000	-5.673	2.625	0.000	-0.00		
	1.266	28.589	24.498	-7.502	24.938	28.306	0.000	0.00		
		-26.462	0.236	0.000	-7.502	28.589	0.000	-0.00		
	1.899	34.967	21.604	-10.396	22.366	29.994	0.000	0.00		
		-26.324	0.179	0.000	-10.396	34.967	0.000	-0.00		
	2.532	38.548	18.585	-13.415	19.541	35.641	0.000	0.00		
		-26.211	0.179	0.000	-13.415	38.548	0.000	-0.00		
	3.165	39.057	16.454	-16.454	16.490	38.507	0.000	0.00		
		-26.098	0.000	-0.179	-16.490	38.507	0.000	-0.00		
	3.798	38.548	13.415	-18.585	13.415	38.548	0.000	0.00		
		-26.211	0.000	-0.179	-19.541	35.641	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR (max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.431	34.967	10.396	-21.604	10.396	34.967	0.000	0.00		
		-26.324	0.000	-0.179	-22.366	29.994	0.000	-0.00		
	5.064	28.589	7.502	-24.498	7.502	28.589	0.000	0.00		
		-26.462	0.000	-0.236	-24.938	28.306	0.000	-0.00		
	5.697	19.954	4.836	-27.164	5.673	2.625	0.000	0.00		
		-26.612	0.000	-0.236	-27.800	19.360	0.000	-0.00		
7	0.000	9.860	2.499	-3.760	31.546	3.307	0.000	0.00		
		-29.696	17.623	-5.673	-30.313	8.629	0.000	0.00		
	1.015	20.096	26.376	-5.624	29.400	18.246	0.000	0.00		
		-13.432	14.507	0.000	-5.624	20.096	0.000	-0.00		
	2.030	33.343	25.813	-6.187	26.574	32.975	0.000	0.00		
		-10.396	1.740	0.000	-7.883	30.939	0.000	-0.00		
	3.045	45.170	23.268	-8.732	23.268	45.170	0.000	0.00		
		-9.937	0.000	-0.534	-10.466	40.722	0.000	-0.00		
	4.060	53.069	19.663	-12.337	19.663	53.069	0.000	0.00		
		-11.039	0.000	-1.321	-13.301	48.068	0.000	-0.00		
	5.075	55.644	15.940	-16.060	15.940	55.644	0.000	0.00		
		-12.587	0.000	-1.748	-16.318	51.889	0.000	-0.00		
	6.090	52.598	12.280	-19.720	12.627	50.816	0.000	0.00		
		-14.556	0.000	-1.992	-19.803	52.587	0.000	-0.00		
	7.105	46.098	9.399	-22.601	9.399	46.098	0.000	0.00		
-17.249		0.000	-2.816	-23.136	44.374	0.000	-0.00			
8.120	36.311	6.370	-25.630	6.370	36.311	0.000	0.00			
	-20.673	0.000	-3.776	-26.131	32.145	0.000	-0.00			
9.135	23.150	3.635	-28.365	3.635	23.150	0.000	0.00			
	-25.595	0.000	-6.061	-28.639	22.495	0.000	-0.00			
8	0.000	8.371	1.340	-3.608	31.596	2.909	0.000	0.00		
		-33.638	11.338	-10.466	-31.033	7.102	0.000	0.00		
	1.015	21.035	26.198	-5.802	29.212	19.580	0.000	0.00		
		-24.817	6.020	0.000	-5.802	21.035	0.000	-0.00		
	2.030	34.536	25.605	-6.395	26.343	34.395	0.000	0.00		
		-20.606	3.551	0.000	-8.261	32.876	0.000	-0.00		
	3.045	45.589	23.195	-8.805	23.195	45.589	0.000	0.00		
		-17.220	1.807	0.000	-10.918	42.667	0.000	-0.00		
	4.060	51.998	19.954	-12.046	19.954	51.998	0.000	0.00		
		-15.844	0.832	0.000	-13.848	49.316	0.000	-0.00		
	5.075	53.319	16.762	-15.238	16.762	53.319	0.000	0.00		
		-15.502	0.000	-0.266	-16.931	52.465	0.000	-0.00		
	6.090	52.171	12.173	-19.827	13.678	50.007	0.000	0.00		
		-16.137	0.000	-1.353	-19.827	52.171	0.000	-0.00		
	7.105	46.670	9.076	-22.924	10.791	43.314	0.000	0.00		
-17.857		0.000	-2.488	-22.924	46.670	0.000	-0.00			
8.120	36.893	6.756	-25.244	8.152	33.607	0.000	0.00			
	-20.944	0.000	-4.037	-25.906	36.822	0.000	-0.00			
9.135	24.541	4.164	-27.836	5.729	21.857	0.000	0.00			
	-26.185	0.000	-6.512	-28.612	23.671	0.000	-0.00			
9	0.000	10.668	1.940	-4.366	31.103	6.955	0.000	0.00		
		-35.244	10.578	-12.247	-30.864	8.743	0.000	0.00		
	1.015	23.503	27.834	-4.166	28.863	22.357	0.000	0.00		
		-26.452	6.904	0.000	-6.644	22.613	0.000	-0.00		
	2.030	36.191	25.219	-6.781	26.167	36.042	0.000	0.00		
		-20.551	3.830	0.000	-9.107	33.491	0.000	-0.00		
	3.045	46.442	23.194	-8.806	23.194	46.442	0.000	0.00		
		-17.875	1.727	0.000	-11.682	42.350	0.000	-0.00		
	4.060	52.469	20.101	-11.899	20.101	52.469	0.000	0.00		
		-16.585	0.000	-0.202	-14.321	48.663	0.000	-0.00		
	5.075	53.767	17.009	-14.991	17.009	53.767	0.000	0.00		
		-16.902	0.000	-0.593	-17.059	52.339	0.000	-0.00		
	6.090	52.754	12.263	-19.737	13.973	50.626	0.000	0.00		
		-18.217	0.000	-2.110	-19.737	52.754	0.000	-0.00		
	7.105	50.048	9.720	-22.280	11.238	44.643	0.000	0.00		
-20.706		0.000	-4.176	-22.280	50.048	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR (max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	8.120	44.907	8.121	-24.574	8.742	36.171	0.000	0.00		
		-24.945	0.000	-4.176	-24.574	44.907	0.000	-0.00		
	9.135	36.062	0.000	-25.410	5.689	20.651	0.000	0.00		
10	10.150	-31.493	0.000	-7.140	-29.521	17.392	0.000	-0.00		
		0.000	22.867	2.857	-10.660	31.985	0.000	-0.174	0.00	
	1.015	-40.798	14.944	-11.144	-31.978	0.000	-0.150	0.00		
		21.644	29.631	-2.369	30.266	15.837	0.000	0.00		
	2.030	-27.579	10.130	0.000	-10.660	12.047	0.000	-0.00		
		36.038	27.562	-4.438	28.070	31.915	0.000	0.00		
	3.045	-20.558	3.359	0.000	-10.660	1.227	0.000	-0.00		
		48.399	25.188	-6.812	25.461	46.458	0.000	0.00		
	4.060	-21.005	0.000	-4.250	-10.660	0.000	-9.593	-0.00		
		57.899	22.493	-9.507	22.621	57.117	0.000	0.00		
	5.075	-28.932	0.000	-9.261	-10.660	0.000	-20.414	-0.00		
		64.881	19.216	-12.784	19.817	61.830	0.000	0.00		
	6.090	-38.333	0.000	-9.261	-12.784	64.881	0.000	-0.00		
		66.254	15.681	-16.319	16.808	61.678	0.000	0.00		
	7.105	-47.733	0.000	-9.261	-16.319	66.254	0.000	-0.00		
61.080		11.941	-20.059	13.580	56.087	0.000	0.00			
8.120	-57.133	0.000	-9.261	-20.059	61.080	0.000	-0.00			
	48.626	8.046	-23.954	10.130	44.396	0.000	0.00			
9.135	-66.534	0.000	-9.261	-23.954	48.626	0.000	-0.00			
	28.370	4.049	-27.951	6.454	25.929	0.000	0.00			
11	10.150	-75.934	0.000	-9.261	-27.951	28.370	0.000	-0.00		
		0.000	2.525	-0.000	32.000	0.000	-0.085	0.00		
	0.267	-85.334	32.000	-10.660	-31.959	0.000	-0.000	0.00		
		0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
	0.533	-76.801	32.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
	0.800	-68.267	32.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
	1.067	-59.734	32.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
	1.333	-51.201	32.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
	1.600	-42.667	32.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
	1.867	-34.134	32.000	0.000	-0.000	0.000	0.000	-0.00		
0.000		32.000	-0.000	32.000	0.000	0.000	0.00			
2.133	-25.600	32.000	0.000	-0.000	0.000	0.000	-0.00			
	0.000	32.000	-0.000	32.000	0.000	0.000	0.00			
2.400	-17.067	32.000	0.000	-0.000	0.000	0.000	-0.00			
	0.000	32.000	-0.000	32.000	0.000	0.000	0.00			
2.667	-8.533	32.000	0.000	-0.000	0.000	0.000	-0.00			
	0.000	0.000	0.000	32.000	0.000	0.000	0.00			
		-0.000	32.000	0.000	0.000	-0.000	-0.00			

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.239	-45.991
3	17.741	-32.126
4	5.299	-27.793
5	3.774	-30.232
6	6.450	-28.489
7	6.450	-28.489
8	3.774	-30.232
9	5.299	-27.793
10	13.517	-32.126
11	2.239	-42.660
12	0.000	-0.000

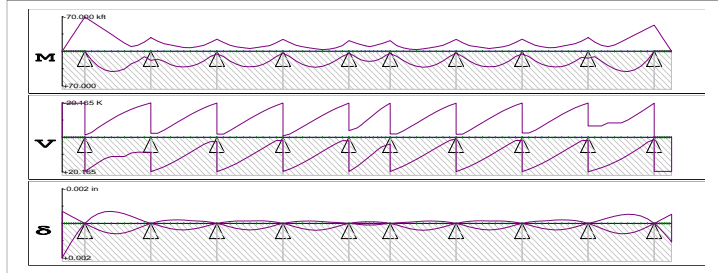
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 2F1  
 Type: Truck

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	0.350	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-7.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	0.700	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-14.000	0.000	0.000	-20.000	-20.000	0.000	0.000	-1.900	-0.00	-0.00
	1.050	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-21.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.400	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-28.000	0.000	0.000	-20.000	-20.000	0.000	0.000	-7.000	-0.00	-0.00
	1.750	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-35.000	0.000	0.000	-20.000	-20.000	0.000	0.000	-2.600	-0.00	-0.00
	2.100	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-42.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
2.450	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-49.000	0.000	0.000	-20.000	-20.000	0.000	0.000	-7.000	-0.00	-0.00	
2.800	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-56.000	0.000	0.000	-20.000	-20.000	0.000	0.000	-3.300	-0.00	-0.00	
3.150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-63.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00	
3.500											
2	0.000	0.000	0.000	-1.364	20.040	0.000	-0.000	0.000	-0.000	0.00	0.00
		-70.000	11.328	-20.000	-20.000	0.000	-7.000	0.000	0.00	0.00	0.00
	1.015	17.731	17.469	-2.531	17.469	17.731	0.000	0.000	0.00	0.00	0.00
		-61.124	8.745	0.000	-2.870	17.387	0.000	0.000	-0.00	-0.00	-0.00
	2.030	30.391	14.971	-5.029	14.971	30.391	0.000	0.000	0.00	0.00	0.00
		-52.248	8.745	0.000	-5.634	29.162	0.000	0.000	-0.00	-0.00	-0.00
	3.045	38.175	12.537	-7.463	12.537	38.175	0.000	0.000	0.00	0.00	0.00
		-43.373	8.745	0.000	-8.212	35.896	0.000	0.000	-0.00	-0.00	-0.00
	4.060	41.409	10.199	-9.801	11.328	0.000	-24.007	0.000	0.00	0.00	0.00
		-34.497	8.745	0.000	-10.590	38.206	0.000	0.000	-0.00	-0.00	-0.00
	5.075	40.550	7.990	-12.010	11.328	0.000	-12.508	0.000	0.00	0.00	0.00
		-25.621	8.745	0.000	-12.757	36.758	0.000	0.000	-0.00	-0.00	-0.00
	6.090	36.187	5.942	-14.058	11.328	0.000	-1.010	0.000	0.00	0.00	0.00
		-16.745	8.745	0.000	-14.702	32.267	0.000	0.000	-0.00	-0.00	-0.00
7.105	25.781	7.703	-12.297	9.276	8.009	0.000	0.000	0.00	0.00	0.00	
	-9.693	0.000	-1.364	-16.412	25.493	0.000	0.000	-0.00	-0.00	-0.00	
8.120	20.217	4.805	-15.195	8.745	1.006	0.000	0.000	0.00	0.00	0.00	
	-12.130	0.000	-5.429	-17.876	17.246	0.000	0.000	-0.00	-0.00	-0.00	
9.135	11.119	2.164	-17.836	8.745	9.882	0.000	0.000	0.00	0.00	0.00	
	-18.584	0.000	-6.643	-19.082	8.383	0.000	0.000	-0.00	-0.00	-0.00	
10.150											
3	0.000	18.758	8.745	-2.344	20.074	0.000	-0.272	0.00	0.00	0.00	0.00
		-28.046	7.498	-13.059	-20.165	0.000	-0.483	0.00	0.00	0.00	0.00
	1.015	16.379	0.000	-2.344	18.836	8.180	0.000	0.00	0.00	0.00	0.00
		-20.782	6.542	0.000	-2.344	16.379	0.000	0.000	-0.00	-0.00	-0.00
	2.030	20.787	15.768	-4.232	17.274	16.628	0.000	0.000	0.00	0.00	0.00
		-15.590	2.610	0.000	-4.232	20.787	0.000	0.000	-0.00	-0.00	-0.00
	3.045	27.592	13.464	-6.536	15.428	23.828	0.000	0.000	0.00	0.00	0.00
		-12.941	2.610	0.000	-6.536	27.592	0.000	0.000	-0.00	-0.00	-0.00
4.060	31.386	11.141	-8.859	13.362	28.923	0.000	0.000	0.00	0.00	0.00	
	-10.292	2.610	0.000	-8.859	31.386	0.000	0.000	-0.00	-0.00	-0.00	
5.075	32.042	8.856	-11.144	11.139	31.313	0.000	0.000	0.00	0.00	0.00	
	-7.643	2.610	0.000	-11.144	32.042	0.000	0.000	-0.00	-0.00	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.090	30.658	8.823	-11.177	8.823	30.658	0.000	0.00		
		-7.442	0.000	-1.833	-13.335	29.660	0.000	-0.00		
	7.105	26.874	6.478	-13.522	6.478	26.874	0.000	0.00		
		-9.302	0.000	-1.833	-15.375	24.570	0.000	-0.00		
	8.120	20.134	4.166	-15.834	4.166	20.134	0.000	0.00		
		-12.051	0.000	-4.964	-17.207	17.333	0.000	-0.00		
9.135	10.873	1.951	-18.049	2.610	2.954	0.000	0.00			
	-18.025	0.000	-6.178	-18.776	8.736	0.000	-0.00			
4	10.150									
	0.000	5.603	2.610	-0.702	20.075	0.000	-0.289	0.00		
		-24.639	7.068	-11.475	-20.083	0.000	-0.307	0.00		
	1.015	10.892	18.062	-1.938	18.755	8.718	0.000	0.00		
		-18.217	6.169	0.000	-1.938	2.174	0.000	-0.00		
	2.030	20.185	15.877	-4.123	17.155	17.279	0.000	0.00		
		-12.202	4.947	0.000	-4.123	20.185	0.000	-0.00		
	3.045	27.008	13.598	-6.402	15.289	24.425	0.000	0.00		
		-9.103	1.844	0.000	-6.402	27.008	0.000	-0.00		
	4.060	30.934	11.285	-8.715	13.218	29.368	0.000	0.00		
		-7.231	1.844	0.000	-8.715	30.934	0.000	-0.00		
	5.075	31.773	8.996	-11.004	11.003	31.567	0.000	0.00		
		-5.694	0.000	-1.938	-11.004	31.773	0.000	-0.00		
	6.090	30.728	8.705	-11.295	8.705	30.728	0.000	0.00		
		-7.660	0.000	-1.938	-13.210	29.577	0.000	-0.00		
	7.105	26.805	6.385	-13.615	6.385	26.805	0.000	0.00		
-9.627		0.000	-1.938	-15.274	24.636	0.000	-0.00			
8.120	20.000	4.104	-15.896	4.104	20.000	0.000	0.00			
	-11.690	0.000	-4.871	-17.136	17.479	0.000	-0.00			
9.135	10.762	1.923	-18.077	1.923	10.762	0.000	0.00			
	-17.447	0.000	-5.901	-18.738	8.876	0.000	-0.00			
5	10.150									
	0.000	4.001	1.844	-0.521	20.058	0.000	-0.252	0.00		
		-24.198	6.946	-11.337	-20.078	0.000	-0.299	0.00		
	1.015	10.811	18.111	-1.889	18.683	8.831	0.000	0.00		
		-17.921	6.044	0.000	-1.889	10.811	0.000	-0.00		
	2.030	20.128	16.003	-3.997	17.003	17.342	0.000	0.00		
		-12.072	4.828	0.000	-3.997	20.128	0.000	-0.00		
	3.045	27.141	13.802	-6.198	15.056	24.268	0.000	0.00		
		-9.135	1.969	0.000	-6.198	27.141	0.000	-0.00		
	4.060	31.400	11.555	-8.445	12.914	28.839	0.000	0.00		
		-7.136	1.969	0.000	-8.445	31.400	0.000	-0.00		
	5.075	32.649	9.311	-10.689	10.647	30.571	0.000	0.00		
		-5.138	1.969	0.000	-10.689	32.649	0.000	-0.00		
	6.090	30.828	7.118	-12.882	8.325	29.267	0.000	0.00		
		-3.448	0.000	-0.874	-12.882	30.828	0.000	-0.00		
	7.105	26.084	5.025	-14.975	6.019	25.015	0.000	0.00		
-4.335		0.000	-0.874	-14.975	26.084	0.000	-0.00			
8.120	18.961	3.116	-16.884	3.798	18.191	0.000	0.00			
	-7.092	0.000	-3.516	-16.884	18.961	0.000	-0.00			
9.135	10.503	1.496	-18.504	1.969	2.856	0.000	0.00			
	-11.457	0.000	-8.445	-18.504	10.503	0.000	-0.00			
6	10.150									
	0.000	4.855	1.969	-0.927	20.035	0.000	-0.311	0.00		
		-21.683	5.540	-10.993	-20.085	0.000	-0.356	0.00		
	0.633	8.389	16.395	-3.605	18.654	6.217	0.000	0.00		
		-18.638	4.781	0.000	-4.781	5.573	0.000	-0.00		
	1.266	13.709	14.611	-5.389	17.032	11.953	0.000	0.00		
		-15.884	4.010	0.000	-5.540	6.370	0.000	-0.00		
	1.899	17.717	12.698	-7.302	15.235	16.486	0.000	0.00		
		-13.412	3.214	0.000	-7.302	17.717	0.000	-0.00		
	2.532	20.110	10.705	-9.295	13.312	19.476	0.000	0.00		
		-11.378	3.214	0.000	-9.295	20.110	0.000	-0.00		
	3.165	20.712	8.685	-11.315	11.315	20.712	0.000	0.00		
		-9.656	2.699	0.000	-11.315	20.712	0.000	-0.00		
	3.798	20.110	9.295	-10.705	9.295	20.110	0.000	0.00		
		-11.378	0.000	-3.214	-13.312	19.476	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.431	17.717	7.302	-12.698	7.302	17.717	0.000	0.00		
		-13.412	0.000	-3.214	-15.235	16.486	0.000	-0.00		
	5.064	13.709	5.389	-14.611	5.540	6.370	0.000	0.00		
		-15.884	0.000	-4.010	-17.032	11.953	0.000	-0.00		
	5.697	8.389	3.605	-16.395	4.781	5.573	0.000	0.00		
-18.638		0.000	-4.781	-18.654	6.217	0.000	-0.00			
7	6.330									
	0.000	4.855	0.927	-1.969	20.085	0.000	-0.356	0.00		
		-21.683	10.993	-5.540	-20.035	0.000	-0.311	0.00		
	1.015	10.503	18.504	-1.496	18.504	10.503	0.000	0.00		
		-11.457	8.445	0.000	-1.969	2.856	0.000	-0.00		
	2.030	18.961	16.884	-3.116	16.884	18.961	0.000	0.00		
		-7.092	3.516	0.000	-3.798	18.191	0.000	-0.00		
	3.045	26.084	14.975	-5.025	14.975	26.084	0.000	0.00		
		-4.335	0.874	0.000	-6.019	25.015	0.000	-0.00		
	4.060	30.828	12.882	-7.118	12.882	30.828	0.000	0.00		
		-3.448	0.874	0.000	-8.325	29.267	0.000	-0.00		
	5.075	32.649	10.689	-9.311	10.689	32.649	0.000	0.00		
		-5.138	0.000	-1.969	-10.647	30.571	0.000	-0.00		
	6.090	31.400	8.445	-11.555	8.445	31.400	0.000	0.00		
		-7.136	0.000	-1.969	-12.914	28.839	0.000	-0.00		
7.105	27.141	6.198	-13.802	6.198	27.141	0.000	0.00			
	-9.135	0.000	-1.969	-15.056	24.268	0.000	-0.00			
8.120	20.128	3.997	-16.003	3.997	20.128	0.000	0.00			
	-12.072	0.000	-4.828	-17.003	17.342	0.000	-0.00			
9.135	10.811	1.889	-18.111	1.889	10.811	0.000	0.00			
	-17.921	0.000	-6.044	-18.683	8.831	0.000	-0.00			
8	10.150									
	0.000	4.001	0.521	-1.844	20.078	0.000	-0.299	0.00		
		-24.198	11.337	-6.946	-20.058	0.000	-0.252	0.00		
	1.015	10.762	18.077	-1.923	18.738	8.876	0.000	0.00		
		-17.447	5.901	0.000	-1.923	10.762	0.000	-0.00		
	2.030	20.000	15.896	-4.104	17.136	17.479	0.000	0.00		
		-11.690	4.871	0.000	-4.104	20.000	0.000	-0.00		
	3.045	26.805	13.615	-6.385	15.274	24.636	0.000	0.00		
		-9.627	1.938	0.000	-6.385	26.805	0.000	-0.00		
	4.060	30.728	11.295	-8.705	13.210	29.577	0.000	0.00		
		-7.660	1.938	0.000	-8.705	30.728	0.000	-0.00		
	5.075	31.773	11.004	-8.996	11.004	31.773	0.000	0.00		
		-5.694	1.938	0.000	-11.003	31.567	0.000	-0.00		
	6.090	30.934	8.715	-11.285	8.715	30.934	0.000	0.00		
		-7.231	0.000	-1.844	-13.218	29.368	0.000	-0.00		
7.105	27.008	6.402	-13.598	6.402	27.008	0.000	0.00			
	-9.103	0.000	-1.844	-15.289	24.425	0.000	-0.00			
8.120	20.185	4.123	-15.877	4.123	20.185	0.000	0.00			
	-12.202	0.000	-4.947	-17.155	17.279	0.000	-0.00			
9.135	10.892	1.938	-18.062	1.938	2.174	0.000	0.00			
	-18.217	0.000	-6.169	-18.755	8.718	0.000	-0.00			
9	10.150									
	0.000	5.603	0.702	-2.610	20.083	0.000	-0.307	0.00		
		-24.639	11.475	-7.068	-20.075	0.000	-0.289	0.00		
	1.015	10.873	18.049	-1.951	18.776	8.736	0.000	0.00		
		-18.025	6.178	0.000	-2.610	2.954	0.000	-0.00		
	2.030	20.134	15.834	-4.166	17.207	17.333	0.000	0.00		
		-12.051	4.964	0.000	-4.166	20.134	0.000	-0.00		
	3.045	26.874	13.522	-6.478	15.375	24.570	0.000	0.00		
		-9.302	1.833	0.000	-6.478	26.874	0.000	-0.00		
	4.060	30.658	11.177	-8.823	13.335	29.660	0.000	0.00		
		-7.442	1.833	0.000	-8.823	30.658	0.000	-0.00		
	5.075	32.042	11.144	-8.856	11.144	32.042	0.000	0.00		
		-7.643	0.000	-2.610	-11.139	31.313	0.000	-0.00		
	6.090	31.386	8.859	-11.141	8.859	31.386	0.000	0.00		
		-10.292	0.000	-2.610	-13.362	28.923	0.000	-0.00		
7.105	27.592	6.536	-13.464	6.536	27.592	0.000	0.00			
	-12.941	0.000	-2.610	-15.428	23.828	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR (max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	8.120	20.787	4.232	-15.768	4.232	20.787	0.000	0.00		
		-15.590	0.000	-2.610	-17.274	16.628	0.000	-0.00		
	9.135	12.479	1.786	0.000	2.003	11.331	0.000	0.00		
10	10.150	-20.782	0.000	-6.542	-18.836	8.180	0.000	-0.00		
	0.000	14.292	1.786	-6.663	20.165	0.000	-0.483	0.00		
		-28.046	13.059	-7.498	-20.074	0.000	-0.272	0.00		
	1.015	11.119	17.836	-2.164	19.082	8.383	0.000	0.00		
		-18.584	6.643	0.000	-6.663	7.529	0.000	-0.00		
	2.030	20.217	15.195	-4.805	17.876	17.246	0.000	0.00		
		-12.130	5.429	0.000	-6.663	0.767	0.000	-0.00		
	3.045	29.036	15.913	-4.087	16.412	25.493	0.000	0.00		
		-9.693	1.364	0.000	-8.512	7.146	0.000	-0.00		
	4.060	36.187	14.058	-5.942	14.702	32.267	0.000	0.00		
		-12.758	0.000	-6.663	-8.512	0.000	-1.494	-0.00		
	5.075	40.550	12.010	-7.990	12.757	36.758	0.000	0.00		
		-19.521	0.000	-6.663	-8.512	0.000	-10.134	-0.00		
	6.090	41.409	9.801	-10.199	10.590	38.206	0.000	0.00		
		-26.284	0.000	-6.663	-10.199	41.409	0.000	-0.00		
7.105	38.175	7.463	-12.537	8.212	35.896	0.000	0.00			
	-33.046	0.000	-6.663	-12.537	38.175	0.000	-0.00			
8.120	30.391	5.029	-14.971	5.634	29.162	0.000	0.00			
	-39.809	0.000	-6.663	-14.971	30.391	0.000	-0.00			
9.135	17.731	2.531	-17.469	2.870	17.387	0.000	0.00			
	-46.571	0.000	-6.663	-17.469	17.731	0.000	-0.00			
11	10.150	0.000	1.364	-0.000	20.000	0.000	-0.053	0.00		
	0.000	-53.334	20.000	-8.512	-20.040	0.000	-0.000	0.00		
	0.267	0.000	0.000	-0.000	20.000	0.000	0.000	0.00		
		-48.001	20.000	0.000	-0.000	0.000	0.000	-0.00		
	0.533	0.000	20.000	-0.000	20.000	0.000	0.000	0.00		
		-42.667	20.000	0.000	-0.000	0.000	0.000	-0.00		
	0.800	0.000	20.000	-0.000	20.000	0.000	-1.300	0.00		
		-37.334	20.000	0.000	-0.000	0.000	0.000	-0.00		
	1.067	0.000	20.000	-0.000	20.000	0.000	0.000	0.00		
		-32.000	20.000	0.000	-0.000	0.000	0.000	-0.00		
	1.333	0.000	20.000	-0.000	20.000	0.000	0.000	0.00		
		-26.667	20.000	0.000	-0.000	0.000	0.000	-0.00		
	1.600	0.000	20.000	-0.000	20.000	0.000	0.000	0.00		
		-21.334	20.000	0.000	-0.000	0.000	0.000	-0.00		
	1.867	0.000	20.000	-0.000	20.000	0.000	-0.266	0.00		
	-16.000	20.000	0.000	-0.000	0.000	0.000	-0.00			
2.133	0.000	20.000	-0.000	20.000	0.000	0.000	0.00			
	-10.667	20.000	0.000	-0.000	0.000	0.000	-0.00			
2.400	0.000	20.000	-0.000	20.000	0.000	0.000	0.00			
	-5.333	20.000	0.000	-0.000	0.000	0.000	-0.00			
2.667	0.000	0.000	0.000	20.000	0.000	-0.000	0.00			
	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00			

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.364	-31.328
3	11.088	-21.665
4	3.312	-20.766
5	2.365	-20.603
6	3.939	-20.189
7	3.939	-20.189
8	2.365	-20.603
9	3.312	-20.766
10	8.448	-21.665
11	1.364	-28.512
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

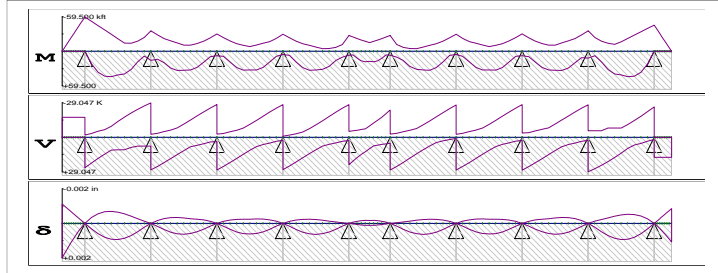


Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 3F1  
 Type: Truck

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (kft)		Corresponding Shear (K)		SHEAR (K)		Corresponding Moment (kft)		DEFLECT (in)	
		(max)	(min)	(+)	(-)	(max)	(min)	(+)	(-)	(max)	(min)
1	0.000	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	-0.000	0.000	0.00
		-0.000	0.000	0.000	0.000	-17.000	0.000	-0.000	-0.000	-0.00	-0.00
	0.350	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-5.950	0.000	0.000	-17.000	-17.000	0.000	-5.950	-0.000	-0.00	-0.00
	0.700	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-11.900	0.000	0.000	-17.000	-17.000	0.000	-3.145	-0.000	-0.00	-0.00
	1.050	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-17.850	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	-0.00
	1.400	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-23.800	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	-0.00
	1.750	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-29.750	0.000	0.000	-17.000	-17.000	0.000	-3.740	-0.000	-0.00	-0.00
	2.100	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-35.700	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	-0.00
	2.450	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
	-41.650	0.000	0.000	-17.000	-17.000	0.000	-0.000	-0.000	-0.00	-0.00	
2.800	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-47.600	0.000	0.000	-17.000	-17.000	0.000	-5.950	-0.000	-0.00	-0.00	
3.150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-53.550	0.000	0.000	-17.000	-17.000	0.000	-0.000	-0.000	-0.00	-0.00	
3.500											
2	0.000	0.000	0.000	-1.965	25.743	0.000	-0.000	0.00	0.00	0.00	
		-59.500	10.533	-17.000	-17.000	0.000	-5.950	0.00	0.00	0.00	
	1.015	22.074	21.748	0.000	21.748	22.074	0.000	0.00	0.00	0.00	
		-51.956	7.433	0.000	-3.373	8.757	0.000	-0.00	-0.00	-0.00	
	2.030	36.286	17.875	0.000	17.875	36.286	0.000	0.00	0.00	0.00	
		-44.411	7.433	0.000	-5.153	13.898	0.000	-0.00	-0.00	-0.00	
	3.045	43.294	14.218	-2.782	14.218	43.294	0.000	0.00	0.00	0.00	
		-36.867	7.433	0.000	-6.614	16.401	0.000	-0.00	-0.00	-0.00	
	4.060	43.984	10.833	-6.167	10.833	43.984	0.000	0.00	0.00	0.00	
		-29.322	7.433	0.000	-9.405	31.856	0.000	-0.00	-0.00	-0.00	
	5.075	41.184	4.514	-12.486	10.533	0.000	-6.043	0.00	0.00	0.00	
		-21.778	7.433	0.000	-13.383	36.634	0.000	-0.00	-0.00	-0.00	
	6.090	39.500	0.652	-16.348	10.533	4.649	0.000	0.00	0.00	0.00	
		-14.233	7.433	0.000	-17.120	34.796	0.000	-0.00	-0.00	-0.00	
	7.105	31.541	0.000	-19.990	8.600	11.889	0.000	0.00	0.00	0.00	
	-13.961	0.000	-1.965	-20.588	27.290	0.000	-0.00	-0.00	-0.00		
8.120	18.422	0.000	-23.357	7.433	0.855	0.000	0.00	0.00	0.00		
	-17.620	0.000	-5.480	-23.756	15.181	0.000	-0.00	-0.00	-0.00		
9.135	8.400	7.433	0.000	7.433	8.400	0.000	0.00	0.00	0.00		
	-23.878	0.000	-6.614	-26.593	0.000	-0.340	-0.00	-0.00	-0.00		
10.150											
3	0.000	15.944	7.433	-1.992	27.515	0.000	-14.195	0.00	0.00	0.00	
		-35.443	7.099	-20.391	-29.047	0.000	-18.073	0.00	0.00	0.00	
	1.015	14.004	0.000	-2.004	24.639	1.859	0.000	0.00	0.00	0.00	
		-28.294	6.856	0.000	-3.407	9.036	0.000	-0.00	-0.00	-0.00	
	2.030	19.977	19.560	0.000	21.437	14.986	0.000	0.00	0.00	0.00	
		-21.889	3.664	0.000	-4.906	12.472	0.000	-0.00	-0.00	-0.00	
	3.045	29.154	16.088	-0.912	18.056	24.243	0.000	0.00	0.00	0.00	
		-18.170	3.664	0.000	-6.172	14.270	0.000	-0.00	-0.00	-0.00	
	4.060	33.468	12.666	-4.334	14.614	29.056	0.000	0.00	0.00	0.00	
	-14.450	3.664	0.000	-7.968	26.201	0.000	-0.00	-0.00	-0.00		
5.075	32.996	9.406	-7.594	11.228	29.328	0.000	0.00	0.00	0.00		
	-10.731	3.664	0.000	-11.225	30.327	0.000	-0.00	-0.00	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.090	32.613	4.241	-12.759	8.018	25.445	0.000	0.00		
		-10.722	0.000	-2.641	-14.645	30.070	0.000	-0.00		
	7.105	28.067	0.853	-16.147	6.856	13.457	0.000	0.00		
		-13.402	0.000	-2.641	-18.117	25.077	0.000	-0.00		
	8.120	18.840	0.000	-19.589	5.524	12.434	0.000	0.00		
		-17.531	0.000	-5.186	-21.532	15.443	0.000	-0.00		
	9.135	9.637	3.921	-8.079	3.921	9.637	0.000	0.00		
		-23.320	0.000	-6.172	-24.779	1.710	0.000	-0.00		
	4	10.150	7.867	3.664	-0.986	27.588	0.000	-14.901	0.00	
			-30.114	6.428	-17.912	-27.722	0.000	-15.239	0.00	
1.015		8.943	8.691	-3.309	24.609	1.902	0.000	0.00		
		-23.705	6.194	0.000	-3.309	8.943	0.000	-0.00		
2.030		18.916	19.769	0.000	21.330	15.426	0.000	0.00		
		-17.866	5.215	0.000	-4.763	12.356	0.000	-0.00		
3.045		28.296	16.292	-0.708	17.896	24.811	0.000	0.00		
		-13.091	2.652	0.000	-6.000	14.244	0.000	-0.00		
4.060		32.865	12.844	-4.156	14.427	29.569	0.000	0.00		
		-10.399	2.652	0.000	-7.833	25.856	0.000	-0.00		
5.075	32.613	9.540	-7.460	11.038	29.690	0.000	0.00			
	-8.221	0.000	-2.798	-11.037	29.974	0.000	-0.00			
6.090	32.622	4.130	-12.870	7.847	25.642	0.000	0.00			
	-11.061	0.000	-2.798	-14.435	29.856	0.000	-0.00			
7.105	27.988	0.691	-16.309	6.194	14.014	0.000	0.00			
	-13.901	0.000	-2.798	-17.914	25.047	0.000	-0.00			
8.120	18.594	0.000	-19.777	4.938	12.345	0.000	0.00			
	-16.753	0.000	-5.035	-21.356	15.556	0.000	-0.00			
9.135	9.113	3.455	-8.545	3.455	9.113	0.000	0.00			
	-22.295	0.000	-6.000	-24.649	1.860	0.000	-0.00			
5	10.150	5.753	2.652	-0.749	27.309	0.000	-14.340	0.00		
		-29.519	6.281	-17.708	-27.647	0.000	-15.197	0.00		
	1.015	7.408	10.051	-1.949	24.217	2.345	0.000	0.00		
		-23.271	6.053	0.000	-1.949	7.408	0.000	-0.00		
	2.030	18.795	20.174	0.000	20.844	15.513	0.000	0.00		
		-17.601	5.111	0.000	-3.097	12.157	0.000	-0.00		
	3.045	28.484	16.585	-0.415	17.354	24.374	0.000	0.00		
		-13.156	2.836	0.000	-4.549	18.702	0.000	-0.00		
	4.060	33.074	12.989	-4.011	13.882	28.588	0.000	0.00		
		-10.277	2.836	0.000	-7.395	26.650	0.000	-0.00		
5.075	32.624	9.563	-7.437	10.561	28.360	0.000	0.00			
	-7.399	2.836	0.000	-10.587	31.227	0.000	-0.00			
6.090	31.361	2.965	-14.035	7.526	24.440	0.000	0.00			
	-4.521	2.836	0.000	-14.035	31.361	0.000	-0.00			
7.105	26.384	0.000	-17.629	6.053	13.594	0.000	0.00			
	-4.913	0.000	-0.990	-17.629	26.384	0.000	-0.00			
8.120	16.302	0.000	-21.220	4.845	12.032	0.000	0.00			
	-6.805	0.000	-2.899	-21.220	16.302	0.000	-0.00			
9.135	10.491	1.497	-10.503	3.430	9.137	0.000	0.00			
	-11.786	0.000	-11.046	-24.631	1.930	0.000	-0.00			
6	10.150	6.991	2.836	-1.336	23.010	0.000	-5.967	0.00		
		-27.410	4.303	-19.019	-27.654	0.000	-15.296	0.00		
	0.633	6.598	6.456	-5.544	20.099	3.286	0.000	0.00		
		-24.686	4.303	0.000	-5.544	6.598	0.000	-0.00		
	1.266	12.341	15.942	-1.058	17.100	9.936	0.000	0.00		
		-22.031	3.833	0.000	-6.070	7.742	0.000	-0.00		
	1.899	16.800	12.952	-4.048	14.563	8.630	0.000	0.00		
		-19.605	3.833	0.000	-6.638	8.817	0.000	-0.00		
	2.532	18.459	10.050	-6.950	12.245	14.041	0.000	0.00		
		-17.206	3.779	0.000	-7.253	9.658	0.000	-0.00		
3.165	17.444	9.695	-7.305	9.695	17.444	0.000	0.00			
	-15.028	0.000	-3.398	-9.695	17.444	0.000	-0.00			
3.798	18.459	6.950	-10.050	7.253	9.658	0.000	0.00			
	-17.206	0.000	-3.779	-12.245	14.041	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
6	4.431	16.800	4.048	-12.952	6.638	8.817	0.000	0.00
		-19.605	0.000	-3.833	-14.563	8.630	0.000	-0.00
	5.064	12.341	1.058	-15.942	6.070	7.742	0.000	0.00
		-22.031	0.000	-3.833	-17.100	9.936	0.000	-0.00
	5.697	6.598	5.544	-6.456	5.544	6.598	0.000	0.00
		-24.686	0.000	-4.303	-20.099	3.286	0.000	-0.00
7	0.000	6.991	1.336	-2.836	27.654	0.000	-15.296	0.00
		-27.410	19.019	-4.303	-23.010	0.000	-5.967	0.00
	1.015	10.491	10.503	-1.497	24.631	1.930	0.000	0.00
		-11.786	11.046	0.000	-3.430	9.137	0.000	-0.00
	2.030	16.302	21.220	0.000	21.220	16.302	0.000	0.00
		-6.805	2.899	0.000	-4.845	12.032	0.000	-0.00
	3.045	26.384	17.629	0.000	17.629	26.384	0.000	0.00
		-4.913	0.990	0.000	-6.053	13.594	0.000	-0.00
	4.060	31.361	14.035	-2.965	14.035	31.361	0.000	0.00
		-4.521	0.000	-2.836	-7.526	24.440	0.000	-0.00
	5.075	32.624	7.437	-9.563	10.587	31.227	0.000	0.00
		-7.399	0.000	-2.836	-10.561	28.360	0.000	-0.00
	6.090	33.074	4.011	-12.989	7.395	26.650	0.000	0.00
		-10.277	0.000	-2.836	-13.882	28.588	0.000	-0.00
	7.105	28.484	0.415	-16.585	4.549	18.702	0.000	0.00
-13.156		0.000	-2.836	-17.354	24.374	0.000	-0.00	
8.120	18.795	0.000	-20.174	3.097	12.157	0.000	0.00	
	-17.601	0.000	-5.111	-20.844	15.513	0.000	-0.00	
9.135	7.408	1.949	-10.051	1.949	7.408	0.000	0.00	
	-23.271	0.000	-6.053	-24.217	2.345	0.000	-0.00	
8	0.000	5.753	0.749	-2.652	27.647	0.000	-15.197	0.00
		-29.519	17.708	-6.281	-27.309	0.000	-14.340	0.00
	1.015	9.113	8.545	-3.455	24.649	1.860	0.000	0.00
		-22.295	6.000	0.000	-3.455	9.113	0.000	-0.00
	2.030	18.594	19.777	0.000	21.356	15.556	0.000	0.00
		-16.753	5.035	0.000	-4.938	12.345	0.000	-0.00
	3.045	27.988	16.309	-0.691	17.914	25.047	0.000	0.00
		-13.901	2.798	0.000	-6.194	14.014	0.000	-0.00
	4.060	32.622	12.870	-4.130	14.435	29.856	0.000	0.00
		-11.061	2.798	0.000	-7.847	25.642	0.000	-0.00
	5.075	32.613	7.460	-9.540	11.037	29.974	0.000	0.00
		-8.221	2.798	0.000	-11.038	29.690	0.000	-0.00
	6.090	32.865	4.156	-12.844	7.833	25.856	0.000	0.00
		-10.399	0.000	-2.652	-14.427	29.569	0.000	-0.00
	7.105	28.296	0.708	-16.292	6.000	14.244	0.000	0.00
-13.091		0.000	-2.652	-17.896	24.811	0.000	-0.00	
8.120	18.916	0.000	-19.769	4.763	12.356	0.000	0.00	
	-17.866	0.000	-5.215	-21.330	15.426	0.000	-0.00	
9.135	8.943	3.309	-8.691	3.309	8.943	0.000	0.00	
	-23.705	0.000	-6.194	-24.609	1.902	0.000	-0.00	
9	0.000	7.867	0.986	-3.664	27.722	0.000	-15.239	0.00
		-30.114	17.912	-6.428	-27.588	0.000	-14.901	0.00
	1.015	9.637	8.079	-3.921	24.779	1.710	0.000	0.00
		-23.320	6.172	0.000	-3.921	9.637	0.000	-0.00
	2.030	18.840	19.589	0.000	21.532	15.443	0.000	0.00
		-17.531	5.186	0.000	-5.524	12.434	0.000	-0.00
	3.045	28.067	16.147	-0.853	18.117	25.077	0.000	0.00
		-13.402	2.641	0.000	-6.856	13.457	0.000	-0.00
	4.060	32.613	12.759	-4.241	14.645	30.070	0.000	0.00
		-10.722	2.641	0.000	-8.018	25.445	0.000	-0.00
5.075	32.996	7.594	-9.406	11.225	30.327	0.000	0.00	
	-10.731	0.000	-3.664	-11.228	29.328	0.000	-0.00	
6.090	33.468	4.334	-12.666	7.968	26.201	0.000	0.00	
	-14.450	0.000	-3.664	-14.614	29.056	0.000	-0.00	
7.105	29.154	0.912	-16.088	6.172	14.270	0.000	0.00	
	-18.170	0.000	-3.664	-18.056	24.244	0.000	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR (max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	8.120	19.977	0.000	-19.560	4.906	12.472	0.000	0.00		
		-21.889	0.000	-3.664	-21.437	14.987	0.000	-0.00		
	9.135	11.131	0.000	-10.124	3.407	9.036	0.000	0.00		
		-28.294	0.000	-6.856	-24.639	1.859	0.000	-0.00		
10	10.150	12.148	1.518	-5.663	29.047	0.000	-18.073	0.00		
		-35.443	20.391	-7.099	-27.515	0.000	-14.195	0.00		
	1.015	8.015	9.513	-2.487	26.593	0.000	-0.340	0.00		
		-23.878	6.614	0.000	-5.663	6.400	0.000	-0.00		
	2.030	18.422	23.357	0.000	23.756	15.181	0.000	0.00		
		-17.620	5.480	0.000	-5.663	0.652	0.000	-0.00		
	3.045	31.541	19.990	0.000	20.588	27.290	0.000	0.00		
		-13.961	1.965	0.000	-7.883	10.673	0.000	-0.00		
	4.060	39.500	16.348	-0.652	17.120	34.796	0.000	0.00		
		-11.966	1.965	0.000	-7.883	2.672	0.000	-0.00		
	5.075	41.184	12.486	-4.514	13.383	36.634	0.000	0.00		
		-16.593	0.000	-5.663	-7.883	0.000	-5.329	-0.00		
	6.090	43.984	6.167	-10.833	9.405	31.856	0.000	0.00		
		-22.341	0.000	-5.663	-10.833	43.984	0.000	-0.00		
	7.105	43.294	2.782	-14.218	6.614	16.401	0.000	0.00		
		-28.089	0.000	-5.663	-14.218	43.294	0.000	-0.00		
8.120	36.286	0.000	-17.875	5.153	13.898	0.000	0.00			
	-33.837	0.000	-5.663	-17.875	36.286	0.000	-0.00			
9.135	22.074	0.000	-21.748	3.373	8.757	0.000	0.00			
	-39.586	0.000	-5.663	-21.748	22.074	0.000	-0.00			
11	10.150	0.000	1.965	-0.000	17.000	0.000	-0.045	0.00		
		-45.334	17.000	-19.842	-25.743	0.000	-0.000	0.00		
	0.267	0.000	0.000	-0.000	17.000	0.000	-0.000	0.00		
		-40.800	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.533	0.000	0.000	-0.000	17.000	0.000	-0.000	0.00		
		-36.267	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.800	0.000	17.000	-0.000	17.000	0.000	-0.000	0.00		
		-31.734	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.067	0.000	17.000	-0.000	17.000	0.000	-0.000	0.00		
		-27.200	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.333	0.000	17.000	-0.000	17.000	0.000	-0.000	0.00		
		-22.667	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.600	0.000	17.000	-0.000	17.000	0.000	0.000	0.00		
		-18.134	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.867	0.000	17.000	-0.000	17.000	0.000	0.000	0.00		
		-13.600	17.000	0.000	-0.000	0.000	0.000	-0.00		
2.133	0.000	17.000	-0.000	17.000	0.000	0.000	0.00			
	-9.067	17.000	0.000	-0.000	0.000	0.000	-0.00			
2.400	0.000	17.000	-0.000	17.000	0.000	0.000	0.00			
	-4.533	17.000	0.000	-0.000	0.000	0.000	-0.00			
2.667	0.000	0.000	0.000	17.000	0.000	-0.000	0.00			
	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00			

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.965	-40.372
3	9.425	-31.435
4	4.650	-30.356
5	3.401	-30.587
6	5.673	-29.677
7	5.673	-29.677
8	3.401	-30.587
9	4.650	-30.356
10	7.181	-32.001
11	1.965	-36.842
12	0.000	-0.000

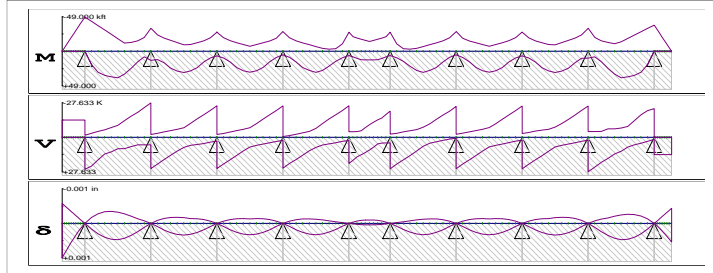
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 4F1  
 Type: Truck

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	-0.00	-0.00
	0.350	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-4.900	0.000	0.000	-14.000	-14.000	0.000	0.000	0.000	-0.00	-0.00
	0.700	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-9.800	0.000	0.000	-14.000	-14.000	0.000	0.000	-2.590	-0.00	-0.00
	1.050	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-14.700	0.000	0.000	-14.000	-14.000	0.000	0.000	0.000	-0.00	-0.00
	1.400	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-19.600	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
	1.750	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-24.500	0.000	0.000	-14.000	-14.000	0.000	0.000	-3.080	-0.00	-0.00
	2.100	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00
		-29.400	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
2.450	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-34.300	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00	
2.800	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-39.200	0.000	0.000	-14.000	-14.000	0.000	0.000	-3.570	-0.00	-0.00	
3.150	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-44.100	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00	
3.500											
2	0.000	0.000	0.000	-1.782	25.704	0.000	-49.000	0.00	0.00	0.00	0.00
		-49.000	25.704	-14.000	-14.000	0.000	-4.900	0.00	0.00	0.00	0.00
	1.015	19.054	18.772	0.000	23.131	0.000	-18.312	0.00	0.00	0.00	0.00
		-42.787	6.121	0.000	-3.304	8.826	0.000	-0.00	0.00	-0.00	-0.00
	2.030	30.041	14.799	0.000	18.166	9.296	0.000	0.00	0.00	0.00	0.00
		-36.574	6.121	0.000	-4.825	14.566	0.000	0.00	0.00	-0.00	-0.00
	3.045	34.458	11.316	-2.684	13.379	27.370	0.000	0.00	0.00	0.00	0.00
		-30.361	6.121	0.000	-6.125	17.889	0.000	0.00	0.00	-0.00	-0.00
	4.060	36.636	8.817	-5.183	11.704	5.518	0.000	0.00	0.00	0.00	0.00
		-24.148	6.121	0.000	-7.912	25.556	0.000	0.00	0.00	-0.00	-0.00
	5.075	38.027	4.527	-9.473	9.222	0.000	-2.200	0.00	0.00	0.00	0.00
		-17.935	6.121	0.000	-9.683	36.959	0.000	0.00	0.00	-0.00	-0.00
	6.090	32.766	0.576	-13.424	9.222	7.160	0.000	0.00	0.00	0.00	0.00
		-11.722	6.121	0.000	-13.456	32.572	0.000	0.00	0.00	-0.00	-0.00
7.105	24.567	0.000	-14.897	7.515	12.865	0.000	0.00	0.00	0.00	0.00	
	-12.664	0.000	-1.782	-16.978	22.312	0.000	0.00	0.00	-0.00	-0.00	
8.120	15.147	0.000	-19.445	6.121	0.704	0.000	0.00	0.00	0.00	0.00	
	-14.899	0.000	-3.734	-20.107	8.092	0.000	0.00	0.00	-0.00	-0.00	
9.135	8.121	0.889	-11.111	6.121	6.917	0.000	0.00	0.00	0.00	0.00	
	-19.810	0.000	-5.203	-23.915	0.000	-2.796	0.00	0.00	-0.00	-0.00	
10.150											
3	0.000	13.130	6.121	-1.641	25.083	0.000	-16.411	0.00	0.00	0.00	0.00
		-32.784	14.575	-20.278	-27.633	0.000	-22.598	0.00	0.00	0.00	0.00
	1.015	12.043	10.280	-1.720	21.519	0.000	-0.163	0.00	0.00	0.00	0.00
		-23.277	5.018	0.000	-3.313	8.941	0.000	0.00	0.00	-0.00	-0.00
	2.030	16.452	17.016	0.000	17.906	11.461	0.000	0.00	0.00	0.00	0.00
		-18.757	3.140	0.000	-4.466	12.472	0.000	0.00	0.00	-0.00	-0.00
	3.045	24.152	13.390	-0.610	14.420	18.290	0.000	0.00	0.00	0.00	0.00
		-15.570	3.140	0.000	-5.522	14.930	0.000	0.00	0.00	-0.00	-0.00
4.060	28.367	10.909	-3.091	11.138	20.630	0.000	0.00	0.00	0.00	0.00	
	-12.383	3.140	0.000	-6.512	16.402	0.000	0.00	0.00	-0.00	-0.00	
5.075	30.445	6.541	-7.459	8.114	19.075	0.000	0.00	0.00	0.00	0.00	
	-9.195	3.140	0.000	-7.785	19.440	0.000	0.00	0.00	-0.00	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)	
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)	
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)	
3	6.090	28.247	2.797	-11.203	6.508	16.073	0.000	0.00	
		-9.672	0.000	-2.382	-11.203	28.247	0.000	-0.00	
	7.105	23.594	0.168	-13.832	5.857	14.354	0.000	0.00	
		-12.090	0.000	-2.382	-14.819	21.165	0.000	-0.00	
	8.120	15.379	0.000	-17.301	5.018	12.375	0.000	0.00	
		-14.833	0.000	-3.633	-18.212	9.795	0.000	-0.00	
	9.135	9.697	3.975	-8.025	3.975	9.697	0.000	0.00	
		-19.283	0.000	-4.627	-21.682	0.000	-0.271	-0.00	
	4	10.150	6.741	3.140	-0.845	25.162	0.000	-17.246	0.00
			-27.370	12.905	-18.878	-25.384	0.000	-17.785	0.00
1.015		9.588	10.627	-1.373	21.473	0.000	-0.042	0.00	
		-19.576	4.638	0.000	-3.184	8.803	0.000	-0.00	
2.030		15.485	17.157	0.000	18.010	10.057	0.000	0.00	
		-15.166	3.680	0.000	-4.327	12.309	0.000	-0.00	
3.045		23.363	13.484	-0.516	14.600	21.113	0.000	0.00	
		-12.210	2.474	0.000	-5.404	14.786	0.000	-0.00	
4.060		27.880	10.981	-3.019	10.981	27.880	0.000	0.00	
		-9.699	2.474	0.000	-6.443	16.225	0.000	-0.00	
5.075	29.989	6.704	-7.296	7.927	19.741	0.000	0.00		
	-7.188	2.474	0.000	-7.834	19.845	0.000	-0.00		
6.090	27.846	2.936	-11.064	6.450	16.117	0.000	0.00		
	-9.634	0.000	-2.437	-11.064	27.846	0.000	-0.00		
7.105	23.205	0.391	-13.609	5.499	14.622	0.000	0.00		
	-12.107	0.000	-2.437	-14.728	20.750	0.000	-0.00		
8.120	15.180	0.000	-17.238	4.483	12.281	0.000	0.00		
	-14.580	0.000	-2.437	-18.183	9.250	0.000	-0.00		
9.135	9.017	3.372	-8.628	3.372	9.017	0.000	0.00		
	-18.495	0.000	-4.624	-21.519	0.000	-0.072	-0.00		
5	10.150	5.366	2.474	-0.698	24.870	0.000	-16.472	0.00	
		-28.168	18.439	-13.789	-25.247	0.000	-17.635	0.00	
	1.015	8.657	10.706	-1.294	20.997	2.101	0.000	0.00	
		-19.224	4.516	0.000	-1.424	6.815	0.000	-0.00	
	2.030	15.423	17.102	0.000	17.859	8.351	0.000	0.00	
		-14.909	3.617	0.000	-2.537	12.093	0.000	-0.00	
	3.045	23.246	13.423	-0.577	14.421	20.014	0.000	0.00	
		-11.962	2.578	0.000	-3.655	16.342	0.000	-0.00	
	4.060	27.517	10.680	-3.320	10.901	21.433	0.000	0.00	
		-9.345	2.578	0.000	-4.811	19.330	0.000	-0.00	
5.075	30.099	6.765	-7.235	8.184	20.583	0.000	0.00		
	-6.728	2.578	0.000	-7.293	23.387	0.000	-0.00		
6.090	27.543	2.877	-11.123	6.286	15.501	0.000	0.00		
	-4.111	2.578	0.000	-11.123	27.543	0.000	-0.00		
7.105	21.412	0.207	-13.793	5.345	14.005	0.000	0.00		
	-3.028	0.467	0.000	-14.785	20.403	0.000	-0.00		
8.120	14.472	2.387	-9.613	4.370	11.825	0.000	0.00		
	-3.690	0.000	-1.647	-18.117	9.592	0.000	-0.00		
9.135	9.373	1.337	-10.663	3.332	8.995	0.000	0.00		
	-10.583	0.000	-15.191	-21.468	0.216	0.000	-0.00		
6	10.150	6.357	2.578	-1.214	21.059	0.000	-15.959	0.00	
		-27.186	12.374	-18.117	-25.310	0.000	-18.204	0.00	
	0.633	8.124	10.237	-1.763	18.423	0.000	-5.901	0.00	
		-20.839	4.529	0.000	-4.529	2.095	0.000	-0.00	
	1.266	10.325	9.425	-2.575	15.643	0.000	-0.202	0.00	
		-18.701	2.697	0.000	-4.664	7.981	0.000	-0.00	
	1.899	12.260	8.705	-5.295	14.101	0.077	0.000	0.00	
		-17.117	2.444	0.000	-5.310	9.884	0.000	-0.00	
	2.532	12.462	7.700	-4.300	12.304	5.564	0.000	0.00	
		-15.570	2.444	0.000	-7.886	12.095	0.000	-0.00	
3.165	12.306	5.152	-6.848	10.228	9.722	0.000	0.00		
	-14.059	0.000	-2.375	-10.228	9.722	0.000	-0.00		
3.798	12.462	4.300	-7.700	7.886	12.095	0.000	0.00		
	-15.570	0.000	-2.444	-12.304	5.564	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		6	4.431	12.260	5.295	-8.705	5.310	9.884	0.000	0.00
		-17.117	0.000	-2.444	-14.101	0.077	0.000	-0.00		
	5.064	10.325	2.575	-9.425	4.664	7.981	0.000	0.00		
		-18.701	0.000	-2.697	-15.643	0.000	-0.202	-0.00		
	5.697	8.124	1.763	-10.237	4.529	2.095	0.000	0.00		
		-20.839	0.000	-4.529	-18.423	0.000	-5.901	-0.00		
	6.330									
7	0.000	6.357	1.214	-2.578	25.310	0.000	-18.204	0.00		
		-27.186	18.117	-12.374	-21.059	0.000	-15.959	0.00		
	1.015	9.373	10.663	-1.337	21.468	0.216	0.000	0.00		
		-10.583	15.191	0.000	-3.332	8.995	0.000	-0.00		
	2.030	14.472	9.613	-2.387	18.117	9.592	0.000	0.00		
		-3.690	1.647	0.000	-4.370	11.825	0.000	-0.00		
	3.045	21.412	13.793	-0.207	14.785	20.403	0.000	0.00		
		-3.028	0.000	-0.467	-5.345	14.005	0.000	-0.00		
	4.060	27.543	11.123	-2.877	11.123	27.543	0.000	0.00		
		-4.111	0.000	-2.578	-6.286	15.501	0.000	-0.00		
	5.075	30.099	7.235	-6.765	7.293	23.387	0.000	0.00		
		-6.728	0.000	-2.578	-8.184	20.583	0.000	-0.00		
	6.090	27.517	3.320	-10.680	4.811	19.330	0.000	0.00		
		-9.345	0.000	-2.578	-10.901	21.433	0.000	-0.00		
	7.105	23.246	0.577	-13.423	3.655	16.342	0.000	0.00		
		-11.962	0.000	-2.578	-14.421	20.014	0.000	-0.00		
	8.120	15.423	0.000	-17.102	2.537	12.093	0.000	0.00		
		-14.909	0.000	-3.617	-17.859	8.351	0.000	-0.00		
	9.135	8.657	1.294	-10.706	1.424	6.815	0.000	0.00		
		-19.224	0.000	-4.516	-20.997	2.101	0.000	-0.00		
	10.150									
8	0.000	5.366	0.698	-2.474	25.247	0.000	-17.635	0.00		
		-28.168	13.789	-18.439	-24.870	0.000	-16.472	0.00		
	1.015	9.017	8.628	-3.372	21.519	0.000	-0.072	0.00		
		-18.495	4.624	0.000	-3.372	9.017	0.000	-0.00		
	2.030	15.180	17.238	0.000	18.183	9.250	0.000	0.00		
		-14.580	2.437	0.000	-4.483	12.281	0.000	-0.00		
	3.045	23.205	13.609	-0.391	14.728	20.750	0.000	0.00		
		-12.107	2.437	0.000	-5.499	14.622	0.000	-0.00		
	4.060	27.846	11.064	-2.936	11.064	27.846	0.000	0.00		
		-9.634	2.437	0.000	-6.450	16.117	0.000	-0.00		
	5.075	29.989	7.296	-6.704	7.834	19.845	0.000	0.00		
		-7.188	0.000	-2.474	-7.927	19.741	0.000	-0.00		
	6.090	27.880	3.019	-10.981	6.443	16.225	0.000	0.00		
		-9.699	0.000	-2.474	-10.981	27.880	0.000	-0.00		
	7.105	23.363	0.516	-13.484	5.404	14.786	0.000	0.00		
		-12.210	0.000	-2.474	-14.600	21.113	0.000	-0.00		
	8.120	15.485	0.000	-17.157	4.327	12.309	0.000	0.00		
		-15.166	0.000	-3.680	-18.010	10.057	0.000	-0.00		
	9.135	9.588	1.373	-10.627	3.184	8.803	0.000	0.00		
		-19.576	0.000	-4.638	-21.473	0.000	-0.042	-0.00		
	10.150									
9	0.000	6.741	0.845	-3.140	25.384	0.000	-17.785	0.00		
		-27.370	18.878	-12.905	-25.162	0.000	-17.246	0.00		
	1.015	9.697	8.025	-3.975	21.682	0.000	-0.271	0.00		
		-19.283	4.627	0.000	-3.975	9.697	0.000	-0.00		
	2.030	15.379	17.301	0.000	18.212	9.795	0.000	0.00		
		-14.833	3.633	0.000	-5.018	12.375	0.000	-0.00		
	3.045	23.594	13.832	-0.168	14.819	21.165	0.000	0.00		
		-12.090	2.382	0.000	-5.857	14.354	0.000	-0.00		
	4.060	28.247	11.203	-2.797	11.203	28.247	0.000	0.00		
		-9.672	2.382	0.000	-6.508	16.073	0.000	-0.00		
	5.075	30.445	7.459	-6.541	7.785	19.440	0.000	0.00		
		-9.195	0.000	-3.140	-8.278	14.119	0.000	-0.00		
	6.090	28.367	3.091	-10.909	6.512	16.402	0.000	0.00		
		-12.383	0.000	-3.140	-11.138	20.630	0.000	-0.00		
	7.105	24.152	0.610	-13.390	5.522	14.930	0.000	0.00		
		-15.570	0.000	-3.140	-14.420	18.290	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR (max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	8.120	16.452	0.000	-17.016	4.466	12.472	0.000	0.00		
		-18.757	0.000	-3.140	-17.906	11.461	0.000	-0.00		
	9.135	10.179	0.000	-10.260	3.313	8.941	0.000	0.00		
		-23.277	0.000	-5.018	-21.595	0.000	-7.586	-0.00		
10	10.150									
	0.000	10.004	1.250	-4.664	27.633	0.000	-22.598	0.00		
		-32.784	20.278	-14.575	-25.083	0.000	-16.411	0.00		
	1.015	8.121	11.111	-0.889	23.915	0.000	-2.796	0.00		
		-19.810	5.203	0.000	-4.664	5.270	0.000	-0.00		
	2.030	15.147	19.445	0.000	20.107	8.092	0.000	0.00		
		-14.899	3.734	0.000	-4.762	12.346	0.000	-0.00		
	3.045	24.567	14.897	0.000	16.978	22.312	0.000	0.00		
		-12.664	1.782	0.000	-6.883	11.573	0.000	-0.00		
	4.060	32.766	13.424	-0.576	13.456	32.572	0.000	0.00		
		-10.855	1.782	0.000	-6.883	4.586	0.000	-0.00		
	5.075	38.027	9.473	-4.527	11.179	29.366	0.000	0.00		
		-13.665	0.000	-4.664	-7.557	19.685	0.000	-0.00		
	6.090	36.636	5.183	-8.817	7.912	25.556	0.000	0.00		
		-18.399	0.000	-4.664	-8.817	36.636	0.000	-0.00		
	7.105	34.458	2.684	-11.316	6.125	17.889	0.000	0.00		
-23.132		0.000	-4.664	-13.379	27.370	0.000	-0.00			
8.120	30.041	0.000	-14.799	4.825	14.566	0.000	0.00			
	-27.866	0.000	-4.664	-18.166	9.296	0.000	-0.00			
9.135	19.054	0.000	-18.772	3.304	8.826	0.000	0.00			
	-32.600	0.000	-4.664	-21.557	0.000	-15.453	-0.00			
11	10.150									
	0.000	0.000	1.782	-0.000	14.000	0.000	-0.037	0.00		
		-37.334	14.000	-21.557	-23.035	0.000	-0.000	0.00		
	0.267	0.000	12.000	-0.000	14.000	0.000	-0.000	0.00		
		-33.600	14.000	0.000	-0.000	0.000	0.000	-0.00		
	0.533	0.000	12.000	-0.000	14.000	0.000	-0.000	0.00		
		-29.867	14.000	0.000	-0.000	0.000	0.000	-0.00		
	0.800	0.000	12.000	-0.000	14.000	0.000	-0.000	0.00		
		-26.134	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.067	0.000	12.000	-0.000	14.000	0.000	-0.000	0.00		
		-22.400	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.333	0.000	12.000	-0.000	14.000	0.000	-0.000	0.00		
		-18.667	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.600	0.000	14.000	-0.000	14.000	0.000	-0.000	0.00		
		-14.934	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.867	0.000	14.000	-0.000	14.000	0.000	-0.000	0.00		
-11.200		14.000	0.000	-0.000	0.000	0.000	-0.00			
2.133	0.000	14.000	-0.000	14.000	0.000	-0.000	0.00			
	-7.467	14.000	0.000	-0.000	0.000	0.000	-0.00			
2.400	0.000	14.000	-0.000	14.000	0.000	0.000	0.00			
	-3.733	14.000	0.000	-0.000	0.000	0.000	-0.00			
2.667	0.000	0.000	-0.000	14.000	0.000	0.000	0.00			
	-0.000	0.000	-0.000	-0.000	0.000	0.000	-0.00			

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.782	-39.704
3	7.762	-35.635
4	3.985	-32.995
5	3.172	-33.634
6	5.149	-31.183
7	5.149	-31.183
8	3.172	-33.634
9	3.985	-32.995
10	5.914	-35.635
11	1.782	-35.557
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

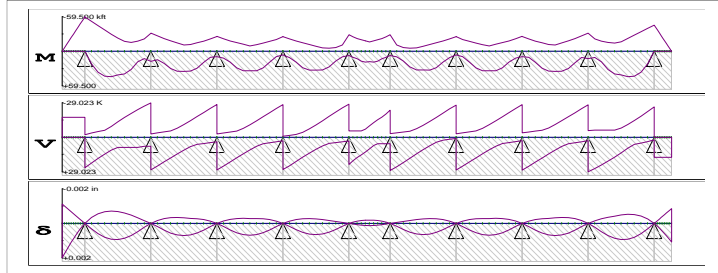


Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 5C1  
 Type: Truck

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.000	0.000	0.00
		-0.000	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.000	-0.00
	0.350	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-5.950	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	0.000	-0.00
	0.700	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-11.900	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-3.145	-0.00
	1.050	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-17.850	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-1.190	-0.00
	1.400	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-23.800	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	0.000	-0.00
	1.750	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-29.750	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-3.740	-0.00
	2.100	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-35.700	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-1.785	-0.00
	2.450	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00
	-41.650	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.000	-0.00	
2.800	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-47.600	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-5.950	-0.00	
3.150	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-53.550	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-2.380	-0.00	
3.500											
2	0.000	0.000	0.000	-2.164	25.743	0.000	-0.000	0.000	-0.000	0.00	0.00
		-59.500	23.372	-17.000	-17.000	0.000	-8.330	0.000	-8.330	0.00	0.00
	1.015	22.074	21.748	0.000	21.748	22.074	0.000	0.000	0.000	0.00	0.00
		-51.956	7.433	0.000	-3.667	8.458	0.000	0.000	0.000	-0.00	-0.00
	2.030	36.286	17.875	0.000	17.875	36.286	0.000	0.000	0.000	0.00	0.00
		-44.411	7.433	0.000	-4.960	14.290	0.000	0.000	0.000	-0.00	-0.00
	3.045	43.294	14.218	-2.782	14.218	43.294	0.000	0.000	0.000	0.00	0.00
		-36.867	7.433	0.000	-6.069	18.061	0.000	0.000	0.000	-0.00	-0.00
	4.060	43.984	10.833	-6.167	10.833	43.984	0.000	0.000	0.000	0.00	0.00
		-29.322	7.433	0.000	-9.235	32.546	0.000	0.000	0.000	-0.00	-0.00
	5.075	41.184	4.514	-12.486	8.579	41.184	-15.960	0.000	0.000	0.00	0.00
		-22.840	5.549	0.000	-13.090	38.119	0.000	0.000	0.000	-0.00	-0.00
	6.090	39.500	0.652	-16.348	8.579	39.500	-7.252	0.000	0.000	0.00	0.00
		-17.208	5.549	0.000	-16.753	37.033	0.000	0.000	0.000	-0.00	-0.00
	7.105	31.541	0.000	-19.990	8.579	31.541	1.456	0.000	0.000	0.00	0.00
	-15.372	0.000	-2.164	-20.195	30.087	0.000	0.000	0.000	-0.00	-0.00	
8.120	18.422	0.000	-23.357	8.579	18.422	10.164	0.000	0.000	0.00	0.00	
	-17.649	0.000	-3.570	-23.384	18.201	0.000	0.000	0.000	-0.00	-0.00	
9.135	12.815	6.735	-5.265	7.602	12.815	9.949	0.000	0.000	0.00	0.00	
	-21.411	0.000	-3.992	-26.394	1.478	0.000	0.000	0.000	-0.00	-0.00	
10.150											
3	0.000	17.665	7.602	-2.840	27.451	0.000	-13.680	0.000	-13.680	0.00	0.00
		-31.449	4.759	-19.998	-29.023	0.000	-17.828	0.000	-17.828	0.00	0.00
	1.015	14.783	0.000	-2.840	24.187	5.077	0.000	0.000	0.000	0.00	0.00
		-26.628	4.708	0.000	-3.798	9.433	0.000	0.000	0.000	-0.00	-0.00
	2.030	21.259	7.852	0.000	20.711	19.545	0.000	0.000	0.000	0.00	0.00
		-22.062	3.815	0.000	-4.645	12.472	0.000	0.000	0.000	-0.00	-0.00
	3.045	30.024	16.945	-0.055	17.422	27.680	0.000	0.000	0.000	0.00	0.00
		-18.206	3.795	0.000	-5.442	15.012	0.000	0.000	0.000	-0.00	-0.00
4.060	34.681	13.264	-3.736	14.112	31.350	0.000	0.000	0.000	0.00	0.00	
	-14.450	3.664	0.000	-7.739	26.665	0.000	0.000	0.000	-0.00	-0.00	
5.075	34.937	6.678	-10.322	10.901	30.589	0.000	0.000	0.000	0.00	0.00	
	-10.889	2.707	0.000	-10.833	31.522	0.000	0.000	0.000	-0.00	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
3	6.090	34.386	3.418	-13.582	7.909	25.917	0.000	0.00
		-11.729	0.000	-2.889	-14.154	32.064	0.000	-0.00
	7.105	29.354	0.000	-17.274	6.067	14.166	0.000	0.00
		-14.661	0.000	-2.889	-17.592	27.743	0.000	-0.00
	8.120	19.099	0.000	-20.082	5.375	12.416	0.000	0.00
		-17.624	0.000	-3.090	-21.037	18.456	0.000	-0.00
9.135	10.674	1.499	-10.501	4.551	10.349	0.000	0.00	
	-21.406	0.000	-3.798	-24.515	3.586	0.000	-0.00	
4	10.150							
	0.000	9.658	3.476	-2.233	27.553	0.000	-14.618	0.00
		-25.850	4.060	-17.387	-27.690	0.000	-14.980	0.00
	1.015	11.912	10.294	-1.706	24.332	3.889	0.000	0.00
		-21.783	3.863	0.000	-3.659	9.336	0.000	-0.00
	2.030	18.864	20.255	0.000	20.839	18.569	0.000	0.00
		-17.978	2.835	0.000	-4.472	12.324	0.000	-0.00
	3.045	29.027	17.097	0.000	17.396	27.574	0.000	0.00
		-15.101	2.835	0.000	-5.263	14.914	0.000	-0.00
	4.060	33.921	13.393	-3.607	13.973	31.663	0.000	0.00
		-12.224	2.835	0.000	-7.584	26.334	0.000	-0.00
	5.075	33.852	6.987	-10.013	10.690	31.004	0.000	0.00
		-9.346	2.835	0.000	-10.633	31.160	0.000	-0.00
	6.090	33.863	3.578	-13.422	7.665	26.249	0.000	0.00
-11.574		0.000	-2.685	-13.946	31.792	0.000	-0.00	
7.105	28.973	0.000	-17.123	5.429	14.683	0.000	0.00	
	-14.318	0.000	-2.713	-17.408	27.561	0.000	-0.00	
8.120	18.848	0.000	-20.226	4.668	12.307	0.000	0.00	
	-17.160	0.000	-2.828	-20.904	18.264	0.000	-0.00	
9.135	9.584	3.863	-8.137	3.863	9.584	0.000	0.00	
	-20.377	0.000	-3.651	-24.418	3.475	0.000	-0.00	
5	10.150							
	0.000	6.527	3.009	-0.849	27.252	0.000	-14.025	0.00
		-25.457	4.014	-17.201	-27.621	0.000	-14.986	0.00
	1.015	11.088	10.342	-1.658	24.041	4.033	0.000	0.00
		-21.471	3.843	0.000	-1.725	7.155	0.000	-0.00
	2.030	19.047	20.219	0.000	20.442	19.021	0.000	0.00
		-17.710	2.946	0.000	-2.559	14.704	0.000	-0.00
	3.045	28.497	16.822	-0.178	16.835	27.064	0.000	0.00
		-14.720	2.946	0.000	-4.307	20.848	0.000	-0.00
	4.060	32.863	13.204	-3.796	13.406	30.619	0.000	0.00
		-11.730	2.946	0.000	-7.170	28.606	0.000	-0.00
	5.075	32.753	6.693	-10.307	10.191	29.618	0.000	0.00
		-8.740	2.946	0.000	-10.410	32.453	0.000	-0.00
	6.090	32.639	3.231	-13.769	7.327	25.011	0.000	0.00
-5.993		1.970	0.000	-13.998	31.738	0.000	-0.00	
7.105	27.323	0.000	-17.394	5.250	14.060	0.000	0.00	
	-5.507	0.000	-0.504	-17.695	25.830	0.000	-0.00	
8.120	16.934	0.000	-21.006	4.551	11.904	0.000	0.00	
	-6.496	0.000	-1.026	-21.400	15.227	0.000	-0.00	
9.135	9.737	3.843	-8.157	3.843	9.737	0.000	0.00	
	-10.887	0.000	-14.034	-24.883	0.170	0.000	-0.00	
6	10.150							
	0.000	7.696	3.121	-1.470	22.927	0.000	-5.629	0.00
		-28.580	5.460	-19.470	-27.937	0.000	-17.562	0.00
	0.633	10.718	9.674	-2.326	19.791	4.781	0.000	0.00
		-25.166	5.138	0.000	-5.464	2.528	0.000	-0.00
	1.266	13.222	16.330	-0.670	17.069	0.000	-0.126	0.00
		-22.068	3.084	0.000	-5.464	0.000	-0.931	-0.00
	1.899	17.338	13.592	-3.408	14.937	7.382	0.000	0.00
		-20.116	3.084	0.000	-5.464	0.000	-4.390	-0.00
	2.532	19.079	10.589	-6.411	12.504	13.343	0.000	0.00
		-18.164	3.084	0.000	-6.932	18.330	0.000	-0.00
3.165	18.032	9.242	-7.758	9.838	16.800	0.000	0.00	
	-16.212	3.084	0.000	-9.801	17.225	0.000	-0.00	
3.798	19.079	6.411	-10.589	6.932	18.330	0.000	0.00	
	-18.157	0.000	-3.103	-12.504	13.343	0.000	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.431	17.338	3.408	-13.592	5.460	0.000	-4.386	0.00		
		-20.122	0.000	-3.103	-14.937	7.382	0.000	-0.00		
	5.064	13.222	0.670	-16.330	5.460	0.000	-0.930	0.00		
		-22.086	0.000	-3.103	-17.069	0.000	-0.126	-0.00		
	5.697	10.718	2.326	-9.674	5.460	2.526	0.000	0.00		
-25.166		0.000	-5.138	-19.791	4.781	0.000	-0.00			
7	6.330	7.696	1.470	-3.121	27.937	0.000	-17.562	0.00		
		-28.601	20.025	-5.464	-22.927	0.000	-5.629	0.00		
	1.015	9.737	8.157	-3.843	24.883	0.170	0.000	0.00		
		-10.897	14.215	0.000	-3.843	9.737	0.000	-0.00		
	2.030	16.934	21.006	0.000	21.400	15.227	0.000	0.00		
		-6.496	1.026	0.000	-4.551	11.904	0.000	-0.00		
	3.045	27.323	17.394	0.000	17.695	25.830	0.000	0.00		
		-5.507	0.504	0.000	-5.250	14.060	0.000	-0.00		
	4.060	32.639	13.769	-3.231	13.998	31.738	0.000	0.00		
		-5.993	0.000	-1.970	-7.327	25.011	0.000	-0.00		
	5.075	32.550	10.409	-6.591	10.409	32.550	0.000	0.00		
		-8.740	0.000	-2.946	-10.191	29.618	0.000	-0.00		
	6.090	32.863	3.796	-13.204	7.170	28.606	0.000	0.00		
		-11.730	0.000	-2.946	-13.406	30.619	0.000	-0.00		
	7.105	28.497	0.178	-16.822	4.307	20.848	0.000	0.00		
-14.720		0.000	-2.946	-16.835	27.064	0.000	-0.00			
8.120	19.047	0.000	-20.219	2.559	14.704	0.000	0.00			
	-17.710	0.000	-2.946	-20.442	19.021	0.000	-0.00			
9.135	11.088	1.658	-10.342	1.725	7.155	0.000	0.00			
	-21.471	0.000	-3.843	-24.041	4.033	0.000	-0.00			
8	10.150	6.527	0.849	-3.009	27.621	0.000	-14.986	0.00		
		-25.457	17.201	-4.014	-27.252	0.000	-14.025	0.00		
	1.015	9.584	8.137	-3.863	24.418	3.475	0.000	0.00		
		-20.377	3.651	0.000	-3.863	9.584	0.000	-0.00		
	2.030	18.848	20.226	0.000	20.904	18.264	0.000	0.00		
		-17.162	2.819	0.000	-4.668	12.307	0.000	-0.00		
	3.045	28.973	17.123	0.000	17.408	27.561	0.000	0.00		
		-14.327	2.733	0.000	-5.429	14.683	0.000	-0.00		
	4.060	33.863	13.422	-3.578	13.946	31.792	0.000	0.00		
		-11.574	2.685	0.000	-7.665	26.249	0.000	-0.00		
	5.075	33.852	10.013	-6.987	10.633	31.160	0.000	0.00		
		-9.346	0.000	-2.835	-10.690	31.004	0.000	-0.00		
	6.090	33.921	3.607	-13.393	7.584	26.334	0.000	0.00		
		-12.224	0.000	-2.835	-13.973	31.663	0.000	-0.00		
	7.105	29.027	0.000	-17.097	5.263	14.914	0.000	0.00		
-15.101		0.000	-2.835	-17.396	27.574	0.000	-0.00			
8.120	18.864	0.000	-20.255	4.472	12.324	0.000	0.00			
	-17.978	0.000	-2.835	-20.839	18.569	0.000	-0.00			
9.135	11.912	1.706	-10.294	3.659	9.336	0.000	0.00			
	-21.783	0.000	-3.863	-24.332	3.889	0.000	-0.00			
9	10.150	9.658	2.233	-3.476	27.690	0.000	-14.980	0.00		
		-25.850	17.387	-4.060	-27.553	0.000	-14.618	0.00		
	1.015	10.674	10.501	-1.499	24.515	3.586	0.000	0.00		
		-21.406	3.798	0.000	-4.551	10.349	0.000	-0.00		
	2.030	19.099	20.082	0.000	21.037	18.456	0.000	0.00		
		-17.624	3.090	0.000	-5.375	12.416	0.000	-0.00		
	3.045	29.354	17.274	0.000	17.592	27.743	0.000	0.00		
		-14.661	2.889	0.000	-6.067	14.166	0.000	-0.00		
	4.060	34.386	13.582	-3.418	14.154	32.064	0.000	0.00		
		-11.729	2.889	0.000	-7.909	25.917	0.000	-0.00		
	5.075	34.937	10.322	-6.678	10.833	31.522	0.000	0.00		
		-10.889	0.000	-2.707	-10.901	30.589	0.000	-0.00		
	6.090	34.681	3.736	-13.264	7.739	26.665	0.000	0.00		
		-14.450	0.000	-3.664	-14.112	31.350	0.000	-0.00		
	7.105	30.024	0.055	-16.945	5.442	15.012	0.000	0.00		
-18.206		0.000	-3.795	-17.422	27.680	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
9	8.120	19.977	0.000	-20.634	4.645	12.472	0.000	0.00
		-22.062	0.000	-3.815	-20.711	19.545	0.000	-0.00
	9.135	11.019	1.924	0.000	3.798	9.433	0.000	0.00
10	10.150	-26.628	0.000	-4.708	-24.187	5.077	0.000	-0.00
	0.000	12.972	1.924	-5.744	29.023	0.000	-17.828	0.00
		-31.449	19.998	-4.759	-27.451	0.000	-13.680	0.00
	1.015	11.048	0.000	-6.172	26.394	1.478	0.000	0.00
		-21.411	3.992	0.000	-6.172	11.048	0.000	-0.00
	2.030	18.422	23.357	0.000	23.384	18.201	0.000	0.00
		-17.649	3.570	0.000	-6.172	4.784	0.000	-0.00
	3.045	31.541	19.990	0.000	20.195	30.087	0.000	0.00
		-15.372	2.164	0.000	-6.172	0.000	-1.481	-0.00
	4.060	39.500	16.348	-0.652	16.753	37.033	0.000	0.00
		-14.143	0.220	0.000	-6.172	0.000	-7.746	-0.00
	5.075	41.184	12.486	-4.514	13.090	38.119	0.000	0.00
		-16.593	0.000	-5.663	-7.874	39.962	0.000	-0.00
	6.090	43.984	6.167	-10.833	9.235	32.546	0.000	0.00
		-22.341	0.000	-5.663	-10.833	43.984	0.000	-0.00
	7.105	43.294	2.782	-14.218	6.069	18.061	0.000	0.00
		-28.089	0.000	-5.663	-14.218	43.294	0.000	-0.00
8.120	36.286	0.000	-17.875	4.960	14.290	0.000	0.00	
	-33.837	0.000	-5.663	-17.875	36.286	0.000	-0.00	
9.135	22.074	0.000	-21.748	3.667	8.458	0.000	0.00	
	-39.586	0.000	-5.663	-21.748	22.074	0.000	-0.00	
11	10.150	0.000	2.164	-0.000	17.000	0.000	-0.170	0.00
	0.000	-45.334	17.000	-19.696	-25.743	0.000	-0.000	0.00
	0.267	0.000	12.000	-0.000	17.000	0.000	-0.000	0.00
		-40.800	17.000	0.000	-0.000	0.000	0.000	-0.00
	0.533	0.000	12.000	-0.000	17.000	0.000	-0.000	0.00
		-36.267	17.000	0.000	-0.000	0.000	0.000	-0.00
	0.800	0.000	12.000	-0.000	17.000	0.000	-0.000	0.00
		-31.734	17.000	0.000	-0.000	0.000	0.000	-0.00
	1.067	0.000	12.000	-0.000	17.000	0.000	-0.000	0.00
		-27.200	17.000	0.000	-0.000	0.000	0.000	-0.00
	1.333	0.000	12.000	-0.000	17.000	0.000	-0.000	0.00
		-22.667	17.000	0.000	-0.000	0.000	0.000	-0.00
	1.600	0.000	17.000	-0.000	17.000	0.000	0.000	0.00
		-18.134	17.000	0.000	-0.000	0.000	0.000	-0.00
	1.867	0.000	17.000	-0.000	17.000	0.000	0.000	0.00
		-13.600	17.000	0.000	-0.000	0.000	0.000	-0.00
2.133	0.000	17.000	-0.000	17.000	0.000	0.000	0.00	
	-9.067	17.000	0.000	-0.000	0.000	0.000	-0.00	
2.400	0.000	17.000	-0.000	17.000	0.000	0.000	0.00	
	-4.533	17.000	0.000	-0.000	0.000	0.000	-0.00	
2.667	0.000	0.000	0.000	17.000	0.000	-0.000	0.00	
	-0.000	12.000	0.000	-0.000	0.000	-0.000	-0.00	

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.164	-40.372
3	10.442	-32.001
4	5.709	-31.436
5	3.858	-31.211
6	6.212	-31.308
7	6.207	-31.309
8	3.858	-31.212
9	5.709	-31.436
10	7.668	-32.001
11	2.164	-36.842
12	0.000	-0.000

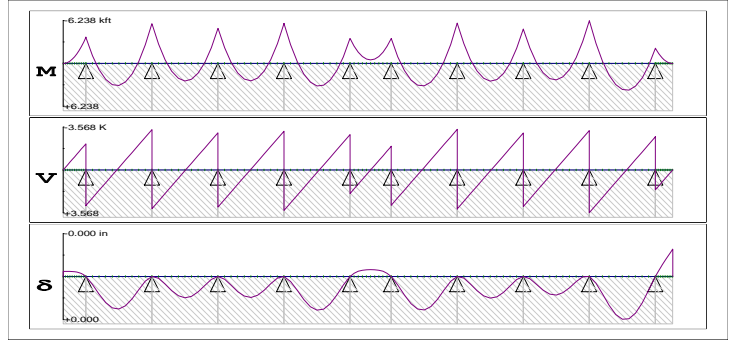
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Wearing Surface

Type: Static

Factor: 1.000



Span	Location (ft)	Moment (kft)	Shear (K)	Deflect (in)	Reaction (K)	
1	0.000	+0.000/ +0.000	+0.000/ +0.000	-0.00	-0.000	
	0.350	-0.038	-0.219	-0.00		
	0.700	-0.153	-0.438	-0.00		
	1.050	-0.345	-0.656	-0.00		
	1.400	-0.613	-0.875	-0.00		
	1.750	-0.957	-1.094	-0.00		
	2.100	-1.378	-1.313	-0.00		
	2.450	-1.876	-1.531	-0.00		
	2.800	-2.450	-1.750	-0.00		
	3.150	-3.101	-1.969	-0.00		
	3.500					
	2	0.000	-3.828	-2.188/ +2.977	+0.00	-5.164
		1.015	-1.129	+2.342	+0.00	
2.030		+0.927	+1.708	+0.00		
3.045		+2.339	+1.074	+0.00		
4.060		+3.107	+0.439	+0.00		
5.075		+3.231	-0.195	+0.00		
6.090		+2.711	-0.829	+0.00		
7.105		+1.547	-1.464	+0.00		
8.120		-0.261	-2.098	+0.00		
9.135		-2.713	-2.733	+0.00		
10.150						
3		0.000	-5.808	-3.367/ +3.238	+0.00	-6.605
		1.015	-2.843	+2.604	+0.00	
	2.030	-0.522	+1.970	+0.00		
	3.045	+1.155	+1.335	+0.00		
	4.060	+2.188	+0.701	+0.00		
	5.075	+2.578	+0.066	+0.00		
	6.090	+2.323	-0.568	+0.00		
	7.105	+1.425	-1.202	+0.00		
	8.120	-0.118	-1.837	+0.00		
	9.135	-2.304	-2.471	+0.00		
	10.150					
	4	0.000	-5.134	-3.105/ +3.101	+0.00	-6.207
		1.015	-2.308	+2.467	+0.00	
2.030		-0.126	+1.833	+0.00		
3.045		+1.412	+1.198	+0.00		
4.060		+2.306	+0.564	+0.00		
5.075		+2.556	-0.071	+0.00		
6.090		+2.163	-0.705	+0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Span	Location (ft)	Moment (kft)	Shear ( K )	Deflect (in)	Reaction ( K )	
4	7.105	+1.125		-1.339	+0.00	
	8.120	-0.556		-1.974	+0.00	
	9.135	-2.882		-2.608	+0.00	
	10.150					
5	0.000	-5.851	-3.242/	+3.388	+0.00	-6.630
	1.015	-2.734		+2.754	+0.00	
	2.030	-0.261		+2.119	+0.00	
	3.045	+1.568		+1.485	+0.00	
	4.060	+2.753		+0.850	+0.00	
	5.075	+3.294		+0.216	+0.00	
	6.090	+3.192		-0.418	+0.00	
	7.105	+2.445		-1.053	+0.00	
	8.120	+1.055		-1.687	+0.00	
	9.135	-0.979		-2.321	+0.00	
	10.150					
6	0.000	-3.658	-2.956/	+1.980	+0.00	-4.936
	0.633	-2.530		+1.584	-0.00	
	1.266	-1.652		+1.189	-0.00	
	1.899	-1.025		+0.793	-0.00	
	2.532	-0.648		+0.398	-0.00	
	3.165	-0.521		+0.002	-0.00	
	3.798	-0.645		-0.394	-0.00	
	4.431	-1.020		-0.789	-0.00	
	5.064	-1.644		-1.185	-0.00	
	5.697	-2.520		-1.581	-0.00	
	6.330					
7	0.000	-3.645	-1.976/	+2.951	+0.00	-4.928
	1.015	-0.972		+2.317	+0.00	
	2.030	+1.058		+1.683	+0.00	
	3.045	+2.444		+1.048	+0.00	
	4.060	+3.186		+0.414	+0.00	
	5.075	+3.285		-0.220	+0.00	
	6.090	+2.739		-0.855	+0.00	
	7.105	+1.549		-1.489	+0.00	
	8.120	-0.284		-2.124	+0.00	
	9.135	-2.761		-2.758	+0.00	
	10.150					
8	0.000	-5.883	-3.392/	+3.257	+0.00	-6.649
	1.015	-2.899		+2.623	+0.00	
	2.030	-0.559		+1.988	+0.00	
	3.045	+1.137		+1.354	+0.00	
	4.060	+2.190		+0.720	+0.00	
	5.075	+2.598		+0.085	+0.00	
	6.090	+2.363		-0.549	+0.00	
	7.105	+1.483		-1.184	+0.00	
	8.120	-0.040		-1.818	+0.00	
	9.135	-2.207		-2.452	+0.00	
	10.150					
9	0.000	-5.018	-3.087/	+3.052	+0.00	-6.138
	1.015	-2.243		+2.417	+0.00	
	2.030	-0.111		+1.783	+0.00	
	3.045	+1.376		+1.149	+0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Span	Location (ft)	Moment (kft)	Shear ( K )	Deflect (in)	Reaction ( K )	
9	4.060	+2.220		+0.514	+0.00	
	5.075	+2.420		-0.120	+0.00	
	6.090	+1.976		-0.755	+0.00	
	7.105	+0.888		-1.389	+0.00	
	8.120	-0.843		-2.023	+0.00	
	9.135	-3.219		-2.658	+0.00	
	10.150					
10	0.000	-6.238	-3.292/	+3.568	+0.00	-6.860
	1.015	-2.939		+2.933	+0.00	
	2.030	-0.284		+2.299	+0.00	
	3.045	+1.727		+1.664	+0.00	
	4.060	+3.095		+1.030	+0.00	
	5.075	+3.818		+0.396	+0.00	
	6.090	+3.898		-0.239	+0.00	
	7.105	+3.334		-0.873	+0.00	
	8.120	+2.126		-1.507	+0.00	
	9.135	+0.274		-2.142	+0.00	
10.150						
11	0.000	-2.222	-2.776/	+1.667	+0.00	-4.443
	0.267	-1.800		+1.500	-0.00	
	0.533	-1.422		+1.333	-0.00	
	0.800	-1.089		+1.167	-0.00	
	1.067	-0.800		+1.000	-0.00	
	1.333	-0.556		+0.833	-0.00	
	1.600	-0.356		+0.667	-0.00	
	1.867	-0.200		+0.500	-0.00	
	2.133	-0.089		+0.333	-0.00	
	2.400	-0.022		+0.167	-0.00	
	2.667	-0.000/	+0.000	+0.000/	+0.000	-0.00

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



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Client ODOT	File Section B' Frame 1.std	Date/Time 24-Feb-2012 08:56

## Job Information

	Engineer	Checked	Approved
<b>Name:</b>	M Johnson	J Kemnitz	
<b>Date:</b>	27-Jan-12	16-Feb-12	

**Structure Type** | SPACE FRAME

Number of Nodes	4	Highest Node	4
Number of Elements	3	Highest Beam	3

Number of Basic Load Cases	12
Number of Combination Load Cases	1

Included in this printout are data for:

<b>All</b>	The Whole Structure
------------	---------------------

Included in this printout are results for load cases:

Type	L/C	Name
Primary	1	SELF WEIGHT DEAD LOAD
Primary	2	SLAB DEAD LOAD
Primary	3	BEAM HAUNCH
Primary	4	LL1 ONE LANE POS 1
Primary	5	LL2 ONE LANE POS 2
Primary	9	LL3 ONE LANE POS 3
Primary	6	LL4 TWO LANES POS 1
Primary	7	LL5 THREE LANES POS 1
Primary	8	LL6 TWO LANES POS 2
Primary	10	CONCRETE WEARING SURFACE
Primary	12	LL7 TWO LANES POS 3
Primary	13	LL8 THREE LANES POS 2
Combination	11	ALL DEAD LOAD

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	10.000	10.000	0.000
2	10.000	29.630	0.000
3	47.000	29.630	0.000
4	47.000	6.750	0.000





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## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	2	19.630	1	0
2	2	3	37.000	2	0
3	3	4	22.880	1	0

## Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 36.00x21.00	756.000	27.8E+3	81.6E+3	70.7E+3	CONCRETE
2	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE

## Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

## Basic Load Cases

Number	Name
1	SELF WEIGHT DEAD LOAD
2	SLAB DEAD LOAD
3	BEAM HAUNCH
4	LL1 ONE LANE POS 1
5	LL2 ONE LANE POS 2
9	LL3 ONE LANE POS 3
6	LL4 TWO LANES POS 1
7	LL5 THREE LANES POS 1
8	LL6 TWO LANES POS 2
10	CONCRETE WEARING SURFACE
12	LL7 TWO LANES POS 3
13	LL8 THREE LANES POS 2

## Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
11	ALL DEAD LOAD	1	SELF WEIGHT DEAD LOAD	1.00
		2	SLAB DEAD LOAD	1.00
		3	BEAM HAUNCH	1.00
		10	CONCRETE WEARING SURFACE	1.00



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## Beam Force Detail

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	Shear		Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)
1	1:SELF WEIGH	0.000	37.284	-4.592	0.000	0.000	0.000	-307.450
		1.963	35.735	-4.592	0.000	0.000	0.000	-199.270
		3.926	34.185	-4.592	0.000	0.000	0.000	-91.090
		5.889	32.636	-4.592	0.000	0.000	0.000	17.091
		7.852	31.087	-4.592	0.000	0.000	0.000	125.271
		9.815	29.537	-4.592	0.000	0.000	0.000	233.451
		11.778	27.988	-4.592	0.000	0.000	0.000	341.632
		13.741	26.439	-4.592	0.000	0.000	0.000	449.812
		15.704	24.889	-4.592	0.000	0.000	0.000	557.992
		17.667	23.340	-4.592	0.000	0.000	0.000	666.172
	19.630	21.791	-4.592	0.000	0.000	0.000	774.353	
	2:SLAB DEAD	0.000	16.077	-3.519	0.000	0.000	0.000	-236.151
		1.963	16.077	-3.519	0.000	0.000	0.000	-153.246
		3.926	16.077	-3.519	0.000	0.000	0.000	-70.342
		5.889	16.077	-3.519	0.000	0.000	0.000	12.563
		7.852	16.077	-3.519	0.000	0.000	0.000	95.468
		9.815	16.077	-3.519	0.000	0.000	0.000	178.372
		11.778	16.077	-3.519	0.000	0.000	0.000	261.277
		13.741	16.077	-3.519	0.000	0.000	0.000	344.181
		15.704	16.077	-3.519	0.000	0.000	0.000	427.086
		17.667	16.077	-3.519	0.000	0.000	0.000	509.991
	19.630	16.077	-3.519	0.000	0.000	0.000	592.895	
	3:BEAM HAUN	0.000	2.348	-0.578	0.000	0.000	0.000	-40.168
		1.963	2.348	-0.578	0.000	0.000	0.000	-26.560
		3.926	2.348	-0.578	0.000	0.000	0.000	-12.952
		5.889	2.348	-0.578	0.000	0.000	0.000	0.656
		7.852	2.348	-0.578	0.000	0.000	0.000	14.264
		9.815	2.348	-0.578	0.000	0.000	0.000	27.872
		11.778	2.348	-0.578	0.000	0.000	0.000	41.480
		13.741	2.348	-0.578	0.000	0.000	0.000	55.087
		15.704	2.348	-0.578	0.000	0.000	0.000	68.695
		17.667	2.348	-0.578	0.000	0.000	0.000	82.303
	19.630	2.348	-0.578	0.000	0.000	0.000	95.911	
	4:LL1 ONE LAI	0.000	37.180	-7.570	0.000	0.000	0.000	-434.400
		1.963	37.180	-7.570	0.000	0.000	0.000	-256.092
		3.926	37.180	-7.570	0.000	0.000	0.000	-77.784
		5.889	37.180	-7.570	0.000	0.000	0.000	100.523
		7.852	37.180	-7.570	0.000	0.000	0.000	278.831
		9.815	37.180	-7.570	0.000	0.000	0.000	457.139
		11.778	37.180	-7.570	0.000	0.000	0.000	635.446
		13.741	37.180	-7.570	0.000	0.000	0.000	813.754
	15.704	37.180	-7.570	0.000	0.000	0.000	992.062	



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Chd J Kemnitz

Client ODOT

File Section B' Frame 1.std

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### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		17.667	37.180	-7.570	0.000	0.000	0.000	0.000	0.000	1.17E+3	
		19.630	37.180	-7.570	0.000	0.000	0.000	0.000	0.000	1.35E+3	
	5:LL2 ONE LAI	0.000	18.437	-7.731	0.000	0.000	0.000	0.000	0.000	-592.813	
		1.963	18.437	-7.731	0.000	0.000	0.000	0.000	0.000	-410.700	
		3.926	18.437	-7.731	0.000	0.000	0.000	0.000	0.000	-228.587	
		5.889	18.437	-7.731	0.000	0.000	0.000	0.000	0.000	-46.473	
		7.852	18.437	-7.731	0.000	0.000	0.000	0.000	0.000	135.640	
		9.815	18.437	-7.731	0.000	0.000	0.000	0.000	0.000	317.754	
		11.778	18.437	-7.731	0.000	0.000	0.000	0.000	0.000	499.867	
		13.741	18.437	-7.731	0.000	0.000	0.000	0.000	0.000	681.981	
		15.704	18.437	-7.731	0.000	0.000	0.000	0.000	0.000	864.094	
		17.667	18.437	-7.731	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		19.630	18.437	-7.731	0.000	0.000	0.000	0.000	0.000	1.23E+3	
	9:LL3 ONE LAI	0.000	27.785	-8.577	0.000	0.000	0.000	0.000	0.000	-575.954	
		1.963	27.785	-8.577	0.000	0.000	0.000	0.000	0.000	-373.915	
		3.926	27.785	-8.577	0.000	0.000	0.000	0.000	0.000	-171.875	
		5.889	27.785	-8.577	0.000	0.000	0.000	0.000	0.000	30.164	
		7.852	27.785	-8.577	0.000	0.000	0.000	0.000	0.000	232.203	
		9.815	27.785	-8.577	0.000	0.000	0.000	0.000	0.000	434.243	
		11.778	27.785	-8.577	0.000	0.000	0.000	0.000	0.000	636.282	
		13.741	27.785	-8.577	0.000	0.000	0.000	0.000	0.000	838.322	
		15.704	27.785	-8.577	0.000	0.000	0.000	0.000	0.000	1.04E+3	
		17.667	27.785	-8.577	0.000	0.000	0.000	0.000	0.000	1.24E+3	
		19.630	27.785	-8.577	0.000	0.000	0.000	0.000	0.000	1.44E+3	
	6:LL4 TWO LA	0.000	55.603	-15.867	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		1.963	55.603	-15.867	0.000	0.000	0.000	0.000	0.000	-691.553	
		3.926	55.603	-15.867	0.000	0.000	0.000	0.000	0.000	-317.792	
		5.889	55.603	-15.867	0.000	0.000	0.000	0.000	0.000	55.969	
		7.852	55.603	-15.867	0.000	0.000	0.000	0.000	0.000	429.729	
		9.815	55.603	-15.867	0.000	0.000	0.000	0.000	0.000	803.491	
		11.778	55.603	-15.867	0.000	0.000	0.000	0.000	0.000	1.18E+3	
		13.741	55.603	-15.867	0.000	0.000	0.000	0.000	0.000	1.55E+3	
		15.704	55.603	-15.867	0.000	0.000	0.000	0.000	0.000	1.92E+3	
		17.667	55.603	-15.867	0.000	0.000	0.000	0.000	0.000	2.3E+3	
		19.630	55.603	-15.867	0.000	0.000	0.000	0.000	0.000	2.67E+3	
	7:LL5 THREE I	0.000	75.163	-17.551	0.000	0.000	0.000	0.000	0.000	-1.18E+3	
		1.963	75.163	-17.551	0.000	0.000	0.000	0.000	0.000	-764.432	
		3.926	75.163	-17.551	0.000	0.000	0.000	0.000	0.000	-350.990	
		5.889	75.163	-17.551	0.000	0.000	0.000	0.000	0.000	62.452	
		7.852	75.163	-17.551	0.000	0.000	0.000	0.000	0.000	475.894	
		9.815	75.163	-17.551	0.000	0.000	0.000	0.000	0.000	889.336	
		11.778	75.163	-17.551	0.000	0.000	0.000	0.000	0.000	1.3E+3	
		13.741	75.163	-17.551	0.000	0.000	0.000	0.000	0.000	1.72E+3	
		15.704	75.163	-17.551	0.000	0.000	0.000	0.000	0.000	2.13E+3	



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By M Johnson

Date 27-Jan-12

Chd J Kemnitz

Client ODOT

File Section B' Frame 1.std

Date/Time 24-Feb-2012 08:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		17.667	75.163	-17.551	0.000	0.000	0.000	0.000	0.000	2.54E+3	
		19.630	75.163	-17.551	0.000	0.000	0.000	0.000	0.000	2.96E+3	
	8:LL6 TWO LA	0.000	49.392	-15.706	0.000	0.000	0.000	0.000	0.000	-1.1E+3	
		1.963	49.392	-15.706	0.000	0.000	0.000	0.000	0.000	-725.643	
		3.926	49.392	-15.706	0.000	0.000	0.000	0.000	0.000	-355.672	
		5.889	49.392	-15.706	0.000	0.000	0.000	0.000	0.000	14.299	
		7.852	49.392	-15.706	0.000	0.000	0.000	0.000	0.000	384.270	
		9.815	49.392	-15.706	0.000	0.000	0.000	0.000	0.000	754.241	
		11.778	49.392	-15.706	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		13.741	49.392	-15.706	0.000	0.000	0.000	0.000	0.000	1.49E+3	
		15.704	49.392	-15.706	0.000	0.000	0.000	0.000	0.000	1.86E+3	
		17.667	49.392	-15.706	0.000	0.000	0.000	0.000	0.000	2.23E+3	
		19.630	49.392	-15.706	0.000	0.000	0.000	0.000	0.000	2.6E+3	
	10:CONCRETE	0.000	2.577	-0.543	0.000	0.000	0.000	0.000	0.000	-36.442	
		1.963	2.577	-0.543	0.000	0.000	0.000	0.000	0.000	-23.647	
		3.926	2.577	-0.543	0.000	0.000	0.000	0.000	0.000	-10.852	
		5.889	2.577	-0.543	0.000	0.000	0.000	0.000	0.000	1.943	
		7.852	2.577	-0.543	0.000	0.000	0.000	0.000	0.000	14.737	
		9.815	2.577	-0.543	0.000	0.000	0.000	0.000	0.000	27.532	
		11.778	2.577	-0.543	0.000	0.000	0.000	0.000	0.000	40.327	
		13.741	2.577	-0.543	0.000	0.000	0.000	0.000	0.000	53.122	
		15.704	2.577	-0.543	0.000	0.000	0.000	0.000	0.000	65.916	
		17.667	2.577	-0.543	0.000	0.000	0.000	0.000	0.000	78.711	
		19.630	2.577	-0.543	0.000	0.000	0.000	0.000	0.000	91.506	
	12:LL7 TWO L/	0.000	55.617	-15.301	0.000	0.000	0.000	0.000	0.000	-1.03E+3	
		1.963	55.617	-15.301	0.000	0.000	0.000	0.000	0.000	-666.792	
		3.926	55.617	-15.301	0.000	0.000	0.000	0.000	0.000	-306.371	
		5.889	55.617	-15.301	0.000	0.000	0.000	0.000	0.000	54.050	
		7.852	55.617	-15.301	0.000	0.000	0.000	0.000	0.000	414.471	
		9.815	55.617	-15.301	0.000	0.000	0.000	0.000	0.000	774.893	
		11.778	55.617	-15.301	0.000	0.000	0.000	0.000	0.000	1.14E+3	
		13.741	55.617	-15.301	0.000	0.000	0.000	0.000	0.000	1.5E+3	
		15.704	55.617	-15.301	0.000	0.000	0.000	0.000	0.000	1.86E+3	
		17.667	55.617	-15.301	0.000	0.000	0.000	0.000	0.000	2.22E+3	
		19.630	55.617	-15.301	0.000	0.000	0.000	0.000	0.000	2.58E+3	
	13:LL8 THREE	0.000	62.848	-16.946	0.000	0.000	0.000	0.000	0.000	-1.16E+3	
		1.963	62.848	-16.946	0.000	0.000	0.000	0.000	0.000	-755.961	
		3.926	62.848	-16.946	0.000	0.000	0.000	0.000	0.000	-356.788	
		5.889	62.848	-16.946	0.000	0.000	0.000	0.000	0.000	42.384	
		7.852	62.848	-16.946	0.000	0.000	0.000	0.000	0.000	441.556	
		9.815	62.848	-16.946	0.000	0.000	0.000	0.000	0.000	840.729	
		11.778	62.848	-16.946	0.000	0.000	0.000	0.000	0.000	1.24E+3	
		13.741	62.848	-16.946	0.000	0.000	0.000	0.000	0.000	1.64E+3	
		15.704	62.848	-16.946	0.000	0.000	0.000	0.000	0.000	2.04E+3	



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Rev

Part Section B' - Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 27-Jan-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 1.std Date/Time 24-Feb-2012 08:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		17.667	62.848	-16.946	0.000	0.000	0.000	0.000	0.000	2.44E+3	
		19.630	62.848	-16.946	0.000	0.000	0.000	0.000	0.000	2.84E+3	
	11:ALL DEAD I	0.000	58.285	-9.233	0.000	0.000	0.000	0.000	0.000	-620.211	
		1.963	56.736	-9.233	0.000	0.000	0.000	0.000	0.000	-402.723	
		3.926	55.187	-9.233	0.000	0.000	0.000	0.000	0.000	-185.235	
		5.889	53.637	-9.233	0.000	0.000	0.000	0.000	0.000	32.252	
		7.852	52.088	-9.233	0.000	0.000	0.000	0.000	0.000	249.740	
		9.815	50.539	-9.233	0.000	0.000	0.000	0.000	0.000	467.227	
		11.778	48.989	-9.233	0.000	0.000	0.000	0.000	0.000	684.715	
		13.741	47.440	-9.233	0.000	0.000	0.000	0.000	0.000	902.202	
		15.704	45.891	-9.233	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		17.667	44.342	-9.233	0.000	0.000	0.000	0.000	0.000	1.34E+3	
		19.630	42.792	-9.233	0.000	0.000	0.000	0.000	0.000	1.55E+3	
2	1:SELF WEIGH	0.000	4.592	21.791	0.000	0.000	0.000	0.000	0.000	774.353	
		3.700	4.592	17.410	0.000	0.000	0.000	0.000	0.000	-85.099	
		7.400	4.592	13.030	0.000	0.000	0.000	0.000	0.000	-755.462	
		11.100	4.592	8.649	0.000	0.000	0.000	0.000	0.000	-1.24E+3	
		14.800	4.592	4.269	0.000	0.000	0.000	0.000	0.000	-1.53E+3	
		18.500	4.592	-0.111	0.000	0.000	0.000	0.000	0.000	-1.63E+3	
		22.200	4.592	-4.492	0.000	0.000	0.000	0.000	0.000	-1.52E+3	
		25.900	4.592	-8.872	0.000	0.000	0.000	0.000	0.000	-1.22E+3	
		29.600	4.592	-13.253	0.000	0.000	0.000	0.000	0.000	-725.760	
		33.300	4.592	-17.633	0.000	0.000	0.000	0.000	0.000	-45.495	
		37.000	4.592	-22.014	0.000	0.000	0.000	0.000	0.000	823.857	
	2:SLAB DEAD	0.000	3.519	16.077	0.000	0.000	0.000	0.000	0.000	592.895	
		3.700	3.519	13.091	0.000	0.000	0.000	0.000	0.000	-47.270	
		7.400	3.519	10.105	0.000	0.000	0.000	0.000	0.000	-558.543	
		11.100	3.519	7.119	0.000	0.000	0.000	0.000	0.000	-940.925	
		14.800	3.519	4.133	0.000	0.000	0.000	0.000	0.000	-1.19E+3	
		18.500	3.519	1.147	0.000	0.000	0.000	0.000	0.000	-1.32E+3	
		22.200	3.519	-4.308	0.000	0.000	0.000	0.000	0.000	-1.19E+3	
		25.900	3.519	-7.294	0.000	0.000	0.000	0.000	0.000	-925.379	
		29.600	3.519	-10.280	0.000	0.000	0.000	0.000	0.000	-535.223	
		33.300	3.519	-13.266	0.000	0.000	0.000	0.000	0.000	-16.176	
		37.000	3.519	-16.252	0.000	0.000	0.000	0.000	0.000	631.762	
	3:BEAM HAUN	0.000	0.578	2.348	0.000	0.000	0.000	0.000	0.000	95.911	
		3.700	0.578	2.001	0.000	0.000	0.000	0.000	0.000	0.062	
		7.400	0.578	1.610	0.000	0.000	0.000	0.000	0.000	-79.787	
		11.100	0.578	1.174	0.000	0.000	0.000	0.000	0.000	-141.765	
		14.800	0.578	0.694	0.000	0.000	0.000	0.000	0.000	-184.000	
		18.500	0.578	0.170	0.000	0.000	0.000	0.000	0.000	-204.623	
		22.200	0.578	-0.405	0.000	0.000	0.000	0.000	0.000	-198.139	
		25.900	0.578	-1.024	0.000	0.000	0.000	0.000	0.000	-165.833	
		29.600	0.578	-1.687	0.000	0.000	0.000	0.000	0.000	-105.833	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**7**

Rev

Part Section B' - Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 27-Jan-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 1.std Date/Time 24-Feb-2012 08:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	0.578	-2.395	0.000	0.000	0.000	0.000	0.000	-16.268	
		37.000	0.578	-3.146	0.000	0.000	0.000	0.000	0.000	104.732	
	4:LL1 ONE LAI	0.000	7.570	37.180	0.000	0.000	0.000	0.000	0.000	1.35E+3	
		3.700	7.570	37.180	0.000	0.000	0.000	0.000	0.000	-302.124	
		7.400	7.570	37.180	0.000	0.000	0.000	0.000	0.000	-1.95E+3	
		11.100	7.570	20.380	0.000	0.000	0.000	0.000	0.000	-3.03E+3	
		14.800	7.570	9.180	0.000	0.000	0.000	0.000	0.000	-3.47E+3	
		18.500	7.570	-18.820	0.000	0.000	0.000	0.000	0.000	-2.87E+3	
		22.200	7.570	-18.820	0.000	0.000	0.000	0.000	0.000	-2.04E+3	
		25.900	7.570	-18.820	0.000	0.000	0.000	0.000	0.000	-1.2E+3	
		29.600	7.570	-18.820	0.000	0.000	0.000	0.000	0.000	-366.534	
		33.300	7.570	-18.820	0.000	0.000	0.000	0.000	0.000	469.064	
		37.000	7.570	-18.820	0.000	0.000	0.000	0.000	0.000	1.3E+3	
	5:LL2 ONE LAI	0.000	7.731	18.437	0.000	0.000	0.000	0.000	0.000	1.23E+3	
		3.700	7.731	18.437	0.000	0.000	0.000	0.000	0.000	409.718	
		7.400	7.731	18.437	0.000	0.000	0.000	0.000	0.000	-408.885	
		11.100	7.731	18.437	0.000	0.000	0.000	0.000	0.000	-1.23E+3	
		14.800	7.731	18.437	0.000	0.000	0.000	0.000	0.000	-2.05E+3	
		18.500	7.731	18.437	0.000	0.000	0.000	0.000	0.000	-2.86E+3	
		22.200	7.731	-9.563	0.000	0.000	0.000	0.000	0.000	-3.45E+3	
		25.900	7.731	-20.763	0.000	0.000	0.000	0.000	0.000	-2.99E+3	
		29.600	7.731	-37.563	0.000	0.000	0.000	0.000	0.000	-1.89E+3	
		33.300	7.731	-37.563	0.000	0.000	0.000	0.000	0.000	-225.508	
		37.000	7.731	-37.563	0.000	0.000	0.000	0.000	0.000	1.44E+3	
	9:LL3 ONE LAI	0.000	8.577	27.785	0.000	0.000	0.000	0.000	0.000	1.44E+3	
		3.700	8.577	27.785	0.000	0.000	0.000	0.000	0.000	210.790	
		7.400	8.577	27.785	0.000	0.000	0.000	0.000	0.000	-1.02E+3	
		11.100	8.577	27.785	0.000	0.000	0.000	0.000	0.000	-2.26E+3	
		14.800	8.577	27.785	0.000	0.000	0.000	0.000	0.000	-3.49E+3	
		18.500	8.577	-0.215	0.000	0.000	0.000	0.000	0.000	-3.72E+3	
		22.200	8.577	-28.215	0.000	0.000	0.000	0.000	0.000	-3.47E+3	
		25.900	8.577	-28.215	0.000	0.000	0.000	0.000	0.000	-2.22E+3	
		29.600	8.577	-28.215	0.000	0.000	0.000	0.000	0.000	-965.558	
		33.300	8.577	-28.215	0.000	0.000	0.000	0.000	0.000	287.192	
		37.000	8.577	-28.215	0.000	0.000	0.000	0.000	0.000	1.54E+3	
	6:LL4 TWO LA	0.000	15.867	55.603	0.000	0.000	0.000	0.000	0.000	2.67E+3	
		3.700	15.867	55.603	0.000	0.000	0.000	0.000	0.000	203.534	
		7.400	15.867	55.603	0.000	0.000	0.000	0.000	0.000	-2.27E+3	
		11.100	15.867	38.803	0.000	0.000	0.000	0.000	0.000	-4.36E+3	
		14.800	15.867	27.603	0.000	0.000	0.000	0.000	0.000	-5.76E+3	
		18.500	15.867	-0.397	0.000	0.000	0.000	0.000	0.000	-6.31E+3	
		22.200	15.867	-28.397	0.000	0.000	0.000	0.000	0.000	-5.72E+3	
		25.900	15.867	-39.597	0.000	0.000	0.000	0.000	0.000	-4.29E+3	
		29.600	15.867	-56.397	0.000	0.000	0.000	0.000	0.000	-2.16E+3	



Software licensed to TranSystems

Job No <b>P402110046</b>	Sheet No <b>8</b>	Rev
Part Section B' - Frame 1		
Ref		
By M Johnson	Date 27-Jan-12	Chd J Kemnitz
File Section B' Frame 1.std	Date/Time 24-Feb-2012 08:56	

Job Title Main Avenue Rating
Client ODOT

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	15.867	-56.397	0.000	0.000	0.000	0.000	0.000	344.642	
		37.000	15.867	-56.397	0.000	0.000	0.000	0.000	0.000	2.85E+3	
	7:LL5 THREE I	0.000	17.551	75.163	0.000	0.000	0.000	0.000	0.000	2.96E+3	
		3.700	17.551	70.123	0.000	0.000	0.000	0.000	0.000	-279.876	
		7.400	17.551	49.963	0.000	0.000	0.000	0.000	0.000	-2.84E+3	
		11.100	17.551	34.843	0.000	0.000	0.000	0.000	0.000	-4.73E+3	
		14.800	17.551	24.763	0.000	0.000	0.000	0.000	0.000	-5.98E+3	
		18.500	17.551	-0.437	0.000	0.000	0.000	0.000	0.000	-6.17E+3	
		22.200	17.551	-25.637	0.000	0.000	0.000	0.000	0.000	-5.94E+3	
		25.900	17.551	-35.717	0.000	0.000	0.000	0.000	0.000	-4.65E+3	
		29.600	17.551	-50.837	0.000	0.000	0.000	0.000	0.000	-2.72E+3	
		33.300	17.551	-70.997	0.000	0.000	0.000	0.000	0.000	-124.536	
		37.000	17.551	-76.037	0.000	0.000	0.000	0.000	0.000	3.15E+3	
	8:LL6 TWO LA	0.000	15.706	49.392	0.000	0.000	0.000	0.000	0.000	2.6E+3	
		3.700	15.706	49.392	0.000	0.000	0.000	0.000	0.000	411.091	
		7.400	15.706	49.392	0.000	0.000	0.000	0.000	0.000	-1.78E+3	
		11.100	15.706	49.392	0.000	0.000	0.000	0.000	0.000	-3.97E+3	
		14.800	15.706	26.992	0.000	0.000	0.000	0.000	0.000	-5.38E+3	
		18.500	15.706	21.392	0.000	0.000	0.000	0.000	0.000	-6.34E+3	
		22.200	15.706	-12.208	0.000	0.000	0.000	0.000	0.000	-5.91E+3	
		25.900	15.706	-34.608	0.000	0.000	0.000	0.000	0.000	-4.62E+3	
		29.600	15.706	-51.408	0.000	0.000	0.000	0.000	0.000	-2.61E+3	
		33.300	15.706	-62.608	0.000	0.000	0.000	0.000	0.000	70.251	
		37.000	15.706	-62.608	0.000	0.000	0.000	0.000	0.000	2.85E+3	
	10:CONCRETE	0.000	0.543	2.577	0.000	0.000	0.000	0.000	0.000	91.506	
		3.700	0.543	2.059	0.000	0.000	0.000	0.000	0.000	-10.114	
		7.400	0.543	1.541	0.000	0.000	0.000	0.000	0.000	-89.373	
		11.100	0.543	1.023	0.000	0.000	0.000	0.000	0.000	-146.272	
		14.800	0.543	0.505	0.000	0.000	0.000	0.000	0.000	-180.810	
		18.500	0.543	-0.013	0.000	0.000	0.000	0.000	0.000	-192.988	
		22.200	0.543	-0.531	0.000	0.000	0.000	0.000	0.000	-179.612	
		25.900	0.543	-1.049	0.000	0.000	0.000	0.000	0.000	-143.875	
		29.600	0.543	-1.567	0.000	0.000	0.000	0.000	0.000	-85.778	
		33.300	0.543	-2.085	0.000	0.000	0.000	0.000	0.000	-5.320	
		37.000	0.543	-2.603	0.000	0.000	0.000	0.000	0.000	97.498	
	12:LL7 TWO L/	0.000	15.301	55.617	0.000	0.000	0.000	0.000	0.000	2.58E+3	
		3.700	15.301	55.617	0.000	0.000	0.000	0.000	0.000	107.594	
		7.400	15.301	55.617	0.000	0.000	0.000	0.000	0.000	-2.36E+3	
		11.100	15.301	38.817	0.000	0.000	0.000	0.000	0.000	-4.26E+3	
		14.800	15.301	27.617	0.000	0.000	0.000	0.000	0.000	-5.52E+3	
		18.500	15.301	-0.383	0.000	0.000	0.000	0.000	0.000	-5.74E+3	
		22.200	15.301	-28.383	0.000	0.000	0.000	0.000	0.000	-5.49E+3	
		25.900	15.301	-39.583	0.000	0.000	0.000	0.000	0.000	-4.19E+3	
		29.600	15.301	-56.383	0.000	0.000	0.000	0.000	0.000	-2.26E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**9**

Rev

Part Section B' - Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 27-Jan-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 1.std Date/Time 24-Feb-2012 08:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	15.301	-56.383	0.000	0.000	0.000	0.000	0.000	243.557	
		37.000	15.301	-56.383	0.000	0.000	0.000	0.000	0.000	2.75E+3	
	13:LL8 THREE	0.000	16.946	62.848	0.000	0.000	0.000	0.000	0.000	2.84E+3	
		3.700	16.946	62.848	0.000	0.000	0.000	0.000	0.000	46.127	
		7.400	16.946	52.768	0.000	0.000	0.000	0.000	0.000	-2.53E+3	
		11.100	16.946	37.648	0.000	0.000	0.000	0.000	0.000	-4.45E+3	
		14.800	16.946	17.488	0.000	0.000	0.000	0.000	0.000	-5.65E+3	
		18.500	16.946	12.448	0.000	0.000	0.000	0.000	0.000	-6.28E+3	
		22.200	16.946	-17.792	0.000	0.000	0.000	0.000	0.000	-5.7E+3	
		25.900	16.946	-37.952	0.000	0.000	0.000	0.000	0.000	-4.72E+3	
		29.600	16.946	-53.072	0.000	0.000	0.000	0.000	0.000	-2.79E+3	
		33.300	16.946	-63.152	0.000	0.000	0.000	0.000	0.000	-202.382	
		37.000	16.946	-88.352	0.000	0.000	0.000	0.000	0.000	3.06E+3	
	11:ALL DEAD I	0.000	9.233	42.792	0.000	0.000	0.000	0.000	0.000	1.55E+3	
		3.700	9.233	34.561	0.000	0.000	0.000	0.000	0.000	-142.420	
		7.400	9.233	26.285	0.000	0.000	0.000	0.000	0.000	-1.48E+3	
		11.100	9.233	17.965	0.000	0.000	0.000	0.000	0.000	-2.47E+3	
		14.800	9.233	9.601	0.000	0.000	0.000	0.000	0.000	-3.09E+3	
		18.500	9.233	1.192	0.000	0.000	0.000	0.000	0.000	-3.35E+3	
		22.200	9.233	-9.737	0.000	0.000	0.000	0.000	0.000	-3.08E+3	
		25.900	9.233	-18.240	0.000	0.000	0.000	0.000	0.000	-2.45E+3	
		29.600	9.233	-26.788	0.000	0.000	0.000	0.000	0.000	-1.45E+3	
		33.300	9.233	-35.379	0.000	0.000	0.000	0.000	0.000	-83.260	
		37.000	9.233	-44.015	0.000	0.000	0.000	0.000	0.000	1.66E+3	
3	1:SELF WEIGH	0.000	22.014	4.592	0.000	0.000	0.000	0.000	0.000	823.857	
		2.288	23.819	4.592	0.000	0.000	0.000	0.000	0.000	697.766	
		4.576	25.625	4.592	0.000	0.000	0.000	0.000	0.000	571.675	
		6.864	27.431	4.592	0.000	0.000	0.000	0.000	0.000	445.585	
		9.152	29.237	4.592	0.000	0.000	0.000	0.000	0.000	319.494	
		11.440	31.043	4.592	0.000	0.000	0.000	0.000	0.000	193.403	
		13.728	32.849	4.592	0.000	0.000	0.000	0.000	0.000	67.312	
		16.016	34.654	4.592	0.000	0.000	0.000	0.000	0.000	-58.779	
		18.304	36.460	4.592	0.000	0.000	0.000	0.000	0.000	-184.870	
		20.592	38.266	4.592	0.000	0.000	0.000	0.000	0.000	-310.961	
		22.880	40.072	4.592	0.000	0.000	0.000	0.000	0.000	-437.052	
	2:SLAB DEAD	0.000	16.252	3.519	0.000	0.000	0.000	0.000	0.000	631.762	
		2.288	16.252	3.519	0.000	0.000	0.000	0.000	0.000	535.131	
		4.576	16.252	3.519	0.000	0.000	0.000	0.000	0.000	438.501	
		6.864	16.252	3.519	0.000	0.000	0.000	0.000	0.000	341.870	
		9.152	16.252	3.519	0.000	0.000	0.000	0.000	0.000	245.239	
		11.440	16.252	3.519	0.000	0.000	0.000	0.000	0.000	148.609	
		13.728	16.252	3.519	0.000	0.000	0.000	0.000	0.000	51.978	
		16.016	16.252	3.519	0.000	0.000	0.000	0.000	0.000	-44.652	
		18.304	16.252	3.519	0.000	0.000	0.000	0.000	0.000	-141.283	





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Job No  
**P402110046**

Sheet No  
**10**

Rev

Part Section B' - Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 27-Jan-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 1.std Date/Time 24-Feb-2012 08:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		20.592	16.252	3.519	0.000	0.000	0.000	0.000	0.000	-237.913	
		22.880	16.252	3.519	0.000	0.000	0.000	0.000	0.000	-334.544	
	3:BEAM HAUN	0.000	3.146	0.578	0.000	0.000	0.000	0.000	0.000	104.732	
		2.288	3.146	0.578	0.000	0.000	0.000	0.000	0.000	88.871	
		4.576	3.146	0.578	0.000	0.000	0.000	0.000	0.000	73.011	
		6.864	3.146	0.578	0.000	0.000	0.000	0.000	0.000	57.150	
		9.152	3.146	0.578	0.000	0.000	0.000	0.000	0.000	41.289	
		11.440	3.146	0.578	0.000	0.000	0.000	0.000	0.000	25.428	
		13.728	3.146	0.578	0.000	0.000	0.000	0.000	0.000	9.567	
		16.016	3.146	0.578	0.000	0.000	0.000	0.000	0.000	-6.294	
		18.304	3.146	0.578	0.000	0.000	0.000	0.000	0.000	-22.155	
		20.592	3.146	0.578	0.000	0.000	0.000	0.000	0.000	-38.016	
		22.880	3.146	0.578	0.000	0.000	0.000	0.000	0.000	-53.877	
	4:LL1 ONE LAI	0.000	18.820	7.570	0.000	0.000	0.000	0.000	0.000	1.3E+3	
		2.288	18.820	7.570	0.000	0.000	0.000	0.000	0.000	1.1E+3	
		4.576	18.820	7.570	0.000	0.000	0.000	0.000	0.000	889.004	
		6.864	18.820	7.570	0.000	0.000	0.000	0.000	0.000	681.175	
		9.152	18.820	7.570	0.000	0.000	0.000	0.000	0.000	473.346	
		11.440	18.820	7.570	0.000	0.000	0.000	0.000	0.000	265.517	
		13.728	18.820	7.570	0.000	0.000	0.000	0.000	0.000	57.688	
		16.016	18.820	7.570	0.000	0.000	0.000	0.000	0.000	-150.141	
		18.304	18.820	7.570	0.000	0.000	0.000	0.000	0.000	-357.970	
		20.592	18.820	7.570	0.000	0.000	0.000	0.000	0.000	-565.799	
		22.880	18.820	7.570	0.000	0.000	0.000	0.000	0.000	-773.628	
	5:LL2 ONE LAI	0.000	37.563	7.731	0.000	0.000	0.000	0.000	0.000	1.44E+3	
		2.288	37.563	7.731	0.000	0.000	0.000	0.000	0.000	1.23E+3	
		4.576	37.563	7.731	0.000	0.000	0.000	0.000	0.000	1.02E+3	
		6.864	37.563	7.731	0.000	0.000	0.000	0.000	0.000	805.495	
		9.152	37.563	7.731	0.000	0.000	0.000	0.000	0.000	593.230	
		11.440	37.563	7.731	0.000	0.000	0.000	0.000	0.000	380.965	
		13.728	37.563	7.731	0.000	0.000	0.000	0.000	0.000	168.701	
		16.016	37.563	7.731	0.000	0.000	0.000	0.000	0.000	-43.564	
		18.304	37.563	7.731	0.000	0.000	0.000	0.000	0.000	-255.829	
		20.592	37.563	7.731	0.000	0.000	0.000	0.000	0.000	-468.094	
		22.880	37.563	7.731	0.000	0.000	0.000	0.000	0.000	-680.358	
	9:LL3 ONE LAI	0.000	28.215	8.577	0.000	0.000	0.000	0.000	0.000	1.54E+3	
		2.288	28.215	8.577	0.000	0.000	0.000	0.000	0.000	1.3E+3	
		4.576	28.215	8.577	0.000	0.000	0.000	0.000	0.000	1.07E+3	
		6.864	28.215	8.577	0.000	0.000	0.000	0.000	0.000	833.473	
		9.152	28.215	8.577	0.000	0.000	0.000	0.000	0.000	597.984	
		11.440	28.215	8.577	0.000	0.000	0.000	0.000	0.000	362.494	
		13.728	28.215	8.577	0.000	0.000	0.000	0.000	0.000	127.005	
		16.016	28.215	8.577	0.000	0.000	0.000	0.000	0.000	-108.485	
		18.304	28.215	8.577	0.000	0.000	0.000	0.000	0.000	-343.975	



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Job No  
**P402110046**

Sheet No  
**11**

Rev

Part Section B' - Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson

Date 27-Jan-12

Chd J Kemnitz

Client ODOT

File Section B' Frame 1.std

Date/Time 24-Feb-2012 08:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		20.592	28.215	8.577	0.000	0.000	0.000	0.000	0.000	-579.464	
		22.880	28.215	8.577	0.000	0.000	0.000	0.000	0.000	-814.954	
	6:LL4 TWO LA	0.000	56.397	15.867	0.000	0.000	0.000	0.000	0.000	2.85E+3	
		2.288	56.397	15.867	0.000	0.000	0.000	0.000	0.000	2.41E+3	
		4.576	56.397	15.867	0.000	0.000	0.000	0.000	0.000	1.98E+3	
		6.864	56.397	15.867	0.000	0.000	0.000	0.000	0.000	1.54E+3	
		9.152	56.397	15.867	0.000	0.000	0.000	0.000	0.000	1.11E+3	
		11.440	56.397	15.867	0.000	0.000	0.000	0.000	0.000	670.470	
		13.728	56.397	15.867	0.000	0.000	0.000	0.000	0.000	234.828	
		16.016	56.397	15.867	0.000	0.000	0.000	0.000	0.000	-200.814	
		18.304	56.397	15.867	0.000	0.000	0.000	0.000	0.000	-636.456	
		20.592	56.397	15.867	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		22.880	56.397	15.867	0.000	0.000	0.000	0.000	0.000	-1.51E+3	
	7:LL5 THREE I	0.000	76.037	17.551	0.000	0.000	0.000	0.000	0.000	3.15E+3	
		2.288	76.037	17.551	0.000	0.000	0.000	0.000	0.000	2.67E+3	
		4.576	76.037	17.551	0.000	0.000	0.000	0.000	0.000	2.19E+3	
		6.864	76.037	17.551	0.000	0.000	0.000	0.000	0.000	1.71E+3	
		9.152	76.037	17.551	0.000	0.000	0.000	0.000	0.000	1.22E+3	
		11.440	76.037	17.551	0.000	0.000	0.000	0.000	0.000	741.253	
		13.728	76.037	17.551	0.000	0.000	0.000	0.000	0.000	259.361	
		16.016	76.037	17.551	0.000	0.000	0.000	0.000	0.000	-222.532	
		18.304	76.037	17.551	0.000	0.000	0.000	0.000	0.000	-704.425	
		20.592	76.037	17.551	0.000	0.000	0.000	0.000	0.000	-1.19E+3	
		22.880	76.037	17.551	0.000	0.000	0.000	0.000	0.000	-1.67E+3	
	8:LL6 TWO LA	0.000	62.608	15.706	0.000	0.000	0.000	0.000	0.000	2.85E+3	
		2.288	62.608	15.706	0.000	0.000	0.000	0.000	0.000	2.42E+3	
		4.576	62.608	15.706	0.000	0.000	0.000	0.000	0.000	1.99E+3	
		6.864	62.608	15.706	0.000	0.000	0.000	0.000	0.000	1.56E+3	
		9.152	62.608	15.706	0.000	0.000	0.000	0.000	0.000	1.13E+3	
		11.440	62.608	15.706	0.000	0.000	0.000	0.000	0.000	693.926	
		13.728	62.608	15.706	0.000	0.000	0.000	0.000	0.000	262.702	
		16.016	62.608	15.706	0.000	0.000	0.000	0.000	0.000	-168.523	
		18.304	62.608	15.706	0.000	0.000	0.000	0.000	0.000	-599.747	
		20.592	62.608	15.706	0.000	0.000	0.000	0.000	0.000	-1.03E+3	
		22.880	62.608	15.706	0.000	0.000	0.000	0.000	0.000	-1.46E+3	
	10:CONCRETE	0.000	2.603	0.543	0.000	0.000	0.000	0.000	0.000	97.498	
		2.288	2.603	0.543	0.000	0.000	0.000	0.000	0.000	82.584	
		4.576	2.603	0.543	0.000	0.000	0.000	0.000	0.000	67.671	
		6.864	2.603	0.543	0.000	0.000	0.000	0.000	0.000	52.758	
		9.152	2.603	0.543	0.000	0.000	0.000	0.000	0.000	37.845	
		11.440	2.603	0.543	0.000	0.000	0.000	0.000	0.000	22.932	
		13.728	2.603	0.543	0.000	0.000	0.000	0.000	0.000	8.019	
		16.016	2.603	0.543	0.000	0.000	0.000	0.000	0.000	-6.894	
		18.304	2.603	0.543	0.000	0.000	0.000	0.000	0.000	-21.807	



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Job No  
**P402110046**

Sheet No  
**12**

Rev

Part Section B' - Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 27-Jan-12 Chd J Kemnitz

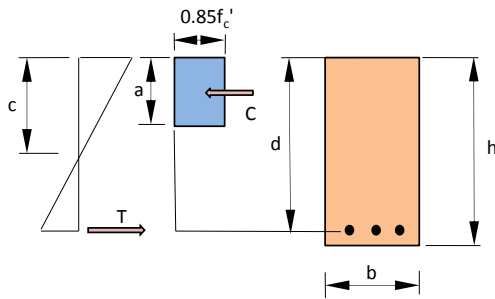
Client ODOT

File Section B' Frame 1.std Date/Time 24-Feb-2012 08:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		20.592	2.603	0.543	0.000	0.000	0.000	0.000	0.000	-36.720	
		22.880	2.603	0.543	0.000	0.000	0.000	0.000	0.000	-51.633	
	12:LL7 TWO L/	0.000	56.383	15.301	0.000	0.000	0.000	0.000	0.000	2.75E+3	
		2.288	56.383	15.301	0.000	0.000	0.000	0.000	0.000	2.33E+3	
		4.576	56.383	15.301	0.000	0.000	0.000	0.000	0.000	1.91E+3	
		6.864	56.383	15.301	0.000	0.000	0.000	0.000	0.000	1.49E+3	
		9.152	56.383	15.301	0.000	0.000	0.000	0.000	0.000	1.07E+3	
		11.440	56.383	15.301	0.000	0.000	0.000	0.000	0.000	646.482	
		13.728	56.383	15.301	0.000	0.000	0.000	0.000	0.000	226.389	
		16.016	56.383	15.301	0.000	0.000	0.000	0.000	0.000	-193.705	
		18.304	56.383	15.301	0.000	0.000	0.000	0.000	0.000	-613.798	
		20.592	56.383	15.301	0.000	0.000	0.000	0.000	0.000	-1.03E+3	
		22.880	56.383	15.301	0.000	0.000	0.000	0.000	0.000	-1.45E+3	
	13:LL8 THREE	0.000	88.352	16.946	0.000	0.000	0.000	0.000	0.000	3.06E+3	
		2.288	88.352	16.946	0.000	0.000	0.000	0.000	0.000	2.59E+3	
		4.576	88.352	16.946	0.000	0.000	0.000	0.000	0.000	2.12E+3	
		6.864	88.352	16.946	0.000	0.000	0.000	0.000	0.000	1.66E+3	
		9.152	88.352	16.946	0.000	0.000	0.000	0.000	0.000	1.19E+3	
		11.440	88.352	16.946	0.000	0.000	0.000	0.000	0.000	728.854	
		13.728	88.352	16.946	0.000	0.000	0.000	0.000	0.000	263.594	
		16.016	88.352	16.946	0.000	0.000	0.000	0.000	0.000	-201.667	
		18.304	88.352	16.946	0.000	0.000	0.000	0.000	0.000	-666.927	
		20.592	88.352	16.946	0.000	0.000	0.000	0.000	0.000	-1.13E+3	
		22.880	88.352	16.946	0.000	0.000	0.000	0.000	0.000	-1.6E+3	
	11:ALL DEAD I	0.000	44.015	9.233	0.000	0.000	0.000	0.000	0.000	1.66E+3	
		2.288	45.821	9.233	0.000	0.000	0.000	0.000	0.000	1.4E+3	
		4.576	47.627	9.233	0.000	0.000	0.000	0.000	0.000	1.15E+3	
		6.864	49.433	9.233	0.000	0.000	0.000	0.000	0.000	897.362	
		9.152	51.239	9.233	0.000	0.000	0.000	0.000	0.000	643.867	
		11.440	53.045	9.233	0.000	0.000	0.000	0.000	0.000	390.372	
		13.728	54.850	9.233	0.000	0.000	0.000	0.000	0.000	136.876	
		16.016	56.656	9.233	0.000	0.000	0.000	0.000	0.000	-116.619	
		18.304	58.462	9.233	0.000	0.000	0.000	0.000	0.000	-370.115	
		20.592	60.268	9.233	0.000	0.000	0.000	0.000	0.000	-623.610	
		22.880	62.074	9.233	0.000	0.000	0.000	0.000	0.000	-877.106	

### Floor Beam Postive Moment Section



b =	103.25	in	
d =	48.38	in	
f'c =	4.5	ksi	
fy =	33	ksi	
φ =	0.9		
Area of Steel =	14.14	in <sup>2</sup>	(5 - 1 1/8" □, 5 - 1 1/4" □)
% Steel Loss =	0%		from 49/246 of original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

As =	14.141	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρb =	0.069		Balanced reinforcement ratio, AASHTO Eq. 8-18
β1 =	0.825		Ratio of depth, Section 8.16.2.7
0.75*Asb =	259.71	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge
a =	1.182	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φMn =	1672.4	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Moment

Total Service Positive Dead Load Moment = 279 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	43	46	31.3	40.4	39.7	40.4	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	55.9	59.8	40.7	52.5	51.6	52.5	kips
Reaction per Wheel (LL+I) =	28.0	29.9	20.3	26.3	25.8	26.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

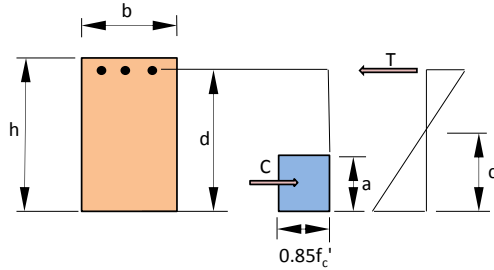
		From STAAD					
Max. Positive LL+I Moment =	528.8	565.7	384.9	496.8	488.2	496.8	ft*kips

Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.07	38.4 Tons	HS21.3
	HS20	36 Tons	RF=1.78	64.1 Tons	HS35.6
Operating	2F1	15 Tons	RF=2.62	39.3 Tons	
	3F1	23 Tons	RF=2.03	46.6 Tons	
	4F1	27 Tons	RF=2.06	55.7 Tons	
	5C1	40 Tons	RF=2.03	81.1 Tons	
	Ohio Legal %	205%			

### Floor Beam Negative Moment Section



b =	21	in
d =	66.375	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	10.125	in <sup>2</sup>
% Steel Loss =	0%	

(8 - 1 1/8" dia)  
from 49/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	10.125	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
β <sub>1</sub> =	0.850		Ratio of depth, Section 8.16.2.7
0.75*A <sub>sb</sub> =	49.78	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.3
a =	6.239	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1585.1	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Moment

Total Service Negative Dead Load Moment = 138.2 ft\*kips From Staad

#### Live Load Moment

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Negative LL+I Moment =		262.6	280.9	191.1	246.7	242.4	246.7

ft\*kips

Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.31	83.0 Tons	HS46.1
Operating	HS20	36 Tons	RF=3.85	138.5 Tons	HS77.0
	2F1	15 Tons	RF=5.66	84.8 Tons	
	3F1	23 Tons	RF=4.38	100.8 Tons	
	4F1	27 Tons	RF=4.46	120.4 Tons	
	5C1	40 Tons	RF=4.38	175.3 Tons	
	Ohio Legal %	440%			



Made by: MJJ Date: 1/31/2012 Job No: P402110046  
 Checked by: JMK Date: 2/17/2012 Page:  
 Project: CUY-2-14.41 (Main Avenue Bridge)  
 Subject: As-Built Concrete Frame Rating (Frame 1)

## Floor Beam Shear Section

### Section Capacity

Taken at face of column

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed conservatively)
$d =$	<input type="text" value="66.375"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="152.7"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="154.6"/>	kips	Shear Capacity of Section (AASHTO Eq. 8-46)
$\phi V_n =$	<input type="text" value="261.2"/>	kips	Shear Capacity of Section

### Dead Load Shear (Dead Load shear is taken at face of column)

Total Service Dead Load Shear =  kips From Staad

### Live Load Shear (Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="63"/>		67.4	45.9	59.2	58.2	59.2

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.42	51.2 Tons	HS28.4
Operating	HS20	36 Tons	RF=2.37	85.4 Tons	HS47.5
	2F1	15 Tons	RF=3.49	52.3 Tons	
	3F1	23 Tons	RF=2.70	62.1 Tons	
	4F1	27 Tons	RF=2.75	74.2 Tons	
	5C1	40 Tons	RF=2.70	108.1 Tons	
	Ohio Legal %	270%			



### Column Section

$h =$	<input type="text" value="36"/>	in	Column Depth
$b =$	<input type="text" value="21"/>	in	Column Width
$A_s =$	<input type="text" value="8"/>	in <sup>2</sup>	Area of Tension Steel (8- 1" bars)
$A'_s =$	<input type="text" value="4"/>	in <sup>2</sup>	Area of Compression Steel (4- 1" bars)
$d =$	<input type="text" value="33"/>	in	Distance from compression face to centroid of tension steel
$d' =$	<input type="text" value="3"/>	in	Distance from compression face to centroid of compression steel
$f_c =$	<input type="text" value="3"/>	ksi	Concrete Strength
$f_y =$	<input type="text" value="33"/>	ksi	Steel Yield Stress
$E_s =$	<input type="text" value="29000"/>	ksi	Modulus of elasticity of steel
$\epsilon_u =$	<input type="text" value="0.003"/>	in/in	Ultimate concrete strain
$\beta_1 =$	<input type="text" value="0.85"/>		
$d'' =$	<input type="text" value="15"/>	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads** (Dead Load moment taken at the top of column, just below column chamfer)

Total Service Dead Load Moment=	<input type="text" value="104"/>	ft-kips	From Staad
Total Service Dead Load Axial Force=	<input type="text" value="44"/>	kips	From Staad

**Live Loads** (Live Load moment taken at the top of column, just below column chamfer)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	<input type="text" value="191.1"/>		204.4	139.1	179.5	176.4	179.5	ft-kips
Max. LL+I Axial Force =	<input type="text" value="88.4"/>		94.6	60.2	114.1	86.9	90.0	kips

Maximum Moment and Axial load results from 3 lanes loaded..

### Section Capacity

#### Balanced Condition

$a_b =$	<input type="text" value="20.34"/>	in	$a_b = (87 / (87+f_y)) * \beta_1 * d$	Depth of stress block for balanced conditions, AASHTO 8-34
$c_b =$	<input type="text" value="23.93"/>	in	$c_b = a_b / \beta_1$	Depth to neutral axis for balanced conditions
$f_s =$	<input type="text" value="33"/>	ksi	$f_s = 87 * (1 - (d'/d)) * ((87+f_y)/87)$	Stress in comp. steel at balanced condition ( $\leq f_y$ ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

$P_b =$	<input type="text" value="957.0"/>	kip	$P_b = .85 * f_c * b * a_b + A'_s * f_s - A_s * f_y$
$M_b =$	<input type="text" value="1205.7"/>	ft-kip	$M_b = 0.85 * f_c * b * a_b * (d - d'' - a_b/2) + A'_s * f_s * (d - d' - d'') + A_s * f_y * d''$

Any choice of  $c$  smaller than  $c_b$  will result in tension failure of the column, any choice greater than  $c_b$  will result in compression failure of the column.

#### Pure Axial Compression Capacity

$P_o =$	<input type="text" value="2293.2"/>	kips	$P_o = .85 * f_c * (A_g - A_{st}) + A_{st} * f_y$	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
$\phi P_o =$	<input type="text" value="1605.2"/>	kips		



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**Pure Bending Capacity** (Ignoring compression steel)

$a =$	<b>4.930</b>	in	$a = A_s * f_y / 0.85 * f_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	<b>671.8</b>	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	<b>604.6</b>	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **15.15** in **Tension Failure**

$f_s =$	<b>33.00</b>	ksi	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	<b>33.00</b>	ksi	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a =$	<b>12.87786742</b>	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	<b>689.6</b>	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	<b>390.3</b>	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	<b>811.6</b>	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	<b>24.95</b>	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	249.0	262.4	187.7	304.8	245.7	252.4	kips
$M_u =$	549.9	578.8	437.1	524.8	518.1	524.8	ft-kips
$e =$	26.50	26.47	27.94	20.66	25.30	24.95	in
$\phi P_n =$	<b>361.56</b>	<b>362.06</b>	<b>337.60</b>	<b>489.59</b>	<b>383.51</b>	<b>390.33</b>	kips
$\phi M_n =$	<b>798.37</b>	<b>798.62</b>	<b>785.97</b>	<b>842.99</b>	<b>808.61</b>	<b>811.57</b>	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value in until the calculated the eccentricities "e" match.

Column Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.49	53.5 Tons	HS29.7
Operating	HS20	36 Tons	RF=2.48	89.3 Tons	HS49.6
	2F1	15 Tons	RF=3.59	53.8 Tons	
	3F1	23 Tons	RF=2.92	67.0 Tons	
	4F1	27 Tons	RF=2.89	78.0 Tons	
	5C1	40 Tons	RF=2.85	113.9 Tons	
Ohio Legal %	285%				

Floor Beam Load Rating Summary:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.07	RF=38.41	HS21.3
Operating	HS20	36 Tons	RF=1.78	RF=64.11	HS35.6
	2F1	15 Tons	RF=2.62	RF=39.26	
	3F1	23 Tons	RF=2.03	RF=46.64	
	4F1	27 Tons	RF=2.06	RF=55.71	
	5C1	40 Tons	RF=2.03	RF=81.11	
Ohio Legal %	205%				

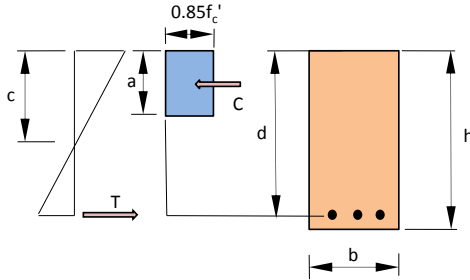
Positive Moment  
 Positive Moment  
 Positive Moment  
 Positive Moment  
 Positive Moment





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### Floor Beam Postive Moment Section



b =	103.25	in
d =	48.38	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	14.14	in <sup>2</sup>
% Steel Loss =	0%	

(5 - 1 1/8" □,  
5 - 1 1/4" □)  
from 49/246 of  
original plans

### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	14.141	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.069		Balanced reinforcement ratio, AASHTO Eq. 8-18
β <sub>1</sub> =	0.825		Ratio of depth, Section 8.16.2.7
0.75*A <sub>sb</sub> =	259.71	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
a =	1.182	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1672.4	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

### Dead Load Moment

Total Service Positive Dead Load Moment = **279** ft\*kips From Staad

### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	43	46	31.3	40.4	39.7	40.4	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	55.9	59.8	40.7	52.5	51.6	52.5	kips
Reaction per Wheel (LL+I) =	28.0	29.9	20.3	26.3	25.8	26.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

### From STAAD

Max. Positive LL+I Moment = **528.8** 565.7 384.9 496.8 488.2 496.8 ft\*kips

Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

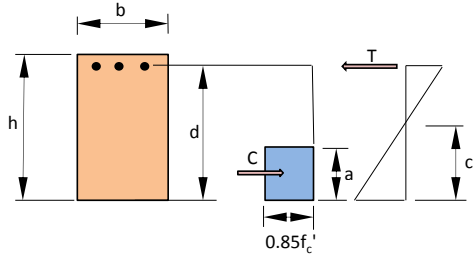
### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.07	38.4 Tons	HS21.3
	Operating	HS20	36 Tons	RF=1.78	64.1 Tons
	2F1	15 Tons	RF=2.62	39.3 Tons	
	3F1	23 Tons	RF=2.03	46.6 Tons	
	4F1	27 Tons	RF=2.06	55.7 Tons	
	5C1	40 Tons	RF=2.03	81.1 Tons	
	Ohio Legal %		205%		



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### Floor Beam Negative Moment Section



b =	21	in
d =	66.375	in
f'c =	3	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	10.125	in <sup>2</sup>
% Steel Loss =	0%	

(8 - 1 1/8" dia)  
from 49/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	10.125	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
β <sub>1</sub> =	0.850		Ratio of depth, Section 8.16.2.7
0.75*A <sub>sb</sub> =	49.78	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.3
a =	6.239	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1585.1	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Moment

Total Service Negative Dead Load Moment = **146** ft\*kips From Staad

#### Live Load Moment

From STAAD						
	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Negative LL+I Moment =	<b>262.6</b>	280.9	191.1	246.7	242.4	246.7

ft\*kips  
Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.29	82.4 Tons	HS45.8
	HS20	36 Tons	RF=3.82	137.5 Tons	HS76.4
Operating	2F1	15 Tons	RF=5.62	84.2 Tons	
	3F1	23 Tons	RF=4.35	100.1 Tons	
	4F1	27 Tons	RF=4.43	119.5 Tons	
	5C1	40 Tons	RF=4.35	174.0 Tons	
	Ohio Legal %			435%	



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## Floor Beam Shear Section

### Section Capacity

Taken at face of column

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed conservatively)
$d =$	<input type="text" value="66"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="151.8"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	Shear Capacity of Section (AASHTO Eq. 8-46)
$\phi V_n =$	<input type="text" value="259.7"/>	kips	Shear Capacity of Section

### Dead Load Shear

(Dead Load shear is taken at face of column)

Total Service Dead Load Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="63"/>	67.4	45.9	59.2	58.2	59.2	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.41	50.8 Tons	HS28.2
Operating	HS20	36 Tons	RF=2.36	84.8 Tons	HS47.1
	2F1	15 Tons	RF=3.46	51.9 Tons	
	3F1	23 Tons	RF=2.68	61.7 Tons	
	4F1	27 Tons	RF=2.73	73.7 Tons	
	5C1	40 Tons	RF=2.68	107.3 Tons	
	Ohio Legal %	270%			



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### Column Section

h =	<b>33</b>	in	Column Depth	<b>(Deducted 3" of concrete due to spalling/delamination)</b>
b =	<b>20</b>	in	Column Width	<b>(Deducted 1" of concrete due to spalling/delamination)</b>
A <sub>s</sub> =	<b>8</b>	in <sup>2</sup>	Area of Tension Steel	(8- 1" bars)
A' <sub>s</sub> =	<b>4</b>	in <sup>2</sup>	Area of Compression Steel	(4- 1" bars)
d =	<b>30</b>	in	Distance from compression face to centroid of tension steel	
d' =	<b>3</b>	in	Distance from compression face to centroid of compression steel	
f <sub>c</sub> =	<b>3</b>	ksi	Concrete Strength	
f <sub>y</sub> =	<b>33</b>	ksi	Steel Yield Stress	
E <sub>s</sub> =	<b>29000</b>	ksi	Modulus of elasticity of steel	
ε <sub>u</sub> =	<b>0.003</b>	in/in	Ultimate concrete strain	
β <sub>1</sub> =	<b>0.85</b>			
d" =	<b>13.5</b>	in	Distance from centroid of gross section to centroid of tension steel	

**Dead Loads** (Dead Load moment taken at the top of column, just below column chamfer)

*Total Service Dead Load Moment =	<b>104</b>	ft-kips	From Staad
Total Service Dead Load Axial Force =	<b>44</b>	kips	From Staad

**Live Loads** (LiveLoad moment taken at the top of column, just below column chamfer)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
*Max. LL+I Moment =	<b>191.1</b>		204.4	139.1	179.5	176.4	179.5	ft-kips
Max. LL+I Axial Force =	<b>88.4</b>		94.6	60.2	114.1	86.9	90.0	kips

Maximum Moment and Axial load results from 3 lanes loaded..

### Section Capacity

\*Moments taken at 2' below bottom of chamfer on South column, area of spalling

#### Balanced Condition

a <sub>b</sub> =	<b>18.49</b>	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	<b>21.75</b>	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	<b>33</b>	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	<b>810.9</b>	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	<b>1015.6</b>	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d''-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d'')+A <sub>s</sub> *f <sub>y</sub> *d''

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

#### Pure Axial Compression Capacity

P <sub>o</sub> =	<b>2048.4</b>	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	<b>1433.9</b>	kips		



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**Pure Bending Capacity** (Ignoring compression steel)

a =	5.176	in	$a = A_s * f_y / (0.85 * f'_c * b)$	Depth of equivalent stress block (AASHTO Eq. 8-17)
M <sub>n</sub> =	603.1	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
φM <sub>n</sub> =	542.8	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from c = 0 (pure bending) to c = infinity (pure compression).

Calculate P<sub>n</sub> and M<sub>n</sub> for chosen c

c = **13.89** in **Tension Failure**

f <sub>s</sub> =	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d - c) / c, f_y)$	Stress in tension steel, limited to f <sub>y</sub> (- indicates tension)
f' <sub>s</sub> =	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c - d') / c, f_y)$	Stress in compression steel
a =	11.80324479	in	$a = \beta_1 * c$	Depth of concrete stress block
C =	602.0	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
φP <sub>n</sub> =	329.0	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
φM <sub>n</sub> =	684.0	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
e =	24.95	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
P <sub>u</sub> =	249.0	262.4	187.7	304.8	245.7	252.4	kips
M <sub>u</sub> =	549.9	578.8	437.1	524.8	518.1	524.8	ft-kips
e =	26.50	26.47	27.94	20.66	25.30	24.95	in
φP <sub>n</sub> =	305.27	305.68	285.56	411.38	323.35	328.98	kips
φM <sub>n</sub> =	674.07	674.26	664.81	708.34	681.77	684.01	ft-kips

φP<sub>n</sub> and φM<sub>n</sub> capacities are calculated by iterating the "c" value in until the calculated the eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.21	43.6 Tons	HS24.2
Operating	HS20	36 Tons	RF=2.02	72.8 Tons	HS40.4
	2F1	15 Tons	RF=2.92	43.8 Tons	
	3F1	23 Tons	RF=2.39	54.9 Tons	
	4F1	27 Tons	RF=2.36	63.6 Tons	
	5C1	40 Tons	RF=2.32	93.0 Tons	
Ohio Legal %			230%		

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.07	RF=38.41	HS21.3
Operating	HS20	36 Tons	RF=1.78	RF=64.11	HS35.6
	2F1	15 Tons	RF=2.62	RF=39.26	
	3F1	23 Tons	RF=2.03	RF=46.64	
	4F1	27 Tons	RF=2.06	RF=55.71	
	5C1	40 Tons	RF=2.03	RF=81.11	
Ohio Legal %			205%		

Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment



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Job No  
**P402110046**Sheet No  
**1**

Rev

Part Section B' - Frame 9

Job Title Main Avenue Rating

Ref

By M Johnson Date 01-Feb-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 9.std Date/Time 24-Feb-2012 08:58

## Job Information

	Engineer	Checked	Approved
<b>Name:</b>	M Johnson	J Kemnitz	
<b>Date:</b>	01-Feb-12	16-Feb-12	

**Structure Type** SPACE FRAME

Number of Nodes	4	Highest Node	4
Number of Elements	3	Highest Beam	3

Number of Basic Load Cases	12
Number of Combination Load Cases	1

*Included in this printout are data for:*

<b>All</b>	The Whole Structure
------------	---------------------

*Included in this printout are results for load cases:*

Type	L/C	Name
Primary	1	SELF WEIGHT DEAD LOAD
Primary	2	SLAB DEAD LOAD
Primary	3	BEAM HAUNCH
Primary	4	LL1 ONE LANE POS 1
Primary	5	LL2 ONE LANE POS 2
Primary	9	LL3 ONE LANE POS 3
Primary	6	LL4 TWO LANES POS 1
Primary	7	LL5 THREE LANES POS 1
Primary	8	LL6 TWO LANES POS 2
Primary	10	CONCRETE WEARING SURFACE
Primary	12	LL7 TWO LANES POS 3
Primary	13	LL8 THREE LANES POS 2
Combination	11	ALL DEAD LOAD

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	10.000	10.000	0.000
2	10.000	33.580	0.000
3	47.000	33.580	0.000
4	47.000	13.000	0.000



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Job No  
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File Section B' Frame 9.std Date/Time 24-Feb-2012 08:58

## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	2	23.580	1	0
2	2	3	37.000	2	0
3	3	4	20.580	1	0

## Section Properties

Prop	Section	Area (in <sup>2</sup> )	$I_{yy}$ (in <sup>4</sup> )	$I_{zz}$ (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 36.00x21.00	756.000	27.8E+3	81.6E+3	70.7E+3	CONCRETE
2	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE

## Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

## Basic Load Cases

Number	Name
1	SELF WEIGHT DEAD LOAD
2	SLAB DEAD LOAD
3	BEAM HAUNCH
4	LL1 ONE LANE POS 1
5	LL2 ONE LANE POS 2
9	LL3 ONE LANE POS 3
6	LL4 TWO LANES POS 1
7	LL5 THREE LANES POS 1
8	LL6 TWO LANES POS 2
10	CONCRETE WEARING SURFACE
12	LL7 TWO LANES POS 3
13	LL8 THREE LANES POS 2

## Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
11	ALL DEAD LOAD	1	SELF WEIGHT DEAD LOAD	1.00
		2	SLAB DEAD LOAD	1.00
		3	BEAM HAUNCH	1.00
		10	CONCRETE WEARING SURFACE	1.00



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Job No <b>P402110046</b>	Sheet No <b>3</b>	Rev
Part Section B' - Frame 9		
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By M Johnson	Date 01-Feb-12	Chd J Kemnitz
Client ODOT	File Section B' Frame 9.std	Date/Time 24-Feb-2012 08:58

## Beam Force Detail

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	Shear		Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)
1	1:SELF WEIGH	0.000	40.611	-4.360	0.000	0.000	0.000	-425.909
		2.358	38.750	-4.360	0.000	0.000	0.000	-302.526
		4.716	36.889	-4.360	0.000	0.000	0.000	-179.142
		7.074	35.028	-4.360	0.000	0.000	0.000	-55.758
		9.432	33.167	-4.360	0.000	0.000	0.000	67.625
		11.790	31.306	-4.360	0.000	0.000	0.000	191.009
		14.148	29.445	-4.360	0.000	0.000	0.000	314.392
		16.506	27.584	-4.360	0.000	0.000	0.000	437.776
		18.864	25.723	-4.360	0.000	0.000	0.000	561.159
		21.222	23.862	-4.360	0.000	0.000	0.000	684.543
	23.580	22.001	-4.360	0.000	0.000	0.000	807.927	
	2:SLAB DEAD	0.000	19.813	-4.130	0.000	0.000	0.000	-402.953
		2.358	19.813	-4.130	0.000	0.000	0.000	-286.085
		4.716	19.813	-4.130	0.000	0.000	0.000	-169.217
		7.074	19.813	-4.130	0.000	0.000	0.000	-52.349
		9.432	19.813	-4.130	0.000	0.000	0.000	64.518
		11.790	19.813	-4.130	0.000	0.000	0.000	181.386
		14.148	19.813	-4.130	0.000	0.000	0.000	298.254
		16.506	19.813	-4.130	0.000	0.000	0.000	415.122
		18.864	19.813	-4.130	0.000	0.000	0.000	531.990
		21.222	19.813	-4.130	0.000	0.000	0.000	648.857
	23.580	19.813	-4.130	0.000	0.000	0.000	765.725	
	3:BEAM HAUN	0.000	2.828	-0.636	0.000	0.000	0.000	-63.074
		2.358	2.828	-0.636	0.000	0.000	0.000	-45.079
		4.716	2.828	-0.636	0.000	0.000	0.000	-27.083
		7.074	2.828	-0.636	0.000	0.000	0.000	-9.088
		9.432	2.828	-0.636	0.000	0.000	0.000	8.908
		11.790	2.828	-0.636	0.000	0.000	0.000	26.903
		14.148	2.828	-0.636	0.000	0.000	0.000	44.899
		16.506	2.828	-0.636	0.000	0.000	0.000	62.895
		18.864	2.828	-0.636	0.000	0.000	0.000	80.890
		21.222	2.828	-0.636	0.000	0.000	0.000	98.886
	23.580	2.828	-0.636	0.000	0.000	0.000	116.881	
	4:LL1 ONE LAI	0.000	29.621	-5.786	0.000	0.000	0.000	-522.361
		2.358	29.621	-5.786	0.000	0.000	0.000	-358.636
		4.716	29.621	-5.786	0.000	0.000	0.000	-194.911
		7.074	29.621	-5.786	0.000	0.000	0.000	-31.187
		9.432	29.621	-5.786	0.000	0.000	0.000	132.538
		11.790	29.621	-5.786	0.000	0.000	0.000	296.263
		14.148	29.621	-5.786	0.000	0.000	0.000	459.988
16.506	29.621	-5.786	0.000	0.000	0.000	623.713		
	18.864	29.621	-5.786	0.000	0.000	0.000	787.438	





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Job No  
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Rev

Part Section B' - Frame 9

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By M Johnson Date 01-Feb-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 9.std Date/Time 24-Feb-2012 08:58

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		21.222	29.621	-5.786	0.000	0.000	0.000	0.000	0.000	951.163	
		23.580	29.621	-5.786	0.000	0.000	0.000	0.000	0.000	1.11E+3	
	5:LL2 ONE LAI	0.000	14.846	-5.680	0.000	0.000	0.000	0.000	0.000	-596.020	
		2.358	14.846	-5.680	0.000	0.000	0.000	0.000	0.000	-435.302	
		4.716	14.846	-5.680	0.000	0.000	0.000	0.000	0.000	-274.583	
		7.074	14.846	-5.680	0.000	0.000	0.000	0.000	0.000	-113.865	
		9.432	14.846	-5.680	0.000	0.000	0.000	0.000	0.000	46.854	
		11.790	14.846	-5.680	0.000	0.000	0.000	0.000	0.000	207.572	
		14.148	14.846	-5.680	0.000	0.000	0.000	0.000	0.000	368.291	
		16.506	14.846	-5.680	0.000	0.000	0.000	0.000	0.000	529.009	
		18.864	14.846	-5.680	0.000	0.000	0.000	0.000	0.000	689.728	
		21.222	14.846	-5.680	0.000	0.000	0.000	0.000	0.000	850.447	
		23.580	14.846	-5.680	0.000	0.000	0.000	0.000	0.000	1.01E+3	
	9:LL3 ONE LAI	0.000	22.250	-6.427	0.000	0.000	0.000	0.000	0.000	-626.852	
		2.358	22.250	-6.427	0.000	0.000	0.000	0.000	0.000	-444.981	
		4.716	22.250	-6.427	0.000	0.000	0.000	0.000	0.000	-263.111	
		7.074	22.250	-6.427	0.000	0.000	0.000	0.000	0.000	-81.240	
		9.432	22.250	-6.427	0.000	0.000	0.000	0.000	0.000	100.631	
		11.790	22.250	-6.427	0.000	0.000	0.000	0.000	0.000	282.502	
		14.148	22.250	-6.427	0.000	0.000	0.000	0.000	0.000	464.373	
		16.506	22.250	-6.427	0.000	0.000	0.000	0.000	0.000	646.245	
		18.864	22.250	-6.427	0.000	0.000	0.000	0.000	0.000	828.115	
		21.222	22.250	-6.427	0.000	0.000	0.000	0.000	0.000	1.01E+3	
		23.580	22.250	-6.427	0.000	0.000	0.000	0.000	0.000	1.19E+3	
	6:LL4 TWO LA	0.000	44.477	-11.890	0.000	0.000	0.000	0.000	0.000	-1.16E+3	
		2.358	44.477	-11.890	0.000	0.000	0.000	0.000	0.000	-823.279	
		4.716	44.477	-11.890	0.000	0.000	0.000	0.000	0.000	-486.828	
		7.074	44.477	-11.890	0.000	0.000	0.000	0.000	0.000	-150.376	
		9.432	44.477	-11.890	0.000	0.000	0.000	0.000	0.000	186.075	
		11.790	44.477	-11.890	0.000	0.000	0.000	0.000	0.000	522.526	
		14.148	44.477	-11.890	0.000	0.000	0.000	0.000	0.000	858.978	
		16.506	44.477	-11.890	0.000	0.000	0.000	0.000	0.000	1.2E+3	
		18.864	44.477	-11.890	0.000	0.000	0.000	0.000	0.000	1.53E+3	
		21.222	44.477	-11.890	0.000	0.000	0.000	0.000	0.000	1.87E+3	
		23.580	44.477	-11.890	0.000	0.000	0.000	0.000	0.000	2.2E+3	
	7:LL5 THREE I	0.000	60.005	-13.159	0.000	0.000	0.000	0.000	0.000	-1.28E+3	
		2.358	60.005	-13.159	0.000	0.000	0.000	0.000	0.000	-911.433	
		4.716	60.005	-13.159	0.000	0.000	0.000	0.000	0.000	-539.073	
		7.074	60.005	-13.159	0.000	0.000	0.000	0.000	0.000	-166.712	
		9.432	60.005	-13.159	0.000	0.000	0.000	0.000	0.000	205.649	
		11.790	60.005	-13.159	0.000	0.000	0.000	0.000	0.000	578.010	
		14.148	60.005	-13.159	0.000	0.000	0.000	0.000	0.000	950.371	
		16.506	60.005	-13.159	0.000	0.000	0.000	0.000	0.000	1.32E+3	
		18.864	60.005	-13.159	0.000	0.000	0.000	0.000	0.000	1.7E+3	



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Job No  
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Sheet No  
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Part Section B' - Frame 9

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By M Johnson Date 01-Feb-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 9.std Date/Time 24-Feb-2012 08:58

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		21.222	60.005	-13.159	0.000	0.000	0.000	0.000	0.000	2.07E+3	
		23.580	60.005	-13.159	0.000	0.000	0.000	0.000	0.000	2.44E+3	
	8:LL6 TWO LA	0.000	39.572	-11.707	0.000	0.000	0.000	0.000	0.000	-1.17E+3	
		2.358	39.572	-11.707	0.000	0.000	0.000	0.000	0.000	-833.968	
		4.716	39.572	-11.707	0.000	0.000	0.000	0.000	0.000	-502.721	
		7.074	39.572	-11.707	0.000	0.000	0.000	0.000	0.000	-171.473	
		9.432	39.572	-11.707	0.000	0.000	0.000	0.000	0.000	159.774	
		11.790	39.572	-11.707	0.000	0.000	0.000	0.000	0.000	491.021	
		14.148	39.572	-11.707	0.000	0.000	0.000	0.000	0.000	822.268	
		16.506	39.572	-11.707	0.000	0.000	0.000	0.000	0.000	1.15E+3	
		18.864	39.572	-11.707	0.000	0.000	0.000	0.000	0.000	1.48E+3	
		21.222	39.572	-11.707	0.000	0.000	0.000	0.000	0.000	1.82E+3	
		23.580	39.572	-11.707	0.000	0.000	0.000	0.000	0.000	2.15E+3	
	10:CONCRETE	0.000	3.438	-0.681	0.000	0.000	0.000	0.000	0.000	-66.491	
		2.358	3.438	-0.681	0.000	0.000	0.000	0.000	0.000	-47.208	
		4.716	3.438	-0.681	0.000	0.000	0.000	0.000	0.000	-27.925	
		7.074	3.438	-0.681	0.000	0.000	0.000	0.000	0.000	-8.642	
		9.432	3.438	-0.681	0.000	0.000	0.000	0.000	0.000	10.641	
		11.790	3.438	-0.681	0.000	0.000	0.000	0.000	0.000	29.924	
		14.148	3.438	-0.681	0.000	0.000	0.000	0.000	0.000	49.207	
		16.506	3.438	-0.681	0.000	0.000	0.000	0.000	0.000	68.490	
		18.864	3.438	-0.681	0.000	0.000	0.000	0.000	0.000	87.773	
		21.222	3.438	-0.681	0.000	0.000	0.000	0.000	0.000	107.056	
		23.580	3.438	-0.681	0.000	0.000	0.000	0.000	0.000	126.339	
	12:LL7 TWO L/	0.000	44.467	-11.466	0.000	0.000	0.000	0.000	0.000	-1.12E+3	
		2.358	44.467	-11.466	0.000	0.000	0.000	0.000	0.000	-793.938	
		4.716	44.467	-11.466	0.000	0.000	0.000	0.000	0.000	-469.495	
		7.074	44.467	-11.466	0.000	0.000	0.000	0.000	0.000	-145.051	
		9.432	44.467	-11.466	0.000	0.000	0.000	0.000	0.000	179.392	
		11.790	44.467	-11.466	0.000	0.000	0.000	0.000	0.000	503.836	
		14.148	44.467	-11.466	0.000	0.000	0.000	0.000	0.000	828.279	
		16.506	44.467	-11.466	0.000	0.000	0.000	0.000	0.000	1.15E+3	
		18.864	44.467	-11.466	0.000	0.000	0.000	0.000	0.000	1.48E+3	
		21.222	44.467	-11.466	0.000	0.000	0.000	0.000	0.000	1.8E+3	
		23.580	44.467	-11.466	0.000	0.000	0.000	0.000	0.000	2.13E+3	
	13:LL8 THREE	0.000	50.260	-12.678	0.000	0.000	0.000	0.000	0.000	-1.25E+3	
		2.358	50.260	-12.678	0.000	0.000	0.000	0.000	0.000	-888.270	
		4.716	50.260	-12.678	0.000	0.000	0.000	0.000	0.000	-529.542	
		7.074	50.260	-12.678	0.000	0.000	0.000	0.000	0.000	-170.814	
		9.432	50.260	-12.678	0.000	0.000	0.000	0.000	0.000	187.914	
		11.790	50.260	-12.678	0.000	0.000	0.000	0.000	0.000	546.642	
		14.148	50.260	-12.678	0.000	0.000	0.000	0.000	0.000	905.369	
		16.506	50.260	-12.678	0.000	0.000	0.000	0.000	0.000	1.26E+3	
		18.864	50.260	-12.678	0.000	0.000	0.000	0.000	0.000	1.62E+3	



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Job No  
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Sheet No  
**6**

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Part Section B' - Frame 9

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By M Johnson Date 01-Feb-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 9.std Date/Time 24-Feb-2012 08:58

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		21.222	50.260	-12.678	0.000	0.000	0.000	0.000	0.000	1.98E+3	
		23.580	50.260	-12.678	0.000	0.000	0.000	0.000	0.000	2.34E+3	
	11:ALL DEAD I	0.000	66.690	-9.808	0.000	0.000	0.000	0.000	0.000	-958.427	
		2.358	64.829	-9.808	0.000	0.000	0.000	0.000	0.000	-680.897	
		4.716	62.968	-9.808	0.000	0.000	0.000	0.000	0.000	-403.368	
		7.074	61.107	-9.808	0.000	0.000	0.000	0.000	0.000	-125.838	
		9.432	59.246	-9.808	0.000	0.000	0.000	0.000	0.000	151.692	
		11.790	57.385	-9.808	0.000	0.000	0.000	0.000	0.000	429.222	
		14.148	55.524	-9.808	0.000	0.000	0.000	0.000	0.000	706.752	
		16.506	53.663	-9.808	0.000	0.000	0.000	0.000	0.000	984.282	
		18.864	51.802	-9.808	0.000	0.000	0.000	0.000	0.000	1.26E+3	
		21.222	49.941	-9.808	0.000	0.000	0.000	0.000	0.000	1.54E+3	
		23.580	48.080	-9.808	0.000	0.000	0.000	0.000	0.000	1.82E+3	
2	1:SELF WEIGH	0.000	4.360	22.001	0.000	0.000	0.000	0.000	0.000	807.927	
		3.700	4.360	17.620	0.000	0.000	0.000	0.000	0.000	-60.847	
		7.400	4.360	13.240	0.000	0.000	0.000	0.000	0.000	-740.532	
		11.100	4.360	8.859	0.000	0.000	0.000	0.000	0.000	-1.23E+3	
		14.800	4.360	4.479	0.000	0.000	0.000	0.000	0.000	-1.53E+3	
		18.500	4.360	0.098	0.000	0.000	0.000	0.000	0.000	-1.65E+3	
		22.200	4.360	-4.282	0.000	0.000	0.000	0.000	0.000	-1.54E+3	
		25.900	4.360	-8.662	0.000	0.000	0.000	0.000	0.000	-1.25E+3	
		29.600	4.360	-13.043	0.000	0.000	0.000	0.000	0.000	-766.760	
		33.300	4.360	-17.423	0.000	0.000	0.000	0.000	0.000	-95.818	
		37.000	4.360	-21.804	0.000	0.000	0.000	0.000	0.000	764.213	
	2:SLAB DEAD	0.000	4.130	19.813	0.000	0.000	0.000	0.000	0.000	765.725	
		3.700	4.130	16.280	0.000	0.000	0.000	0.000	0.000	-26.820	
		7.400	4.130	12.746	0.000	0.000	0.000	0.000	0.000	-666.836	
		11.100	4.130	9.213	0.000	0.000	0.000	0.000	0.000	-1.15E+3	
		14.800	4.130	5.679	0.000	0.000	0.000	0.000	0.000	-1.49E+3	
		18.500	4.130	2.146	0.000	0.000	0.000	0.000	0.000	-1.67E+3	
		22.200	4.130	-5.488	0.000	0.000	0.000	0.000	0.000	-1.5E+3	
		25.900	4.130	-9.021	0.000	0.000	0.000	0.000	0.000	-1.17E+3	
		29.600	4.130	-12.555	0.000	0.000	0.000	0.000	0.000	-692.323	
		33.300	4.130	-16.088	0.000	0.000	0.000	0.000	0.000	-60.803	
		37.000	4.130	-19.622	0.000	0.000	0.000	0.000	0.000	723.246	
	3:BEAM HAUN	0.000	0.636	2.828	0.000	0.000	0.000	0.000	0.000	116.881	
		3.700	0.636	2.391	0.000	0.000	0.000	0.000	0.000	1.940	
		7.400	0.636	1.911	0.000	0.000	0.000	0.000	0.000	-93.150	
		11.100	0.636	1.385	0.000	0.000	0.000	0.000	0.000	-166.504	
		14.800	0.636	0.815	0.000	0.000	0.000	0.000	0.000	-216.235	
		18.500	0.636	0.201	0.000	0.000	0.000	0.000	0.000	-240.457	
		22.200	0.636	-0.465	0.000	0.000	0.000	0.000	0.000	-233.101	
		25.900	0.636	-1.175	0.000	0.000	0.000	0.000	0.000	-195.992	
		29.600	0.636	-1.930	0.000	0.000	0.000	0.000	0.000	-127.244	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**7**

Rev

Part Section B' - Frame 9

Job Title Main Avenue Rating

Ref

By M Johnson Date 01-Feb-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 9.std Date/Time 24-Feb-2012 08:58

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	0.636	-2.729	0.000	0.000	0.000	0.000	0.000	-24.970	
		37.000	0.636	-3.573	0.000	0.000	0.000	0.000	0.000	112.715	
	4:LL1 ONE LAI	0.000	5.786	29.621	0.000	0.000	0.000	0.000	0.000	1.11E+3	
		3.700	5.786	29.621	0.000	0.000	0.000	0.000	0.000	-200.292	
		7.400	5.786	29.621	0.000	0.000	0.000	0.000	0.000	-1.52E+3	
		11.100	5.786	16.361	0.000	0.000	0.000	0.000	0.000	-2.38E+3	
		14.800	5.786	7.521	0.000	0.000	0.000	0.000	0.000	-2.74E+3	
		18.500	5.786	-14.579	0.000	0.000	0.000	0.000	0.000	-2.28E+3	
		22.200	5.786	-14.579	0.000	0.000	0.000	0.000	0.000	-1.63E+3	
		25.900	5.786	-14.579	0.000	0.000	0.000	0.000	0.000	-984.012	
		29.600	5.786	-14.579	0.000	0.000	0.000	0.000	0.000	-336.712	
		33.300	5.786	-14.579	0.000	0.000	0.000	0.000	0.000	310.588	
		37.000	5.786	-14.579	0.000	0.000	0.000	0.000	0.000	957.888	
	5:LL2 ONE LAI	0.000	5.680	14.846	0.000	0.000	0.000	0.000	0.000	1.01E+3	
		3.700	5.680	14.846	0.000	0.000	0.000	0.000	0.000	352.008	
		7.400	5.680	14.846	0.000	0.000	0.000	0.000	0.000	-307.150	
		11.100	5.680	14.846	0.000	0.000	0.000	0.000	0.000	-966.307	
		14.800	5.680	14.846	0.000	0.000	0.000	0.000	0.000	-1.63E+3	
		18.500	5.680	14.846	0.000	0.000	0.000	0.000	0.000	-2.28E+3	
		22.200	5.680	-7.254	0.000	0.000	0.000	0.000	0.000	-2.76E+3	
		25.900	5.680	-16.094	0.000	0.000	0.000	0.000	0.000	-2.41E+3	
		29.600	5.680	-29.354	0.000	0.000	0.000	0.000	0.000	-1.56E+3	
		33.300	5.680	-29.354	0.000	0.000	0.000	0.000	0.000	-253.732	
		37.000	5.680	-29.354	0.000	0.000	0.000	0.000	0.000	1.05E+3	
	9:LL3 ONE LAI	0.000	6.427	22.250	0.000	0.000	0.000	0.000	0.000	1.19E+3	
		3.700	6.427	22.250	0.000	0.000	0.000	0.000	0.000	203.954	
		7.400	6.427	22.250	0.000	0.000	0.000	0.000	0.000	-783.949	
		11.100	6.427	22.250	0.000	0.000	0.000	0.000	0.000	-1.77E+3	
		14.800	6.427	22.250	0.000	0.000	0.000	0.000	0.000	-2.76E+3	
		18.500	6.427	0.150	0.000	0.000	0.000	0.000	0.000	-2.95E+3	
		22.200	6.427	-21.950	0.000	0.000	0.000	0.000	0.000	-2.77E+3	
		25.900	6.427	-21.950	0.000	0.000	0.000	0.000	0.000	-1.8E+3	
		29.600	6.427	-21.950	0.000	0.000	0.000	0.000	0.000	-823.928	
		33.300	6.427	-21.950	0.000	0.000	0.000	0.000	0.000	150.648	
		37.000	6.427	-21.950	0.000	0.000	0.000	0.000	0.000	1.13E+3	
	6:LL4 TWO LA	0.000	11.890	44.477	0.000	0.000	0.000	0.000	0.000	2.2E+3	
		3.700	11.890	44.477	0.000	0.000	0.000	0.000	0.000	229.997	
		7.400	11.890	44.477	0.000	0.000	0.000	0.000	0.000	-1.74E+3	
		11.100	11.890	31.217	0.000	0.000	0.000	0.000	0.000	-3.43E+3	
		14.800	11.890	22.377	0.000	0.000	0.000	0.000	0.000	-4.55E+3	
		18.500	11.890	0.277	0.000	0.000	0.000	0.000	0.000	-5.02E+3	
		22.200	11.890	-21.823	0.000	0.000	0.000	0.000	0.000	-4.58E+3	
		25.900	11.890	-30.663	0.000	0.000	0.000	0.000	0.000	-3.48E+3	
		29.600	11.890	-43.923	0.000	0.000	0.000	0.000	0.000	-1.82E+3	



Software licensed to TranSystems

Job No <b>P402110046</b>	Sheet No <b>8</b>	Rev
Part Section B' - Frame 9		
Ref		
By M Johnson	Date 01-Feb-12	Chd J Kemnitz
Client ODOT	File Section B' Frame 9.std	Date/Time 24-Feb-2012 08:58

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	11.890	-43.923	0.000	0.000	0.000	0.000	0.000	131.547	
		37.000	11.890	-43.923	0.000	0.000	0.000	0.000	0.000	2.08E+3	
	7:LL5 THREE I	0.000	13.159	60.005	0.000	0.000	0.000	0.000	0.000	2.44E+3	
		3.700	13.159	56.025	0.000	0.000	0.000	0.000	0.000	-144.819	
		7.400	13.159	40.105	0.000	0.000	0.000	0.000	0.000	-2.2E+3	
		11.100	13.159	28.165	0.000	0.000	0.000	0.000	0.000	-3.71E+3	
		14.800	13.159	20.205	0.000	0.000	0.000	0.000	0.000	-4.73E+3	
		18.500	13.159	0.305	0.000	0.000	0.000	0.000	0.000	-4.91E+3	
		22.200	13.159	-19.595	0.000	0.000	0.000	0.000	0.000	-4.76E+3	
		25.900	13.159	-27.555	0.000	0.000	0.000	0.000	0.000	-3.77E+3	
		29.600	13.159	-39.495	0.000	0.000	0.000	0.000	0.000	-2.28E+3	
		33.300	13.159	-55.415	0.000	0.000	0.000	0.000	0.000	-253.247	
		37.000	13.159	-59.395	0.000	0.000	0.000	0.000	0.000	2.3E+3	
	8:LL6 TWO LA	0.000	11.707	39.572	0.000	0.000	0.000	0.000	0.000	2.15E+3	
		3.700	11.707	39.572	0.000	0.000	0.000	0.000	0.000	390.239	
		7.400	11.707	39.572	0.000	0.000	0.000	0.000	0.000	-1.37E+3	
		11.100	11.707	39.572	0.000	0.000	0.000	0.000	0.000	-3.12E+3	
		14.800	11.707	21.892	0.000	0.000	0.000	0.000	0.000	-4.26E+3	
		18.500	11.707	17.472	0.000	0.000	0.000	0.000	0.000	-5.05E+3	
		22.200	11.707	-9.048	0.000	0.000	0.000	0.000	0.000	-4.73E+3	
		25.900	11.707	-26.728	0.000	0.000	0.000	0.000	0.000	-3.73E+3	
		29.600	11.707	-39.988	0.000	0.000	0.000	0.000	0.000	-2.18E+3	
		33.300	11.707	-48.828	0.000	0.000	0.000	0.000	0.000	-87.671	
		37.000	11.707	-48.828	0.000	0.000	0.000	0.000	0.000	2.08E+3	
	10:CONCRETE	0.000	0.681	3.438	0.000	0.000	0.000	0.000	0.000	126.339	
		3.700	0.681	2.754	0.000	0.000	0.000	0.000	0.000	-9.436	
		7.400	0.681	2.069	0.000	0.000	0.000	0.000	0.000	-115.663	
		11.100	0.681	1.385	0.000	0.000	0.000	0.000	0.000	-192.342	
		14.800	0.681	0.700	0.000	0.000	0.000	0.000	0.000	-239.474	
		18.500	0.681	0.016	0.000	0.000	0.000	0.000	0.000	-257.058	
		22.200	0.681	-0.669	0.000	0.000	0.000	0.000	0.000	-240.874	
		25.900	0.681	-1.353	0.000	0.000	0.000	0.000	0.000	-195.142	
		29.600	0.681	-2.038	0.000	0.000	0.000	0.000	0.000	-119.862	
		33.300	0.681	-2.722	0.000	0.000	0.000	0.000	0.000	-15.035	
		37.000	0.681	-3.407	0.000	0.000	0.000	0.000	0.000	119.340	
	12:LL7 TWO L/	0.000	11.466	44.467	0.000	0.000	0.000	0.000	0.000	2.13E+3	
		3.700	11.466	44.467	0.000	0.000	0.000	0.000	0.000	151.716	
		7.400	11.466	44.467	0.000	0.000	0.000	0.000	0.000	-1.82E+3	
		11.100	11.466	31.207	0.000	0.000	0.000	0.000	0.000	-3.35E+3	
		14.800	11.466	22.367	0.000	0.000	0.000	0.000	0.000	-4.37E+3	
		18.500	11.466	0.267	0.000	0.000	0.000	0.000	0.000	-4.56E+3	
		22.200	11.466	-21.833	0.000	0.000	0.000	0.000	0.000	-4.39E+3	
		25.900	11.466	-30.673	0.000	0.000	0.000	0.000	0.000	-3.39E+3	
		29.600	11.466	-43.933	0.000	0.000	0.000	0.000	0.000	-1.89E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**9**

Rev

Part Section B' - Frame 9

Job Title Main Avenue Rating

Ref

By M Johnson Date 01-Feb-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 9.std Date/Time 24-Feb-2012 08:58

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	11.466	-43.933	0.000	0.000	0.000	0.000	0.000	56.855	
		37.000	11.466	-43.933	0.000	0.000	0.000	0.000	0.000	2.01E+3	
	13:LL8 THREE	0.000	12.678	50.260	0.000	0.000	0.000	0.000	0.000	2.34E+3	
		3.700	12.678	50.260	0.000	0.000	0.000	0.000	0.000	108.744	
		7.400	12.678	42.300	0.000	0.000	0.000	0.000	0.000	-1.96E+3	
		11.100	12.678	30.360	0.000	0.000	0.000	0.000	0.000	-3.49E+3	
		14.800	12.678	14.440	0.000	0.000	0.000	0.000	0.000	-4.48E+3	
		18.500	12.678	10.460	0.000	0.000	0.000	0.000	0.000	-5E+3	
		22.200	12.678	-13.420	0.000	0.000	0.000	0.000	0.000	-4.57E+3	
		25.900	12.678	-29.340	0.000	0.000	0.000	0.000	0.000	-3.82E+3	
		29.600	12.678	-41.280	0.000	0.000	0.000	0.000	0.000	-2.33E+3	
		33.300	12.678	-49.240	0.000	0.000	0.000	0.000	0.000	-311.153	
		37.000	12.678	-69.140	0.000	0.000	0.000	0.000	0.000	2.23E+3	
	11:ALL DEAD I	0.000	9.808	48.080	0.000	0.000	0.000	0.000	0.000	1.82E+3	
		3.700	9.808	39.045	0.000	0.000	0.000	0.000	0.000	-95.163	
		7.400	9.808	29.966	0.000	0.000	0.000	0.000	0.000	-1.62E+3	
		11.100	9.808	20.842	0.000	0.000	0.000	0.000	0.000	-2.74E+3	
		14.800	9.808	11.673	0.000	0.000	0.000	0.000	0.000	-3.48E+3	
		18.500	9.808	2.460	0.000	0.000	0.000	0.000	0.000	-3.81E+3	
		22.200	9.808	-10.904	0.000	0.000	0.000	0.000	0.000	-3.51E+3	
		25.900	9.808	-20.212	0.000	0.000	0.000	0.000	0.000	-2.81E+3	
		29.600	9.808	-29.565	0.000	0.000	0.000	0.000	0.000	-1.71E+3	
		33.300	9.808	-38.963	0.000	0.000	0.000	0.000	0.000	-196.626	
		37.000	9.808	-48.406	0.000	0.000	0.000	0.000	0.000	1.72E+3	
3	1:SELF WEIGH	0.000	21.804	4.360	0.000	0.000	0.000	0.000	0.000	764.213	
		2.058	23.428	4.360	0.000	0.000	0.000	0.000	0.000	656.527	
		4.116	25.052	4.360	0.000	0.000	0.000	0.000	0.000	548.841	
		6.174	26.677	4.360	0.000	0.000	0.000	0.000	0.000	441.155	
		8.232	28.301	4.360	0.000	0.000	0.000	0.000	0.000	333.469	
		10.290	29.925	4.360	0.000	0.000	0.000	0.000	0.000	225.784	
		12.348	31.549	4.360	0.000	0.000	0.000	0.000	0.000	118.098	
		14.406	33.174	4.360	0.000	0.000	0.000	0.000	0.000	10.412	
		16.464	34.798	4.360	0.000	0.000	0.000	0.000	0.000	-97.274	
		18.522	36.422	4.360	0.000	0.000	0.000	0.000	0.000	-204.960	
		20.580	38.047	4.360	0.000	0.000	0.000	0.000	0.000	-312.646	
	2:SLAB DEAD	0.000	19.622	4.130	0.000	0.000	0.000	0.000	0.000	723.246	
		2.058	19.622	4.130	0.000	0.000	0.000	0.000	0.000	621.247	
		4.116	19.622	4.130	0.000	0.000	0.000	0.000	0.000	519.248	
		6.174	19.622	4.130	0.000	0.000	0.000	0.000	0.000	417.249	
		8.232	19.622	4.130	0.000	0.000	0.000	0.000	0.000	315.250	
		10.290	19.622	4.130	0.000	0.000	0.000	0.000	0.000	213.250	
		12.348	19.622	4.130	0.000	0.000	0.000	0.000	0.000	111.251	
		14.406	19.622	4.130	0.000	0.000	0.000	0.000	0.000	9.252	
		16.464	19.622	4.130	0.000	0.000	0.000	0.000	0.000	-92.747	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**10**

Rev

Part Section B' - Frame 9

Job Title Main Avenue Rating

Ref

By M Johnson Date 01-Feb-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 9.std Date/Time 24-Feb-2012 08:58

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		18.522	19.622	4.130	0.000	0.000	0.000	0.000	0.000	-194.746	
		20.580	19.622	4.130	0.000	0.000	0.000	0.000	0.000	-296.745	
	3:BEAM HAUN	0.000	3.573	0.636	0.000	0.000	0.000	0.000	0.000	112.715	
		2.058	3.573	0.636	0.000	0.000	0.000	0.000	0.000	97.009	
		4.116	3.573	0.636	0.000	0.000	0.000	0.000	0.000	81.303	
		6.174	3.573	0.636	0.000	0.000	0.000	0.000	0.000	65.597	
		8.232	3.573	0.636	0.000	0.000	0.000	0.000	0.000	49.891	
		10.290	3.573	0.636	0.000	0.000	0.000	0.000	0.000	34.185	
		12.348	3.573	0.636	0.000	0.000	0.000	0.000	0.000	18.479	
		14.406	3.573	0.636	0.000	0.000	0.000	0.000	0.000	2.773	
		16.464	3.573	0.636	0.000	0.000	0.000	0.000	0.000	-12.933	
		18.522	3.573	0.636	0.000	0.000	0.000	0.000	0.000	-28.639	
		20.580	3.573	0.636	0.000	0.000	0.000	0.000	0.000	-44.345	
	4:LL1 ONE LAI	0.000	14.579	5.786	0.000	0.000	0.000	0.000	0.000	957.888	
		2.058	14.579	5.786	0.000	0.000	0.000	0.000	0.000	814.994	
		4.116	14.579	5.786	0.000	0.000	0.000	0.000	0.000	672.099	
		6.174	14.579	5.786	0.000	0.000	0.000	0.000	0.000	529.204	
		8.232	14.579	5.786	0.000	0.000	0.000	0.000	0.000	386.309	
		10.290	14.579	5.786	0.000	0.000	0.000	0.000	0.000	243.414	
		12.348	14.579	5.786	0.000	0.000	0.000	0.000	0.000	100.520	
		14.406	14.579	5.786	0.000	0.000	0.000	0.000	0.000	-42.375	
		16.464	14.579	5.786	0.000	0.000	0.000	0.000	0.000	-185.270	
		18.522	14.579	5.786	0.000	0.000	0.000	0.000	0.000	-328.165	
		20.580	14.579	5.786	0.000	0.000	0.000	0.000	0.000	-471.060	
	5:LL2 ONE LAI	0.000	29.354	5.680	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		2.058	29.354	5.680	0.000	0.000	0.000	0.000	0.000	909.320	
		4.116	29.354	5.680	0.000	0.000	0.000	0.000	0.000	769.049	
		6.174	29.354	5.680	0.000	0.000	0.000	0.000	0.000	628.778	
		8.232	29.354	5.680	0.000	0.000	0.000	0.000	0.000	488.507	
		10.290	29.354	5.680	0.000	0.000	0.000	0.000	0.000	348.236	
		12.348	29.354	5.680	0.000	0.000	0.000	0.000	0.000	207.965	
		14.406	29.354	5.680	0.000	0.000	0.000	0.000	0.000	67.694	
		16.464	29.354	5.680	0.000	0.000	0.000	0.000	0.000	-72.577	
		18.522	29.354	5.680	0.000	0.000	0.000	0.000	0.000	-212.847	
		20.580	29.354	5.680	0.000	0.000	0.000	0.000	0.000	-353.118	
	9:LL3 ONE LAI	0.000	21.950	6.427	0.000	0.000	0.000	0.000	0.000	1.13E+3	
		2.058	21.950	6.427	0.000	0.000	0.000	0.000	0.000	966.493	
		4.116	21.950	6.427	0.000	0.000	0.000	0.000	0.000	807.761	
		6.174	21.950	6.427	0.000	0.000	0.000	0.000	0.000	649.029	
		8.232	21.950	6.427	0.000	0.000	0.000	0.000	0.000	490.296	
		10.290	21.950	6.427	0.000	0.000	0.000	0.000	0.000	331.564	
		12.348	21.950	6.427	0.000	0.000	0.000	0.000	0.000	172.832	
		14.406	21.950	6.427	0.000	0.000	0.000	0.000	0.000	14.100	
		16.464	21.950	6.427	0.000	0.000	0.000	0.000	0.000	-144.632	



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Job No  
**P402110046**

Sheet No  
**11**

Rev

Part Section B' - Frame 9

Job Title Main Avenue Rating

Ref

By M Johnson Date 01-Feb-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 9.std Date/Time 24-Feb-2012 08:58

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		18.522	21.950	6.427	0.000	0.000	0.000	0.000	0.000	-303.364	
		20.580	21.950	6.427	0.000	0.000	0.000	0.000	0.000	-462.097	
	6:LL4 TWO LA	0.000	43.923	11.890	0.000	0.000	0.000	0.000	0.000	2.08E+3	
		2.058	43.923	11.890	0.000	0.000	0.000	0.000	0.000	1.79E+3	
		4.116	43.923	11.890	0.000	0.000	0.000	0.000	0.000	1.49E+3	
		6.174	43.923	11.890	0.000	0.000	0.000	0.000	0.000	1.2E+3	
		8.232	43.923	11.890	0.000	0.000	0.000	0.000	0.000	907.137	
		10.290	43.923	11.890	0.000	0.000	0.000	0.000	0.000	613.491	
		12.348	43.923	11.890	0.000	0.000	0.000	0.000	0.000	319.845	
		14.406	43.923	11.890	0.000	0.000	0.000	0.000	0.000	26.199	
		16.464	43.923	11.890	0.000	0.000	0.000	0.000	0.000	-267.447	
		18.522	43.923	11.890	0.000	0.000	0.000	0.000	0.000	-561.092	
		20.580	43.923	11.890	0.000	0.000	0.000	0.000	0.000	-854.738	
	7:LL5 THREE I	0.000	59.395	13.159	0.000	0.000	0.000	0.000	0.000	2.3E+3	
		2.058	59.395	13.159	0.000	0.000	0.000	0.000	0.000	1.98E+3	
		4.116	59.395	13.159	0.000	0.000	0.000	0.000	0.000	1.65E+3	
		6.174	59.395	13.159	0.000	0.000	0.000	0.000	0.000	1.33E+3	
		8.232	59.395	13.159	0.000	0.000	0.000	0.000	0.000	1E+3	
		10.290	59.395	13.159	0.000	0.000	0.000	0.000	0.000	679.344	
		12.348	59.395	13.159	0.000	0.000	0.000	0.000	0.000	354.357	
		14.406	59.395	13.159	0.000	0.000	0.000	0.000	0.000	29.370	
		16.464	59.395	13.159	0.000	0.000	0.000	0.000	0.000	-295.616	
		18.522	59.395	13.159	0.000	0.000	0.000	0.000	0.000	-620.603	
		20.580	59.395	13.159	0.000	0.000	0.000	0.000	0.000	-945.590	
	8:LL6 TWO LA	0.000	48.828	11.707	0.000	0.000	0.000	0.000	0.000	2.08E+3	
		2.058	48.828	11.707	0.000	0.000	0.000	0.000	0.000	1.79E+3	
		4.116	48.828	11.707	0.000	0.000	0.000	0.000	0.000	1.5E+3	
		6.174	48.828	11.707	0.000	0.000	0.000	0.000	0.000	1.21E+3	
		8.232	48.828	11.707	0.000	0.000	0.000	0.000	0.000	923.855	
		10.290	48.828	11.707	0.000	0.000	0.000	0.000	0.000	634.751	
		12.348	48.828	11.707	0.000	0.000	0.000	0.000	0.000	345.647	
		14.406	48.828	11.707	0.000	0.000	0.000	0.000	0.000	56.543	
		16.464	48.828	11.707	0.000	0.000	0.000	0.000	0.000	-232.560	
		18.522	48.828	11.707	0.000	0.000	0.000	0.000	0.000	-521.664	
		20.580	48.828	11.707	0.000	0.000	0.000	0.000	0.000	-810.768	
	10:CONCRETE	0.000	3.407	0.681	0.000	0.000	0.000	0.000	0.000	119.340	
		2.058	3.407	0.681	0.000	0.000	0.000	0.000	0.000	102.510	
		4.116	3.407	0.681	0.000	0.000	0.000	0.000	0.000	85.681	
		6.174	3.407	0.681	0.000	0.000	0.000	0.000	0.000	68.851	
		8.232	3.407	0.681	0.000	0.000	0.000	0.000	0.000	52.021	
		10.290	3.407	0.681	0.000	0.000	0.000	0.000	0.000	35.192	
		12.348	3.407	0.681	0.000	0.000	0.000	0.000	0.000	18.362	
		14.406	3.407	0.681	0.000	0.000	0.000	0.000	0.000	1.532	
		16.464	3.407	0.681	0.000	0.000	0.000	0.000	0.000	-15.297	





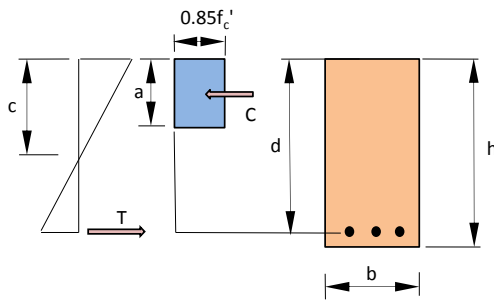
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Job No <b>P402110046</b>	Sheet No <b>12</b>	Rev
Part Section B' - Frame 9		
Ref		
By M Johnson	Date 01-Feb-12	Chd J Kemnitz
Client ODOT	File Section B' Frame 9.std	Date/Time 24-Feb-2012 08:58

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion		Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)				
		18.522	3.407	0.681	0.000	0.000	0.000	0.000	0.000	0.000	-32.127	
		20.580	3.407	0.681	0.000	0.000	0.000	0.000	0.000	0.000	-48.956	
	12:LL7 TWO L/	0.000	43.933	11.466	0.000	0.000	0.000	0.000	0.000	0.000	2.01E+3	
		2.058	43.933	11.466	0.000	0.000	0.000	0.000	0.000	0.000	1.72E+3	
		4.116	43.933	11.466	0.000	0.000	0.000	0.000	0.000	0.000	1.44E+3	
		6.174	43.933	11.466	0.000	0.000	0.000	0.000	0.000	0.000	1.16E+3	
		8.232	43.933	11.466	0.000	0.000	0.000	0.000	0.000	0.000	874.816	
		10.290	43.933	11.466	0.000	0.000	0.000	0.000	0.000	0.000	591.651	
		12.348	43.933	11.466	0.000	0.000	0.000	0.000	0.000	0.000	308.485	
		14.406	43.933	11.466	0.000	0.000	0.000	0.000	0.000	0.000	25.319	
		16.464	43.933	11.466	0.000	0.000	0.000	0.000	0.000	0.000	-257.846	
		18.522	43.933	11.466	0.000	0.000	0.000	0.000	0.000	0.000	-541.012	
		20.580	43.933	11.466	0.000	0.000	0.000	0.000	0.000	0.000	-824.178	
	13:LL8 THREE	0.000	69.140	12.678	0.000	0.000	0.000	0.000	0.000	0.000	2.23E+3	
		2.058	69.140	12.678	0.000	0.000	0.000	0.000	0.000	0.000	1.92E+3	
		4.116	69.140	12.678	0.000	0.000	0.000	0.000	0.000	0.000	1.61E+3	
		6.174	69.140	12.678	0.000	0.000	0.000	0.000	0.000	0.000	1.29E+3	
		8.232	69.140	12.678	0.000	0.000	0.000	0.000	0.000	0.000	980.958	
		10.290	69.140	12.678	0.000	0.000	0.000	0.000	0.000	0.000	667.870	
		12.348	69.140	12.678	0.000	0.000	0.000	0.000	0.000	0.000	354.782	
		14.406	69.140	12.678	0.000	0.000	0.000	0.000	0.000	0.000	41.693	
		16.464	69.140	12.678	0.000	0.000	0.000	0.000	0.000	0.000	-271.395	
		18.522	69.140	12.678	0.000	0.000	0.000	0.000	0.000	0.000	-584.483	
		20.580	69.140	12.678	0.000	0.000	0.000	0.000	0.000	0.000	-897.571	
	11:ALL DEAD I	0.000	48.406	9.808	0.000	0.000	0.000	0.000	0.000	0.000	1.72E+3	
		2.058	50.030	9.808	0.000	0.000	0.000	0.000	0.000	0.000	1.48E+3	
		4.116	51.654	9.808	0.000	0.000	0.000	0.000	0.000	0.000	1.24E+3	
		6.174	53.279	9.808	0.000	0.000	0.000	0.000	0.000	0.000	992.852	
		8.232	54.903	9.808	0.000	0.000	0.000	0.000	0.000	0.000	750.631	
		10.290	56.527	9.808	0.000	0.000	0.000	0.000	0.000	0.000	508.411	
		12.348	58.151	9.808	0.000	0.000	0.000	0.000	0.000	0.000	266.190	
		14.406	59.776	9.808	0.000	0.000	0.000	0.000	0.000	0.000	23.969	
		16.464	61.400	9.808	0.000	0.000	0.000	0.000	0.000	0.000	-218.252	
		18.522	63.024	9.808	0.000	0.000	0.000	0.000	0.000	0.000	-460.472	
		20.580	64.649	9.808	0.000	0.000	0.000	0.000	0.000	0.000	-702.693	

### Floor Beam Postive Moment Section



b =	121.8	in	
d =	48.4	in	
f <sub>c</sub> ' =	4.5	ksi	
f <sub>y</sub> =	33	ksi	
φ =	0.9		
Area of Steel =	12.66	in <sup>2</sup>	(10 - 1 1/8" □)
% Steel Loss =	0		from 49/246 of original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	12.656	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.069		Balanced reinforcement ratio, AASHTO Eq. 8-18
β <sub>1</sub> =	0.825		Ratio of depth, Section 8.16.2.7
0.75*A <sub>sb</sub> =	306.24	in <sup>2</sup>	75% of steel required for balanced condions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
a =	0.897	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1501.3	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Moment

Total Service Positive Dead Load Moment = 317.8 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	34	32.1	21.7	32	35.6	32	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	44.2	41.7	28.2	41.6	46.3	41.6	kips
Reaction per Wheel (LL+I) =	22.1	20.9	14.1	20.8	23.1	20.8	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

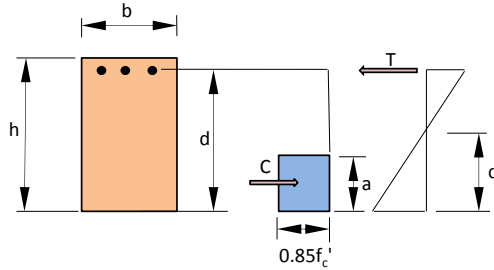
From STAAD							
Max. Positive LL+I Moment =	420.6	397.1	268.4	395.9	440.4	395.9	ft*kips

Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.19	42.9 Tons	HS23.8
	HS20	36 Tons	RF=1.99	71.6 Tons	HS39.8
Operating	2F1	15 Tons	RF=3.12	46.8 Tons	
	3F1	23 Tons	RF=2.11	48.6 Tons	
	4F1	27 Tons	RF=1.90	51.3 Tons	
	5C1	40 Tons	RF=2.11	84.6 Tons	
	Ohio Legal %	190%			

### Floor Beam Negative Moment Section



b =	21	in
d =	66.38	in
f' <sub>c</sub> =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	8	in <sup>2</sup>
% Steel Loss =	0%	

(8 - 1" □) from  
49/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	8.000	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
β <sub>1</sub> =	0.850		Ratio of depth, Section 8.16.2.7
0.75*A <sub>sb</sub> =	49.78	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
a =	4.930	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1265.4	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Moment

Moment at face of support

Total Service Negative Dead Load Moment = 82 ft\*kips From Staad

#### Live Load Moment

Moment at face of support

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Negative LL+I Moment =	113.31	107.0	72.3	106.6	118.6	106.6	ft*kips

Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=4.71	169.7 Tons	HS94.3
Operating	HS20	36 Tons	RF=7.87	283.2 Tons	HS157.3
	2F1	15 Tons	RF=12.33	184.9 Tons	
	3F1	23 Tons	RF=8.36	192.2 Tons	
	4F1	27 Tons	RF=7.51	202.9 Tons	
	5C1	40 Tons	RF=8.36	334.3 Tons	
	Ohio Legal %	750%			



Made by: **MJJ** Date: **1/31/2012** Job No: **P402110046**  
 Checked by: **JMK** Date: **2/17/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Built Concrete Frame Rating (Frame 9)**

## Floor Beam Shear Section

### Section Capacity

Taken at face of column

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed conservatively)
$d =$	<input type="text" value="66"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="151.8"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="259.7"/>	kips	Shear Capacity of Section

### Dead Load Shear (Dead Load shear is taken at face of column)

Total Service Dead Load Shear =  kips From Staad

### Live Load Shear (Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="60"/>	56.6	38.3	56.5	62.8	56.5	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.55	55.9 Tons	HS31.0
Operating	HS20	36 Tons	RF=2.59	93.2 Tons	HS51.8
	2F1	15 Tons	RF=4.06	60.9 Tons	
	3F1	23 Tons	RF=2.75	63.3 Tons	
	4F1	27 Tons	RF=2.47	66.8 Tons	
	5C1	40 Tons	RF=2.75	110.1 Tons	
	Ohio Legal %	245%			



## Column Section

$h =$	<input type="text" value="36"/>	in	Column Depth
$b =$	<input type="text" value="21"/>	in	Column Width
$A_s =$	<input type="text" value="8"/>	in <sup>2</sup>	Area of Tension Steel (8- 1" □ bars)
$A'_s =$	<input type="text" value="4"/>	in <sup>2</sup>	Area of Compression Steel (4- 1" □ bars)
$d =$	<input type="text" value="33"/>	in	Distance from compression face to centroid of tension steel
$d' =$	<input type="text" value="3"/>	in	Distance from compression face to centroid of compression steel
$f_c =$	<input type="text" value="3"/>	ksi	Concrete Strength
$f_y =$	<input type="text" value="33"/>	ksi	Steel Yield Stress
$E_s =$	<input type="text" value="29000"/>	ksi	Modulus of elasticity of steel
$\epsilon_u =$	<input type="text" value="0.003"/>	in/in	Ultimate concrete strain
$\beta_1 =$	<input type="text" value="0.85"/>		
$d'' =$	<input type="text" value="15"/>	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads** (Dead Load moment taken at the top of column, just below column chamfer)

Total Service Dead Load Moment=	<input type="text" value="115"/>	ft-kips	From Staad
Total Service Dead Load Axial Force=	<input type="text" value="48"/>	kips	From Staad

**Live Loads** (LiveLoad moment taken at the top of column, just below column chamfer)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	<input type="text" value="154"/>	145.4	98.3	144.9	161.2	144.9		ft-kips
Max. LL+I Axial Force =	<input type="text" value="60"/>	56.6	40.6	88.5	66.8	53.9		kips

Maximum Moment and Axial load results from 3 lanes loaded..

## Section Capacity

### Balanced Condition

$a_b =$	<input type="text" value="20.34"/>	in	$a_b = (87 / (87+f_y)) \cdot \beta_1 \cdot d$	Depth of stress block for balanced conditions, AASHTO 8-34
$c_b =$	<input type="text" value="23.93"/>	in	$c_b = a_b / \beta_1$	Depth to neutral axis for balanced conditions
$f_s =$	<input type="text" value="33"/>	ksi	$f_s = 87 \cdot (1 - (d'/d)) \cdot ((87+f_y)/87)$	Stress in comp. steel at balanced condition ( $\leq f_y$ ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

$P_b =$	<input type="text" value="957.0"/>	kip	$P_b = .85 \cdot f_c \cdot b \cdot a_b + A'_s \cdot f_s - A_s \cdot f_y$
$M_b =$	<input type="text" value="1205.7"/>	ft-kip	$M_b = 0.85 \cdot f_c \cdot b \cdot a_b \cdot (d - d'' - a_b/2) + A'_s \cdot f_s \cdot (d - d' - d'') + A_s \cdot f_y \cdot d''$

Any choice of  $c$  smaller than  $c_b$  will result in tension failure of the column, any choice greater than  $c_b$  will result in compression failure of the column.

### Pure Axial Compression Capacity

$P_o =$	<input type="text" value="2293.2"/>	kips	$P_o = .85 \cdot f_c \cdot (A_g - A_{st}) + A_{st} \cdot f_y$	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
$\phi P_o =$	<input type="text" value="1605.2"/>	kips		



Made by:	MJJ	Date:	1/31/2012	Job No:	P402110046
Checked by:	JMK	Date:	2/17/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	As-Built Concrete Frame Rating (Frame 9)				

**Pure Bending Capacity** (Ignoring compression steel)

$a =$	4.930	in	$a = A_s * f_y / 0.85 * f_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	671.8	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	604.6	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  12.14 in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d - c) / c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c - d') / c, f_y)$	Stress in compression steel
$a =$	10.31770262	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	552.5	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	294.4	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	760.4	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	31.00	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	192.6	185.3	150.4	254.4	207.2	179.4	kips
$M_u =$	483.2	464.5	362.3	463.5	498.9	463.5	ft-kips
$e =$	30.10	30.08	28.90	21.86	28.89	31.00	in
$\phi P_n =$	306.02	306.39	322.93	458.59	323.14	294.36	kips
$\phi M_n =$	767.68	767.91	777.75	835.53	777.88	760.37	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value in until the calculated the eccentricities "e" match.

Column Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.85	66.7 Tons	HS37.0
Operating	HS20	36 Tons	RF=3.09	111.3 Tons	HS61.8
	2F1	15 Tons	RF=4.92	73.8 Tons	
	3F1	23 Tons	RF=3.44	79.2 Tons	
	4F1	27 Tons	RF=3.00	81.0 Tons	
	5C1	40 Tons	RF=3.24	129.8 Tons	
Ohio Legal %	300%				

Floor Beam Load Rating Summary:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.19	RF=42.92	HS23.8
Operating	HS20	36 Tons	RF=1.99	RF=71.64	HS39.8
	2F1	15 Tons	RF=3.12	RF=46.77	
	3F1	23 Tons	RF=2.11	RF=48.63	
	4F1	27 Tons	RF=1.90	RF=51.32	
	5C1	40 Tons	RF=2.11	RF=84.58	
Ohio Legal %	190%				

Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment



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Client ODOT	File Section B' Frame 10.std	Date/Time 24-Feb-2012 08:59

## Job Information

	Engineer	Checked	Approved
<b>Name:</b>	M Johnson	J Kemnitz	
<b>Date:</b>	27-Jan-12	16-Feb-12	

**Structure Type** | SPACE FRAME

Number of Nodes	4	Highest Node	4
Number of Elements	3	Highest Beam	3

Number of Basic Load Cases	12
Number of Combination Load Cases	1

Included in this printout are data for:

<b>All</b>	The Whole Structure
------------	---------------------

Included in this printout are results for load cases:

Type	L/C	Name
Primary	1	SELF WEIGHT DEAD LOAD
Primary	2	SLAB DEAD LOAD
Primary	3	BEAM HAUNCH
Primary	4	LL1 ONE LANE POS 1
Primary	5	LL2 ONE LANE POS 2
Primary	9	LL3 ONE LANE POS 3
Primary	6	LL4 TWO LANES POS 1
Primary	7	LL5 THREE LANES POS 1
Primary	8	LL6 TWO LANES POS 2
Primary	10	CONCRETE WEARING SURFACE
Primary	12	LL7 TWO LANES POS 3
Primary	13	LL8 THREE LANES POS 2
Combination	11	ALL DEAD LOAD

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	10.000	10.000	0.000
2	10.000	33.760	0.000
3	47.000	33.760	0.000
4	47.000	13.000	0.000



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## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	2	23.760	1	0
2	2	3	37.000	2	0
3	3	4	20.760	1	0

## Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 36.00x21.00	756.000	27.8E+3	81.6E+3	70.7E+3	CONCRETE
2	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE

## Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

## Basic Load Cases

Number	Name
1	SELF WEIGHT DEAD LOAD
2	SLAB DEAD LOAD
3	BEAM HAUNCH
4	LL1 ONE LANE POS 1
5	LL2 ONE LANE POS 2
9	LL3 ONE LANE POS 3
6	LL4 TWO LANES POS 1
7	LL5 THREE LANES POS 1
8	LL6 TWO LANES POS 2
10	CONCRETE WEARING SURFACE
12	LL7 TWO LANES POS 3
13	LL8 THREE LANES POS 2

## Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
11	ALL DEAD LOAD	1	SELF WEIGHT DEAD LOAD	1.00
		2	SLAB DEAD LOAD	1.00
		3	BEAM HAUNCH	1.00
		10	CONCRETE WEARING SURFACE	1.00





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## Beam Force Detail

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	Shear		Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)
1	1:SELF WEIGH	0.000	40.752	-4.311	0.000	0.000	0.000	-424.260
		2.376	38.877	-4.311	0.000	0.000	0.000	-301.357
		4.752	37.002	-4.311	0.000	0.000	0.000	-178.455
		7.128	35.127	-4.311	0.000	0.000	0.000	-55.552
		9.504	33.251	-4.311	0.000	0.000	0.000	67.350
		11.880	31.376	-4.311	0.000	0.000	0.000	190.253
		14.256	29.501	-4.311	0.000	0.000	0.000	313.155
		16.632	27.625	-4.311	0.000	0.000	0.000	436.057
		19.008	25.750	-4.311	0.000	0.000	0.000	558.960
		21.384	23.875	-4.311	0.000	0.000	0.000	681.862
	23.760	22.000	-4.311	0.000	0.000	0.000	804.765	
	2:SLAB DEAD	0.000	14.580	-2.957	0.000	0.000	0.000	-290.736
		2.376	14.580	-2.957	0.000	0.000	0.000	-206.418
		4.752	14.580	-2.957	0.000	0.000	0.000	-122.100
		7.128	14.580	-2.957	0.000	0.000	0.000	-37.781
		9.504	14.580	-2.957	0.000	0.000	0.000	46.537
		11.880	14.580	-2.957	0.000	0.000	0.000	130.855
		14.256	14.580	-2.957	0.000	0.000	0.000	215.173
		16.632	14.580	-2.957	0.000	0.000	0.000	299.491
		19.008	14.580	-2.957	0.000	0.000	0.000	383.809
		21.384	14.580	-2.957	0.000	0.000	0.000	468.128
	23.760	14.580	-2.957	0.000	0.000	0.000	552.446	
	3:BEAM HAUN	0.000	3.107	-0.671	0.000	0.000	0.000	-66.794
		2.376	3.107	-0.671	0.000	0.000	0.000	-47.668
		4.752	3.107	-0.671	0.000	0.000	0.000	-28.542
		7.128	3.107	-0.671	0.000	0.000	0.000	-9.416
		9.504	3.107	-0.671	0.000	0.000	0.000	9.710
		11.880	3.107	-0.671	0.000	0.000	0.000	28.836
		14.256	3.107	-0.671	0.000	0.000	0.000	47.962
		16.632	3.107	-0.671	0.000	0.000	0.000	67.088
		19.008	3.107	-0.671	0.000	0.000	0.000	86.213
		21.384	3.107	-0.671	0.000	0.000	0.000	105.339
	23.760	3.107	-0.671	0.000	0.000	0.000	124.465	
	4:LL1 ONE LAI	0.000	34.443	-6.651	0.000	0.000	0.000	-605.178
		2.376	34.443	-6.651	0.000	0.000	0.000	-415.544
		4.752	34.443	-6.651	0.000	0.000	0.000	-225.910
		7.128	34.443	-6.651	0.000	0.000	0.000	-36.276
		9.504	34.443	-6.651	0.000	0.000	0.000	153.357
		11.880	34.443	-6.651	0.000	0.000	0.000	342.991
		14.256	34.443	-6.651	0.000	0.000	0.000	532.625
		16.632	34.443	-6.651	0.000	0.000	0.000	722.259
19.008	34.443	-6.651	0.000	0.000	0.000	911.893		



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By M Johnson Date 27-Jan-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 10.std Date/Time 24-Feb-2012 08:59

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		21.384	34.443	-6.651	0.000	0.000	0.000	0.000	0.000	1.1E+3	
		23.760	34.443	-6.651	0.000	0.000	0.000	0.000	0.000	1.29E+3	
	5:LL2 ONE LAI	0.000	17.265	-6.530	0.000	0.000	0.000	0.000	0.000	-690.339	
		2.376	17.265	-6.530	0.000	0.000	0.000	0.000	0.000	-504.150	
		4.752	17.265	-6.530	0.000	0.000	0.000	0.000	0.000	-317.962	
		7.128	17.265	-6.530	0.000	0.000	0.000	0.000	0.000	-131.773	
		9.504	17.265	-6.530	0.000	0.000	0.000	0.000	0.000	54.416	
		11.880	17.265	-6.530	0.000	0.000	0.000	0.000	0.000	240.604	
		14.256	17.265	-6.530	0.000	0.000	0.000	0.000	0.000	426.793	
		16.632	17.265	-6.530	0.000	0.000	0.000	0.000	0.000	612.981	
		19.008	17.265	-6.530	0.000	0.000	0.000	0.000	0.000	799.170	
		21.384	17.265	-6.530	0.000	0.000	0.000	0.000	0.000	985.359	
		23.760	17.265	-6.530	0.000	0.000	0.000	0.000	0.000	1.17E+3	
	9:LL3 ONE LAI	0.000	25.873	-7.389	0.000	0.000	0.000	0.000	0.000	-726.137	
		2.376	25.873	-7.389	0.000	0.000	0.000	0.000	0.000	-515.465	
		4.752	25.873	-7.389	0.000	0.000	0.000	0.000	0.000	-304.792	
		7.128	25.873	-7.389	0.000	0.000	0.000	0.000	0.000	-94.120	
		9.504	25.873	-7.389	0.000	0.000	0.000	0.000	0.000	116.552	
		11.880	25.873	-7.389	0.000	0.000	0.000	0.000	0.000	327.224	
		14.256	25.873	-7.389	0.000	0.000	0.000	0.000	0.000	537.896	
		16.632	25.873	-7.389	0.000	0.000	0.000	0.000	0.000	748.568	
		19.008	25.873	-7.389	0.000	0.000	0.000	0.000	0.000	959.240	
		21.384	25.873	-7.389	0.000	0.000	0.000	0.000	0.000	1.17E+3	
		23.760	25.873	-7.389	0.000	0.000	0.000	0.000	0.000	1.38E+3	
	6:LL4 TWO LA	0.000	51.719	-13.669	0.000	0.000	0.000	0.000	0.000	-1.34E+3	
		2.376	51.719	-13.669	0.000	0.000	0.000	0.000	0.000	-953.683	
		4.752	51.719	-13.669	0.000	0.000	0.000	0.000	0.000	-563.951	
		7.128	51.719	-13.669	0.000	0.000	0.000	0.000	0.000	-174.219	
		9.504	51.719	-13.669	0.000	0.000	0.000	0.000	0.000	215.513	
		11.880	51.719	-13.669	0.000	0.000	0.000	0.000	0.000	605.245	
		14.256	51.719	-13.669	0.000	0.000	0.000	0.000	0.000	994.977	
		16.632	51.719	-13.669	0.000	0.000	0.000	0.000	0.000	1.38E+3	
		19.008	51.719	-13.669	0.000	0.000	0.000	0.000	0.000	1.77E+3	
		21.384	51.719	-13.669	0.000	0.000	0.000	0.000	0.000	2.16E+3	
		23.760	51.719	-13.669	0.000	0.000	0.000	0.000	0.000	2.55E+3	
	7:LL5 THREE I	0.000	69.651	-15.101	0.000	0.000	0.000	0.000	0.000	-1.48E+3	
		2.376	69.651	-15.101	0.000	0.000	0.000	0.000	0.000	-1.05E+3	
		4.752	69.651	-15.101	0.000	0.000	0.000	0.000	0.000	-623.348	
		7.128	69.651	-15.101	0.000	0.000	0.000	0.000	0.000	-192.796	
		9.504	69.651	-15.101	0.000	0.000	0.000	0.000	0.000	237.756	
		11.880	69.651	-15.101	0.000	0.000	0.000	0.000	0.000	668.309	
		14.256	69.651	-15.101	0.000	0.000	0.000	0.000	0.000	1.1E+3	
		16.632	69.651	-15.101	0.000	0.000	0.000	0.000	0.000	1.53E+3	
		19.008	69.651	-15.101	0.000	0.000	0.000	0.000	0.000	1.96E+3	



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By M Johnson

Date 27-Jan-12

Chd J Kemnitz

Client ODOT

File Section B' Frame 10.std

Date/Time 24-Feb-2012 08:59

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		21.384	69.651	-15.101	0.000	0.000	0.000	0.000	0.000	2.39E+3	
		23.760	69.651	-15.101	0.000	0.000	0.000	0.000	0.000	2.82E+3	
	8:LL6 TWO LA	0.000	46.017	-13.458	0.000	0.000	0.000	0.000	0.000	-1.35E+3	
		2.376	46.017	-13.458	0.000	0.000	0.000	0.000	0.000	-966.006	
		4.752	46.017	-13.458	0.000	0.000	0.000	0.000	0.000	-582.291	
		7.128	46.017	-13.458	0.000	0.000	0.000	0.000	0.000	-198.577	
		9.504	46.017	-13.458	0.000	0.000	0.000	0.000	0.000	185.137	
		11.880	46.017	-13.458	0.000	0.000	0.000	0.000	0.000	568.851	
		14.256	46.017	-13.458	0.000	0.000	0.000	0.000	0.000	952.565	
		16.632	46.017	-13.458	0.000	0.000	0.000	0.000	0.000	1.34E+3	
		19.008	46.017	-13.458	0.000	0.000	0.000	0.000	0.000	1.72E+3	
		21.384	46.017	-13.458	0.000	0.000	0.000	0.000	0.000	2.1E+3	
		23.760	46.017	-13.458	0.000	0.000	0.000	0.000	0.000	2.49E+3	
	10:CONCRETE	0.000	2.230	-0.437	0.000	0.000	0.000	0.000	0.000	-42.962	
		2.376	2.230	-0.437	0.000	0.000	0.000	0.000	0.000	-30.503	
		4.752	2.230	-0.437	0.000	0.000	0.000	0.000	0.000	-18.044	
		7.128	2.230	-0.437	0.000	0.000	0.000	0.000	0.000	-5.585	
		9.504	2.230	-0.437	0.000	0.000	0.000	0.000	0.000	6.874	
		11.880	2.230	-0.437	0.000	0.000	0.000	0.000	0.000	19.333	
		14.256	2.230	-0.437	0.000	0.000	0.000	0.000	0.000	31.793	
		16.632	2.230	-0.437	0.000	0.000	0.000	0.000	0.000	44.252	
		19.008	2.230	-0.437	0.000	0.000	0.000	0.000	0.000	56.711	
		21.384	2.230	-0.437	0.000	0.000	0.000	0.000	0.000	69.170	
		23.760	2.230	-0.437	0.000	0.000	0.000	0.000	0.000	81.629	
	12:LL7 TWO L/	0.000	51.707	-13.181	0.000	0.000	0.000	0.000	0.000	-1.3E+3	
		2.376	51.707	-13.181	0.000	0.000	0.000	0.000	0.000	-919.694	
		4.752	51.707	-13.181	0.000	0.000	0.000	0.000	0.000	-543.872	
		7.128	51.707	-13.181	0.000	0.000	0.000	0.000	0.000	-168.049	
		9.504	51.707	-13.181	0.000	0.000	0.000	0.000	0.000	207.773	
		11.880	51.707	-13.181	0.000	0.000	0.000	0.000	0.000	583.596	
		14.256	51.707	-13.181	0.000	0.000	0.000	0.000	0.000	959.418	
		16.632	51.707	-13.181	0.000	0.000	0.000	0.000	0.000	1.34E+3	
		19.008	51.707	-13.181	0.000	0.000	0.000	0.000	0.000	1.71E+3	
		21.384	51.707	-13.181	0.000	0.000	0.000	0.000	0.000	2.09E+3	
		23.760	51.707	-13.181	0.000	0.000	0.000	0.000	0.000	2.46E+3	
	13:LL8 THREE	0.000	58.339	-14.548	0.000	0.000	0.000	0.000	0.000	-1.44E+3	
		2.376	58.339	-14.548	0.000	0.000	0.000	0.000	0.000	-1.03E+3	
		4.752	58.339	-14.548	0.000	0.000	0.000	0.000	0.000	-612.271	
		7.128	58.339	-14.548	0.000	0.000	0.000	0.000	0.000	-197.476	
		9.504	58.339	-14.548	0.000	0.000	0.000	0.000	0.000	217.318	
		11.880	58.339	-14.548	0.000	0.000	0.000	0.000	0.000	632.112	
		14.256	58.339	-14.548	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		16.632	58.339	-14.548	0.000	0.000	0.000	0.000	0.000	1.46E+3	
		19.008	58.339	-14.548	0.000	0.000	0.000	0.000	0.000	1.88E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**6**

Rev

Part Section B' - Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson

Date 27-Jan-12

Chd J Kemnitz

Client ODOT

File Section B' Frame 10.std

Date/Time 24-Feb-2012 08:59

## Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		21.384	58.339	-14.548	0.000	0.000	0.000	0.000	0.000	2.29E+3	
		23.760	58.339	-14.548	0.000	0.000	0.000	0.000	0.000	2.71E+3	
	11:ALL DEAD I	0.000	60.669	-8.376	0.000	0.000	0.000	0.000	0.000	-824.751	
		2.376	58.794	-8.376	0.000	0.000	0.000	0.000	0.000	-585.946	
		4.752	56.919	-8.376	0.000	0.000	0.000	0.000	0.000	-347.140	
		7.128	55.044	-8.376	0.000	0.000	0.000	0.000	0.000	-108.334	
		9.504	53.168	-8.376	0.000	0.000	0.000	0.000	0.000	130.471	
		11.880	51.293	-8.376	0.000	0.000	0.000	0.000	0.000	369.277	
		14.256	49.418	-8.376	0.000	0.000	0.000	0.000	0.000	608.082	
		16.632	47.542	-8.376	0.000	0.000	0.000	0.000	0.000	846.888	
		19.008	45.667	-8.376	0.000	0.000	0.000	0.000	0.000	1.09E+3	
		21.384	43.792	-8.376	0.000	0.000	0.000	0.000	0.000	1.32E+3	
		23.760	41.917	-8.376	0.000	0.000	0.000	0.000	0.000	1.56E+3	
2	1:SELF WEIGH	0.000	4.311	22.000	0.000	0.000	0.000	0.000	0.000	804.765	
		3.700	4.311	17.619	0.000	0.000	0.000	0.000	0.000	-63.963	
		7.400	4.311	13.239	0.000	0.000	0.000	0.000	0.000	-743.603	
		11.100	4.311	8.858	0.000	0.000	0.000	0.000	0.000	-1.23E+3	
		14.800	4.311	4.478	0.000	0.000	0.000	0.000	0.000	-1.54E+3	
		18.500	4.311	0.097	0.000	0.000	0.000	0.000	0.000	-1.65E+3	
		22.200	4.311	-4.283	0.000	0.000	0.000	0.000	0.000	-1.54E+3	
		25.900	4.311	-8.663	0.000	0.000	0.000	0.000	0.000	-1.25E+3	
		29.600	4.311	-13.044	0.000	0.000	0.000	0.000	0.000	-769.557	
		33.300	4.311	-17.424	0.000	0.000	0.000	0.000	0.000	-98.569	
		37.000	4.311	-21.805	0.000	0.000	0.000	0.000	0.000	761.507	
	2:SLAB DEAD	0.000	2.957	14.580	0.000	0.000	0.000	0.000	0.000	552.446	
		3.700	2.957	11.883	0.000	0.000	0.000	0.000	0.000	-28.375	
		7.400	2.957	9.185	0.000	0.000	0.000	0.000	0.000	-492.763	
		11.100	2.957	6.488	0.000	0.000	0.000	0.000	0.000	-840.718	
		14.800	2.957	3.791	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		18.500	2.957	1.094	0.000	0.000	0.000	0.000	0.000	-1.19E+3	
		22.200	2.957	-3.654	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		25.900	2.957	-6.351	0.000	0.000	0.000	0.000	0.000	-852.894	
		29.600	2.957	-9.048	0.000	0.000	0.000	0.000	0.000	-511.028	
		33.300	2.957	-11.746	0.000	0.000	0.000	0.000	0.000	-52.728	
		37.000	2.957	-14.443	0.000	0.000	0.000	0.000	0.000	522.004	
	3:BEAM HAUN	0.000	0.671	3.107	0.000	0.000	0.000	0.000	0.000	124.465	
		3.700	0.671	2.594	0.000	0.000	0.000	0.000	0.000	-0.947	
		7.400	0.671	2.043	0.000	0.000	0.000	0.000	0.000	-103.355	
		11.100	0.671	1.456	0.000	0.000	0.000	0.000	0.000	-181.191	
		14.800	0.671	0.831	0.000	0.000	0.000	0.000	0.000	-232.888	
		18.500	0.671	0.170	0.000	0.000	0.000	0.000	0.000	-256.881	
		22.200	0.671	-0.534	0.000	0.000	0.000	0.000	0.000	-247.196	
		25.900	0.671	-1.275	0.000	0.000	0.000	0.000	0.000	-206.280	
		29.600	0.671	-2.053	0.000	0.000	0.000	0.000	0.000	-132.568	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
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Rev

Part Section B' - Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 27-Jan-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 10.std Date/Time 24-Feb-2012 08:59

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	0.671	-2.868	0.000	0.000	0.000	0.000	0.000	-24.492	
		37.000	0.671	-3.720	0.000	0.000	0.000	0.000	0.000	119.515	
	4:LL1 ONE LAI	0.000	6.651	34.443	0.000	0.000	0.000	0.000	0.000	1.29E+3	
		3.700	6.651	34.443	0.000	0.000	0.000	0.000	0.000	-238.093	
		7.400	6.651	34.443	0.000	0.000	0.000	0.000	0.000	-1.77E+3	
		11.100	6.651	19.023	0.000	0.000	0.000	0.000	0.000	-2.77E+3	
		14.800	6.651	8.743	0.000	0.000	0.000	0.000	0.000	-3.19E+3	
		18.500	6.651	-16.957	0.000	0.000	0.000	0.000	0.000	-2.65E+3	
		22.200	6.651	-16.957	0.000	0.000	0.000	0.000	0.000	-1.9E+3	
		25.900	6.651	-16.957	0.000	0.000	0.000	0.000	0.000	-1.15E+3	
		29.600	6.651	-16.957	0.000	0.000	0.000	0.000	0.000	-395.595	
		33.300	6.651	-16.957	0.000	0.000	0.000	0.000	0.000	357.311	
		37.000	6.651	-16.957	0.000	0.000	0.000	0.000	0.000	1.11E+3	
	5:LL2 ONE LAI	0.000	6.530	17.265	0.000	0.000	0.000	0.000	0.000	1.17E+3	
		3.700	6.530	17.265	0.000	0.000	0.000	0.000	0.000	404.992	
		7.400	6.530	17.265	0.000	0.000	0.000	0.000	0.000	-361.562	
		11.100	6.530	17.265	0.000	0.000	0.000	0.000	0.000	-1.13E+3	
		14.800	6.530	17.265	0.000	0.000	0.000	0.000	0.000	-1.89E+3	
		18.500	6.530	17.265	0.000	0.000	0.000	0.000	0.000	-2.66E+3	
		22.200	6.530	-8.435	0.000	0.000	0.000	0.000	0.000	-3.21E+3	
		25.900	6.530	-18.715	0.000	0.000	0.000	0.000	0.000	-2.81E+3	
		29.600	6.530	-34.135	0.000	0.000	0.000	0.000	0.000	-1.82E+3	
		33.300	6.530	-34.135	0.000	0.000	0.000	0.000	0.000	-299.605	
		37.000	6.530	-34.135	0.000	0.000	0.000	0.000	0.000	1.22E+3	
	9:LL3 ONE LAI	0.000	7.389	25.873	0.000	0.000	0.000	0.000	0.000	1.38E+3	
		3.700	7.389	25.873	0.000	0.000	0.000	0.000	0.000	231.834	
		7.400	7.389	25.873	0.000	0.000	0.000	0.000	0.000	-916.916	
		11.100	7.389	25.873	0.000	0.000	0.000	0.000	0.000	-2.07E+3	
		14.800	7.389	25.873	0.000	0.000	0.000	0.000	0.000	-3.21E+3	
		18.500	7.389	0.173	0.000	0.000	0.000	0.000	0.000	-3.44E+3	
		22.200	7.389	-25.527	0.000	0.000	0.000	0.000	0.000	-3.23E+3	
		25.900	7.389	-25.527	0.000	0.000	0.000	0.000	0.000	-2.1E+3	
		29.600	7.389	-25.527	0.000	0.000	0.000	0.000	0.000	-962.936	
		33.300	7.389	-25.527	0.000	0.000	0.000	0.000	0.000	170.473	
		37.000	7.389	-25.527	0.000	0.000	0.000	0.000	0.000	1.3E+3	
	6:LL4 TWO LA	0.000	13.669	51.719	0.000	0.000	0.000	0.000	0.000	2.55E+3	
		3.700	13.669	51.719	0.000	0.000	0.000	0.000	0.000	257.579	
		7.400	13.669	51.719	0.000	0.000	0.000	0.000	0.000	-2.04E+3	
		11.100	13.669	36.299	0.000	0.000	0.000	0.000	0.000	-4E+3	
		14.800	13.669	26.019	0.000	0.000	0.000	0.000	0.000	-5.31E+3	
		18.500	13.669	0.319	0.000	0.000	0.000	0.000	0.000	-5.84E+3	
		22.200	13.669	-25.381	0.000	0.000	0.000	0.000	0.000	-5.33E+3	
		25.900	13.669	-35.661	0.000	0.000	0.000	0.000	0.000	-4.05E+3	
		29.600	13.669	-51.081	0.000	0.000	0.000	0.000	0.000	-2.12E+3	



Software licensed to TranSystems

Job No <b>P402110046</b>	Sheet No <b>8</b>	Rev
Part Section B' - Frame 10		
Ref		
By M Johnson	Date 27-Jan-12	Chd J Kemnitz
Client ODOT	File Section B' Frame 10.std	Date/Time 24-Feb-2012 08:59

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	13.669	-51.081	0.000	0.000	0.000	0.000	0.000	144.252	
		37.000	13.669	-51.081	0.000	0.000	0.000	0.000	0.000	2.41E+3	
	7:LL5 THREE I	0.000	15.101	69.651	0.000	0.000	0.000	0.000	0.000	2.82E+3	
		3.700	15.101	65.031	0.000	0.000	0.000	0.000	0.000	-179.024	
		7.400	15.101	46.551	0.000	0.000	0.000	0.000	0.000	-2.56E+3	
		11.100	15.101	32.691	0.000	0.000	0.000	0.000	0.000	-4.32E+3	
		14.800	15.101	23.451	0.000	0.000	0.000	0.000	0.000	-5.5E+3	
		18.500	15.101	0.351	0.000	0.000	0.000	0.000	0.000	-5.71E+3	
		22.200	15.101	-22.749	0.000	0.000	0.000	0.000	0.000	-5.53E+3	
		25.900	15.101	-31.989	0.000	0.000	0.000	0.000	0.000	-4.38E+3	
		29.600	15.101	-45.849	0.000	0.000	0.000	0.000	0.000	-2.65E+3	
		33.300	15.101	-64.329	0.000	0.000	0.000	0.000	0.000	-303.613	
		37.000	15.101	-68.949	0.000	0.000	0.000	0.000	0.000	2.67E+3	
	8:LL6 TWO LA	0.000	13.458	46.017	0.000	0.000	0.000	0.000	0.000	2.49E+3	
		3.700	13.458	46.017	0.000	0.000	0.000	0.000	0.000	444.283	
		7.400	13.458	46.017	0.000	0.000	0.000	0.000	0.000	-1.6E+3	
		11.100	13.458	46.017	0.000	0.000	0.000	0.000	0.000	-3.64E+3	
		14.800	13.458	25.457	0.000	0.000	0.000	0.000	0.000	-4.97E+3	
		18.500	13.458	20.317	0.000	0.000	0.000	0.000	0.000	-5.88E+3	
		22.200	13.458	-10.523	0.000	0.000	0.000	0.000	0.000	-5.51E+3	
		25.900	13.458	-31.083	0.000	0.000	0.000	0.000	0.000	-4.35E+3	
		29.600	13.458	-46.503	0.000	0.000	0.000	0.000	0.000	-2.54E+3	
		33.300	13.458	-56.783	0.000	0.000	0.000	0.000	0.000	-110.749	
		37.000	13.458	-56.783	0.000	0.000	0.000	0.000	0.000	2.41E+3	
	10:CONCRETE	0.000	0.437	2.230	0.000	0.000	0.000	0.000	0.000	81.629	
		3.700	0.437	1.786	0.000	0.000	0.000	0.000	0.000	-6.436	
		7.400	0.437	1.342	0.000	0.000	0.000	0.000	0.000	-75.336	
		11.100	0.437	0.898	0.000	0.000	0.000	0.000	0.000	-125.069	
		14.800	0.437	0.454	0.000	0.000	0.000	0.000	0.000	-155.636	
		18.500	0.437	0.010	0.000	0.000	0.000	0.000	0.000	-167.038	
		22.200	0.437	-0.434	0.000	0.000	0.000	0.000	0.000	-156.535	
		25.900	0.437	-0.878	0.000	0.000	0.000	0.000	0.000	-126.867	
		29.600	0.437	-1.322	0.000	0.000	0.000	0.000	0.000	-78.032	
		33.300	0.437	-1.766	0.000	0.000	0.000	0.000	0.000	-10.031	
		37.000	0.437	-2.210	0.000	0.000	0.000	0.000	0.000	77.135	
	12:LL7 TWO L/	0.000	13.181	51.707	0.000	0.000	0.000	0.000	0.000	2.46E+3	
		3.700	13.181	51.707	0.000	0.000	0.000	0.000	0.000	166.899	
		7.400	13.181	51.707	0.000	0.000	0.000	0.000	0.000	-2.13E+3	
		11.100	13.181	36.287	0.000	0.000	0.000	0.000	0.000	-3.9E+3	
		14.800	13.181	26.007	0.000	0.000	0.000	0.000	0.000	-5.09E+3	
		18.500	13.181	0.307	0.000	0.000	0.000	0.000	0.000	-5.32E+3	
		22.200	13.181	-25.393	0.000	0.000	0.000	0.000	0.000	-5.11E+3	
		25.900	13.181	-35.673	0.000	0.000	0.000	0.000	0.000	-3.96E+3	
		29.600	13.181	-51.093	0.000	0.000	0.000	0.000	0.000	-2.21E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
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Rev

Part Section B' - Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 27-Jan-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 10.std Date/Time 24-Feb-2012 08:59

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	13.181	-51.093	0.000	0.000	0.000	0.000	0.000	57.708	
		37.000	13.181	-51.093	0.000	0.000	0.000	0.000	0.000	2.33E+3	
	13:LL8 THREE	0.000	14.548	58.339	0.000	0.000	0.000	0.000	0.000	2.71E+3	
		3.700	14.548	58.339	0.000	0.000	0.000	0.000	0.000	115.831	
		7.400	14.548	49.099	0.000	0.000	0.000	0.000	0.000	-2.28E+3	
		11.100	14.548	35.239	0.000	0.000	0.000	0.000	0.000	-4.07E+3	
		14.800	14.548	16.759	0.000	0.000	0.000	0.000	0.000	-5.21E+3	
		18.500	14.548	12.139	0.000	0.000	0.000	0.000	0.000	-5.81E+3	
		22.200	14.548	-15.581	0.000	0.000	0.000	0.000	0.000	-5.31E+3	
		25.900	14.548	-34.061	0.000	0.000	0.000	0.000	0.000	-4.45E+3	
		29.600	14.548	-47.921	0.000	0.000	0.000	0.000	0.000	-2.71E+3	
		33.300	14.548	-57.161	0.000	0.000	0.000	0.000	0.000	-370.588	
		37.000	14.548	-80.261	0.000	0.000	0.000	0.000	0.000	2.58E+3	
	11:ALL DEAD I	0.000	8.376	41.917	0.000	0.000	0.000	0.000	0.000	1.56E+3	
		3.700	8.376	33.882	0.000	0.000	0.000	0.000	0.000	-99.722	
		7.400	8.376	25.809	0.000	0.000	0.000	0.000	0.000	-1.42E+3	
		11.100	8.376	17.700	0.000	0.000	0.000	0.000	0.000	-2.38E+3	
		14.800	8.376	9.554	0.000	0.000	0.000	0.000	0.000	-3E+3	
		18.500	8.376	1.371	0.000	0.000	0.000	0.000	0.000	-3.26E+3	
		22.200	8.376	-8.904	0.000	0.000	0.000	0.000	0.000	-3.03E+3	
		25.900	8.376	-17.167	0.000	0.000	0.000	0.000	0.000	-2.44E+3	
		29.600	8.376	-25.467	0.000	0.000	0.000	0.000	0.000	-1.49E+3	
		33.300	8.376	-33.803	0.000	0.000	0.000	0.000	0.000	-185.821	
		37.000	8.376	-42.177	0.000	0.000	0.000	0.000	0.000	1.48E+3	
3	1:SELF WEIGH	0.000	21.805	4.311	0.000	0.000	0.000	0.000	0.000	761.507	
		2.076	23.443	4.311	0.000	0.000	0.000	0.000	0.000	654.122	
		4.152	25.082	4.311	0.000	0.000	0.000	0.000	0.000	546.738	
		6.228	26.720	4.311	0.000	0.000	0.000	0.000	0.000	439.353	
		8.304	28.359	4.311	0.000	0.000	0.000	0.000	0.000	331.969	
		10.380	29.997	4.311	0.000	0.000	0.000	0.000	0.000	224.585	
		12.456	31.636	4.311	0.000	0.000	0.000	0.000	0.000	117.200	
		14.532	33.274	4.311	0.000	0.000	0.000	0.000	0.000	9.816	
		16.608	34.913	4.311	0.000	0.000	0.000	0.000	0.000	-97.569	
		18.684	36.551	4.311	0.000	0.000	0.000	0.000	0.000	-204.953	
		20.760	38.190	4.311	0.000	0.000	0.000	0.000	0.000	-312.338	
	2:SLAB DEAD	0.000	14.443	2.957	0.000	0.000	0.000	0.000	0.000	522.004	
		2.076	14.443	2.957	0.000	0.000	0.000	0.000	0.000	448.332	
		4.152	14.443	2.957	0.000	0.000	0.000	0.000	0.000	374.661	
		6.228	14.443	2.957	0.000	0.000	0.000	0.000	0.000	300.989	
		8.304	14.443	2.957	0.000	0.000	0.000	0.000	0.000	227.317	
		10.380	14.443	2.957	0.000	0.000	0.000	0.000	0.000	153.645	
		12.456	14.443	2.957	0.000	0.000	0.000	0.000	0.000	79.973	
		14.532	14.443	2.957	0.000	0.000	0.000	0.000	0.000	6.301	
		16.608	14.443	2.957	0.000	0.000	0.000	0.000	0.000	-67.371	



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Job No  
**P402110046**

Sheet No  
**10**

Rev

Part Section B' - Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 27-Jan-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 10.std Date/Time 24-Feb-2012 08:59

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		18.684	14.443	2.957	0.000	0.000	0.000	0.000	0.000	-141.043	
		20.760	14.443	2.957	0.000	0.000	0.000	0.000	0.000	-214.715	
	3:BEAM HAUN	0.000	3.720	0.671	0.000	0.000	0.000	0.000	0.000	119.515	
		2.076	3.720	0.671	0.000	0.000	0.000	0.000	0.000	102.804	
		4.152	3.720	0.671	0.000	0.000	0.000	0.000	0.000	86.093	
		6.228	3.720	0.671	0.000	0.000	0.000	0.000	0.000	69.382	
		8.304	3.720	0.671	0.000	0.000	0.000	0.000	0.000	52.671	
		10.380	3.720	0.671	0.000	0.000	0.000	0.000	0.000	35.960	
		12.456	3.720	0.671	0.000	0.000	0.000	0.000	0.000	19.249	
		14.532	3.720	0.671	0.000	0.000	0.000	0.000	0.000	2.538	
		16.608	3.720	0.671	0.000	0.000	0.000	0.000	0.000	-14.173	
		18.684	3.720	0.671	0.000	0.000	0.000	0.000	0.000	-30.884	
		20.760	3.720	0.671	0.000	0.000	0.000	0.000	0.000	-47.595	
	4:LL1 ONE LAI	0.000	16.957	6.651	0.000	0.000	0.000	0.000	0.000	1.11E+3	
		2.076	16.957	6.651	0.000	0.000	0.000	0.000	0.000	944.527	
		4.152	16.957	6.651	0.000	0.000	0.000	0.000	0.000	778.837	
		6.228	16.957	6.651	0.000	0.000	0.000	0.000	0.000	613.146	
		8.304	16.957	6.651	0.000	0.000	0.000	0.000	0.000	447.456	
		10.380	16.957	6.651	0.000	0.000	0.000	0.000	0.000	281.766	
		12.456	16.957	6.651	0.000	0.000	0.000	0.000	0.000	116.076	
		14.532	16.957	6.651	0.000	0.000	0.000	0.000	0.000	-49.615	
		16.608	16.957	6.651	0.000	0.000	0.000	0.000	0.000	-215.305	
		18.684	16.957	6.651	0.000	0.000	0.000	0.000	0.000	-380.995	
		20.760	16.957	6.651	0.000	0.000	0.000	0.000	0.000	-546.685	
	5:LL2 ONE LAI	0.000	34.135	6.530	0.000	0.000	0.000	0.000	0.000	1.22E+3	
		2.076	34.135	6.530	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		4.152	34.135	6.530	0.000	0.000	0.000	0.000	0.000	890.641	
		6.228	34.135	6.530	0.000	0.000	0.000	0.000	0.000	727.961	
		8.304	34.135	6.530	0.000	0.000	0.000	0.000	0.000	565.281	
		10.380	34.135	6.530	0.000	0.000	0.000	0.000	0.000	402.601	
		12.456	34.135	6.530	0.000	0.000	0.000	0.000	0.000	239.921	
		14.532	34.135	6.530	0.000	0.000	0.000	0.000	0.000	77.241	
		16.608	34.135	6.530	0.000	0.000	0.000	0.000	0.000	-85.439	
		18.684	34.135	6.530	0.000	0.000	0.000	0.000	0.000	-248.119	
		20.760	34.135	6.530	0.000	0.000	0.000	0.000	0.000	-410.799	
	9:LL3 ONE LAI	0.000	25.527	7.389	0.000	0.000	0.000	0.000	0.000	1.3E+3	
		2.076	25.527	7.389	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		4.152	25.527	7.389	0.000	0.000	0.000	0.000	0.000	935.740	
		6.228	25.527	7.389	0.000	0.000	0.000	0.000	0.000	751.667	
		8.304	25.527	7.389	0.000	0.000	0.000	0.000	0.000	567.595	
		10.380	25.527	7.389	0.000	0.000	0.000	0.000	0.000	383.523	
		12.456	25.527	7.389	0.000	0.000	0.000	0.000	0.000	199.451	
		14.532	25.527	7.389	0.000	0.000	0.000	0.000	0.000	15.379	
		16.608	25.527	7.389	0.000	0.000	0.000	0.000	0.000	-168.693	





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Job No  
**P402110046**

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Part Section B' - Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 27-Jan-12 Chd J Kemnitz

Client ODOT

File Section B' Frame 10.std Date/Time 24-Feb-2012 08:59

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		18.684	25.527	7.389	0.000	0.000	0.000	0.000	0.000	-352.765	
		20.760	25.527	7.389	0.000	0.000	0.000	0.000	0.000	-536.837	
	6:LL4 TWO LA	0.000	51.081	13.669	0.000	0.000	0.000	0.000	0.000	2.41E+3	
		2.076	51.081	13.669	0.000	0.000	0.000	0.000	0.000	2.07E+3	
		4.152	51.081	13.669	0.000	0.000	0.000	0.000	0.000	1.73E+3	
		6.228	51.081	13.669	0.000	0.000	0.000	0.000	0.000	1.39E+3	
		8.304	51.081	13.669	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		10.380	51.081	13.669	0.000	0.000	0.000	0.000	0.000	709.630	
		12.456	51.081	13.669	0.000	0.000	0.000	0.000	0.000	369.107	
		14.532	51.081	13.669	0.000	0.000	0.000	0.000	0.000	28.583	
		16.608	51.081	13.669	0.000	0.000	0.000	0.000	0.000	-311.940	
		18.684	51.081	13.669	0.000	0.000	0.000	0.000	0.000	-652.464	
		20.760	51.081	13.669	0.000	0.000	0.000	0.000	0.000	-992.987	
	7:LL5 THREE I	0.000	68.949	15.101	0.000	0.000	0.000	0.000	0.000	2.67E+3	
		2.076	68.949	15.101	0.000	0.000	0.000	0.000	0.000	2.29E+3	
		4.152	68.949	15.101	0.000	0.000	0.000	0.000	0.000	1.91E+3	
		6.228	68.949	15.101	0.000	0.000	0.000	0.000	0.000	1.54E+3	
		8.304	68.949	15.101	0.000	0.000	0.000	0.000	0.000	1.16E+3	
		10.380	68.949	15.101	0.000	0.000	0.000	0.000	0.000	784.388	
		12.456	68.949	15.101	0.000	0.000	0.000	0.000	0.000	408.198	
		14.532	68.949	15.101	0.000	0.000	0.000	0.000	0.000	32.008	
		16.608	68.949	15.101	0.000	0.000	0.000	0.000	0.000	-344.181	
		18.684	68.949	15.101	0.000	0.000	0.000	0.000	0.000	-720.371	
		20.760	68.949	15.101	0.000	0.000	0.000	0.000	0.000	-1.1E+3	
	8:LL6 TWO LA	0.000	56.783	13.458	0.000	0.000	0.000	0.000	0.000	2.41E+3	
		2.076	56.783	13.458	0.000	0.000	0.000	0.000	0.000	2.08E+3	
		4.152	56.783	13.458	0.000	0.000	0.000	0.000	0.000	1.74E+3	
		6.228	56.783	13.458	0.000	0.000	0.000	0.000	0.000	1.4E+3	
		8.304	56.783	13.458	0.000	0.000	0.000	0.000	0.000	1.07E+3	
		10.380	56.783	13.458	0.000	0.000	0.000	0.000	0.000	734.103	
		12.456	56.783	13.458	0.000	0.000	0.000	0.000	0.000	398.838	
		14.532	56.783	13.458	0.000	0.000	0.000	0.000	0.000	63.572	
		16.608	56.783	13.458	0.000	0.000	0.000	0.000	0.000	-271.693	
		18.684	56.783	13.458	0.000	0.000	0.000	0.000	0.000	-606.959	
		20.760	56.783	13.458	0.000	0.000	0.000	0.000	0.000	-942.224	
	10:CONCRETE	0.000	2.210	0.437	0.000	0.000	0.000	0.000	0.000	77.135	
		2.076	2.210	0.437	0.000	0.000	0.000	0.000	0.000	66.249	
		4.152	2.210	0.437	0.000	0.000	0.000	0.000	0.000	55.363	
		6.228	2.210	0.437	0.000	0.000	0.000	0.000	0.000	44.478	
		8.304	2.210	0.437	0.000	0.000	0.000	0.000	0.000	33.592	
		10.380	2.210	0.437	0.000	0.000	0.000	0.000	0.000	22.706	
		12.456	2.210	0.437	0.000	0.000	0.000	0.000	0.000	11.820	
		14.532	2.210	0.437	0.000	0.000	0.000	0.000	0.000	0.934	
		16.608	2.210	0.437	0.000	0.000	0.000	0.000	0.000	-9.952	



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Job No  
**P402110046**

Sheet No  
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Rev

Part Section B' - Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 27-Jan-12 Chd J Kemnitz

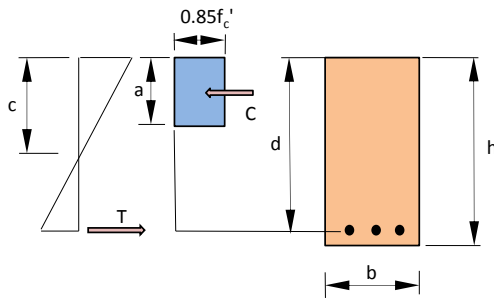
Client ODOT

File Section B' Frame 10.std Date/Time 24-Feb-2012 08:59

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		18.684	2.210	0.437	0.000	0.000	0.000	0.000	0.000	-20.838	
		20.760	2.210	0.437	0.000	0.000	0.000	0.000	0.000	-31.724	
	12:LL7 TWO L/	0.000	51.093	13.181	0.000	0.000	0.000	0.000	0.000	2.33E+3	
		2.076	51.093	13.181	0.000	0.000	0.000	0.000	0.000	2E+3	
		4.152	51.093	13.181	0.000	0.000	0.000	0.000	0.000	1.67E+3	
		6.228	51.093	13.181	0.000	0.000	0.000	0.000	0.000	1.34E+3	
		8.304	51.093	13.181	0.000	0.000	0.000	0.000	0.000	1.01E+3	
		10.380	51.093	13.181	0.000	0.000	0.000	0.000	0.000	684.367	
		12.456	51.093	13.181	0.000	0.000	0.000	0.000	0.000	355.997	
		14.532	51.093	13.181	0.000	0.000	0.000	0.000	0.000	27.626	
		16.608	51.093	13.181	0.000	0.000	0.000	0.000	0.000	-300.744	
		18.684	51.093	13.181	0.000	0.000	0.000	0.000	0.000	-629.114	
		20.760	51.093	13.181	0.000	0.000	0.000	0.000	0.000	-957.484	
	13:LL8 THREE	0.000	80.261	14.548	0.000	0.000	0.000	0.000	0.000	2.58E+3	
		2.076	80.261	14.548	0.000	0.000	0.000	0.000	0.000	2.22E+3	
		4.152	80.261	14.548	0.000	0.000	0.000	0.000	0.000	1.86E+3	
		6.228	80.261	14.548	0.000	0.000	0.000	0.000	0.000	1.5E+3	
		8.304	80.261	14.548	0.000	0.000	0.000	0.000	0.000	1.13E+3	
		10.380	80.261	14.548	0.000	0.000	0.000	0.000	0.000	771.053	
		12.456	80.261	14.548	0.000	0.000	0.000	0.000	0.000	408.632	
		14.532	80.261	14.548	0.000	0.000	0.000	0.000	0.000	46.211	
		16.608	80.261	14.548	0.000	0.000	0.000	0.000	0.000	-316.211	
		18.684	80.261	14.548	0.000	0.000	0.000	0.000	0.000	-678.632	
		20.760	80.261	14.548	0.000	0.000	0.000	0.000	0.000	-1.04E+3	
	11:ALL DEAD I	0.000	42.177	8.376	0.000	0.000	0.000	0.000	0.000	1.48E+3	
		2.076	43.816	8.376	0.000	0.000	0.000	0.000	0.000	1.27E+3	
		4.152	45.454	8.376	0.000	0.000	0.000	0.000	0.000	1.06E+3	
		6.228	47.093	8.376	0.000	0.000	0.000	0.000	0.000	854.201	
		8.304	48.731	8.376	0.000	0.000	0.000	0.000	0.000	645.548	
		10.380	50.370	8.376	0.000	0.000	0.000	0.000	0.000	436.894	
		12.456	52.008	8.376	0.000	0.000	0.000	0.000	0.000	228.241	
		14.532	53.647	8.376	0.000	0.000	0.000	0.000	0.000	19.588	
		16.608	55.285	8.376	0.000	0.000	0.000	0.000	0.000	-189.066	
		18.684	56.924	8.376	0.000	0.000	0.000	0.000	0.000	-397.719	
		20.760	58.562	8.376	0.000	0.000	0.000	0.000	0.000	-606.372	

### Floor Beam Postive Moment Section



b =	92.88	in
d =	48.38	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	14.14	in <sup>2</sup>
% Steel Loss =	0%	

(5 - 1 1/8" □,  
5 - 1 1/4" □)  
from 49/246 of  
original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	14.141	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.069		Balanced reinforcement ratio, AASHTO Eq. 8-18
β <sub>1</sub> =	0.825		Ratio of depth, Section 8.16.2.7
0.75*A <sub>sb</sub> =	233.61	in <sup>2</sup>	75% of steel required for balanced condions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.3
a =	1.314	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1670.0	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Moment

Total Service Positive Dead Load Moment = 271.6 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	39.5	42.7	28.5	36.8	35.6	36.8	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	51.4	55.5	37.1	47.8	46.3	47.8	kips
Reaction per Wheel (LL+I) =	25.7	27.8	18.5	23.9	23.1	23.9	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

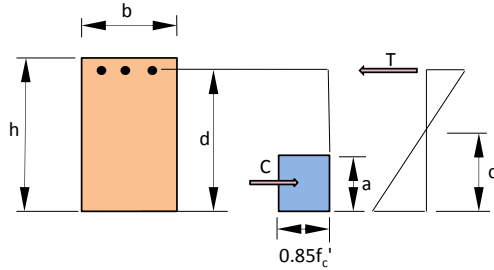
From STAAD							
Max. Positive LL+I Moment =	489.8	529.5	353.4	456.3	441.4	456.3	ft*kips

Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.15	41.3 Tons	HS22.9
	HS20	36 Tons	RF=1.91	68.9 Tons	HS38.3
Operating	2F1	15 Tons	RF=2.87	43.0 Tons	
	3F1	23 Tons	RF=2.22	51.1 Tons	
	4F1	27 Tons	RF=2.29	62.0 Tons	
	5C1	40 Tons	RF=2.22	88.8 Tons	
	Ohio Legal %	220%			

### Floor Beam Negative Moment Section



b =	21	in
d =	66.375	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	8	in <sup>2</sup>
% Steel Loss =	0%	

(8 - 1" □) from  
49/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	8.000	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
β <sub>1</sub> =	0.850		Ratio of depth, Section 8.16.2.7
0.75*A <sub>sb</sub> =	49.78	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.3
a =	4.930	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1265.4	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Moment

Moment taken at face of column

Total Service Negative Dead Load Moment = 69.8 ft\*kips From Staad

#### Live Load Moment

Moment taken at face of column

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Negative LL+I Moment =		130.6	141.2	94.2	121.7	117.7	121.7

ft\*kips

Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=3.83	138.0 Tons	HS76.7
Operating	HS20	36 Tons	RF=6.40	230.4 Tons	HS128.0
	2F1	15 Tons	RF=9.59	143.8 Tons	
	3F1	23 Tons	RF=7.43	170.8 Tons	
	4F1	27 Tons	RF=7.68	207.3 Tons	
	5C1	40 Tons	RF=7.43	297.1 Tons	
	Ohio Legal %	745%			



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 Checked by: **JMK** Date: **2/17/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Built Concrete Frame Rating (Frame 10)**

## Floor Beam Shear Section

### Section Capacity

Taken at face of column

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed conservatively)
$d =$	<input type="text" value="66.375"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="152.7"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="154.6"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="261.2"/>	kips	Shear Capacity of Section

### Dead Load Shear

Dead Load shear is taken at face of column

Total Service Dead Load Shear =  kips From Staad

### Live Load Shear

Live Load shear is taken at face of column

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="69.7"/>	75.3	50.3	64.9	62.8	64.9	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.29	46.4 Tons	HS25.8
Operating	HS20	36 Tons	RF=2.15	77.5 Tons	HS43.1
	2F1	15 Tons	RF=3.23	48.4 Tons	
	3F1	23 Tons	RF=2.50	57.5 Tons	
	4F1	27 Tons	RF=2.58	69.7 Tons	
	5C1	40 Tons	RF=2.50	99.9 Tons	
	Ohio Legal %	250%			



### Column Section

$h =$	<input type="text" value="36"/>	in	Column Depth
$b =$	<input type="text" value="21"/>	in	Column Width
$A_s =$	<input type="text" value="8"/>	in <sup>2</sup>	Area of Tension Steel (8- 1" □ bars)
$A'_s =$	<input type="text" value="4"/>	in <sup>2</sup>	Area of Compression Steel (4- 1" □ bars)
$d =$	<input type="text" value="33"/>	in	Distance from compression face to centroid of tension steel
$d' =$	<input type="text" value="3"/>	in	Distance from compression face to centroid of compression steel
$f_c =$	<input type="text" value="3"/>	ksi	Concrete Strength
$f_y =$	<input type="text" value="33"/>	ksi	Steel Yield Stress
$E_s =$	<input type="text" value="29000"/>	ksi	Modulus of elasticity of steel
$\epsilon_u =$	<input type="text" value="0.003"/>	in/in	Ultimate concrete strain
$\beta_1 =$	<input type="text" value="0.85"/>		
$d'' =$	<input type="text" value="15"/>	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads** (Dead Load moment taken at the top of column, just below column chamfer)

Total Service Dead Load Moment=	<input type="text" value="98.9"/>	ft-kips	From Staad
Total Service Dead Load Axial Force=	<input type="text" value="41.9"/>	kips	From Staad

**Live Loads** (Live Load moment taken at the top of column, just below column chamfer)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	<input type="text" value="178.5"/>		193.0	128.8	166.3	160.9	166.3	ft-kips
Max. LL+I Axial Force =	<input type="text" value="69.7"/>		75.3	46.5	90.0	67.4	72.0	kips

Maximum Moment and Axial load results from 3 lanes loaded..

### Section Capacity

#### Balanced Condition

$a_b =$	<input type="text" value="20.34"/>	in	$a_b = (87 / (87+f_y)) * \beta_1 * d$	Depth of stress block for balanced conditions, AASHTO 8-34
$c_b =$	<input type="text" value="23.93"/>	in	$c_b = a_b / \beta_1$	Depth to neutral axis for balanced conditions
$f_s =$	<input type="text" value="33"/>	ksi	$f_s = 87 * (1 - (d'/d)) * ((87+f_y)/87)$	Stress in comp. steel at balanced condition ( $\leq f_y$ ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

$P_b =$	<input type="text" value="957.0"/>	kip	$P_b = .85 * f_c * b * a_b + A'_s * f_s - A_s * f_y$
$M_b =$	<input type="text" value="1205.7"/>	ft-kip	$M_b = 0.85 * f_c * b * a_b * (d - d'' - a_b/2) + A'_s * f_s * (d - d' - d'') + A_s * f_y * d''$

Any choice of c smaller than  $c_b$  will result in tension failure of the column, any choice greater than  $c_b$  will result in compression failure of the column.

#### Pure Axial Compression Capacity

$P_o =$	<input type="text" value="2293.2"/>	kips	$P_o = .85 * f_c * (A_g - A_{st}) + A_{st} * f_y$	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
$\phi P_o =$	<input type="text" value="1605.2"/>	kips		



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Subject:	As-Built Concrete Frame Rating (Frame 10)				

**Pure Bending Capacity** (Ignoring compression steel)

$a =$	4.930	in	$a = A_s * f_y / 0.85 * f'_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	671.8	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	604.6	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **13.53** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a =$	11.5041	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	616.0	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	338.8	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	786.6	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	27.86	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	205.7	218.0	155.4	249.8	200.8	210.8	kips
$M_u =$	515.9	547.3	408.0	489.4	477.7	489.4	ft-kips
$e =$	30.09	30.13	31.51	23.51	28.55	27.86	in
$\phi P_n =$	306.14	305.66	288.07	420.15	328.20	338.83	kips
$\phi M_n =$	767.76	767.46	756.30	823.31	780.76	786.64	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value in until the calculated the eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.53	54.9 Tons	HS30.5
Operating	HS20	36 Tons	RF=2.55	91.7 Tons	HS50.9
	2F1	15 Tons	RF=3.75	56.2 Tons	
	3F1	23 Tons	RF=3.13	71.9 Tons	
	4F1	27 Tons	RF=3.12	84.2 Tons	
	5C1	40 Tons	RF=3.04	121.4 Tons	
Ohio Legal %	305%				

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.15	RF=41.26	HS22.9
Operating	HS20	36 Tons	RF=1.91	RF=68.88	HS38.3
	2F1	15 Tons	RF=2.87	RF=43.00	
	3F1	23 Tons	RF=2.22	RF=51.06	
	4F1	27 Tons	RF=2.29	RF=61.96	
	5C1	40 Tons	RF=2.22	RF=88.80	
Ohio Legal %	220%				

Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment



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**BRIDGE LOAD RATING SUMMARY REPORT**

**CUY-2-1441**

**SECTION D**

SFN	BRIDGE NUMBER	DISTRICT
1800035	CUY-2-1441	12
ORIGINAL CONSTRUCTION YEAR	REHABILITATION YEAR	OVERALL STRUCTURE LENGTH (FT)
1938 - 1940	1991 - 1992	6580
<b>FEATURE INTERSECTED:</b>	NUMEROUS LOCAL STREETS, RTA RAILROAD TRACKS AND THE CUYAHOGA RIVER	
<b>SPECIAL ASSUMPTIONS &amp; COMMENTS</b>		
<b>RATING &amp; ANALYSIS OPTION:</b>		
<b>LOAD RATING PURPOSE:</b>	LOAD RATING FOR FUTURE REHABILITATION RECOMMENDATIONS	
<b>RATING SOFTWARE:</b>	STAAD, CONSYS	
<b>BASIS OF ANALYSIS:</b>	EXISTING PLANS AND FIELD MEASUREMENTS	
<b>METHOD OF ANALYSIS:</b>	LOAD FACTOR	
<b>DESIGN LOADING (ORIGINAL):</b>	H20-33	
<b>STRUCTURE RATING SUMMARY</b>		
LOADING & RATING TYPE	RATING FACTOR - RF (ROUNDED TO 2 DECIMAL POINTS)	RATING LOAD
INVENTORY CURRENT DESIGN	1.07	HS21.4
OPERATING CURRENT DESIGN	1.78	
OHIO LEGAL - 2F1	2.64	<b>OHIO LEGAL LOADS OVERALL MINIMUM RATING FACTOR</b>
OHIO LEGAL - 3F1	2.04	1.97
OHIO LEGAL - 4F1	1.97	<b>OHIO LEGAL LOADS OVERALL CONTROLLING TRUCK</b>
OHIO LEGAL - 5C1	1.97	4F1 & 5C1
RATED BY, PE#	REVIEWED BY, PE#	REPORT DATE
Matt Johnson, PE	Jason Kemnitz, PE	3/2/2012
AGENCY/FIRM	PHONE NUMBER	EMAIL
Transystems	216-861-1780	mjohnson@transystems.com

**SFN: 1800035 BRIDGE NO.: CUY-2-1441**

# SUMMARY SHEET

## West Approach - Section D

**CUY-2-1441 Load Rating Analysis  
Main Ave Bridge**

Calculated: MJJ 3/1/2012  
Checked: JMK 3/1/2012  
Revised: CTG 5/14/2012

### As-Built Controlling Rating Factor Summary

Item	Location/ Member	HS20 Inventory	HS20 Operating	2F1 Operating	3F1 Operating	4F1 Operating	5C1 Operating	
Frame Cap	Frame 21 / Pos Moment	1.07	1.78	2.64	2.04	2.10	2.04	
Deck	Deck	1.30	2.17	3.47	2.54	2.93	2.54	

### As-Inspected Controlling Rating Factor Summary

Item	Location/ Member	HS20 Inventory	HS20 Operating	2F1 Operating	3F1 Operating	4F1 Operating	5C1 Operating	
Frame Cap	Frame 21 / Pos Moment	1.07	1.78	2.64	2.04	2.10	2.04	
Frame Cap	Frame 16/ Pos Moment	1.09	1.83	3.05	2.07	1.97	1.97	
Deck	Deck	1.30	2.17	3.47	2.54	2.93	2.54	

### Overall Summary

Case	Rating Factor	Tonnage	HS equivalent or Ohio Legal Load %
HS20 Inventory	1.07	38.52	HS21.4
HS20 Operating	1.78	64.08	HS35.6
2F1	2.64	39.60	195%
3F1	2.04	46.92	
4F1	1.97	53.19	
5C1	1.97	78.80	



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 Checked by: **DBH** Date: **2/29/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **Profile Grade Elevations - Section D**

**Curve 1 Information**

At Beg. VPI	At PI VPI	At End VPI
<b>11+20.</b> PI <sub>Curve</sub> (Station)	<b>13+15.</b> PI <sub>Curve</sub> (Station)	<b>15+10.</b> PI <sub>Curve</sub> (Station)
<b>686.04</b> PI <sub>Elev</sub> (ft)	<b>693.84</b> PI <sub>Elev</sub> (ft)	<b>688.91625</b> PI <sub>Elev</sub> (ft)
4.000% g <sub>1</sub> (%)		
-2.525% g <sub>2</sub> (%)		
390.00 L <sub>c</sub> (feet)		
-1.67308 r (1/feet)		

**Curve 2 Information (If Applicable)**

At Beg. VPI	At PI VPI	At End VPI
<b>16+92.</b> PI <sub>Curve</sub> (Station)	<b>17+87.</b> PI <sub>Curve</sub> (Station)	<b>18+82.</b> PI <sub>Curve</sub> (Station)
<b>684.32</b> PI <sub>Elev</sub> (ft)	<b>681.92</b> PI <sub>Elev</sub> (ft)	<b>681.92</b> PI <sub>Elev</sub> (ft)
-2.526% g <sub>1</sub> (%)		
0.000% g <sub>2</sub> (%)		
190.00 L <sub>c</sub> (feet)		
1.3296 r (1/feet)		

Cross Slope	Station
-1.56%	13+50.
-4.00%	14+50.

(Negative is down toward north)

-0.024%	% change per foot
---------	-------------------

**13+77.89** Station at beginning of section

Location	Distance	Station	New Profile Grade Elevation		Elev. from original plans	Cross Slope	Elevations after rehab	
			Rehab	Original			North Gutter Elevation	South Gutter Elevation
Frame 1	2.667	13+80.56	690.68	115.88	114.912	-2.31%	115.429	116.352
Frame 2	10.146	13+90.7	690.63	115.83	114.863	-2.55%	115.336	116.357
Frame 3	10.169	14+00.87	690.57	115.77	114.736	-2.80%	115.225	116.346
Frame 4	10.138	14+11.01	690.49	115.69	114.712	-3.05%	115.097	116.317
Frame 5	10.138	14+21.15	690.40	115.60	114.612	-3.30%	114.952	116.271
Frame 6	6.344	14+27.49	690.33	115.53	114.540	-3.45%	114.853	116.233
Frame 7	10.138	14+37.63	690.20	115.40	114.411	-3.70%	114.680	116.159
Frame 8	10.138	14+47.77	690.06	115.26	114.266	-3.95%	114.490	116.068
Frame 9	10.138	14+57.91	689.90	115.10	114.103	-4.00%	114.320	115.920
Frame 10	10.138	14+68.04	689.72	114.92	113.923	-4.00%	114.144	115.744
Frame 11	6.344	14+74.39	689.61	114.81	113.804	-4.00%	114.025	115.625
Frame 12	10.138	14+84.53	689.40	114.60	113.537	-4.00%	113.821	115.421
Frame 13	10.138	14+94.66	689.18	114.38	113.372	-4.00%	113.600	115.200
Frame 14	10.138	15+04.8	688.94	114.14	113.130	-4.00%	113.361	114.961
Frame 15	10.138	15+14.94	688.69	113.89	112.871	-4.00%	113.107	114.707
Frame 16	6.344	15+21.28	688.53	113.73	112.707	-4.00%	112.947	114.547
Frame 17	10.138	15+31.42	688.27	113.47	112.440	-4.00%	112.691	114.291



Made by: **MJJ** Date: **2/20/2012** Job No: **P402110046**  
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 Subject: **Profile Grade Elevations - Section D**

Frame 18	10.138	15+41.56	688.02	113.22	112.173	-4.00%	112.435	114.035
Frame 19	10.138	15+51.7	687.76	112.96	111.906	-4.00%	112.179	113.779
Frame 20	10.138	15+61.84	687.50	112.70	111.639	-4.00%	111.923	113.523
Frame 21	6.344	15+68.18	687.34	112.54	111.473	-4.00%	111.763	113.363
Frame 22	10.138	15+78.32	687.09	112.29	111.206	-4.00%	111.507	113.107
Frame 23	10.138	15+88.46	686.83	112.03	110.939	-4.00%	111.251	112.851
Frame 24	10.138	15+98.59	686.58	111.78	110.672	-4.00%	110.995	112.595
Frame 25	10.138	16+08.73	686.32	111.52	110.495	-4.00%	110.739	112.339
Frame 26	6.344	16+15.08	686.16	111.36	110.238	-4.00%	110.579	112.179
Frame 27	10.138	16+25.21	685.90	111.10	109.972	-4.00%	110.323	111.923
Frame 28	10.138	16+35.35	685.65	110.85	109.705	-4.00%	110.067	111.667
Frame 29	10.138	16+45.49	685.39	110.59	109.438	-4.00%	109.811	111.411
Frame 30	10.138	16+55.63	685.13	110.33	109.176	-4.00%	109.555	111.155
Frame 31	6.344	16+61.97	684.97	110.17	109.018	-4.00%	109.395	110.995
Frame 32	10.138	16+72.11	684.72	109.92	108.771	-4.00%	109.139	110.739
Frame 33	10.138	16+82.25	684.46	109.66	108.533	-4.00%	108.883	110.483
Frame 34	10.138	16+92.39	684.21	109.41	108.304	-4.00%	108.626	110.226
Frame 35	10.138	17+02.52	683.96	109.16	108.084	-4.00%	108.377	109.977
Frame 36	6.344	17+08.87	683.81	109.01	107.951	-4.00%	108.229	109.829
Frame 37	10.138	17+19.01	683.58	108.78	107.745	-4.00%	108.002	109.602
Frame 38	10.138	17+29.14	683.37	108.57	107.548	-4.00%	107.789	109.389
Frame 39	10.138	17+39.28	683.17	108.37	107.361	-4.00%	107.590	109.190
Frame 40	10.138	17+49.42	682.98	108.18	107.182	-4.00%	107.404	109.004
Frame 41	6.344	17+55.76	682.88	108.08	107.075	-4.00%	107.295	108.895
Frame 42	10.138	17+65.9	682.71	107.91	106.910	-4.00%	107.132	108.732
Frame 43	10.138	17+76.04	682.56	107.76	106.755	-4.00%	106.982	108.582
Frame 44	10.138	17+86.18	682.43	107.63	106.608	-4.00%	106.846	108.446
Frame 45	10.138	17+96.32	682.30	107.50	106.470	-4.00%	106.724	108.324
Frame 46	6.344	18+02.66	682.23	107.43	106.388	-4.00%	106.654	108.254
Frame 47	10.138	18+12.8	682.13	107.33	106.265	-4.00%	106.554	108.154
Frame 48	10.146	18+22.94	682.05	107.25	106.151	-4.00%	106.468	108.068
Frame 49	10.146	18+33.09	681.97	107.17	106.045	-4.00%	106.395	107.995
Frame 50	10.146	18+43.24	681.92	107.12	105.949	-4.00%	106.336	107.936

Elevation Equation from rehab plans sheet G7/93 is (Rehab El. + 574.8 ft = Original El.)

From 118/991 of rehab plans, cross slope through Section M varies from 1.56% to 4%

North and south gutterline elevations after rehab are used to determine the haunch dead load to add on Staad model



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 Project: CUY-2-14.41 (Main Avenue Bridge)  
 Subject: Profile Grade Elevations - Section D

**Section D, North Ramp, West Approach - Frame Column Heights**

Frame No.	Rehab North Gutter El.	Rehab South Gutter El.	Original Grade El.	Orig. Bot of Foot. (North)	Orig. Bot of Foot. (South)	**North Col. Height (Col 1)	**South Col. Height (Col 2)
Frame 1	115.429	116.352	114.912	85.0	89.0	25.66	21.66
Frame 2	115.336	116.357	114.863	85.0	89.0	25.61	21.61
Frame 3	115.225	116.346	114.736	85.0	89.0	25.49	21.49
Frame 4	115.097	116.317	114.712	85.0	89.0	25.46	21.46
Frame 5	114.952	116.271	114.612	85.0	89.0	25.36	21.36
Frame 6	114.853	116.233	114.540	85.0	89.0	25.29	21.29
Frame 7	114.680	116.159	114.411	85.0	89.0	25.16	21.16
Frame 8	114.490	116.068	114.266	85.0	89.0	25.02	21.02
Frame 9	114.320	115.920	114.103	85.0	89.0	24.85	20.85
Frame 10	114.144	115.744	113.923	85.0	89.0	24.67	20.67
Frame 11	114.025	115.625	113.804	85.0	88.0	24.55	21.55
Frame 12	113.821	115.421	113.537	85.0	88.0	24.29	21.29
Frame 13	113.600	115.200	113.372	85.0	88.0	24.12	21.12
Frame 14	113.361	114.961	113.130	85.0	88.0	23.88	20.88
Frame 15	113.107	114.707	112.871	85.0	86.0	23.62	22.62
Frame 16	112.947	114.547	112.707	83.0	86.0	25.46	22.46
Frame 17	112.691	114.291	112.440	83.0	86.0	25.19	22.19
Frame 18	112.435	114.035	112.173	83.0	86.0	24.92	21.92
Frame 19	112.179	113.779	111.906	83.0	86.0	24.66	21.66
Frame 20	111.923	113.523	111.639	83.0	86.0	24.39	21.39
Frame 21	111.763	113.363	111.473	83.0	84.0	24.22	23.22
Frame 22	111.507	113.107	111.206	83.0	84.0	23.96	22.96
Frame 23	111.251	112.851	110.939	83.0	84.0	23.69	22.69
Frame 24	110.995	112.595	110.672	83.0	84.0	23.42	22.42
Frame 25	110.739	112.339	110.495	83.0	84.0	23.25	22.25
Frame 26	110.579	112.179	110.238	81.0	84.0	24.99	21.99
Frame 27	110.323	111.923	109.972	81.0	84.0	24.72	21.72
Frame 28	110.067	111.667	109.705	81.0	84.0	24.46	21.46
Frame 29	109.811	111.411	109.438	81.0	84.0	24.19	21.19
Frame 30	109.555	111.155	109.176	81.0	84.0	23.93	20.93
Frame 31	109.395	110.995	109.018	79.0	82.0	25.77	22.77
Frame 32	109.139	110.739	108.771	79.0	82.0	25.52	22.52
Frame 33	108.883	110.483	108.533	79.0	82.0	25.28	22.28
Frame 34	108.626	110.226	108.304	79.0	82.0	25.05	22.05
Frame 35	108.377	109.977	108.084	79.0	82.0	24.83	21.83
Frame 36	108.229	109.829	107.951	79.0	82.0	24.70	21.70
Frame 37	108.002	109.602	107.745	79.0	82.0	24.50	21.50
Frame 38	107.789	109.389	107.548	79.0	82.0	24.30	21.30
Frame 39	107.590	109.190	107.361	79.0	82.0	24.11	21.11
Frame 40	107.404	109.004	107.182	79.0	82.0	23.93	20.93
Frame 41	107.295	108.895	107.075	77.0	82.0	25.83	20.83
Frame 42	107.132	108.732	106.910	77.0	82.0	25.66	20.66
Frame 43	106.982	108.582	106.755	77.0	82.0	25.51	20.51
Frame 44	106.846	108.446	106.608	77.0	82.0	25.36	20.36
Frame 45	106.724	108.324	106.470	77.0	79.0	25.22	23.22
Frame 46	106.654	108.254	106.388	75.0	79.0	27.14	23.14
Frame 47	106.554	108.154	106.265	75.0	79.0	27.02	23.02
Frame 48	106.468	108.068	106.151	75.0	79.0	26.90	22.90
Frame 49	106.395	107.995	106.045	75.0	79.0	26.80	22.80
Frame 50	106.336	107.936	105.949	75.0	79.0	26.70	22.70

\*Original grade elevations are from original plans, sheet 46/246.

\*\*Heights are from top of footing to original center of cap. Cap is 4'-6" deep, this is the original cap depth including slab. The bottom of footing elevations are from original plans, sheet 46/246.



Slab, Haunch and Diaphragm Dead Loads are directly input into Staad for analysis. Concrete wearing surface and Live loads are input into Consys as continuous loads to determine reactions. The reactions determined by Consys are input into Staad for analysis. Frame self weight is directly calculated by Staad.

**Slab Dead Loads**      *Slab is 10" thick lightweight concrete (113 lbs/ft<sup>3</sup>).*

Slab Dead Load Frame 1 and 50:

$$\text{Slab}_{DL} = \boxed{0.776} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (10.15\text{ft}/2 + 3.167\text{ft}) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frame 2:

$$\text{Slab}_{DL} = \boxed{0.957} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (10.15\text{ft}/2 + 10.17\text{ft}/2) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frame 3:

$$\text{Slab}_{DL} = \boxed{0.957} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (10.138\text{ft}/2 + 10.17\text{ft}/2) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frames 4, 7-9, 12-14, 17-19, 22-24, 27-29, 32-34, 37-39, 42-44:

$$\text{Slab}_{DL} = \boxed{0.955} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times 10.138\text{ft} \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frames 5-6, 10-11, 15-16, 20-21, 25-26, 30-31, 35-36, 40-41 and 45

$$\text{Slab}_{DL} = \boxed{0.776} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (10.138\text{ft}/2 + 6.35\text{ft}/2) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frame 46:

$$\text{Slab}_{DL} = \boxed{0.776} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (6.35\text{ft}/2 + 10.138\text{ft}/2) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frames 47-49:

$$\text{Slab}_{DL} = \boxed{0.776} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (6.35\text{ft}/2 + 10.138\text{ft}/2) \times 113 \text{ lbs/ft}^3$$

**Beam Haunch Dead Loads:**

*Haunch Height varies across frames due to superelevation in deck.  
Haunch Heights are calculated in Section D Elevations.xls*

Haunch Dead Load Frame 1:

$$\text{Haunch Height at North Column} = \boxed{0.517} \quad \text{Haunch Height at South Column} = \boxed{1.44}$$

$$\begin{aligned} \text{Hanch}_{DL\text{North}} &= \boxed{0.102} \text{ kips/ft} & \text{Hanch}_{DL} &= \text{Haunch Height} \times 21\text{in} \times 113 \text{ lbs/ft}^3 \\ \text{Hanch}_{DL\text{South}} &= \boxed{0.285} \text{ kips/ft} \end{aligned}$$



Haunch Dead Load Frame 2:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 3:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 4:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 5:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 6:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 7:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft



Haunch Dead Load Frame 8:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 9:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 10:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 11:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 12:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 13:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft





Haunch Dead Load Frame 14:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 15:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 16:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 17:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 18:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 19:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft



Haunch Dead Load Frame 20:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 21:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 22:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 23:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 24:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 25:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft



Haunch Dead Load Frame 26:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 27:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 28:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 29:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 30:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 31:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft



Haunch Dead Load Frame 32:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 33:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 34:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 35:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 36:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 37:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft



Haunch Dead Load Frame 38:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 39:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 40:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 41:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 42:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 43:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft



Haunch Dead Load Frame 44:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 45:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 46:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 47:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 48:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 49:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft



Made by:	MJJ	Date:	2/21/2012	Job No:	P402110046
Checked by:	DBH	Date:	2/29/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	Dead Load Calculations for Frames (Section D)				

Haunch Dead Load Frame 50:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

**Diaphragm Dead Loads:**      *Diaphragm is assumed to be all 150 lb/ft<sup>3</sup> concrete*

Diaphragm Dead Load Frames: 1, 5-6, 10-11, 15-16, 20-21, 25-26, 30-31, 35-36, 40-41, 45-46 and 50

Diaphragm<sub>DL</sub> =  kips      Diaphragm<sub>DL</sub> = 1.5ft x 10.138ft/2 x 2.167ft x 150 lbs/ft<sup>3</sup>

Diaphragm Dead Load Frames: 4, 7-9, 12-14, 17-19, 22-24, 27-29, 32-34, 37-39, 42-44 and 47-49:

Diaphragm<sub>DL</sub> =  kips      Diaphragm<sub>DL</sub> = 1.5ft x 10.138ft x 2.167ft x 150 lbs/ft<sup>3</sup>



**NonComposite Dead Load Summary for Staad Input**

Frame No.	Slab DL (kips/ft)	Haunch DL (kips/ft)		Diap. DL (kips)
		North Col.	South Col.	
1	0.776	0.102	0.285	2.47
2	0.957	0.094	0.295	4.94
3	0.957	0.097	0.318	4.94
4	0.955	0.076	0.317	4.94
5	0.776	0.067	0.328	2.47
6	0.776	0.062	0.335	2.47
7	0.955	0.053	0.346	4.94
8	0.955	0.044	0.356	4.94
9	0.955	0.043	0.359	4.94
10	0.776	0.044	0.360	2.47
11	0.776	0.044	0.360	2.47
12	0.955	0.056	0.373	4.94
13	0.955	0.045	0.361	4.94
14	0.955	0.046	0.362	4.94
15	0.776	0.047	0.363	2.47
16	0.776	0.047	0.364	2.47
17	0.955	0.050	0.366	4.94
18	0.955	0.052	0.368	4.94
19	0.955	0.054	0.370	4.94
20	0.776	0.056	0.373	2.47
21	0.776	0.057	0.374	2.47
22	0.955	0.060	0.376	4.94
23	0.955	0.062	0.378	4.94
24	0.955	0.064	0.380	4.94
25	0.776	0.048	0.365	2.47
26	0.776	0.067	0.384	2.47
27	0.955	0.069	0.386	4.94
28	0.955	0.072	0.388	4.94
29	0.955	0.074	0.390	4.94
30	0.776	0.075	0.391	2.47
31	0.776	0.075	0.391	2.47
32	0.955	0.073	0.389	4.94
33	0.955	0.069	0.386	4.94
34	0.955	0.064	0.380	4.94
35	0.776	0.058	0.374	2.47
36	0.776	0.055	0.371	2.47
37	0.955	0.051	0.367	4.94
38	0.955	0.048	0.364	4.94
39	0.955	0.045	0.362	4.94
40	0.776	0.044	0.360	2.47
41	0.776	0.044	0.360	2.47
42	0.955	0.044	0.360	4.94
43	0.955	0.045	0.361	4.94
44	0.955	0.047	0.364	4.94
45	0.776	0.050	0.367	2.47
46	0.776	0.053	0.369	2.47
47	0.776	0.057	0.374	4.94
48	0.776	0.063	0.379	4.94
49	0.776	0.069	0.386	4.94
50	0.776	0.076	0.393	2.47

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**Soil Loads** Soil load is applied to south column only. Wall between columns is assumed to transfer load to columns. At-rest condition assumed. Soil Unit weight assumed to be 120 lbs/ft<sup>3</sup>.

Frame No.	Height of South Wall	Int. Soil Height Ratio	Ext. Soil Height Ratio	kips	
				Int. Load at Btm. of Wall	Ext. Load at Btm. of Wall
1	21.66				
2	21.61				
3	21.49				
4	21.46				
5	21.36				
6	21.29				
7	21.16				
8	21.02				
9	20.85				
10	20.67				
<b>Soil Heights on Interior and Exterior are approximately the same for frames 1-10.</b>					
11	21.55	0.24	0.27	2.30	2.59
12	21.29	0.19	0.3	2.21	3.49
13	21.12	0.17	0.33	1.96	3.81
14	20.88	0.18	0.37	2.05	4.22
15	22.62	0.16	0.39	1.61	3.92
16	22.46	0.16	0.4	1.60	4.00
17	22.19	0.16	0.43	1.94	5.21
18	21.92	0.15	0.48	1.80	5.75
19	21.66	0.14	0.5	1.66	5.92
20	21.39	0.14	0.53	1.33	5.04
21	23.22	0.2	0.57	2.07	5.89
22	22.96	0.16	0.610	2.01	7.65
23	22.69	0.15	0.640	1.86	7.94
24	22.42	0.15	0.660	1.84	8.09
25	22.25	0.14	0.660	1.39	6.53
26	21.99	0.14	0.680	1.37	6.65
27	21.72	0.13	0.700	1.54	8.31
28	21.46	0.13	0.740	1.52	8.68
29	21.19	0.12	0.760	1.39	8.80
30	20.93	0.12	0.790	1.12	7.35
31	22.77	0.23	0.830	2.33	8.41
32	22.52	0.23	0.850	2.83	10.46
33	22.28	0.2	0.900	2.44	10.96
34	22.05	0.19	0.910	2.29	10.97
35	21.83	0.18	0.930	1.75	9.03
36	21.70	0.18	0.940	1.74	9.07
37	21.50	0.18	0.950	2.11	11.16
38	21.30	0.17	0.960	1.98	11.17
39	21.11	0.17	0.980	1.96	11.31
40	20.93	0.16	1.000	1.49	9.31
41	20.83	0.16	1.000	1.48	9.26
42	20.66	0.16	1.000	1.81	11.29
43	20.51	0.15	1.000	1.68	11.21
44	20.36	0.15	1.000	1.67	11.13
45	23.22	0.18	1.000	1.86	10.33
46	23.14	0.17	1.000	1.75	10.23
47	23.02	0.16	1.000	2.01	12.33
48	22.90	0.15	1.000	1.88	12.27
49	22.80	0.14	1.000	1.74	12.22
50	22.70	0.13	1.000	1.31	9.88

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Soil Heights are estimated from original bridge plans sheets 24 and 25/246.



Made by:	MJJ	Date:	2/21/2012	Job No:	P402110046
Checked by:	DBH	Date:	2/29/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	Dead Load Calculations for Frames (Section D)				

**Latex Modified Wearing Surface Dead Load**

*Wearing Surface Dead Load is applied to the composite section.  
Unit weight is assumed to be 150 lbs/ft<sup>3</sup>*

$WS_{DL} = 0.625$  kips/ft       $WS_{DL} = 1.25in \times 40 ft \times 150 lbs/ft^3$

**Live Loads**

*See Consys output for live load reactions per lane on each frame.*

live loads are HS20 Truck, HS20 Lane and Ohio Legal Loads shown in Table 1.  
live load positions are shown in table 2.

OHIO LEGAL LOADS		
Load Designation	Load Configuration	Gross Weight
2F1		15 Tons
3F1		23 Tons
4F1		27 Tons
5C1		40 Tons

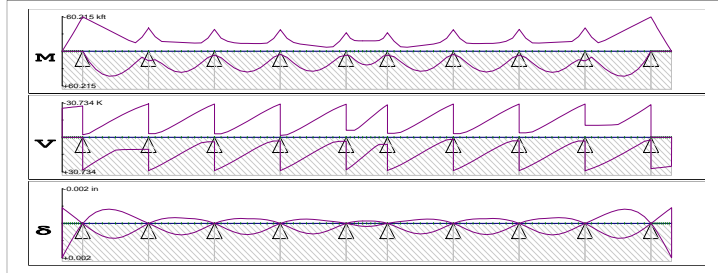
Table 1

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: HS20 Lane Load  
 Type: Lane Load

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	-0.000	-26.000	0.000	-0.000	-0.000	-0.00	-0.00
	0.317	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
		-5.733	0.000	0.000	-18.203	-26.203	0.000	-0.032	-0.032	-0.00	-0.00
	0.633	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
		-11.530	0.000	0.000	-18.405	-26.405	0.000	-0.128	-0.128	-0.00	-0.00
	0.950	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
		-17.391	0.000	0.000	-18.608	-26.608	0.000	-0.289	-0.289	-0.00	-0.00
	1.267	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
		-23.316	0.000	0.000	-18.811	-26.811	0.000	-0.514	-0.514	-0.00	-0.00
	1.583	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
		-29.305	0.000	0.000	-19.013	-27.013	0.000	-0.802	-0.802	-0.00	-0.00
	1.900	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
		-35.359	0.000	0.000	-19.216	-27.216	0.000	-1.155	-1.155	-0.00	-0.00
2.217	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-41.477	0.000	0.000	-19.419	-27.419	0.000	-1.573	-1.573	-0.00	-0.00	
2.534	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-47.659	0.000	0.000	-19.622	-27.621	0.000	-2.054	-2.054	-0.00	-0.00	
2.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-53.905	0.000	0.000	-19.824	-27.824	0.000	-2.600	-2.600	-0.00	-0.00	
3.167	0.000	0.000	0.000	-1.417	29.265	0.000	-3.210	-3.210	0.00	0.00	
	-60.215	16.711	-20.025	-28.368	0.000	-3.292	-3.292	-3.292	0.00	0.00	
1.014	18.547	17.970	-0.030	25.400	22.541	-0.483	0.000	0.000	0.00	0.00	
	-54.363	5.773	0.000	-3.672	22.965	-0.059	-0.059	-0.059	-0.00	-0.00	
2.028	31.877	15.073	-2.927	21.626	40.639	0.000	0.000	0.000	0.00	0.00	
	-48.511	5.773	0.000	-7.043	39.754	0.000	0.000	0.000	-0.00	-0.00	
3.041	40.167	12.233	-5.767	18.016	51.583	0.000	0.000	0.000	0.00	0.00	
	-42.659	5.773	0.000	-10.410	50.376	0.000	0.000	0.000	-0.00	-0.00	
4.055	43.708	9.481	-8.519	14.608	56.030	0.000	0.000	0.000	0.00	0.00	
	-36.807	5.773	0.000	-13.729	55.024	0.000	0.000	0.000	-0.00	-0.00	
5.069	42.913	6.844	-11.156	11.442	54.789	0.000	0.000	0.000	0.00	0.00	
	-30.954	5.773	0.000	-16.955	54.072	0.000	0.000	0.000	-0.00	-0.00	
6.083	38.310	4.352	-13.648	11.128	1.834	-17.864	0.000	0.000	0.00	0.00	
	-25.102	5.773	0.000	-20.041	48.088	0.000	0.000	0.000	-0.00	-0.00	
7.097	30.543	2.033	-15.967	10.966	1.524	-7.733	0.000	0.000	0.00	0.00	
	-19.251	5.772	0.000	-22.940	37.835	0.000	0.000	0.000	-0.00	-0.00	
8.110	20.436	0.684	-17.316	10.860	2.528	0.000	0.000	0.000	0.00	0.00	
	-15.066	0.000	-2.223	-25.602	24.276	-1.624	-1.624	-1.624	-0.00	-0.00	
9.124	10.488	0.888	-17.112	10.803	13.021	0.000	0.000	0.000	0.00	0.00	
	-24.882	0.000	-13.034	-27.979	8.582	-4.270	-4.270	-4.270	-0.00	-0.00	
10.138	0.000	17.021	7.618	-2.455	30.350	0.000	-6.249	-6.249	0.00	0.00	
	-41.014	17.198	-18.083	-30.552	0.000	-6.260	-6.260	-6.260	0.00	0.00	
1.014	14.981	0.000	-1.406	27.240	9.684	-4.430	0.000	0.000	0.00	0.00	
	-25.636	11.302	0.000	-3.328	20.629	0.000	-0.000	-0.000	-0.00	-0.00	
2.028	21.302	16.727	-1.273	24.236	25.050	-1.942	0.000	0.000	0.00	0.00	
	-17.304	3.386	0.000	-5.097	28.259	0.000	0.000	0.000	-0.00	-0.00	
3.041	29.951	14.292	-3.708	20.985	36.857	-0.288	0.000	0.000	0.00	0.00	
	-16.725	0.571	0.000	-7.989	38.496	0.000	0.000	0.000	-0.00	-0.00	
4.055	35.336	11.601	-6.399	17.602	44.215	0.000	0.000	0.000	0.00	0.00	
	-16.147	0.571	0.000	-11.155	44.991	0.000	0.000	0.000	-0.00	-0.00	
5.069	37.038	8.845	-9.155	14.201	46.696	0.000	0.000	0.000	0.00	0.00	
	-15.568	0.571	0.000	-14.490	46.965	0.000	0.000	0.000	-0.00	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)	
3	6.083	34.947	6.099	-11.901	10.890	44.331	0.000	0.00			
		-14.990	0.570	0.000	-17.886	44.071	0.000	-0.00			
	7.097	29.259	3.440	-14.560	7.778	37.589	0.000	0.00			
		-14.412	0.570	0.000	-21.232	36.404	0.000	-0.00			
	8.110	20.559	1.705	-16.295	4.970	27.367	0.000	0.00			
		-14.612	0.000	-2.610	-24.414	24.520	-1.483	-0.00			
	9.124	11.084	0.904	-17.096	4.082	5.437	0.000	0.00			
		-23.087	0.000	-13.134	-27.316	9.443	-3.930	-0.00			
	4	10.138	7.159	3.016	-1.221	30.405	0.000	-5.329	0.00		
			-38.412	16.805	-16.935	-30.392	0.000	-5.324	0.00		
1.014		11.251	17.131	-0.869	27.199	9.483	-3.999	0.00			
		-23.209	12.987	0.000	-3.278	4.673	0.000	-0.00			
2.028		20.802	16.266	-1.734	24.242	24.478	-1.620	0.00			
		-17.617	3.102	0.000	-5.004	27.627	0.000	-0.00			
3.041		29.292	14.312	-3.688	21.009	36.157	-0.075	0.00			
		-15.004	2.522	0.000	-7.871	37.780	0.000	-0.00			
4.055		34.670	11.620	-6.380	17.621	43.517	0.000	0.00			
		-13.980	0.162	0.000	-11.034	44.336	0.000	-0.00			
5.069	36.404	8.852	-9.148	14.197	46.053	0.000	0.00				
	-13.817	0.162	0.000	-14.384	46.436	0.000	-0.00				
6.083	34.348	6.086	-11.914	10.855	43.736	0.000	0.00				
	-13.653	0.161	0.000	-17.805	43.679	0.000	-0.00				
7.097	28.673	3.403	-14.597	7.707	37.005	0.000	0.00				
	-13.490	0.161	0.000	-21.183	36.125	0.000	-0.00				
8.110	19.970	1.604	-16.396	4.864	26.750	0.000	0.00				
	-14.484	0.000	-2.667	-24.397	24.319	-1.500	-0.00				
9.124	10.428	0.769	-17.231	3.394	4.310	0.000	0.00				
	-22.634	0.000	-13.016	-27.325	9.300	-3.974	-0.00				
5	10.138	5.672	2.494	-0.863	30.273	0.000	-6.122	0.00			
		-37.900	16.602	-16.836	-30.131	0.000	-6.123	0.00			
	1.014	10.866	17.338	-0.662	27.123	9.501	-4.050	0.00			
		-22.846	12.739	0.000	-2.353	14.796	0.000	-0.00			
	2.028	20.618	16.335	-1.665	24.057	24.408	-1.651	0.00			
		-15.446	2.933	0.000	-4.932	27.432	0.000	-0.00			
	3.041	28.905	14.091	-3.909	20.714	35.789	-0.076	0.00			
		-12.870	1.400	0.000	-7.922	37.534	0.000	-0.00			
	4.055	33.917	11.327	-6.673	17.230	42.666	0.000	0.00			
		-11.452	1.399	0.000	-11.200	43.813	0.000	-0.00			
5.069	35.197	8.503	-9.497	13.739	44.615	0.000	0.00				
	-10.033	1.399	0.000	-14.641	45.482	0.000	-0.00				
6.083	32.689	5.711	-12.289	10.371	41.745	0.000	0.00				
	-8.614	1.399	0.000	-18.114	42.267	0.000	-0.00				
7.097	26.700	3.039	-14.961	7.253	34.690	0.000	0.00				
	-7.195	1.399	0.000	-21.489	34.429	0.000	-0.00				
8.110	18.284	1.688	-16.312	4.509	24.584	0.000	0.00				
	-8.057	0.000	-6.859	-24.628	22.773	-0.368	-0.00				
9.124	9.700	1.179	-16.821	3.602	5.974	0.000	0.00				
	-17.736	0.000	-12.801	-27.394	8.672	-2.691	-0.00				
6	10.138	7.236	2.672	-2.067	29.735	0.000	-3.803	0.00			
		-32.584	17.747	-16.151	-30.734	0.000	-3.893	0.00			
	0.634	8.445	16.093	-1.907	26.640	5.579	-4.140	0.00			
		-22.805	12.635	0.000	-6.305	3.973	0.000	-0.00			
	1.268	14.560	16.075	-1.925	23.851	15.522	-2.736	0.00			
		-18.897	3.854	0.000	-6.356	1.059	0.000	-0.00			
	1.902	19.789	13.813	-4.187	20.854	23.220	-1.663	0.00			
		-18.465	0.000	0.000	-8.484	25.512	0.000	-0.00			
	2.536	23.072	11.435	-6.565	17.734	28.206	-0.860	0.00			
		-18.465	0.000	0.000	-11.467	29.279	0.000	-0.00			
3.170	24.190	9.000	-9.000	14.578	30.237	-0.259	0.00				
	-18.465	0.000	-7.179	-14.578	30.237	-0.259	-0.00				
3.804	23.072	6.565	-11.435	11.467	29.279	0.000	0.00				
	-18.465	0.000	-0.000	-17.734	28.206	-0.860	-0.00				

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.438	19.789	4.187	-13.813	8.484	25.512	0.000	0.00		
		-18.465	0.000	-0.000	-20.854	23.220	-1.663	-0.00		
	5.072	14.560	1.925	-16.075	6.356	1.059	0.000	0.00		
		-18.897	0.000	-3.854	-23.851	15.522	-2.736	-0.00		
5.706	8.445	1.907	-16.093	6.305	3.973	0.000	0.00			
	-22.805	0.000	-12.635	-26.640	5.579	-4.140	-0.00			
7	6.340									
	0.000	7.236	2.067	-2.672	30.734	0.000	-3.893	0.00		
		-32.584	16.151	-17.747	-29.735	0.000	-3.803	0.00		
	1.014	9.700	16.821	-1.179	27.394	8.672	-2.691	0.00		
		-17.736	12.801	0.000	-3.602	5.974	0.000	-0.00		
	2.028	18.284	16.312	-1.688	24.628	22.773	-0.368	0.00		
		-8.057	6.859	0.000	-4.509	24.584	0.000	-0.00		
	3.041	26.700	14.961	-3.039	21.489	34.429	0.000	0.00		
		-7.195	0.000	-1.399	-7.253	34.690	0.000	-0.00		
	4.055	32.689	12.289	-5.711	18.114	42.267	0.000	0.00		
		-8.614	0.000	-1.399	-10.371	41.745	0.000	-0.00		
	5.069	35.197	9.497	-8.503	14.641	45.482	0.000	0.00		
		-10.033	0.000	-1.399	-13.739	44.615	0.000	-0.00		
	6.083	33.917	6.673	-11.327	11.200	43.813	0.000	0.00		
-11.452		0.000	-1.399	-17.230	42.666	0.000	-0.00			
7.097	28.905	3.909	-14.091	7.922	37.534	0.000	0.00			
	-12.870	0.000	-1.400	-20.714	35.789	-0.076	-0.00			
8.110	20.618	1.665	-16.335	4.932	27.432	0.000	0.00			
	-15.446	0.000	-2.933	-24.057	24.408	-1.651	-0.00			
9.124	10.866	0.662	-17.338	2.353	14.796	0.000	0.00			
	-22.846	0.000	-12.739	-27.123	9.501	-4.050	-0.00			
8	10.138									
	0.000	5.672	0.863	-2.494	30.131	0.000	-6.123	0.00		
		-37.900	16.836	-16.602	-30.273	0.000	-6.122	0.00		
	1.014	10.428	17.232	-0.769	27.325	9.300	-3.974	0.00		
		-22.634	13.016	0.000	-3.394	4.310	0.000	-0.00		
	2.028	19.970	16.396	-1.604	24.397	24.319	-1.500	0.00		
		-14.484	2.667	0.000	-4.864	26.750	0.000	-0.00		
	3.041	28.673	14.597	-3.403	21.183	36.125	0.000	0.00		
		-13.490	0.000	-0.161	-7.707	37.005	0.000	-0.00		
	4.055	34.348	11.914	-6.086	17.805	43.679	0.000	0.00		
		-13.653	0.000	-0.161	-10.855	43.736	0.000	-0.00		
	5.069	36.404	9.148	-8.852	14.384	46.436	0.000	0.00		
		-13.817	0.000	-0.162	-14.197	46.053	0.000	-0.00		
	6.083	34.670	6.380	-11.620	11.034	44.336	0.000	0.00		
-13.980		0.000	-0.162	-17.621	43.517	0.000	-0.00			
7.097	29.292	3.688	-14.312	7.871	37.780	0.000	0.00			
	-15.001	0.000	-2.521	-21.009	36.157	-0.075	-0.00			
8.110	20.802	1.734	-16.266	5.004	27.627	0.000	0.00			
	-17.613	0.000	-3.101	-24.242	24.478	-1.620	-0.00			
9.124	11.251	0.869	-17.131	3.278	4.673	0.000	0.00			
	-23.209	0.000	-12.987	-27.199	9.483	-3.999	-0.00			
9	10.138									
	0.000	7.159	1.221	-3.016	30.392	0.000	-5.324	0.00		
		-38.412	16.935	-16.805	-30.405	0.000	-5.329	0.00		
	1.014	11.084	17.096	-0.904	27.316	9.443	-3.930	0.00		
		-23.087	13.134	0.000	-4.082	5.437	0.000	-0.00		
	2.028	20.559	16.295	-1.705	24.414	24.520	-1.483	0.00		
		-14.612	2.610	0.000	-4.970	27.367	0.000	-0.00		
	3.041	29.259	14.560	-3.440	21.232	36.404	0.000	0.00		
		-14.412	0.000	-0.570	-7.778	37.589	0.000	-0.00		
	4.055	34.947	11.901	-6.099	17.886	44.071	0.000	0.00		
		-14.990	0.000	-0.570	-10.890	44.331	0.000	-0.00		
	5.069	37.038	9.155	-8.845	14.490	46.965	0.000	0.00		
		-15.568	0.000	-0.571	-14.201	46.696	0.000	-0.00		
	6.083	35.336	6.399	-11.601	11.155	44.991	0.000	0.00		
-16.147		0.000	-0.571	-17.602	44.215	0.000	-0.00			
7.097	29.951	3.708	-14.292	7.989	38.496	0.000	0.00			
	-16.725	0.000	-0.571	-20.985	36.857	-0.288	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		9	8.110	21.302	1.273	-16.727	5.097	28.259	0.000	0.00
		-17.304	0.000	-3.386	-24.236	25.050	-1.942	-0.00		
	9.124	14.968	1.404	0.000	3.325	20.609	0.000	0.00		
		-25.636	0.000	-11.302	-27.240	9.684	-4.430	-0.00		
	10.138									
10	0.000	17.005	2.453	-7.611	30.552	0.000	-6.260	0.00		
		-41.014	18.083	-17.198	-30.350	0.000	-6.249	0.00		
	1.014	10.488	17.112	-0.888	27.979	8.582	-4.270	0.00		
		-24.882	13.034	0.000	-10.793	13.009	0.000	-0.00		
	2.028	20.436	17.316	-0.684	25.602	24.276	-1.624	0.00		
		-15.066	2.223	0.000	-10.850	2.527	0.000	-0.00		
	3.041	30.543	15.967	-2.033	22.940	37.835	0.000	0.00		
		-19.244	0.000	-5.765	-10.955	1.524	-7.724	-0.00		
	4.055	38.310	13.648	-4.352	20.041	48.088	0.000	0.00		
		-25.089	0.000	-5.765	-11.117	1.834	-17.844	-0.00		
	5.069	42.913	11.156	-6.844	16.955	54.072	0.000	0.00		
		-30.934	0.000	-5.765	-11.442	54.789	0.000	-0.00		
	6.083	43.708	8.519	-9.481	13.729	55.023	0.000	0.00		
		-36.778	0.000	-5.765	-14.608	56.030	0.000	-0.00		
	7.097	40.167	5.767	-12.233	10.410	50.376	0.000	0.00		
		-42.623	0.000	-5.765	-18.016	51.583	0.000	-0.00		
	8.110	31.877	2.927	-15.073	7.043	39.754	0.000	0.00		
		-48.468	0.000	-5.765	-21.626	40.639	0.000	-0.00		
	9.124	18.547	0.030	-17.970	3.672	22.965	-0.059	0.00		
		-54.313	0.000	-5.766	-25.400	22.541	-0.483	-0.00		
	10.138									
11	0.000	0.000	1.417	-0.000	28.368	0.000	-3.292	0.00		
		-60.158	20.025	-16.703	-29.265	0.000	-3.210	0.00		
	0.317	0.000	0.000	-0.000	27.824	0.000	-2.600	0.00		
		-53.848	19.824	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	18.000	-0.000	27.621	0.000	-2.054	0.00		
		-47.602	19.622	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	18.000	-0.000	27.419	0.000	-1.573	0.00		
		-41.420	19.419	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	18.000	-0.000	27.216	0.000	-1.155	0.00		
		-35.302	19.216	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	18.000	-0.000	27.013	0.000	-0.802	0.00		
		-29.248	19.013	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	18.000	-0.000	26.811	0.000	-0.514	0.00		
		-23.259	18.811	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	18.000	-0.000	26.608	0.000	-0.289	0.00		
		-17.334	18.608	0.000	-0.000	0.000	0.000	-0.00		
	2.534	0.000	18.000	-0.000	26.405	0.000	-0.128	0.00		
		-11.473	18.405	0.000	-0.000	0.000	0.000	-0.00		
	2.850	0.000	18.000	-0.000	26.203	0.000	-0.032	0.00		
		-5.676	18.203	0.000	-0.000	0.000	0.000	-0.00		
	3.167	0.000	0.000	0.000	0.000	0.000	0.000	0.00		
		-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00		

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.389	-41.623
3	14.092	-34.002
4	5.562	-33.575
5	4.482	-33.615
6	7.623	-33.705
7	7.623	-33.705
8	4.482	-33.615
9	5.562	-33.575
10	14.078	-34.002
11	2.389	-41.613
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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ID: HS20

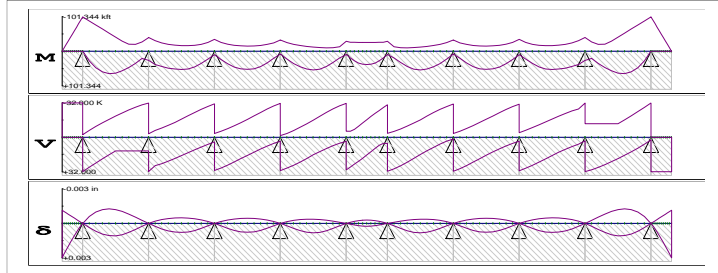
Type: Truck

Factors:

Moment: 1.000

Shear: 1.000

Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-32.000	0.000	-0.000	-0.000	-0.00	-0.00
	0.317	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-10.134	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	0.633	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-20.269	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	0.950	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-30.403	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	1.267	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-40.537	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	1.583	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-50.672	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	1.900	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-60.806	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
2.217	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-70.941	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00	
2.534	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-81.075	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00	
2.850	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-91.209	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00	
3.167											
2	0.000	0.000	0.000	-2.525	31.959	0.000	-0.000	0.000	-0.101	0.00	0.00
		-101.344	12.675	-32.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
	1.014	28.337	27.951	-4.049	27.951	28.337	0.000	0.000	0.000	0.00	0.00
		-89.407	11.775	0.000	-6.450	25.902	0.000	0.000	0.000	-0.00	-0.00
	2.028	48.568	23.954	-8.046	23.954	48.568	0.000	0.000	0.000	0.00	0.00
		-77.470	11.775	0.000	-10.124	44.357	0.000	0.000	0.000	-0.00	-0.00
	3.041	61.007	20.059	-11.941	20.059	61.007	0.000	0.000	0.000	0.00	0.00
		-65.533	11.775	0.000	-13.573	56.044	0.000	0.000	0.000	-0.00	-0.00
	4.055	66.176	16.319	-15.681	16.319	66.176	0.000	0.000	0.000	0.00	0.00
		-53.596	11.775	0.000	-16.800	61.640	0.000	0.000	0.000	-0.00	-0.00
	5.069	64.804	12.784	-19.216	12.784	64.804	0.000	0.000	0.000	0.00	0.00
		-41.659	11.775	0.000	-19.809	61.798	0.000	0.000	0.000	-0.00	-0.00
	6.083	57.830	9.507	-22.493	12.675	57.830	-24.243	0.000	0.000	0.00	0.00
		-29.722	11.775	0.000	-22.614	57.091	0.000	0.000	0.000	-0.00	-0.00
7.097	48.376	6.817	-25.183	12.675	48.376	-11.393	0.000	0.000	0.00	0.00	
	-21.036	4.176	0.000	-25.461	46.403	0.000	0.000	0.000	-0.00	-0.00	
8.110	36.019	4.441	-27.559	12.675	36.019	1.457	0.000	0.000	0.00	0.00	
	-20.527	0.000	-3.293	-28.070	31.877	0.000	0.000	0.000	-0.00	-0.00	
9.124	21.630	2.371	-29.629	12.675	21.630	14.307	0.000	0.000	0.00	0.00	
	-27.486	0.000	-10.124	-30.266	15.818	0.000	0.000	0.000	-0.00	-0.00	
10.138											
3	0.000	27.157	12.675	-3.397	31.978	0.000	-0.150	0.000	0.00	0.00	
		-40.652	11.176	-14.829	-31.985	0.000	-0.174	0.000	0.00	0.00	
	1.014	39.510	25.664	-6.336	26.466	39.510	0.000	0.000	0.00	0.00	
		-31.417	7.097	0.000	-6.448	25.953	0.000	0.000	0.000	-0.00	-0.00
	2.028	44.960	23.864	-8.136	24.556	44.960	0.000	0.000	0.000	0.00	0.00
		-24.915	4.176	0.000	-8.738	36.155	0.000	0.000	0.000	-0.00	-0.00
	3.041	50.077	22.263	-9.737	22.263	50.077	0.000	0.000	0.000	0.00	0.00
		-20.681	4.176	0.000	-11.231	44.623	0.000	0.000	0.000	-0.00	-0.00
4.055	52.761	19.719	-12.281	19.719	52.761	0.000	0.000	0.000	0.00	0.00	
	-18.235	2.120	0.000	-13.962	50.589	0.000	0.000	0.000	-0.00	-0.00	
5.069	53.737	15.002	-16.998	17.042	53.737	0.000	0.000	0.000	0.00	0.00	
	-16.926	0.579	0.000	-16.998	53.737	0.000	0.000	0.000	-0.00	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR(max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT(max) (min) (in)
3	6.083	52.444	11.909	-20.091	14.306	48.635	0.000	0.00		
		-16.600	0.220	0.000	-20.091	52.444	0.000	-0.00		
	7.097	46.420	8.812	-23.188	11.671	42.319	0.000	0.00		
		-17.879	0.000	-1.700	-23.188	46.420	0.000	-0.00		
	8.110	36.172	6.782	-25.218	9.100	33.456	0.000	0.00		
		-20.523	0.000	-3.792	-26.163	36.024	0.000	-0.00		
	9.124	23.487	4.167	-27.833	6.641	22.586	0.000	0.00		
		-26.383	0.000	-6.867	-28.861	22.344	0.000	-0.00		
	4	10.138	10.661	4.369	-1.941	30.863	8.739	0.000	0.00	
			-35.116	11.807	-10.903	-31.103	6.948	0.000	0.00	
1.014		24.529	27.835	-4.165	28.609	23.662	0.000	0.00		
		-26.110	6.529	0.000	-5.725	21.831	0.000	-0.00		
2.028		36.878	25.241	-6.759	25.901	36.808	0.000	0.00		
		-20.916	4.002	0.000	-8.146	33.574	0.000	-0.00		
3.041		46.652	22.917	-9.083	22.917	46.652	0.000	0.00		
		-17.858	2.054	0.000	-10.783	43.281	0.000	-0.00		
4.055		52.150	19.817	-12.183	19.817	52.150	0.000	0.00		
		-16.150	1.365	0.000	-13.667	49.968	0.000	-0.00		
5.069	53.286	15.248	-16.752	16.922	52.431	0.000	0.00			
	-15.524	0.280	0.000	-16.752	53.286	0.000	-0.00			
6.083	51.968	12.054	-19.946	13.838	49.278	0.000	0.00			
	-15.864	0.000	-0.815	-19.946	51.968	0.000	-0.00			
7.097	45.562	8.810	-23.190	10.908	42.633	0.000	0.00			
	-17.225	0.000	-1.783	-23.190	45.562	0.000	-0.00			
8.110	34.514	6.396	-25.604	8.253	32.841	0.000	0.00			
	-20.586	0.000	-3.543	-26.340	34.374	0.000	-0.00			
9.124	21.007	5.798	-26.202	5.798	21.007	0.000	0.00			
	-24.747	0.000	-5.975	-29.210	19.570	0.000	-0.00			
5	10.138	8.362	3.608	-1.341	31.033	7.098	0.000	0.00		
		-33.514	10.457	-11.281	-31.596	2.913	0.000	0.00		
	1.014	23.135	28.363	-3.637	28.638	22.483	0.000	0.00		
		-25.524	6.021	0.000	-3.637	23.135	0.000	-0.00		
	2.028	36.292	25.628	-6.372	26.131	32.107	0.000	0.00		
		-20.648	3.775	0.000	-6.372	36.292	0.000	-0.00		
	3.041	46.078	22.597	-9.403	23.139	44.324	0.000	0.00		
		-17.251	2.815	0.000	-9.403	46.078	0.000	-0.00		
	4.055	52.543	19.724	-12.276	19.804	52.540	0.000	0.00		
		-14.578	1.992	0.000	-12.634	50.798	0.000	-0.00		
5.069	55.591	16.065	-15.935	16.310	51.871	0.000	0.00			
	-12.616	1.752	0.000	-15.935	55.591	0.000	-0.00			
6.083	53.026	12.342	-19.658	13.293	48.047	0.000	0.00			
	-11.074	1.308	0.000	-19.658	53.026	0.000	-0.00			
7.097	45.141	8.737	-23.263	10.457	40.698	0.000	0.00			
	-9.975	0.545	0.000	-23.263	45.141	0.000	-0.00			
8.110	33.325	6.189	-25.811	7.876	30.914	0.000	0.00			
	-10.426	0.000	-1.747	-26.570	32.960	0.000	-0.00			
9.124	20.072	5.620	-26.380	5.620	20.072	0.000	0.00			
	-13.394	0.000	-14.618	-29.397	18.244	0.000	-0.00			
6	10.138	9.841	3.759	-2.491	30.318	8.614	0.000	0.00		
		-29.663	5.660	-17.731	-31.546	3.307	0.000	0.00		
	0.634	19.955	27.172	-4.828	27.804	19.365	0.000	0.00		
		-26.542	0.234	0.000	-5.660	2.631	0.000	-0.00		
	1.268	28.610	24.504	-7.496	24.940	28.330	0.000	0.00		
		-26.394	0.234	0.000	-7.496	28.610	0.000	-0.00		
	1.902	35.006	21.608	-10.392	22.375	30.032	0.000	0.00		
		-26.256	0.176	0.000	-10.392	35.006	0.000	-0.00		
	2.536	38.598	18.586	-13.414	19.548	35.689	0.000	0.00		
		-26.144	0.176	0.000	-13.414	38.598	0.000	-0.00		
3.170	39.111	16.457	-15.543	16.495	38.559	0.000	0.00			
	-26.032	0.176	-0.176	-16.495	38.559	0.000	-0.00			
3.804	38.598	13.414	-18.586	13.414	38.598	0.000	0.00			
	-26.144	0.000	-0.176	-19.548	35.689	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.438	35.006	10.392	-21.608	10.392	35.006	0.000	0.00		
		-26.256	0.000	-0.176	-22.375	30.032	0.000	-0.00		
	5.072	28.610	7.496	-24.504	7.496	28.610	0.000	0.00		
		-26.394	0.000	-0.234	-24.940	28.330	0.000	-0.00		
	5.706	19.955	4.828	-27.172	5.660	2.631	0.000	0.00		
-26.542		0.000	-0.234	-27.804	19.365	0.000	-0.00			
7	6.340									
	0.000	9.841	2.491	-3.759	31.546	3.307	0.000	0.00		
		-29.663	17.731	-5.660	-30.318	8.614	0.000	0.00		
	1.014	20.072	26.380	-5.620	29.397	18.244	0.000	0.00		
		-13.394	14.618	0.000	-5.620	20.072	0.000	-0.00		
	2.028	33.325	25.811	-6.189	26.570	32.960	0.000	0.00		
		-10.426	1.747	0.000	-7.876	30.914	0.000	-0.00		
	3.041	45.141	23.263	-8.737	23.263	45.141	0.000	0.00		
		-9.975	0.000	-0.545	-10.457	40.698	0.000	-0.00		
	4.055	53.026	19.658	-12.342	19.658	53.026	0.000	0.00		
		-11.074	0.000	-1.308	-13.293	48.047	0.000	-0.00		
	5.069	55.591	15.935	-16.065	15.935	55.591	0.000	0.00		
		-12.616	0.000	-1.752	-16.310	51.871	0.000	-0.00		
	6.083	52.543	12.276	-19.724	12.634	50.798	0.000	0.00		
		-14.578	0.000	-1.992	-19.804	52.540	0.000	-0.00		
7.097	46.078	9.403	-22.597	9.403	46.078	0.000	0.00			
	-17.251	0.000	-2.815	-23.139	44.324	0.000	-0.00			
8.110	36.292	6.372	-25.628	6.372	36.292	0.000	0.00			
	-20.648	0.000	-3.775	-26.131	32.107	0.000	-0.00			
9.124	23.135	3.637	-28.363	3.637	23.135	0.000	0.00			
	-25.524	0.000	-6.021	-28.638	22.483	0.000	-0.00			
8	10.138									
	0.000	8.362	1.341	-3.608	31.596	2.913	0.000	0.00		
		-33.514	11.281	-10.457	-31.033	7.098	0.000	0.00		
	1.014	21.007	26.202	-5.798	29.210	19.570	0.000	0.00		
		-24.747	5.975	0.000	-5.798	21.007	0.000	-0.00		
	2.028	34.514	25.604	-6.396	26.340	34.374	0.000	0.00		
		-20.586	3.543	0.000	-8.252	32.841	0.000	-0.00		
	3.041	45.562	23.190	-8.810	23.190	45.562	0.000	0.00		
		-17.225	1.783	0.000	-10.908	42.633	0.000	-0.00		
	4.055	51.968	19.946	-12.054	19.946	51.968	0.000	0.00		
		-15.864	0.815	0.000	-13.838	49.278	0.000	-0.00		
	5.069	53.286	16.752	-15.248	16.752	53.286	0.000	0.00		
		-15.524	0.000	-0.280	-16.922	52.431	0.000	-0.00		
	6.083	52.150	12.183	-19.817	13.667	49.968	0.000	0.00		
		-16.150	0.000	-1.365	-19.817	52.150	0.000	-0.00		
7.097	46.652	9.083	-22.917	10.783	43.281	0.000	0.00			
	-17.858	0.000	-2.054	-22.917	46.652	0.000	-0.00			
8.110	36.878	6.759	-25.241	8.146	33.574	0.000	0.00			
	-20.916	0.000	-4.002	-25.901	36.808	0.000	-0.00			
9.124	24.529	4.165	-27.835	5.725	21.831	0.000	0.00			
	-26.110	0.000	-6.529	-28.609	23.662	0.000	-0.00			
9	10.138									
	0.000	10.661	1.941	-4.369	31.103	6.948	0.000	0.00		
		-35.116	10.903	-11.807	-30.863	8.739	0.000	0.00		
	1.014	23.487	27.833	-4.167	28.861	22.344	0.000	0.00		
		-26.383	6.867	0.000	-6.641	22.586	0.000	-0.00		
	2.028	36.172	25.218	-6.782	26.163	36.024	0.000	0.00		
		-20.523	3.792	0.000	-9.100	33.456	0.000	-0.00		
	3.041	46.420	23.188	-8.812	23.188	46.420	0.000	0.00		
		-17.879	1.700	0.000	-11.671	42.319	0.000	-0.00		
	4.055	52.444	20.091	-11.909	20.091	52.444	0.000	0.00		
		-16.600	0.000	-0.220	-14.306	48.635	0.000	-0.00		
	5.069	53.737	16.998	-15.002	16.998	53.737	0.000	0.00		
		-16.926	0.000	-0.579	-17.042	52.327	0.000	-0.00		
	6.083	52.761	12.281	-19.719	13.962	50.589	0.000	0.00		
		-18.235	0.000	-2.120	-19.719	52.761	0.000	-0.00		
7.097	50.077	9.737	-22.263	11.231	44.623	0.000	0.00			
	-20.681	0.000	-4.176	-22.263	50.077	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
9	8.110	44.960	8.136	-24.556	8.738	36.155	0.000	0.00
		-24.915	0.000	-4.176	-24.556	44.960	0.000	-0.00
	9.124	39.510	6.336	-25.664	6.448	25.953	0.000	0.00
10	10.138	-31.417	0.000	-7.097	-26.466	38.697	0.000	-0.00
	0.000	27.157	3.397	-12.675	31.985	0.000	-0.174	0.00
		-40.652	14.829	-11.176	-31.978	0.000	-0.150	0.00
	1.014	21.630	29.629	-2.371	30.266	15.818	0.000	0.00
		-27.486	10.124	0.000	-12.675	14.307	0.000	-0.00
	2.028	36.019	27.559	-4.441	28.070	31.877	0.000	0.00
		-20.527	3.293	0.000	-12.675	1.457	0.000	-0.00
	3.041	48.376	25.183	-6.817	25.461	46.403	0.000	0.00
		-21.036	0.000	-4.176	-12.675	0.000	-11.393	-0.00
	4.055	57.830	22.493	-9.507	22.614	57.091	0.000	0.00
		-29.722	0.000	-11.775	-12.675	0.000	-24.243	-0.00
	5.069	64.804	19.216	-12.784	19.809	61.798	0.000	0.00
		-41.659	0.000	-11.775	-12.784	64.804	0.000	-0.00
	6.083	66.176	15.681	-16.319	16.800	61.640	0.000	0.00
		-53.596	0.000	-11.775	-16.319	66.176	0.000	-0.00
	7.097	61.007	11.941	-20.059	13.573	56.044	0.000	0.00
		-65.533	0.000	-11.775	-20.059	61.007	0.000	-0.00
8.110	48.568	8.046	-23.954	10.124	44.357	0.000	0.00	
	-77.470	0.000	-11.775	-23.954	48.568	0.000	-0.00	
9.124	28.337	4.049	-27.951	6.450	25.902	0.000	0.00	
	-89.407	0.000	-11.775	-27.951	28.337	0.000	-0.00	
11	10.138	0.000	2.525	-0.000	32.000	0.000	-0.101	0.00
	0.000	-101.344	32.000	-12.675	-31.959	0.000	-0.000	0.00
	0.317	0.000	32.000	-0.000	32.000	0.000	0.000	0.00
		-91.209	32.000	0.000	-0.000	0.000	0.000	-0.00
	0.633	0.000	32.000	-0.000	32.000	0.000	0.000	0.00
		-81.075	32.000	0.000	-0.000	0.000	0.000	-0.00
	0.950	0.000	32.000	-0.000	32.000	0.000	0.000	0.00
		-70.941	32.000	0.000	-0.000	0.000	0.000	-0.00
	1.267	0.000	32.000	-0.000	32.000	0.000	0.000	0.00
		-60.806	32.000	0.000	-0.000	0.000	0.000	-0.00
	1.583	0.000	32.000	-0.000	32.000	0.000	0.000	0.00
		-50.672	32.000	0.000	-0.000	0.000	0.000	-0.00
	1.900	0.000	32.000	-0.000	32.000	0.000	0.000	0.00
		-40.537	32.000	0.000	-0.000	0.000	0.000	-0.00
	2.217	0.000	32.000	-0.000	32.000	0.000	0.000	0.00
		-30.403	32.000	0.000	-0.000	0.000	0.000	-0.00
	2.534	0.000	32.000	-0.000	32.000	0.000	0.000	0.00
	-20.269	32.000	0.000	-0.000	0.000	0.000	-0.00	
2.850	0.000	32.000	-0.000	32.000	0.000	0.000	0.00	
	-10.134	32.000	0.000	-0.000	0.000	0.000	-0.00	
3.167	0.000	32.000	0.000	32.000	0.000	-0.000	0.00	
	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00	

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.241	-44.675
3	16.072	-32.126
4	5.299	-27.792
5	3.779	-30.230
6	6.437	-28.494
7	6.437	-28.494
8	3.779	-30.230
9	5.299	-27.792
10	16.072	-32.126
11	2.241	-44.675
12	0.000	-0.000

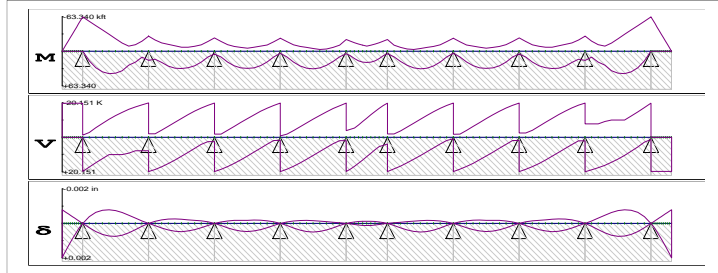
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 2F1  
Type: Truck

Factors:

Moment: 1.000  
Shear: 1.000  
Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	0.317	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-6.334	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	0.633	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-12.668	0.000	0.000	-20.000	-20.000	0.000	0.000	-6.334	-0.00	-0.00
	0.950	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-19.002	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.267	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-25.336	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.583	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-31.670	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.900	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-38.004	0.000	0.000	-20.000	-20.000	0.000	0.000	-6.334	-0.00	-0.00
2.217	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-44.338	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00	
2.534	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-50.672	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00	
2.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-57.006	0.000	0.000	-20.000	-20.000	0.000	0.000	-6.334	-0.00	-0.00	
3.167											
2	0.000	0.000	0.000	-1.364	20.034	0.000	-0.000	0.000	-0.063	0.00	0.00
		-63.340	10.196	-20.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
	1.014	17.710	17.469	-2.531	17.469	17.710	0.000	17.710	0.000	0.00	0.00
		-55.309	7.922	0.000	-2.874	17.363	0.000	0.000	0.000	-0.00	-0.00
	2.028	30.355	14.971	-5.029	14.971	30.355	0.000	0.000	0.000	0.00	0.00
		-47.277	7.922	0.000	-5.637	29.123	0.000	0.000	0.000	-0.00	-0.00
	3.041	38.130	12.537	-7.463	12.537	38.130	0.000	0.000	0.000	0.00	0.00
		-39.246	7.922	0.000	-8.213	35.850	0.000	0.000	0.000	-0.00	-0.00
	4.055	41.360	10.199	-9.801	10.199	41.360	0.000	0.000	0.000	0.00	0.00
		-31.215	7.922	0.000	-10.590	38.161	0.000	0.000	0.000	-0.00	-0.00
	5.069	40.502	7.990	-12.010	10.196	0.000	-11.655	0.000	0.000	0.00	0.00
		-23.183	7.922	0.000	-12.756	36.719	0.000	0.000	0.000	-0.00	-0.00
	6.083	36.144	5.942	-14.058	10.196	0.000	-1.318	0.000	0.000	0.00	0.00
		-15.152	7.922	0.000	-14.700	32.238	0.000	0.000	0.000	-0.00	-0.00
7.097	25.738	7.718	-12.282	9.306	7.973	0.000	0.000	0.000	0.00	0.00	
	-9.681	0.000	-1.364	-16.410	25.476	0.000	0.000	0.000	-0.00	-0.00	
8.110	20.195	4.820	-15.180	7.922	0.911	0.000	0.000	0.000	0.00	0.00	
	-12.121	0.000	-5.415	-17.874	17.242	0.000	0.000	0.000	-0.00	-0.00	
9.124	11.123	2.179	-17.821	7.922	8.942	0.000	0.000	0.000	0.00	0.00	
	-18.560	0.000	-6.630	-19.080	8.390	0.000	0.000	0.000	-0.00	-0.00	
10.138											
3	0.000	16.973	7.922	-2.123	20.066	0.000	-0.256	0.000	0.00	0.00	
		-28.000	7.497	-13.034	-20.151	0.000	-0.451	0.000	0.00	0.00	
	1.014	14.821	0.000	-2.123	18.832	8.197	0.000	0.000	0.00	0.00	
		-20.756	6.529	0.000	-2.123	14.821	0.000	0.000	0.000	-0.00	-0.00
	2.028	20.763	15.765	-4.235	17.270	16.629	0.000	0.000	0.000	0.00	0.00
		-15.572	2.610	0.000	-4.235	20.763	0.000	0.000	0.000	-0.00	-0.00
	3.041	27.558	13.462	-6.538	15.425	23.814	0.000	0.000	0.000	0.00	0.00
		-12.926	2.610	0.000	-6.538	27.558	0.000	0.000	0.000	-0.00	-0.00
4.055	31.349	11.141	-8.859	13.360	28.897	0.000	0.000	0.000	0.00	0.00	
	-10.280	2.610	0.000	-8.859	31.349	0.000	0.000	0.000	-0.00	-0.00	
5.069	32.007	8.857	-11.143	11.139	31.279	0.000	0.000	0.000	0.00	0.00	
	-7.634	2.610	0.000	-11.143	32.007	0.000	0.000	0.000	-0.00	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)	
3	6.083	30.621	8.824	-11.176	8.824	30.621	0.000	0.00			
		-7.433	0.000	-1.833	-13.333	29.633	0.000	-0.00			
	7.097	26.840	6.480	-13.520	6.480	26.840	0.000	0.00			
		-9.291	0.000	-1.833	-15.372	24.554	0.000	-0.00			
	8.110	20.111	4.170	-15.830	4.170	20.111	0.000	0.00			
		-12.043	0.000	-4.951	-17.205	17.328	0.000	-0.00			
	9.124	10.867	1.957	-18.043	2.610	2.950	0.000	0.00			
		-18.002	0.000	-6.164	-18.774	8.743	0.000	-0.00			
	10.138										
		0.000	5.596	2.610	-0.702	20.068	0.000	-0.272	0.00		
4	0.000	-24.590	7.066	-11.448	-20.075	0.000	-0.289	0.00			
		10.885	18.057	-1.943	18.752	8.726	0.000	0.00			
	1.014	-18.193	6.156	0.000	-1.943	10.885	0.000	-0.00			
		20.161	15.874	-4.126	17.152	17.275	0.000	0.00			
	2.028	-12.194	4.934	0.000	-4.126	20.161	0.000	-0.00			
		26.975	13.597	-6.403	15.286	24.409	0.000	0.00			
	3.041	-9.092	1.844	0.000	-6.403	26.975	0.000	-0.00			
		30.898	11.285	-8.715	13.216	29.342	0.000	0.00			
	4.055	-7.222	1.844	0.000	-8.715	30.898	0.000	-0.00			
		31.739	8.997	-11.003	11.002	31.534	0.000	0.00			
5.069	-5.687	0.000	-1.938	-11.003	31.739	0.000	-0.00				
	30.692	8.705	-11.295	8.705	30.692	0.000	0.00				
6.083	-7.652	0.000	-1.938	-13.208	29.550	0.000	-0.00				
	26.773	6.387	-13.613	6.387	26.773	0.000	0.00				
7.097	-9.617	0.000	-1.938	-15.271	24.618	0.000	-0.00				
	19.977	4.107	-15.893	4.107	19.977	0.000	0.00				
8.110	-11.684	0.000	-4.859	-17.133	17.472	0.000	-0.00				
	10.757	1.928	-18.072	1.928	10.757	0.000	0.00				
9.124	-17.427	0.000	-5.901	-18.736	8.881	0.000	-0.00				
	10.138										
0.000		3.995	1.844	-0.520	20.051	0.000	-0.239	0.00			
		-24.151	6.944	-11.309	-20.070	0.000	-0.281	0.00			
5	1.014	10.803	18.107	-1.893	18.681	8.838	0.000	0.00			
		-17.898	6.030	0.000	-1.893	10.803	0.000	-0.00			
	2.028	20.104	16.001	-3.999	17.001	17.338	0.000	0.00			
		-12.064	4.816	0.000	-3.999	20.104	0.000	-0.00			
	3.041	27.109	13.802	-6.198	15.055	24.253	0.000	0.00			
		-9.125	1.968	0.000	-6.198	27.109	0.000	-0.00			
	4.055	31.363	11.556	-8.444	12.914	28.816	0.000	0.00			
		-7.129	1.968	0.000	-8.444	31.363	0.000	-0.00			
	5.069	32.613	9.312	-10.688	10.648	30.544	0.000	0.00			
		-5.134	1.968	0.000	-10.688	32.613	0.000	-0.00			
6.083	30.798	7.119	-12.881	8.327	29.241	0.000	0.00				
	-3.461	0.000	-0.878	-12.881	30.798	0.000	-0.00				
7.097	26.063	5.027	-14.973	6.022	24.996	0.000	0.00				
	-4.352	0.000	-0.878	-14.973	26.063	0.000	-0.00				
8.110	18.949	3.117	-16.883	3.804	18.182	0.000	0.00				
	-7.107	0.000	-3.514	-16.883	18.949	0.000	-0.00				
9.124	10.500	1.498	-18.502	1.968	2.848	0.000	0.00				
	-11.439	0.000	-8.444	-18.502	10.500	0.000	-0.00				
10.138											
	0.000	4.844	1.968	-0.924	20.031	0.000	-0.290	0.00			
6	0.000	-21.649	5.527	-10.997	-20.076	0.000	-0.336	0.00			
		8.396	16.403	-3.597	18.650	6.244	0.000	0.00			
	0.634	-18.602	4.767	0.000	-4.767	5.578	0.000	-0.00			
		13.725	14.619	-5.381	17.028	11.984	0.000	0.00			
	1.268	-15.846	3.996	0.000	-5.527	6.383	0.000	-0.00			
		17.742	12.705	-7.295	15.230	16.521	0.000	0.00			
	1.902	-13.375	3.208	0.000	-7.295	17.742	0.000	-0.00			
		20.141	10.712	-9.288	13.307	19.513	0.000	0.00			
	2.536	-11.342	3.208	0.000	-9.288	20.141	0.000	-0.00			
		20.747	8.691	-11.309	11.309	20.747	0.000	0.00			
3.170	-9.624	2.686	0.000	-11.309	20.747	0.000	-0.00				
	20.141	9.288	-10.712	9.288	20.141	0.000	0.00				
3.804	-11.342	0.000	-3.208	-13.307	19.513	0.000	-0.00				

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.438	17.742	7.295	-12.705	7.295	17.742	0.000	0.00		
		-13.375	0.000	-3.208	-15.230	16.521	0.000	-0.00		
	5.072	13.725	5.381	-14.619	5.527	6.383	0.000	0.00		
		-15.846	0.000	-3.996	-17.028	11.984	0.000	-0.00		
	5.706	8.396	3.597	-16.403	4.767	5.578	0.000	0.00		
-18.602		0.000	-4.767	-18.650	6.244	0.000	-0.00			
7	0.000	4.844	0.924	-1.968	20.076	0.000	-0.336	0.00		
		-21.649	10.997	-5.527	-20.031	0.000	-0.290	0.00		
	1.014	10.500	18.502	-1.498	18.502	10.500	0.000	0.00		
		-11.439	8.444	0.000	-1.968	2.848	0.000	-0.00		
	2.028	18.949	16.883	-3.117	16.883	18.949	0.000	0.00		
		-7.107	3.514	0.000	-3.804	18.182	0.000	-0.00		
	3.041	26.063	14.973	-5.027	14.973	26.063	0.000	0.00		
		-4.352	0.878	0.000	-6.022	24.996	0.000	-0.00		
	4.055	30.798	12.881	-7.119	12.881	30.798	0.000	0.00		
		-3.461	0.878	0.000	-8.327	29.241	0.000	-0.00		
	5.069	32.613	10.688	-9.312	10.688	32.613	0.000	0.00		
		-5.134	0.000	-1.968	-10.648	30.544	0.000	-0.00		
	6.083	31.363	8.444	-11.556	8.444	31.363	0.000	0.00		
		-7.129	0.000	-1.968	-12.914	28.816	0.000	-0.00		
	7.097	27.109	6.198	-13.802	6.198	27.109	0.000	0.00		
-9.125		0.000	-1.968	-15.055	24.253	0.000	-0.00			
8.110	20.104	3.999	-16.001	3.999	20.104	0.000	0.00			
	-12.064	0.000	-4.816	-17.001	17.338	0.000	-0.00			
9.124	10.803	1.893	-18.107	1.893	10.803	0.000	0.00			
	-17.898	0.000	-6.030	-18.681	8.838	0.000	-0.00			
8	0.000	3.995	0.520	-1.844	20.070	0.000	-0.281	0.00		
		-24.151	11.309	-6.944	-20.051	0.000	-0.239	0.00		
	1.014	10.757	18.072	-1.928	18.736	8.881	0.000	0.00		
		-17.427	5.901	0.000	-1.928	10.757	0.000	-0.00		
	2.028	19.977	15.893	-4.107	17.133	17.472	0.000	0.00		
		-11.684	4.859	0.000	-4.107	19.977	0.000	-0.00		
	3.041	26.773	13.613	-6.387	15.271	24.618	0.000	0.00		
		-9.617	1.938	0.000	-6.387	26.773	0.000	-0.00		
	4.055	30.692	11.295	-8.705	13.208	29.550	0.000	0.00		
		-7.652	1.938	0.000	-8.705	30.692	0.000	-0.00		
	5.069	31.739	11.003	-8.997	11.003	31.739	0.000	0.00		
		-5.687	1.938	0.000	-11.002	31.534	0.000	-0.00		
	6.083	30.898	8.715	-11.285	8.715	30.898	0.000	0.00		
		-7.222	0.000	-1.844	-13.216	29.342	0.000	-0.00		
	7.097	26.975	6.403	-13.597	6.403	26.975	0.000	0.00		
-9.092		0.000	-1.844	-15.286	24.409	0.000	-0.00			
8.110	20.161	4.126	-15.874	4.126	20.161	0.000	0.00			
	-12.194	0.000	-4.934	-17.152	17.275	0.000	-0.00			
9.124	10.885	1.943	-18.057	1.943	10.885	0.000	0.00			
	-18.193	0.000	-6.156	-18.752	8.727	0.000	-0.00			
9	0.000	5.596	0.702	-2.610	20.075	0.000	-0.289	0.00		
		-24.590	11.448	-7.066	-20.068	0.000	-0.272	0.00		
	1.014	10.867	18.043	-1.957	18.774	8.743	0.000	0.00		
		-18.002	6.164	0.000	-2.610	2.950	0.000	-0.00		
	2.028	20.111	15.830	-4.170	17.205	17.328	0.000	0.00		
		-12.043	4.951	0.000	-4.170	20.111	0.000	-0.00		
	3.041	26.840	13.520	-6.480	15.372	24.554	0.000	0.00		
		-9.291	1.833	0.000	-6.480	26.840	0.000	-0.00		
	4.055	30.621	11.176	-8.824	13.333	29.633	0.000	0.00		
		-7.433	1.833	0.000	-8.824	30.621	0.000	-0.00		
	5.069	32.007	11.143	-8.857	11.143	32.007	0.000	0.00		
		-7.634	0.000	-2.610	-11.139	31.279	0.000	-0.00		
	6.083	31.349	8.859	-11.141	8.859	31.349	0.000	0.00		
		-10.280	0.000	-2.610	-13.360	28.897	0.000	-0.00		
	7.097	27.558	6.538	-13.462	6.538	27.558	0.000	0.00		
-12.926		0.000	-2.610	-15.425	23.814	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR (max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	8.110	20.763	4.235	-15.765	4.235	20.763	0.000	0.00		
		-15.572	0.000	-2.610	-17.270	16.629	0.000	-0.00		
	9.124	14.821	2.123	0.000	2.123	14.821	0.000	0.00		
10	10.138	-20.756	0.000	-6.529	-18.832	8.197	0.000	-0.00		
		0.000	16.973	2.123	-7.922	20.151	0.000	-0.451	0.00	
	1.014	-28.000	13.034	-7.497	-20.066	0.000	-0.256	0.00		
		11.123	17.821	-2.179	19.080	8.390	0.000	0.00		
	2.028	-18.560	6.630	0.000	-7.922	8.942	0.000	-0.00		
		20.195	15.180	-4.820	17.874	17.242	0.000	0.00		
	3.041	-12.121	5.415	0.000	-7.922	0.911	0.000	-0.00		
		25.738	12.282	-7.718	16.410	25.476	0.000	0.00		
	4.055	-9.681	1.364	0.000	-9.306	7.973	0.000	-0.00		
		36.144	14.058	-5.942	14.700	32.238	0.000	0.00		
	5.069	-15.152	0.000	-7.922	-10.196	0.000	-1.318	-0.00		
		40.502	12.010	-7.990	12.756	36.719	0.000	0.00		
	6.083	-23.183	0.000	-7.922	-10.196	0.000	-11.655	-0.00		
		41.360	9.801	-10.199	10.590	38.161	0.000	0.00		
	7.097	-31.215	0.000	-7.922	-10.199	41.360	0.000	-0.00		
38.130		7.463	-12.537	8.213	35.850	0.000	0.00			
8.110	-39.246	0.000	-7.922	-12.537	38.130	0.000	-0.00			
	30.355	5.029	-14.971	5.637	29.123	0.000	0.00			
9.124	-47.277	0.000	-7.922	-14.971	30.355	0.000	-0.00			
	17.710	2.531	-17.469	2.874	17.363	0.000	0.00			
11	10.138	-55.309	0.000	-7.922	-17.469	17.710	0.000	-0.00		
		0.000	0.000	1.364	-0.000	20.000	0.000	-0.063	0.00	
	0.317	-63.340	20.000	-10.196	-20.034	0.000	-0.100	0.00		
		0.000	0.000	0.000	-0.000	20.000	0.000	-6.334	0.00	
	0.633	-57.006	20.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	20.000	-0.000	20.000	0.000	0.000	0.00		
	0.950	-50.672	20.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	20.000	-0.000	20.000	0.000	0.000	0.00		
	1.267	-44.338	20.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	20.000	-0.000	20.000	0.000	0.000	0.00		
	1.583	-38.004	20.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	20.000	-0.000	20.000	0.000	0.000	0.00		
	1.900	-31.670	20.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	20.000	-0.000	20.000	0.000	0.000	0.00		
	2.217	-25.336	20.000	0.000	-0.000	0.000	0.000	-0.00		
0.000		20.000	-0.000	20.000	0.000	0.000	0.00			
2.534	-19.002	20.000	0.000	-0.000	0.000	0.000	-0.00			
	0.000	20.000	-0.000	20.000	0.000	0.000	0.00			
2.850	-12.668	20.000	0.000	-0.000	0.000	0.000	-0.00			
	0.000	20.000	-0.000	20.000	0.000	0.000	0.00			
3.167	-6.334	20.000	0.000	-0.000	0.000	0.000	-0.00			
	0.000	0.000	0.000	20.000	0.000	0.000	0.00			
		-0.000	0.000	-0.000	0.000	-0.000	-0.00			

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.364	-30.196
3	10.045	-21.649
4	3.312	-20.750
5	2.365	-20.588
6	3.927	-20.174
7	3.927	-20.174
8	2.365	-20.588
9	3.312	-20.750
10	10.045	-21.649
11	1.364	-30.196
12	0.000	-0.000

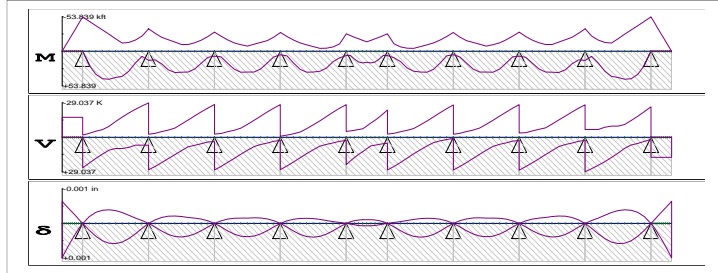
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 3F1  
Type: Truck

Factors:

Moment: 1.000  
Shear: 1.000  
Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-17.000	0.000	0.000	-0.000	-0.00	-0.00
	0.317	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-5.384	0.000	0.000	-17.000	-17.000	0.000	0.000	-2.310	-0.00	-0.00
	0.633	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-10.768	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	0.00	-0.00
	0.950	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-16.152	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	0.00	-0.00
	1.267	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-21.536	0.000	0.000	-17.000	-17.000	0.000	0.000	-1.227	-0.00	-0.00
	1.583	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-26.919	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	0.00	-0.00
	1.900	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-32.303	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	-0.00
	2.217	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
	-37.687	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.145	-0.00	-0.00	
2.534	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-43.071	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	-0.00	
2.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-48.455	0.000	0.000	-17.000	-17.000	0.000	0.000	-5.384	-0.00	-0.00	
3.167											
2	0.000	0.000	0.000	-1.963	25.734	0.000	-0.000	0.000	-0.054	0.00	0.00
		-53.839	21.965	-17.000	-17.000	0.000	0.000	-0.054	0.00	0.00	0.00
	1.014	22.040	21.740	0.000	21.740	22.040	0.000	0.000	0.000	0.00	0.00
		-47.012	6.734	0.000	-3.377	8.742	0.000	0.000	-0.000	-0.00	-0.00
	2.028	36.227	17.867	0.000	17.867	36.227	0.000	0.000	0.000	0.00	0.00
		-40.186	6.734	0.000	-5.154	13.881	0.000	0.000	0.000	-0.00	-0.00
	3.041	43.222	14.211	-2.789	14.211	43.222	0.000	0.000	0.000	0.00	0.00
		-33.359	6.734	0.000	-6.611	16.389	0.000	0.000	0.000	-0.00	-0.00
	4.055	43.907	10.827	-6.173	10.827	43.907	0.000	0.000	0.000	0.00	0.00
		-26.532	6.734	0.000	-9.395	31.779	0.000	0.000	0.000	-0.00	-0.00
	5.069	41.106	4.524	-12.476	9.463	0.000	-5.871	0.000	0.000	0.00	0.00
		-19.706	6.734	0.000	-13.371	36.566	0.000	0.000	0.000	-0.00	-0.00
	6.083	39.433	0.662	-16.338	9.463	3.722	0.000	0.000	0.000	0.00	0.00
		-12.879	6.734	0.000	-17.109	34.745	0.000	0.000	0.000	-0.00	-0.00
	7.097	31.491	0.000	-19.980	8.625	11.852	0.000	0.000	0.000	0.00	0.00
	-13.932	0.000	-1.963	-20.577	27.260	0.000	0.000	0.000	-0.00	-0.00	
8.110	18.393	0.000	-23.348	6.734	0.774	0.000	0.000	0.000	0.00	0.00	
	-17.591	0.000	-5.455	-23.745	15.175	0.000	0.000	0.000	-0.00	-0.00	
9.124	8.034	2.512	-9.488	6.734	7.601	0.000	0.000	0.000	0.00	0.00	
	-23.826	0.000	-6.611	-26.583	0.000	-0.322	-0.000	-0.322	-0.00	-0.00	
10.138											
3	0.000	14.427	6.734	-1.805	27.501	0.000	-14.139	0.000	0.00	0.00	0.00
		-35.360	7.077	-20.395	-29.037	0.000	-18.035	0.000	0.00	0.00	0.00
	1.014	13.600	0.000	-1.947	24.625	1.886	0.000	0.000	0.00	0.00	0.00
		-28.240	6.853	0.000	-3.413	9.032	0.000	0.000	-0.000	-0.00	-0.00
	2.028	19.946	19.554	0.000	21.424	14.985	0.000	0.000	0.000	0.00	0.00
		-21.852	3.663	0.000	-4.907	12.458	0.000	0.000	0.000	-0.00	-0.00
	3.041	29.110	16.083	-0.917	18.044	24.218	0.000	0.000	0.000	0.00	0.00
		-18.139	3.663	0.000	-6.169	14.257	0.000	0.000	0.000	-0.00	-0.00
4.055	33.420	12.663	-4.337	14.604	29.013	0.000	0.000	0.000	0.00	0.00	
	-14.425	3.663	0.000	-7.962	26.149	0.000	0.000	0.000	-0.00	-0.00	
5.069	32.949	9.404	-7.596	11.221	29.275	0.000	0.000	0.000	0.00	0.00	
	-10.712	3.663	0.000	-11.217	30.275	0.000	0.000	0.000	-0.00	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.083	32.568	4.243	-12.757	8.013	25.393	0.000	0.00		
		-10.700	0.000	-2.638	-14.635	30.026	0.000	-0.00		
	7.097	28.025	0.857	-16.143	6.853	13.444	0.000	0.00		
		-13.374	0.000	-2.638	-18.105	25.049	0.000	-0.00		
	8.110	18.810	0.000	-19.583	5.526	12.419	0.000	0.00		
		-17.503	0.000	-5.164	-21.519	15.437	0.000	-0.00		
9.124	9.635	3.930	-8.070	3.930	9.635	0.000	0.00			
	-23.267	0.000	-6.169	-24.767	1.727	0.000	-0.00			
4	10.138	7.853	3.663	-0.985	27.577	0.000	-14.861	0.00		
		-30.039	6.406	-17.917	-27.710	0.000	-15.200	0.00		
	1.014	8.939	8.685	-3.315	24.596	1.919	0.000	0.00		
		-23.652	6.190	0.000	-3.315	8.939	0.000	-0.00		
	2.028	18.886	19.763	0.000	21.317	15.421	0.000	0.00		
		-17.837	5.194	0.000	-4.764	12.341	0.000	-0.00		
	3.041	28.253	16.287	-0.713	17.885	24.784	0.000	0.00		
		-13.064	2.650	0.000	-5.997	14.230	0.000	-0.00		
	4.055	32.817	12.840	-4.160	14.417	29.527	0.000	0.00		
		-10.377	2.650	0.000	-7.828	25.805	0.000	-0.00		
	5.069	32.566	9.537	-7.463	11.030	29.640	0.000	0.00		
		-8.209	0.000	-2.797	-11.029	29.922	0.000	-0.00		
	6.083	32.576	4.133	-12.867	7.842	25.592	0.000	0.00		
		-11.045	0.000	-2.797	-14.425	29.813	0.000	-0.00		
7.097	27.947	0.696	-16.304	6.190	14.001	0.000	0.00			
	-13.881	0.000	-2.797	-17.902	25.019	0.000	-0.00			
8.110	18.566	0.000	-19.771	4.939	12.330	0.000	0.00			
	-16.731	0.000	-5.014	-21.344	15.548	0.000	-0.00			
9.124	9.110	3.461	-8.539	3.461	9.110	0.000	0.00			
	-22.249	0.000	-5.997	-24.637	1.874	0.000	-0.00			
5	10.138	5.741	2.650	-0.748	27.298	0.000	-14.305	0.00		
		-29.447	6.260	-17.713	-27.636	0.000	-15.160	0.00		
	1.014	7.408	10.043	-1.957	24.206	2.359	0.000	0.00		
		-23.218	6.050	0.000	-1.957	7.408	0.000	-0.00		
	2.028	18.765	20.168	0.000	20.834	15.506	0.000	0.00		
		-17.572	5.090	0.000	-3.101	12.143	0.000	-0.00		
	3.041	28.441	16.580	-0.420	17.346	24.351	0.000	0.00		
		-13.129	2.832	0.000	-4.547	18.662	0.000	-0.00		
	4.055	33.026	12.985	-4.015	13.875	28.554	0.000	0.00		
		-10.258	2.832	0.000	-7.390	26.599	0.000	-0.00		
	5.069	32.578	9.560	-7.440	10.556	28.321	0.000	0.00		
		-7.387	2.832	0.000	-10.579	31.174	0.000	-0.00		
	6.083	31.316	2.975	-14.025	7.524	24.403	0.000	0.00		
		-4.515	2.832	0.000	-14.025	31.316	0.000	-0.00		
7.097	26.355	0.000	-17.617	6.050	13.583	0.000	0.00			
	-4.939	0.000	-0.997	-17.617	26.355	0.000	-0.00			
8.110	16.297	0.000	-21.208	4.846	12.020	0.000	0.00			
	-6.827	0.000	-2.903	-21.208	16.297	0.000	-0.00			
9.124	10.485	1.498	-10.502	3.436	9.136	0.000	0.00			
	-11.755	0.000	-11.045	-24.618	1.949	0.000	-0.00			
6	10.138	6.970	2.832	-1.330	23.023	0.000	-5.971	0.00		
		-27.336	4.286	-19.027	-27.643	0.000	-15.258	0.00		
	0.634	6.604	6.472	-5.528	20.111	3.303	0.000	0.00		
		-24.619	4.286	0.000	-5.528	6.604	0.000	-0.00		
	1.268	12.355	15.961	-1.039	17.110	9.971	0.000	0.00		
		-21.965	3.817	0.000	-6.055	7.757	0.000	-0.00		
	1.902	16.830	12.969	-4.031	14.554	8.672	0.000	0.00		
		-19.545	3.817	0.000	-6.624	8.841	0.000	-0.00		
	2.536	18.499	10.065	-6.935	12.235	14.086	0.000	0.00		
		-17.150	3.767	0.000	-7.240	9.689	0.000	-0.00		
	3.170	17.490	9.683	-7.317	9.683	17.490	0.000	0.00		
		-14.978	0.000	-3.381	-9.683	17.490	0.000	-0.00		
	3.804	18.499	6.935	-10.065	7.240	9.689	0.000	0.00		
		-17.150	0.000	-3.767	-12.235	14.086	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.438	16.830	4.031	-12.969	6.624	8.841	0.000	0.00		
		-19.545	0.000	-3.817	-14.554	8.672	0.000	-0.00		
	5.072	12.355	1.039	-15.961	6.055	7.757	0.000	0.00		
		-21.965	0.000	-3.817	-17.110	9.971	0.000	-0.00		
	5.706	6.604	5.528	-6.472	5.528	6.604	0.000	0.00		
-24.619		0.000	-4.286	-20.111	3.303	0.000	-0.00			
7	0.000	6.970	1.330	-2.832	27.643	0.000	-15.258	0.00		
		-27.336	19.027	-4.286	-23.023	0.000	-5.971	0.00		
	1.014	10.485	10.502	-1.498	24.618	1.949	0.000	0.00		
		-11.755	11.045	0.000	-3.436	9.136	0.000	-0.00		
	2.028	16.297	21.208	0.000	21.208	16.297	0.000	0.00		
		-6.827	2.903	0.000	-4.846	12.020	0.000	-0.00		
	3.041	26.355	17.617	0.000	17.617	26.355	0.000	0.00		
		-4.939	0.997	0.000	-6.050	13.583	0.000	-0.00		
	4.055	31.316	14.025	-2.975	14.025	31.316	0.000	0.00		
		-4.515	0.000	-2.832	-7.524	24.403	0.000	-0.00		
	5.069	32.578	7.440	-9.560	10.579	31.174	0.000	0.00		
		-7.387	0.000	-2.832	-10.556	28.321	0.000	-0.00		
	6.083	33.025	4.015	-12.985	7.390	26.599	0.000	0.00		
		-10.258	0.000	-2.832	-13.875	28.554	0.000	-0.00		
	7.097	28.441	0.420	-16.580	4.547	18.662	0.000	0.00		
-13.129		0.000	-2.832	-17.346	24.351	0.000	-0.00			
8.110	18.765	0.000	-20.168	3.101	12.143	0.000	0.00			
	-17.573	0.000	-5.090	-20.834	15.506	0.000	-0.00			
9.124	7.408	1.957	-10.043	1.957	7.408	0.000	0.00			
	-23.218	0.000	-6.050	-24.206	2.359	0.000	-0.00			
8	0.000	5.741	0.748	-2.650	27.636	0.000	-15.160	0.00		
		-29.447	17.713	-6.260	-27.298	0.000	-14.305	0.00		
	1.014	9.110	8.539	-3.461	24.637	1.874	0.000	0.00		
		-22.249	5.997	0.000	-3.461	9.110	0.000	-0.00		
	2.028	18.566	19.771	0.000	21.344	15.548	0.000	0.00		
		-16.731	5.014	0.000	-4.939	12.330	0.000	-0.00		
	3.041	27.947	16.304	-0.696	17.902	25.019	0.000	0.00		
		-13.881	2.797	0.000	-6.190	14.001	0.000	-0.00		
	4.055	32.576	12.867	-4.133	14.425	29.813	0.000	0.00		
		-11.045	2.797	0.000	-7.842	25.592	0.000	-0.00		
	5.069	32.566	7.463	-9.537	11.029	29.922	0.000	0.00		
		-8.209	2.797	0.000	-11.030	29.640	0.000	-0.00		
	6.083	32.817	4.160	-12.840	7.828	25.805	0.000	0.00		
		-10.377	0.000	-2.650	-14.417	29.527	0.000	-0.00		
	7.097	28.253	0.713	-16.287	5.997	14.230	0.000	0.00		
-13.064		0.000	-2.650	-17.885	24.784	0.000	-0.00			
8.110	18.886	0.000	-19.763	4.764	12.341	0.000	0.00			
	-17.837	0.000	-5.194	-21.317	15.421	0.000	-0.00			
9.124	8.939	3.315	-8.685	3.315	8.939	0.000	0.00			
	-23.652	0.000	-6.190	-24.596	1.919	0.000	-0.00			
9	0.000	7.853	0.985	-3.663	27.710	0.000	-15.200	0.00		
		-30.039	17.917	-6.406	-27.577	0.000	-14.861	0.00		
	1.014	9.635	8.070	-3.930	24.767	1.727	0.000	0.00		
		-23.267	6.169	0.000	-3.930	9.635	0.000	-0.00		
	2.028	18.810	19.583	0.000	21.519	15.437	0.000	0.00		
		-17.503	5.164	0.000	-5.526	12.419	0.000	-0.00		
	3.041	28.025	16.143	-0.857	18.105	25.049	0.000	0.00		
		-13.374	2.638	0.000	-6.853	13.444	0.000	-0.00		
	4.055	32.568	12.757	-4.243	14.635	30.026	0.000	0.00		
		-10.700	2.638	0.000	-8.013	25.393	0.000	-0.00		
	5.069	32.949	7.596	-9.404	11.217	30.275	0.000	0.00		
		-10.712	0.000	-3.663	-11.221	29.275	0.000	-0.00		
	6.083	33.420	4.337	-12.663	7.962	26.149	0.000	0.00		
		-14.425	0.000	-3.663	-14.604	29.013	0.000	-0.00		
	7.097	29.110	0.917	-16.083	6.169	14.257	0.000	0.00		
-18.139		0.000	-3.663	-18.044	24.218	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR(max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT(max) (min) (in)
9	8.110	19.946	0.000	-19.554	4.907	12.458	0.000	0.00		
		-21.852	0.000	-3.663	-21.424	14.985	0.000	-0.00		
	9.124	13.600	1.947	0.000	3.413	9.032	0.000	0.00		
10	10.138	-28.240	0.000	-6.853	-24.625	1.886	0.000	-0.00		
		0.000	14.427	1.805	-6.734	29.037	0.000	-18.035	0.00	
	1.014	-35.360	20.395	-7.077	-27.501	0.000	-14.139	0.00		
		8.034	9.488	-2.512	26.583	0.000	-0.322	0.00		
	2.028	-23.826	6.611	0.000	-6.734	7.601	0.000	-0.00		
		18.393	23.348	0.000	23.745	15.175	0.000	0.00		
	3.041	-17.591	5.455	0.000	-6.734	0.774	0.000	-0.00		
		31.491	19.980	0.000	20.577	27.260	0.000	0.00		
	4.055	-13.932	1.963	0.000	-8.625	11.852	0.000	-0.00		
		39.433	16.338	-0.662	17.109	34.745	0.000	0.00		
	5.069	-12.879	0.000	-6.734	-9.463	3.722	0.000	-0.00		
		41.106	12.476	-4.524	13.372	36.566	0.000	0.00		
	6.083	-19.706	0.000	-6.734	-9.463	0.000	-5.871	-0.00		
		43.907	6.173	-10.827	9.395	31.779	0.000	0.00		
	7.097	-26.532	0.000	-6.734	-10.827	43.907	0.000	-0.00		
43.222		2.789	-14.211	6.611	16.389	0.000	0.00			
8.110	-33.359	0.000	-6.734	-14.211	43.222	0.000	-0.00			
	36.227	0.000	-17.867	5.154	13.881	0.000	0.00			
9.124	-40.186	0.000	-6.734	-17.867	36.227	0.000	-0.00			
	22.040	0.000	-21.740	3.377	8.742	0.000	0.00			
11	10.138	-47.012	0.000	-6.734	-21.740	22.040	0.000	-0.00		
		0.000	0.000	1.963	-0.000	17.000	0.000	-0.054	0.00	
	0.317	-53.839	17.000	-9.463	-25.734	0.000	-0.000	0.00		
		0.000	0.000	-0.000	17.000	0.000	-0.000	0.00		
	0.633	-48.455	17.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	12.000	-0.000	17.000	0.000	-0.000	0.00		
	0.950	-43.071	17.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	17.000	-0.000	17.000	0.000	-0.145	0.00		
	1.267	-37.687	17.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	17.000	-0.000	17.000	0.000	-0.000	0.00		
	1.583	-32.303	17.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	17.000	-0.000	17.000	0.000	0.000	0.00		
	1.900	-26.919	17.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	17.000	-0.000	17.000	0.000	-1.227	0.00		
	2.217	-21.536	17.000	0.000	-0.000	0.000	0.000	-0.00		
0.000		17.000	-0.000	17.000	0.000	0.000	0.00			
2.534	-16.152	17.000	0.000	-0.000	0.000	0.000	-0.00			
	0.000	17.000	-0.000	17.000	0.000	0.000	0.00			
2.850	-10.768	17.000	0.000	-0.000	0.000	0.000	-0.00			
	0.000	17.000	-0.000	17.000	0.000	0.000	0.00			
3.167	-5.384	17.000	0.000	-0.000	0.000	0.000	-0.00			
	0.000	0.000	0.000	17.000	0.000	0.000	0.00			
		-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00		

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.963	-38.965
3	8.538	-31.416
4	4.648	-30.340
5	3.398	-30.574
6	5.651	-29.661
7	5.651	-29.661
8	3.398	-30.574
9	4.648	-30.340
10	8.538	-31.416
11	1.963	-38.965
12	0.000	-0.000

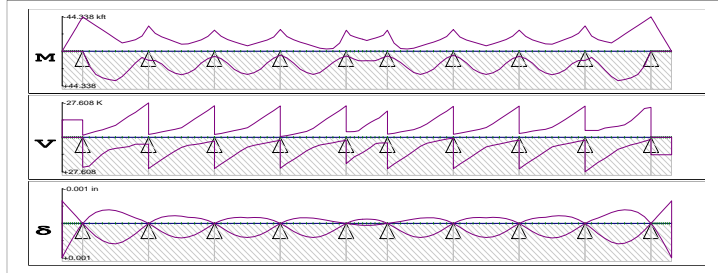
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 4F1  
Type: Truck

Factors:

Moment: 1.000  
Shear: 1.000  
Deflection: 1.000



Span	Location (ft)	MOMENT (kft)		Corresponding Shear (K)		SHEAR (K)		Corresponding Moment (kft)		DEFLECT (in)	
		(max)	(min)	(+)	(-)	(max)	(min)	(+)	(-)	(max)	(min)
1	0.000	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00
		-0.000	0.000	0.000	0.000	-14.000	0.000	-0.000	-0.000	-0.00	-0.00
	0.317	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-4.434	0.000	0.000	-14.000	-14.000	0.000	-1.903	-0.00	-0.00	-0.00
	0.633	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.00	0.00	0.00
		-8.868	0.000	0.000	-14.000	-14.000	0.000	0.000	0.00	0.00	-0.00
	0.950	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.00	0.00	0.00
		-13.301	0.000	0.000	-14.000	-14.000	0.000	0.000	0.00	0.00	-0.00
	1.267	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.00	0.00	0.00
		-17.735	0.000	0.000	-14.000	-14.000	0.000	-1.011	-0.00	-0.00	-0.00
	1.583	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.00	0.00	0.00
		-22.169	0.000	0.000	-14.000	-14.000	0.000	-0.000	-0.00	-0.00	-0.00
	1.900	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.00	0.00	0.00
		-26.603	0.000	0.000	-14.000	-14.000	0.000	-0.000	-0.00	-0.00	-0.00
2.217	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.00	0.00	0.00	
	-31.037	0.000	0.000	-14.000	-14.000	0.000	-0.119	-0.00	-0.00	-0.00	
2.534	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.00	0.00	0.00	
	-35.470	0.000	0.000	-14.000	-14.000	0.000	-3.780	-0.00	-0.00	-0.00	
2.850	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.00	0.00	0.00	
	-39.904	0.000	0.000	-14.000	-14.000	0.000	-0.000	-0.00	-0.00	-0.00	
3.167											
2	0.000	0.000	0.000	-1.781	24.033	0.000	-44.338	0.00	0.00	0.00	
		-44.338	24.033	-14.000	-14.000	0.000	-0.044	0.00	0.00	0.00	
	1.014	19.016	18.757	0.000	23.132	0.000	-18.356	0.00	0.00	0.00	
		-38.716	5.545	0.000	-3.303	8.817	0.000	0.00	-0.00	-0.00	
	2.028	29.980	14.786	0.000	18.168	9.223	0.000	0.00	0.00	0.00	
		-33.094	5.545	0.000	-4.821	14.556	0.000	0.00	-0.00	-0.00	
	3.041	34.394	11.309	-2.691	13.382	27.279	0.000	0.00	0.00	0.00	
		-27.472	5.545	0.000	-6.120	17.883	0.000	0.00	-0.00	-0.00	
	4.055	36.540	8.820	-5.180	10.033	8.009	0.000	0.00	0.00	0.00	
		-21.850	5.545	0.000	-7.904	25.494	0.000	0.00	-0.00	-0.00	
	5.069	37.936	4.532	-9.468	8.858	18.833	0.000	0.00	0.00	0.00	
		-16.228	5.545	0.000	-9.676	36.886	0.000	0.00	-0.00	-0.00	
	6.083	32.691	0.581	-13.419	8.275	5.995	0.000	0.00	0.00	0.00	
		-10.832	0.000	-1.781	-13.449	32.513	0.000	0.00	-0.00	-0.00	
7.097	24.512	0.000	-14.873	7.536	12.831	0.000	0.00	0.00	0.00		
	-12.637	0.000	-1.781	-16.972	22.260	0.000	0.00	-0.00	-0.00		
8.110	15.125	0.000	-19.421	5.545	0.637	0.000	0.00	0.00	0.00		
	-14.853	0.000	-3.699	-20.101	8.066	0.000	0.00	-0.00	-0.00		
9.124	8.129	0.891	-11.109	5.545	6.259	0.000	0.00	0.00	0.00		
	-19.748	0.000	-5.171	-23.890	0.000	-2.757	-0.00	-0.00	-0.00		
10.138											
3	0.000	11.881	5.545	-1.486	25.058	0.000	-16.331	0.00	0.00	0.00	
		-32.744	14.575	-20.259	-27.608	0.000	-22.523	0.00	0.00	0.00	
	1.014	12.120	10.267	-1.733	21.496	0.000	-0.124	0.00	0.00	0.00	
		-23.193	5.010	0.000	-3.312	8.929	0.000	0.00	-0.00	-0.00	
	2.028	16.426	17.005	0.000	17.886	11.466	0.000	0.00	0.00	0.00	
		-18.702	3.135	0.000	-4.462	12.458	0.000	0.00	-0.00	-0.00	
	3.041	24.110	13.380	-0.620	14.404	18.268	0.000	0.00	0.00	0.00	
	-15.524	3.135	0.000	-5.516	14.919	0.000	0.00	-0.00	-0.00		
4.055	28.328	10.901	-3.099	11.125	20.593	0.000	0.00	0.00	0.00		
	-12.346	3.135	0.000	-6.505	16.398	0.000	0.00	-0.00	-0.00		
5.069	30.388	6.545	-7.455	8.106	19.034	0.000	0.00	0.00	0.00		
	-9.168	3.135	0.000	-7.776	19.398	0.000	0.00	-0.00	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.083	28.196	2.803	-11.197	6.492	16.084	0.000	0.00		
		-9.651	0.000	-2.380	-11.197	28.196	0.000	-0.00		
	7.097	23.557	0.174	-13.826	5.844	14.349	0.000	0.00		
		-12.064	0.000	-2.380	-14.812	21.127	0.000	-0.00		
	8.110	15.355	0.000	-17.293	5.010	12.359	0.000	0.00		
		-14.789	0.000	-3.606	-18.205	9.776	0.000	-0.00		
	9.124	9.683	3.972	-8.028	3.972	9.683	0.000	0.00		
		-19.225	0.000	-4.610	-21.660	0.000	-0.240	-0.00		
	4	10.138	6.721	3.135	-0.843	25.139	0.000	-17.180	0.00	
			-27.321	12.923	-18.819	-25.361	0.000	-17.719	0.00	
1.014		9.597	10.624	-1.376	21.451	0.000	-0.010	0.00		
		-19.516	4.621	0.000	-3.184	8.792	0.000	-0.00		
2.028		15.461	17.145	0.000	18.003	10.040	0.000	0.00		
		-15.120	3.653	0.000	-4.324	12.294	0.000	-0.00		
3.041		23.322	13.474	-0.526	14.593	21.078	0.000	0.00		
		-12.189	2.472	0.000	-5.398	14.773	0.000	-0.00		
4.055		27.831	10.975	-3.025	10.975	27.831	0.000	0.00		
		-9.683	2.472	0.000	-6.437	16.217	0.000	-0.00		
5.069	29.932	6.708	-7.292	7.918	19.701	0.000	0.00			
	-7.176	2.472	0.000	-7.825	19.804	0.000	-0.00			
6.083	27.794	2.942	-11.058	6.442	16.114	0.000	0.00			
	-9.613	0.000	-2.435	-11.058	27.794	0.000	-0.00			
7.097	23.166	0.401	-13.599	5.492	14.611	0.000	0.00			
	-12.081	0.000	-2.435	-14.721	20.711	0.000	-0.00			
8.110	15.158	0.000	-17.226	4.478	12.266	0.000	0.00			
	-14.549	0.000	-2.435	-18.176	9.230	0.000	-0.00			
9.124	9.005	3.370	-8.630	3.370	9.005	0.000	0.00			
	-18.445	0.000	-4.598	-21.497	0.000	-0.043	-0.00			
5	10.138	5.356	2.472	-0.698	24.853	0.000	-16.436	0.00		
		-28.143	18.438	-13.781	-25.224	0.000	-17.571	0.00		
	1.014	8.666	10.704	-1.296	20.983	2.103	0.000	0.00		
		-19.167	4.500	0.000	-1.430	6.814	0.000	-0.00		
	2.028	15.399	17.090	0.000	17.855	8.325	0.000	0.00		
		-14.865	3.593	0.000	-2.540	12.079	0.000	-0.00		
	3.041	23.206	13.414	-0.586	14.420	19.969	0.000	0.00		
		-11.938	2.575	0.000	-3.657	16.321	0.000	-0.00		
	4.055	27.461	10.682	-3.318	10.892	21.402	0.000	0.00		
		-9.327	2.575	0.000	-4.812	19.305	0.000	-0.00		
5.069	30.042	6.769	-7.231	8.177	20.546	0.000	0.00			
	-6.716	2.575	0.000	-7.285	23.347	0.000	-0.00			
6.083	27.495	2.883	-11.117	6.279	15.500	0.000	0.00			
	-4.106	2.575	0.000	-11.117	27.495	0.000	-0.00			
7.097	21.384	0.223	-13.777	5.338	13.996	0.000	0.00			
	-3.044	0.473	0.000	-14.778	20.371	0.000	-0.00			
8.110	14.459	2.388	-9.612	4.365	11.811	0.000	0.00			
	-3.700	0.000	-1.640	-18.109	9.577	0.000	-0.00			
9.124	9.366	1.338	-10.662	3.331	8.982	0.000	0.00			
	-10.574	0.000	-15.184	-21.446	0.251	0.000	-0.00			
6	10.138	6.337	2.575	-1.209	21.067	0.000	-15.957	0.00		
		-27.141	12.366	-18.109	-25.286	0.000	-18.130	0.00		
	0.634	8.133	10.237	-1.763	18.429	0.000	-5.884	0.00		
		-20.773	4.509	0.000	-4.509	2.096	0.000	-0.00		
	1.268	10.343	9.423	-2.577	15.651	0.000	-0.169	0.00		
		-18.631	2.682	0.000	-4.653	7.994	0.000	-0.00		
	1.902	12.290	8.725	-5.275	14.087	0.125	0.000	0.00		
		-17.047	2.425	0.000	-5.300	9.904	0.000	-0.00		
	2.536	12.490	7.695	-4.305	12.290	5.611	0.000	0.00		
		-15.510	2.425	0.000	-7.869	12.135	0.000	-0.00		
3.170	12.334	5.159	-6.841	10.213	9.767	0.000	0.00			
	-14.004	0.000	-2.362	-10.213	9.767	0.000	-0.00			
3.804	12.490	4.305	-7.695	7.869	12.135	0.000	0.00			
	-15.510	0.000	-2.425	-12.290	5.611	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
6	4.438	12.290	5.275	-8.725	5.300	9.904	0.000	0.00
		-17.047	0.000	-2.425	-14.087	0.125	0.000	-0.00
	5.072	10.343	2.577	-9.423	4.653	7.994	0.000	0.00
		-18.631	0.000	-2.682	-15.651	0.000	-0.169	-0.00
	5.706	8.133	1.763	-10.237	4.509	2.096	0.000	0.00
-20.773		0.000	-4.509	-18.429	0.000	-5.884	-0.00	
7	6.340	6.337	1.209	-2.575	25.286	0.000	-18.130	0.00
		-27.141	18.109	-12.366	-21.067	0.000	-15.957	0.00
	1.014	9.366	10.662	-1.338	21.446	0.251	0.000	0.00
		-10.574	15.184	0.000	-3.331	8.982	0.000	-0.00
	2.028	14.459	9.612	-2.388	18.109	9.577	0.000	0.00
		-3.700	1.640	0.000	-4.365	11.811	0.000	-0.00
	3.041	21.384	13.777	-0.223	14.778	20.371	0.000	0.00
		-3.044	0.000	-0.473	-5.338	13.996	0.000	-0.00
	4.055	27.495	11.117	-2.883	11.117	27.495	0.000	0.00
		-4.106	0.000	-2.575	-6.279	15.500	0.000	-0.00
	5.069	30.042	7.231	-6.769	7.285	23.347	0.000	0.00
		-6.716	0.000	-2.575	-8.177	20.546	0.000	-0.00
	6.083	27.461	3.318	-10.682	4.812	19.305	0.000	0.00
		-9.327	0.000	-2.575	-10.892	21.402	0.000	-0.00
	7.097	23.206	0.586	-13.414	3.657	16.321	0.000	0.00
-11.938		0.000	-2.575	-14.420	19.969	0.000	-0.00	
8.110	15.399	0.000	-17.090	2.540	12.079	0.000	0.00	
	-14.865	0.000	-3.593	-17.855	8.325	0.000	-0.00	
9.124	8.666	1.296	-10.704	1.430	6.814	0.000	0.00	
	-19.167	0.000	-4.500	-20.983	2.103	0.000	-0.00	
8	10.138	5.356	0.698	-2.472	25.224	0.000	-17.571	0.00
		-28.143	13.781	-18.438	-24.853	0.000	-16.436	0.00
	1.014	9.005	8.630	-3.370	21.497	0.000	-0.043	0.00
		-18.445	4.598	0.000	-3.370	9.005	0.000	-0.00
	2.028	15.158	17.226	0.000	18.176	9.231	0.000	0.00
		-14.549	2.435	0.000	-4.478	12.266	0.000	-0.00
	3.041	23.166	13.599	-0.401	14.721	20.711	0.000	0.00
		-12.081	2.435	0.000	-5.492	14.611	0.000	-0.00
	4.055	27.794	11.058	-2.942	11.058	27.794	0.000	0.00
		-9.613	2.435	0.000	-6.442	16.114	0.000	-0.00
	5.069	29.932	7.292	-6.708	7.825	19.804	0.000	0.00
		-7.176	0.000	-2.472	-7.918	19.701	0.000	-0.00
	6.083	27.831	3.025	-10.975	6.437	16.217	0.000	0.00
		-9.683	0.000	-2.472	-10.975	27.831	0.000	-0.00
	7.097	23.322	0.526	-13.474	5.398	14.773	0.000	0.00
-12.189		0.000	-2.472	-14.593	21.078	0.000	-0.00	
8.110	15.461	0.000	-17.145	4.324	12.294	0.000	0.00	
	-15.120	0.000	-3.653	-18.003	10.040	0.000	-0.00	
9.124	9.597	1.376	-10.624	3.184	8.792	0.000	0.00	
	-19.516	0.000	-4.621	-21.451	0.000	-0.010	-0.00	
9	10.138	6.721	0.843	-3.135	25.361	0.000	-17.719	0.00
		-27.321	18.819	-12.923	-25.139	0.000	-17.180	0.00
	1.014	9.683	8.028	-3.972	21.660	0.000	-0.240	0.00
		-19.225	4.610	0.000	-3.972	9.683	0.000	-0.00
	2.028	15.355	17.293	0.000	18.205	9.776	0.000	0.00
		-14.789	3.606	0.000	-5.010	12.359	0.000	-0.00
	3.041	23.557	13.826	-0.174	14.812	21.127	0.000	0.00
		-12.064	2.380	0.000	-5.844	14.349	0.000	-0.00
	4.055	28.196	11.197	-2.803	11.197	28.196	0.000	0.00
		-9.651	2.380	0.000	-6.492	16.084	0.000	-0.00
	5.069	30.388	7.455	-6.545	7.776	19.398	0.000	0.00
		-9.168	0.000	-3.135	-8.106	19.034	0.000	-0.00
	6.083	28.328	3.099	-10.901	6.505	16.398	0.000	0.00
		-12.346	0.000	-3.135	-11.125	20.593	0.000	-0.00
	7.097	24.110	0.620	-13.380	5.516	14.919	0.000	0.00
-15.524		0.000	-3.135	-14.404	18.268	0.000	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		9	8.110	16.426	0.000	-17.005	4.462	12.458	0.000	0.00
		-18.702	0.000	-3.135	-17.886	11.466	0.000	-0.00		
	9.124	12.120	1.733	-10.267	3.312	8.929	0.000	0.00		
		-23.193	0.000	-5.010	-21.496	0.000	-0.124	-0.00		
	10.138									
10	0.000	11.881	1.486	-5.545	27.608	0.000	-22.523	0.00		
		-32.744	20.259	-14.575	-25.058	0.000	-16.331	0.00		
	1.014	8.129	11.109	-0.891	23.890	0.000	-2.757	0.00		
		-19.748	5.171	0.000	-5.545	6.259	0.000	-0.00		
	2.028	15.125	19.421	0.000	20.101	8.066	0.000	0.00		
		-14.853	3.699	0.000	-5.545	0.637	0.000	-0.00		
	3.041	24.512	14.873	0.000	16.972	22.260	0.000	0.00		
		-12.637	1.781	0.000	-7.536	12.831	0.000	-0.00		
	4.055	32.691	13.419	-0.581	13.449	32.513	0.000	0.00		
		-10.832	1.781	0.000	-8.275	5.995	0.000	-0.00		
	5.069	37.936	9.468	-4.532	9.676	36.886	0.000	0.00		
		-16.228	0.000	-5.545	-8.858	18.833	0.000	-0.00		
	6.083	36.540	5.180	-8.820	7.904	25.494	0.000	0.00		
		-21.850	0.000	-5.545	-10.033	8.009	0.000	-0.00		
	7.097	34.394	2.691	-11.309	6.120	17.883	0.000	0.00		
		-27.472	0.000	-5.545	-13.382	27.279	0.000	-0.00		
	8.110	29.980	0.000	-14.786	4.821	14.556	0.000	0.00		
		-33.094	0.000	-5.545	-18.168	9.223	0.000	-0.00		
	9.124	19.016	0.000	-18.757	3.303	8.817	0.000	0.00		
		-38.716	0.000	-5.545	-23.132	0.000	-18.355	-0.00		
	10.138									
11	0.000	0.000	1.781	-0.000	14.000	0.000	-0.044	0.00		
		-44.338	14.000	-24.033	-24.033	0.000	-44.338	0.00		
	0.317	0.000	12.000	-0.000	14.000	0.000	-0.000	0.00		
		-39.904	14.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	12.000	-0.000	14.000	0.000	-0.000	0.00		
		-35.470	14.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	12.000	-0.000	14.000	0.000	-0.119	0.00		
		-31.037	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	12.000	-0.000	14.000	0.000	-0.000	0.00		
		-26.603	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	14.000	-0.000	14.000	0.000	-0.000	0.00		
		-22.169	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	14.000	-0.000	14.000	0.000	-1.011	0.00		
		-17.735	14.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	14.000	-0.000	14.000	0.000	0.000	0.00		
		-13.301	14.000	0.000	-0.000	0.000	0.000	-0.00		
	2.534	0.000	14.000	-0.000	14.000	0.000	0.000	0.00		
		-8.868	14.000	0.000	-0.000	0.000	0.000	-0.00		
	2.850	0.000	14.000	-0.000	14.000	0.000	-1.130	0.00		
		-4.434	14.000	0.000	-0.000	0.000	0.000	-0.00		
	3.167	0.000	0.000	0.000	14.000	0.000	-0.000	0.00		
		-0.000	12.000	0.000	-0.000	0.000	-0.000	-0.00		

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.781	-38.033
3	7.032	-35.619
4	3.978	-32.980
5	3.170	-33.618
6	5.129	-31.167
7	5.129	-31.167
8	3.170	-33.618
9	3.978	-32.980
10	7.032	-35.619
11	1.781	-38.033
12	0.000	-0.000

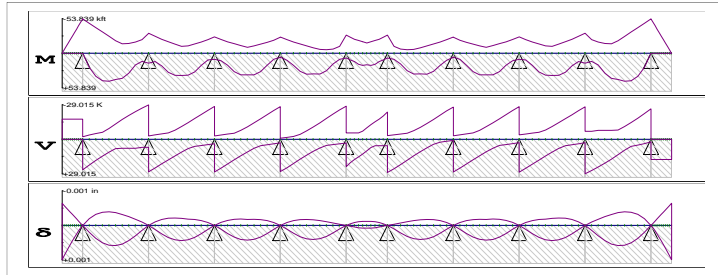
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 5C1  
Type: Truck

Factors:

Moment: 1.000  
Shear: 1.000  
Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.000	0.000	0.00
		-0.000	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	-0.00
	0.317	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-5.384	0.000	0.000	-17.000	-17.000	0.000	0.000	-2.310	0.000	-0.00
	0.633	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-10.768	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.422	0.000	-0.00
	0.950	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-16.152	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	0.000	-0.00
	1.267	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-21.536	0.000	0.000	-17.000	-17.000	0.000	0.000	-3.064	0.000	-0.00
	1.583	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-26.919	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	0.000	-0.00
	1.900	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00
		-32.303	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	0.000	-0.00
2.217	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-37.687	0.000	0.000	-17.000	-17.000	0.000	0.000	-1.981	0.000	-0.00	
2.534	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-43.071	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	0.000	-0.00	
2.850	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-48.455	0.000	0.000	-17.000	-17.000	0.000	0.000	-5.384	0.000	-0.00	
3.167											
2	0.000	0.000	0.000	-2.162	25.734	0.000	0.000	-0.000	0.000	0.00	
		-53.839	21.965	-17.000	-17.000	0.000	0.000	-0.898	0.000	0.00	
	1.014	22.040	21.740	0.000	21.740	22.040	0.000	0.000	0.000	0.00	
		-47.012	6.734	0.000	-3.665	8.450	0.000	0.000	0.000	-0.00	
	2.028	36.227	17.867	0.000	17.867	36.227	0.000	0.000	0.000	0.00	
		-40.186	6.734	0.000	-4.955	14.285	0.000	0.000	0.000	-0.00	
	3.041	43.222	14.211	-2.789	14.211	43.222	0.000	0.000	0.000	0.00	
		-33.359	6.734	0.000	-6.062	18.061	0.000	0.000	0.000	-0.00	
	4.055	43.907	10.827	-6.173	10.827	43.907	0.000	0.000	0.000	0.00	
		-26.532	6.734	0.000	-9.223	32.476	0.000	0.000	0.000	-0.00	
	5.069	41.106	4.524	-12.476	7.871	39.900	0.000	0.000	0.000	0.00	
		-19.706	6.734	0.000	-13.077	38.057	0.000	0.000	0.000	-0.00	
	6.083	39.433	0.662	-16.338	7.603	0.000	0.000	-7.588	0.000	0.00	
		-14.800	4.090	0.000	-16.741	36.986	0.000	0.000	0.000	-0.00	
7.097	31.491	0.000	-19.980	7.603	0.120	0.000	0.000	0.000	0.00		
	-15.344	0.000	-2.162	-20.182	30.057	0.000	0.000	0.000	-0.00		
8.110	18.393	0.000	-23.348	7.603	7.828	0.000	0.000	0.000	0.00		
	-17.632	0.000	-3.514	-23.373	18.190	0.000	0.000	0.000	-0.00		
9.124	12.834	6.765	-5.235	6.863	8.784	0.000	0.000	0.000	0.00		
	-21.351	0.000	-3.964	-26.386	1.473	0.000	0.000	0.000	-0.00		
10.138											
3	0.000	15.742	6.863	-2.453	27.442	0.000	-13.663	0.000	0.00		
		-31.365	4.738	-20.001	-29.015	0.000	-17.809	0.000	0.00		
	1.014	13.255	0.000	-2.453	24.178	5.067	0.000	0.000	0.00		
		-26.570	4.691	0.000	-3.794	9.418	0.000	0.000	-0.00		
	2.028	19.946	20.592	0.000	20.697	19.548	0.000	0.000	0.00		
		-22.025	3.805	0.000	-4.638	12.458	0.000	0.000	-0.00		
	3.041	29.975	16.936	-0.064	17.408	27.661	0.000	0.000	0.00		
		-18.179	3.794	0.000	-5.433	15.003	0.000	0.000	-0.00		
4.055	34.622	13.256	-3.744	14.099	31.315	0.000	0.000	0.00			
	-14.425	3.663	0.000	-7.731	26.618	0.000	0.000	-0.00			
5.069	34.899	6.677	-10.323	10.890	30.544	0.000	0.000	0.00			
	-10.897	2.693	0.000	-10.823	31.475	0.000	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.083	34.330	3.426	-13.574	7.901	25.870	0.000	0.00		
		-11.708	0.000	-2.887	-14.142	32.024	0.000	-0.00		
	7.097	29.307	0.000	-17.265	6.055	14.160	0.000	0.00		
		-14.635	0.000	-2.887	-17.579	27.716	0.000	-0.00		
	8.110	19.069	0.000	-20.079	5.367	12.401	0.000	0.00		
		-17.591	0.000	-3.700	-21.025	18.444	0.000	-0.00		
9.124	10.677	1.501	-10.499	4.548	10.333	0.000	0.00			
	-21.354	0.000	-3.794	-24.506	3.579	0.000	-0.00			
4	10.138	9.594	3.450	-2.228	27.544	0.000	-14.600	0.00		
		-25.774	4.039	-17.391	-27.681	0.000	-14.961	0.00		
	1.014	11.917	10.291	-1.709	24.324	3.881	0.000	0.00		
		-21.731	3.859	0.000	-3.656	9.322	0.000	-0.00		
	2.028	18.834	20.251	0.000	20.827	18.559	0.000	0.00		
		-17.949	2.833	0.000	-4.466	12.309	0.000	-0.00		
	3.041	28.980	17.089	0.000	17.384	27.548	0.000	0.00		
		-15.077	2.833	0.000	-5.254	14.904	0.000	-0.00		
	4.055	33.864	13.386	-3.614	13.961	31.625	0.000	0.00		
		-12.205	2.833	0.000	-7.576	26.288	0.000	-0.00		
	5.069	33.803	6.991	-10.009	10.679	30.959	0.000	0.00		
		-9.332	2.833	0.000	-10.623	31.113	0.000	-0.00		
	6.083	33.808	3.587	-13.413	7.657	26.203	0.000	0.00		
		-11.580	0.000	-2.673	-13.934	31.752	0.000	-0.00		
7.097	28.929	0.000	-17.114	5.419	14.675	0.000	0.00			
	-14.306	0.000	-2.696	-17.396	27.532	0.000	-0.00			
8.110	18.819	0.000	-20.222	4.661	12.292	0.000	0.00			
	-17.136	0.000	-2.794	-20.892	18.251	0.000	-0.00			
9.124	9.569	3.859	-8.141	3.859	9.569	0.000	0.00			
	-20.334	0.000	-3.613	-24.408	3.470	0.000	-0.00			
5	10.138	6.514	3.007	-0.849	27.245	0.000	-14.012	0.00		
		-25.385	3.995	-17.205	-27.611	0.000	-14.966	0.00		
	1.014	11.089	10.340	-1.660	24.033	4.034	0.000	0.00		
		-21.418	3.839	0.000	-1.728	7.149	0.000	-0.00		
	2.028	19.035	20.210	0.000	20.433	19.010	0.000	0.00		
		-17.681	2.943	0.000	-2.562	14.713	0.000	-0.00		
	3.041	28.468	16.814	-0.186	16.826	27.041	0.000	0.00		
		-14.697	2.943	0.000	-4.302	20.812	0.000	-0.00		
	4.055	32.825	13.197	-3.803	13.398	30.587	0.000	0.00		
		-11.713	2.943	0.000	-7.164	28.564	0.000	-0.00		
	5.069	32.510	6.599	-10.401	10.184	29.583	0.000	0.00		
		-8.729	2.943	0.000	-10.401	32.510	0.000	-0.00		
	6.083	32.603	3.238	-13.762	7.322	24.978	0.000	0.00		
		-6.010	1.975	0.000	-13.990	31.703	0.000	-0.00		
7.097	27.300	0.000	-17.385	5.241	14.053	0.000	0.00			
	-5.538	0.000	-0.508	-17.686	25.808	0.000	-0.00			
8.110	16.929	0.000	-20.996	4.544	11.889	0.000	0.00			
	-6.526	0.000	-1.028	-21.387	15.225	0.000	-0.00			
9.124	9.718	3.839	-8.161	3.839	9.718	0.000	0.00			
	-10.845	0.000	-13.990	-24.870	0.191	0.000	-0.00			
6	10.138	7.674	3.118	-1.464	22.947	0.000	-5.660	0.00		
		-28.525	5.442	-19.639	-27.926	0.000	-17.523	0.00		
	0.634	10.718	9.677	-2.323	19.810	4.774	0.000	0.00		
		-25.098	5.118	0.000	-5.442	2.530	0.000	-0.00		
	1.268	13.246	16.345	-0.655	17.061	0.000	-0.091	0.00		
		-22.019	3.108	0.000	-5.442	0.000	-0.921	-0.00		
	1.902	17.373	13.605	-3.395	14.929	7.421	0.000	0.00		
		-20.048	3.108	0.000	-5.442	0.000	-4.371	-0.00		
	2.536	19.122	10.599	-6.401	12.494	13.385	0.000	0.00		
		-18.097	3.047	0.000	-6.922	18.374	0.000	-0.00		
	3.170	18.077	9.235	-7.765	9.829	16.847	0.000	0.00		
		-16.165	3.047	0.000	-9.829	16.847	0.000	-0.00		
	3.804	19.122	6.401	-10.599	6.922	18.374	0.000	0.00		
		-18.097	0.000	-3.047	-12.494	13.385	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.438	17.373	3.395	-13.605	5.442	0.000	-4.371	0.00		
		-20.048	0.000	-3.108	-14.929	7.421	0.000	-0.00		
	5.072	13.246	0.655	-16.345	5.442	0.000	-0.921	0.00		
		-22.019	0.000	-3.108	-17.061	0.000	-0.091	-0.00		
	5.706	10.718	2.323	-9.677	5.442	2.530	0.000	0.00		
-25.098		0.000	-5.118	-19.810	4.774	0.000	-0.00			
7	0.000	7.674	1.464	-3.118	27.926	0.000	-17.523	0.00		
		-28.525	19.640	-5.442	-22.947	0.000	-5.660	0.00		
	1.014	9.718	8.161	-3.839	24.870	0.191	0.000	0.00		
		-10.845	13.990	0.000	-3.839	9.718	0.000	-0.00		
	2.028	16.929	20.996	0.000	21.387	15.225	0.000	0.00		
		-6.526	1.028	0.000	-4.544	11.889	0.000	-0.00		
	3.041	27.300	17.385	0.000	17.686	25.808	0.000	0.00		
		-5.538	0.508	0.000	-5.241	14.053	0.000	-0.00		
	4.055	32.603	13.762	-3.238	13.990	31.703	0.000	0.00		
		-6.010	0.000	-1.975	-7.322	24.978	0.000	-0.00		
	5.069	32.510	10.401	-6.599	10.401	32.510	0.000	0.00		
		-8.729	0.000	-2.943	-10.184	29.583	0.000	-0.00		
	6.083	32.825	3.803	-13.197	7.164	28.564	0.000	0.00		
		-11.713	0.000	-2.943	-13.398	30.587	0.000	-0.00		
	7.097	28.468	0.186	-16.814	4.302	20.812	0.000	0.00		
-14.697		0.000	-2.943	-16.826	27.041	0.000	-0.00			
8.110	19.035	0.000	-20.210	2.562	14.713	0.000	0.00			
	-17.681	0.000	-2.943	-20.433	19.010	0.000	-0.00			
9.124	11.089	1.660	-10.340	1.728	7.149	0.000	0.00			
	-21.418	0.000	-3.839	-24.033	4.034	0.000	-0.00			
8	0.000	6.514	0.849	-3.007	27.611	0.000	-14.966	0.00		
		-25.385	17.205	-3.995	-27.245	0.000	-14.012	0.00		
	1.014	9.569	8.141	-3.859	24.408	3.470	0.000	0.00		
		-20.334	3.613	0.000	-3.859	9.569	0.000	-0.00		
	2.028	18.819	20.222	0.000	20.892	18.251	0.000	0.00		
		-17.136	2.794	0.000	-4.661	12.292	0.000	-0.00		
	3.041	28.929	17.114	0.000	17.396	27.532	0.000	0.00		
		-14.306	2.696	0.000	-5.419	14.675	0.000	-0.00		
	4.055	33.808	13.413	-3.587	13.934	31.752	0.000	0.00		
		-11.580	2.673	0.000	-7.657	26.203	0.000	-0.00		
	5.069	33.803	10.009	-6.991	10.623	31.113	0.000	0.00		
		-9.332	0.000	-2.833	-10.679	30.959	0.000	-0.00		
	6.083	33.864	3.614	-13.386	7.576	26.288	0.000	0.00		
		-12.205	0.000	-2.833	-13.961	31.625	0.000	-0.00		
	7.097	28.980	0.000	-17.089	5.254	14.904	0.000	0.00		
-15.077		0.000	-2.833	-17.384	27.548	0.000	-0.00			
8.110	18.834	0.000	-20.251	4.466	12.309	0.000	0.00			
	-17.949	0.000	-2.833	-20.827	18.559	0.000	-0.00			
9.124	11.917	1.709	-10.291	3.656	9.322	0.000	0.00			
	-21.731	0.000	-3.859	-24.324	3.881	0.000	-0.00			
9	0.000	9.594	2.228	-3.450	27.681	0.000	-14.961	0.00		
		-25.774	17.391	-4.039	-27.544	0.000	-14.600	0.00		
	1.014	10.677	10.499	-1.501	24.506	3.579	0.000	0.00		
		-21.354	3.794	0.000	-4.548	10.333	0.000	-0.00		
	2.028	19.069	20.079	0.000	21.025	18.444	0.000	0.00		
		-17.591	3.700	0.000	-5.367	12.401	0.000	-0.00		
	3.041	29.307	17.265	0.000	17.579	27.716	0.000	0.00		
		-14.635	2.887	0.000	-6.055	14.160	0.000	-0.00		
	4.055	34.330	13.574	-3.426	14.142	32.024	0.000	0.00		
		-11.708	2.887	0.000	-7.901	25.870	0.000	-0.00		
	5.069	34.899	10.323	-6.677	10.823	31.475	0.000	0.00		
		-10.897	0.000	-2.692	-10.890	30.544	0.000	-0.00		
	6.083	34.622	3.744	-13.256	7.731	26.618	0.000	0.00		
		-14.425	0.000	-3.663	-14.099	31.315	0.000	-0.00		
	7.097	29.975	0.064	-16.936	5.433	15.003	0.000	0.00		
-18.179		0.000	-3.794	-17.408	27.661	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	8.110	19.946	0.000	-20.625	4.638	12.458	0.000	0.00		
		-22.025	0.000	-3.805	-20.697	19.548	0.000	-0.00		
	9.124	13.255	2.453	0.000	3.794	9.418	0.000	0.00		
		-26.570	0.000	-4.691	-24.178	5.067	0.000	-0.00		
10	10.138									
	0.000	15.742	2.453	-6.863	29.015	0.000	-17.809	0.00		
		-31.365	20.001	-4.738	-27.442	0.000	-13.663	0.00		
	1.014	12.834	5.235	-6.765	26.386	1.473	0.000	0.00		
		-21.351	3.964	0.000	-6.863	8.784	0.000	-0.00		
	2.028	18.393	23.348	0.000	23.373	18.190	0.000	0.00		
		-17.632	3.514	0.000	-7.603	7.828	0.000	-0.00		
	3.041	31.491	19.980	0.000	20.182	30.057	0.000	0.00		
		-15.344	2.162	0.000	-7.603	0.120	0.000	-0.00		
	4.055	39.433	16.338	-0.662	16.741	36.986	0.000	0.00		
		-14.800	0.000	-4.090	-7.603	0.000	-7.588	-0.00		
	5.069	41.106	12.476	-4.524	13.077	38.057	0.000	0.00		
		-19.686	0.000	-6.727	-7.871	39.900	0.000	-0.00		
	6.083	43.907	6.173	-10.827	9.223	32.476	0.000	0.00		
		-26.506	0.000	-6.727	-10.827	43.907	0.000	-0.00		
	7.097	43.222	2.789	-14.211	6.062	18.061	0.000	0.00		
-33.326		0.000	-6.727	-14.211	43.222	0.000	-0.00			
8.110	36.227	0.000	-17.867	4.955	14.285	0.000	0.00			
	-40.145	0.000	-6.727	-17.867	36.227	0.000	-0.00			
9.124	22.040	0.000	-21.740	3.665	8.450	0.000	0.00			
	-46.965	0.000	-6.727	-21.740	22.040	0.000	-0.00			
11	10.138									
	0.000	0.000	2.162	-0.000	17.000	0.000	-0.898	0.00		
		-53.839	17.000	-21.825	-25.734	0.000	-0.000	0.00		
	0.317	0.000	12.000	-0.000	17.000	0.000	-2.702	0.00		
		-48.455	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	12.000	-0.000	17.000	0.000	-0.000	0.00		
		-43.071	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	12.000	-0.000	17.000	0.000	-1.981	0.00		
		-37.687	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	12.000	-0.000	17.000	0.000	-0.000	0.00		
		-32.303	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	17.000	-0.000	17.000	0.000	0.000	0.00		
		-26.919	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	17.000	-0.000	17.000	0.000	-1.227	0.00		
		-21.536	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	17.000	-0.000	17.000	0.000	0.000	0.00		
-16.152		17.000	0.000	-0.000	0.000	0.000	-0.00			
2.534	0.000	17.000	-0.000	17.000	0.000	-0.422	0.00			
	-10.768	17.000	0.000	-0.000	0.000	0.000	-0.00			
2.850	0.000	17.000	-0.000	17.000	0.000	0.000	0.00			
	-5.384	17.000	0.000	-0.000	0.000	0.000	-0.00			
3.167	0.000	0.000	0.000	17.000	0.000	0.000	0.00			
	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00			

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.162	-38.965
3	9.317	-31.995
4	5.678	-31.430
5	3.855	-31.208
6	6.190	-31.294
7	6.190	-31.294
8	3.855	-31.208
9	5.678	-31.430
10	9.317	-31.995
11	2.162	-38.952
12	0.000	-0.000

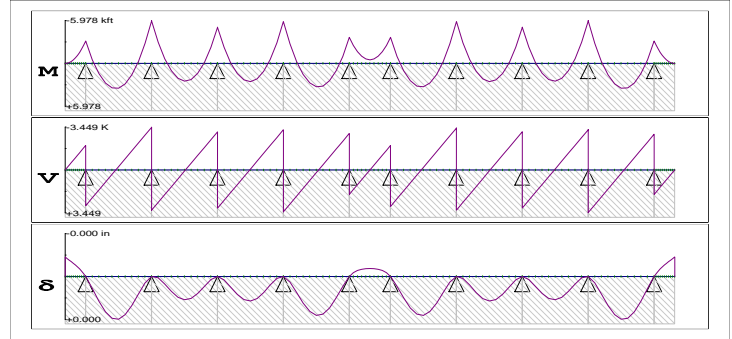
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Wearing Surface

Type: Static

Factor: 1.000



Span	Location (ft)	Moment (kft)	Shear ( K)	Deflect (in)	Reaction ( K)			
1	0.000	+0.000/	+0.000	+0.000/	-0.000	-0.00	0.000	
	0.317		-0.031		-0.198	-0.00		
	0.633		-0.125		-0.396	-0.00		
	0.950		-0.282		-0.594	-0.00		
	1.267		-0.501		-0.792	-0.00		
	1.583		-0.784		-0.990	-0.00		
	1.900		-1.128		-1.188	-0.00		
	2.217		-1.536		-1.386	-0.00		
	2.534		-2.006		-1.583	-0.00		
	2.850		-2.539		-1.781	-0.00		
	3.167							
	2	0.000		-3.134	-1.979/	+2.888	+0.00	-4.867
		1.014		-0.528		+2.254	+0.00	
2.028			+1.436		+1.620	+0.00		
3.041			+2.757		+0.987	+0.00		
4.055			+3.437		+0.353	+0.00		
5.069			+3.474		-0.280	+0.00		
6.083			+2.868		-0.914	+0.00		
7.097			+1.620		-1.548	+0.00		
8.110			-0.270		-2.181	+0.00		
9.124			-2.803		-2.815	+0.00		
10.138								
3		0.000		-5.978	-3.449/	+3.257	+0.00	-6.706
		1.014		-2.997		+2.624	+0.00	
	2.028		-0.658		+1.990	+0.00		
	3.041		+1.039		+1.357	+0.00		
	4.055		+2.093		+0.723	+0.00		
	5.069		+2.504		+0.089	+0.00		
	6.083		+2.274		-0.544	+0.00		
	7.097		+1.401		-1.178	+0.00		
	8.110		-0.115		-1.812	+0.00		
	9.124		-2.273		-2.445	+0.00		
	10.138							
	4	0.000		-5.073	-3.079/	+3.091	+0.00	-6.170
		1.014		-2.260		+2.458	+0.00	
2.028			-0.089		+1.824	+0.00		
3.041			+1.439		+1.191	+0.00		
4.055			+2.325		+0.557	+0.00		
5.069			+2.568		-0.077	+0.00		
6.083			+2.170		-0.710	+0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Span	Location (ft)	Moment (kft)	Shear ( K )	Deflect (in)	Reaction ( K )	
4	7.097	+1.128		-1.344	+0.00	
	8.110	-0.555		-1.978	+0.00	
	9.124	-2.881		-2.611	+0.00	
	10.138					
5	0.000	-5.850	-3.245/	+3.385	+0.00	-6.630
	1.014	-2.739		+2.752	+0.00	
	2.028	-0.270		+2.118	+0.00	
	3.041	+1.556		+1.484	+0.00	
	4.055	+2.740		+0.851	+0.00	
	5.069	+3.281		+0.217	+0.00	
	6.083	+3.180		-0.416	+0.00	
	7.097	+2.437		-1.050	+0.00	
	8.110	+1.051		-1.684	+0.00	
	9.124	-0.977		-2.317	+0.00	
	10.138					
6	0.000	-3.647	-2.951/	+1.981	+0.00	-4.932
	0.634	-2.517		+1.585	-0.00	
	1.268	-1.638		+1.189	-0.00	
	1.902	-1.009		+0.792	-0.00	
	2.536	-0.633		+0.396	-0.00	
	3.170	-0.507	-0.000/	-0.000	-0.00	
	3.804	-0.633		-0.396	-0.00	
	4.438	-1.009		-0.792	-0.00	
	5.072	-1.638		-1.189	-0.00	
	5.706	-2.517		-1.585	-0.00	
	6.340					
7	0.000	-3.647	-1.981/	+2.951	+0.00	-4.932
	1.014	-0.977		+2.317	+0.00	
	2.028	+1.051		+1.684	+0.00	
	3.041	+2.437		+1.050	+0.00	
	4.055	+3.180		+0.416	+0.00	
	5.069	+3.281		-0.217	+0.00	
	6.083	+2.740		-0.851	+0.00	
	7.097	+1.556		-1.484	+0.00	
	8.110	-0.270		-2.118	+0.00	
	9.124	-2.739		-2.752	+0.00	
	10.138					
8	0.000	-5.850	-3.385/	+3.245	+0.00	-6.630
	1.014	-2.881		+2.611	+0.00	
	2.028	-0.555		+1.978	+0.00	
	3.041	+1.128		+1.344	+0.00	
	4.055	+2.170		+0.710	+0.00	
	5.069	+2.568		+0.077	+0.00	
	6.083	+2.325		-0.557	+0.00	
	7.097	+1.439		-1.191	+0.00	
	8.110	-0.089		-1.824	+0.00	
	9.124	-2.260		-2.458	+0.00	
	10.138					
9	0.000	-5.073	-3.091/	+3.079	+0.00	-6.170
	1.014	-2.273		+2.445	+0.00	
	2.028	-0.115		+1.812	+0.00	
	3.041	+1.401		+1.178	+0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Span	Location (ft)	Moment (kft)	Shear (K)	Deflect (in)	Reaction (K)	
9	4.055	+2.274		+0.544	+0.00	
	5.069	+2.504		-0.089	+0.00	
	6.083	+2.093		-0.723	+0.00	
	7.097	+1.039		-1.357	+0.00	
	8.110	-0.658		-1.990	+0.00	
	9.124	-2.997		-2.624	+0.00	
	10.138					
10	0.000	-5.978	-3.257/	+3.449	+0.00	-6.706
	1.014	-2.803		+2.815	+0.00	
	2.028	-0.270		+2.181	+0.00	
	3.041	+1.620		+1.548	+0.00	
	4.055	+2.868		+0.914	+0.00	
	5.069	+3.474		+0.280	+0.00	
	6.083	+3.437		-0.353	+0.00	
	7.097	+2.757		-0.987	+0.00	
	8.110	+1.436		-1.620	+0.00	
	9.124	-0.528		-2.254	+0.00	
10.138						
11	0.000	-3.134	-2.888/	+1.979	+0.00	-4.867
	0.317	-2.539		+1.781	-0.00	
	0.633	-2.006		+1.583	-0.00	
	0.950	-1.536		+1.386	-0.00	
	1.267	-1.128		+1.188	-0.00	
	1.583	-0.784		+0.990	-0.00	
	1.900	-0.501		+0.792	-0.00	
	2.217	-0.282		+0.594	-0.00	
	2.534	-0.125		+0.396	-0.00	
	2.850	-0.031		+0.198	-0.00	
	3.167	+0.000/	+0.000	-0.000/	+0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



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Job No  
**P402110046**Sheet No  
**1**

Rev

Part Section D, Frame 16

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 16.std Date/Time 01-Mar-2012 09:32

## Job Information

	Engineer	Checked	Approved
Name:	M Johnson	D Hoff	
Date:	21-Feb-12	29-Feb-12	

Structure Type SPACE FRAME

Number of Nodes	4	Highest Node	4
Number of Elements	3	Highest Beam	3

Number of Basic Load Cases	8
Number of Combination Load Cases	2

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	DEAD LOAD
Primary	3	LIVE LOAD 1
Primary	4	LIVE LOAD 2
Primary	5	LIVE LOAD 3
Primary	6	LIVE LOAD 4
Primary	7	LIVE LOAD 5
Primary	8	LIVE LOAD 6
Primary	2	SOIL LOAD
Combination	9	DEAD PLUS SOIL
Combination	10	DL PLUS SOIL POS MOM

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	0.000	0.000
2	0.000	25.460	0.000
3	37.000	25.460	0.000
4	37.000	3.000	0.000

## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	2	25.460	2	0
2	2	3	37.000	1	0
3	4	3	22.460	2	0



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**P402110046**Sheet No  
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Rev

Part Section D, Frame 16

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By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 16.std Date/Time 01-Mar-2012 09:32

## Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE
2	Rect 36.00x21.00	756.000	27.8E+3	81.6E+3	70.7E+3	CONCRETE

## Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

## Basic Load Cases

Number	Name
1	DEAD LOAD
3	LIVE LOAD 1
4	LIVE LOAD 2
5	LIVE LOAD 3
6	LIVE LOAD 4
7	LIVE LOAD 5
8	LIVE LOAD 6
2	SOIL LOAD

## Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	DEAD PLUS SOIL	1	DEAD LOAD	1.00
		2	SOIL LOAD	1.15
10	DL PLUS SOIL POS MOM	1	DEAD LOAD	1.00
		2	SOIL LOAD	0.50



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Job No <b>P402110046</b>	Sheet No <b>3</b>	Rev
Part Section D, Frame 16		
Ref		
By M Johnson	Date 21-Feb-12	Chd D Hoff
Client ODOT	File Section D Frame 16.std	Date/Time 01-Mar-2012 09:32

## Beam Force Detail

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			Shear			Torsion		Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)				
1	1:DEAD LOAD	0.000	63.042	-7.856	0.000	0.000	0.000	0.000	0.000	0.000	-830.520	
		2.546	61.032	-7.856	0.000	0.000	0.000	0.000	0.000	0.000	-590.496	
		5.092	59.023	-7.856	0.000	0.000	0.000	0.000	0.000	0.000	-350.471	
		7.638	57.013	-7.856	0.000	0.000	0.000	0.000	0.000	0.000	-110.446	
		10.184	55.004	-7.856	0.000	0.000	0.000	0.000	0.000	0.000	129.579	
		12.730	52.994	-7.856	0.000	0.000	0.000	0.000	0.000	0.000	369.603	
		15.276	50.985	-7.856	0.000	0.000	0.000	0.000	0.000	0.000	609.628	
		17.822	48.975	-7.856	0.000	0.000	0.000	0.000	0.000	0.000	849.653	
		20.368	46.966	-7.856	0.000	0.000	0.000	0.000	0.000	0.000	1.09E+3	
		22.914	44.957	-7.856	0.000	0.000	0.000	0.000	0.000	0.000	1.33E+3	
		25.460	42.947	-7.856	0.000	0.000	0.000	0.000	0.000	1.57E+3		
	3:LIVE LOAD 1	0.000	70.518	-10.322	0.000	0.000	0.000	0.000	0.000	0.000	-1.09E+3	
		2.546	70.518	-10.322	0.000	0.000	0.000	0.000	0.000	0.000	-772.954	
		5.092	70.518	-10.322	0.000	0.000	0.000	0.000	0.000	0.000	-457.609	
		7.638	70.518	-10.322	0.000	0.000	0.000	0.000	0.000	0.000	-142.263	
		10.184	70.518	-10.322	0.000	0.000	0.000	0.000	0.000	0.000	173.082	
		12.730	70.518	-10.322	0.000	0.000	0.000	0.000	0.000	0.000	488.428	
		15.276	70.518	-10.322	0.000	0.000	0.000	0.000	0.000	0.000	803.773	
		17.822	70.518	-10.322	0.000	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		20.368	70.518	-10.322	0.000	0.000	0.000	0.000	0.000	0.000	1.43E+3	
		22.914	70.518	-10.322	0.000	0.000	0.000	0.000	0.000	0.000	1.75E+3	
		25.460	70.518	-10.322	0.000	0.000	0.000	0.000	0.000	2.07E+3		
	4:LIVE LOAD 2	0.000	48.165	-10.324	0.000	0.000	0.000	0.000	0.000	0.000	-1.09E+3	
		2.546	48.165	-10.324	0.000	0.000	0.000	0.000	0.000	0.000	-771.272	
		5.092	48.165	-10.324	0.000	0.000	0.000	0.000	0.000	0.000	-455.866	
		7.638	48.165	-10.324	0.000	0.000	0.000	0.000	0.000	0.000	-140.460	
		10.184	48.165	-10.324	0.000	0.000	0.000	0.000	0.000	0.000	174.946	
		12.730	48.165	-10.324	0.000	0.000	0.000	0.000	0.000	0.000	490.352	
		15.276	48.165	-10.324	0.000	0.000	0.000	0.000	0.000	0.000	805.757	
		17.822	48.165	-10.324	0.000	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		20.368	48.165	-10.324	0.000	0.000	0.000	0.000	0.000	0.000	1.44E+3	
		22.914	48.165	-10.324	0.000	0.000	0.000	0.000	0.000	0.000	1.75E+3	
		25.460	48.165	-10.324	0.000	0.000	0.000	0.000	0.000	2.07E+3		
	5:LIVE LOAD 3	0.000	59.355	-10.885	0.000	0.000	0.000	0.000	0.000	0.000	-1.15E+3	
		2.546	59.355	-10.885	0.000	0.000	0.000	0.000	0.000	0.000	-814.077	
		5.092	59.355	-10.885	0.000	0.000	0.000	0.000	0.000	0.000	-481.528	
		7.638	59.355	-10.885	0.000	0.000	0.000	0.000	0.000	0.000	-148.979	
		10.184	59.355	-10.885	0.000	0.000	0.000	0.000	0.000	0.000	183.569	
		12.730	59.355	-10.885	0.000	0.000	0.000	0.000	0.000	0.000	516.118	
		15.276	59.355	-10.885	0.000	0.000	0.000	0.000	0.000	0.000	848.667	
		17.822	59.355	-10.885	0.000	0.000	0.000	0.000	0.000	0.000	1.18E+3	
		20.368	59.355	-10.885	0.000	0.000	0.000	0.000	0.000	1.51E+3		





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Job No  
**P402110046**

Sheet No  
**4**

Rev

Part Section D, Frame 16

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 16.std Date/Time 01-Mar-2012 09:32

## Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		22.914	59.355	-10.885	0.000	0.000	0.000	0.000	0.000	1.85E+3	
		25.460	59.355	-10.885	0.000	0.000	0.000	0.000	0.000	2.18E+3	
	6:LIVE LOAD 4	0.000	64.148	-10.782	0.000	0.000	0.000	0.000	0.000	-1.14E+3	
		2.546	64.148	-10.782	0.000	0.000	0.000	0.000	0.000	-805.805	
		5.092	64.148	-10.782	0.000	0.000	0.000	0.000	0.000	-476.391	
		7.638	64.148	-10.782	0.000	0.000	0.000	0.000	0.000	-146.976	
		10.184	64.148	-10.782	0.000	0.000	0.000	0.000	0.000	182.439	
		12.730	64.148	-10.782	0.000	0.000	0.000	0.000	0.000	511.854	
		15.276	64.148	-10.782	0.000	0.000	0.000	0.000	0.000	841.268	
		17.822	64.148	-10.782	0.000	0.000	0.000	0.000	0.000	1.17E+3	
		20.368	64.148	-10.782	0.000	0.000	0.000	0.000	0.000	1.5E+3	
		22.914	64.148	-10.782	0.000	0.000	0.000	0.000	0.000	1.83E+3	
		25.460	64.148	-10.782	0.000	0.000	0.000	0.000	0.000	2.16E+3	
	7:LIVE LOAD 5	0.000	54.558	-10.781	0.000	0.000	0.000	0.000	0.000	-1.14E+3	
		2.546	54.558	-10.781	0.000	0.000	0.000	0.000	0.000	-806.933	
		5.092	54.558	-10.781	0.000	0.000	0.000	0.000	0.000	-477.559	
		7.638	54.558	-10.781	0.000	0.000	0.000	0.000	0.000	-148.185	
		10.184	54.558	-10.781	0.000	0.000	0.000	0.000	0.000	181.190	
		12.730	54.558	-10.781	0.000	0.000	0.000	0.000	0.000	510.564	
		15.276	54.558	-10.781	0.000	0.000	0.000	0.000	0.000	839.938	
		17.822	54.558	-10.781	0.000	0.000	0.000	0.000	0.000	1.17E+3	
		20.368	54.558	-10.781	0.000	0.000	0.000	0.000	0.000	1.5E+3	
		22.914	54.558	-10.781	0.000	0.000	0.000	0.000	0.000	1.83E+3	
		25.460	54.558	-10.781	0.000	0.000	0.000	0.000	0.000	2.16E+3	
	8:LIVE LOAD 6	0.000	44.047	-10.481	0.000	0.000	0.000	0.000	0.000	-1.1E+3	
		2.546	44.047	-10.481	0.000	0.000	0.000	0.000	0.000	-783.579	
		5.092	44.047	-10.481	0.000	0.000	0.000	0.000	0.000	-463.356	
		7.638	44.047	-10.481	0.000	0.000	0.000	0.000	0.000	-143.132	
		10.184	44.047	-10.481	0.000	0.000	0.000	0.000	0.000	177.091	
		12.730	44.047	-10.481	0.000	0.000	0.000	0.000	0.000	497.315	
		15.276	44.047	-10.481	0.000	0.000	0.000	0.000	0.000	817.538	
		17.822	44.047	-10.481	0.000	0.000	0.000	0.000	0.000	1.14E+3	
		20.368	44.047	-10.481	0.000	0.000	0.000	0.000	0.000	1.46E+3	
		22.914	44.047	-10.481	0.000	0.000	0.000	0.000	0.000	1.78E+3	
		25.460	44.047	-10.481	0.000	0.000	0.000	0.000	0.000	2.1E+3	
	2:SOIL LOAD	0.000	0.148	-0.388	0.000	0.000	0.000	0.000	0.000	-65.968	
		2.546	0.148	-0.388	0.000	0.000	0.000	0.000	0.000	-54.126	
		5.092	0.148	-0.388	0.000	0.000	0.000	0.000	0.000	-42.283	
		7.638	0.148	-0.388	0.000	0.000	0.000	0.000	0.000	-30.441	
		10.184	0.148	-0.388	0.000	0.000	0.000	0.000	0.000	-18.599	
		12.730	0.148	-0.388	0.000	0.000	0.000	0.000	0.000	-6.757	
		15.276	0.148	-0.388	0.000	0.000	0.000	0.000	0.000	5.086	
		17.822	0.148	-0.388	0.000	0.000	0.000	0.000	0.000	16.928	
		20.368	0.148	-0.388	0.000	0.000	0.000	0.000	0.000	28.770	



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Job No  
**P402110046**

Sheet No  
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Rev

Part Section D, Frame 16

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 16.std Date/Time 01-Mar-2012 09:32

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		22.914	0.148	-0.388	0.000	0.000	0.000	0.000	0.000	40.612	
		25.460	0.148	-0.388	0.000	0.000	0.000	0.000	0.000	52.455	
	9:DEAD PLUS	0.000	63.211	-8.302	0.000	0.000	0.000	0.000	0.000	-906.383	
		2.546	61.202	-8.302	0.000	0.000	0.000	0.000	0.000	-652.740	
		5.092	59.192	-8.302	0.000	0.000	0.000	0.000	0.000	-399.097	
		7.638	57.183	-8.302	0.000	0.000	0.000	0.000	0.000	-145.453	
		10.184	55.173	-8.302	0.000	0.000	0.000	0.000	0.000	108.190	
		12.730	53.164	-8.302	0.000	0.000	0.000	0.000	0.000	361.833	
		15.276	51.155	-8.302	0.000	0.000	0.000	0.000	0.000	615.477	
		17.822	49.145	-8.302	0.000	0.000	0.000	0.000	0.000	869.120	
		20.368	47.136	-8.302	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		22.914	45.126	-8.302	0.000	0.000	0.000	0.000	0.000	1.38E+3	
		25.460	43.117	-8.302	0.000	0.000	0.000	0.000	0.000	1.63E+3	
	10:DL PLUS S	0.000	63.115	-8.050	0.000	0.000	0.000	0.000	0.000	-863.504	
		2.546	61.106	-8.050	0.000	0.000	0.000	0.000	0.000	-617.558	
		5.092	59.097	-8.050	0.000	0.000	0.000	0.000	0.000	-371.613	
		7.638	57.087	-8.050	0.000	0.000	0.000	0.000	0.000	-125.667	
		10.184	55.078	-8.050	0.000	0.000	0.000	0.000	0.000	120.279	
		12.730	53.068	-8.050	0.000	0.000	0.000	0.000	0.000	366.225	
		15.276	51.059	-8.050	0.000	0.000	0.000	0.000	0.000	612.171	
		17.822	49.049	-8.050	0.000	0.000	0.000	0.000	0.000	858.117	
		20.368	47.040	-8.050	0.000	0.000	0.000	0.000	0.000	1.1E+3	
		22.914	45.030	-8.050	0.000	0.000	0.000	0.000	0.000	1.35E+3	
		25.460	43.021	-8.050	0.000	0.000	0.000	0.000	0.000	1.6E+3	
2	1:DEAD LOAD	0.000	7.856	42.947	0.000	0.000	0.000	0.000	0.000	1.57E+3	
		3.700	7.856	34.964	0.000	0.000	0.000	0.000	0.000	-140.616	
		7.400	7.856	26.867	0.000	0.000	0.000	0.000	0.000	-1.5E+3	
		11.100	7.856	18.657	0.000	0.000	0.000	0.000	0.000	-2.51E+3	
		14.800	7.856	10.332	0.000	0.000	0.000	0.000	0.000	-3.17E+3	
		18.500	7.856	1.893	0.000	0.000	0.000	0.000	0.000	-3.46E+3	
		22.200	7.856	-9.146	0.000	0.000	0.000	0.000	0.000	-3.23E+3	
		25.900	7.856	-17.830	0.000	0.000	0.000	0.000	0.000	-2.62E+3	
		29.600	7.856	-26.627	0.000	0.000	0.000	0.000	0.000	-1.63E+3	
		33.300	7.856	-35.538	0.000	0.000	0.000	0.000	0.000	-260.973	
		37.000	7.856	-44.564	0.000	0.000	0.000	0.000	0.000	1.49E+3	
	3:LIVE LOAD 1	0.000	10.322	70.518	0.000	0.000	0.000	0.000	0.000	2.07E+3	
		3.700	10.322	46.878	0.000	0.000	0.000	0.000	0.000	-183.284	
		7.400	10.322	31.118	0.000	0.000	0.000	0.000	0.000	-2.12E+3	
		11.100	10.322	19.298	0.000	0.000	0.000	0.000	0.000	-3.45E+3	
		14.800	10.322	11.418	0.000	0.000	0.000	0.000	0.000	-4.22E+3	
		18.500	10.322	-8.282	0.000	0.000	0.000	0.000	0.000	-4.61E+3	
		22.200	10.322	-12.222	0.000	0.000	0.000	0.000	0.000	-4.21E+3	
		25.900	10.322	-27.982	0.000	0.000	0.000	0.000	0.000	-3.42E+3	
		29.600	10.322	-39.802	0.000	0.000	0.000	0.000	0.000	-2.06E+3	



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Job No  
**P402110046**

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Part Section D, Frame 16

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 16.std Date/Time 01-Mar-2012 09:32

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	10.322	-47.682	0.000	0.000	0.000	0.000	0.000	-157.093	
		37.000	10.322	-47.682	0.000	0.000	0.000	0.000	0.000	1.96E+3	
	4:LIVE LOAD 2	0.000	10.324	48.165	0.000	0.000	0.000	0.000	0.000	2.07E+3	
		3.700	10.324	48.165	0.000	0.000	0.000	0.000	0.000	-71.156	
		7.400	10.324	40.285	0.000	0.000	0.000	0.000	0.000	-2E+3	
		11.100	10.324	28.465	0.000	0.000	0.000	0.000	0.000	-3.38E+3	
		14.800	10.324	12.705	0.000	0.000	0.000	0.000	0.000	-4.19E+3	
		18.500	10.324	8.765	0.000	0.000	0.000	0.000	0.000	-4.61E+3	
		22.200	10.324	-10.935	0.000	0.000	0.000	0.000	0.000	-4.24E+3	
		25.900	10.324	-18.815	0.000	0.000	0.000	0.000	0.000	-3.49E+3	
		29.600	10.324	-30.635	0.000	0.000	0.000	0.000	0.000	-2.18E+3	
		33.300	10.324	-46.395	0.000	0.000	0.000	0.000	0.000	-268.971	
		37.000	10.324	-70.035	0.000	0.000	0.000	0.000	0.000	1.96E+3	
	5:LIVE LOAD 3	0.000	10.885	59.355	0.000	0.000	0.000	0.000	0.000	2.18E+3	
		3.700	10.885	55.415	0.000	0.000	0.000	0.000	0.000	-330.428	
		7.400	10.885	39.655	0.000	0.000	0.000	0.000	0.000	-2.17E+3	
		11.100	10.885	27.835	0.000	0.000	0.000	0.000	0.000	-3.53E+3	
		14.800	10.885	19.955	0.000	0.000	0.000	0.000	0.000	-4.44E+3	
		18.500	10.885	0.255	0.000	0.000	0.000	0.000	0.000	-4.62E+3	
		22.200	10.885	-19.445	0.000	0.000	0.000	0.000	0.000	-4.46E+3	
		25.900	10.885	-27.325	0.000	0.000	0.000	0.000	0.000	-3.57E+3	
		29.600	10.885	-39.145	0.000	0.000	0.000	0.000	0.000	-2.24E+3	
		33.300	10.885	-54.905	0.000	0.000	0.000	0.000	0.000	-421.059	
		37.000	10.885	-58.845	0.000	0.000	0.000	0.000	0.000	2.07E+3	
	6:LIVE LOAD 4	0.000	10.782	64.148	0.000	0.000	0.000	0.000	0.000	2.16E+3	
		3.700	10.782	44.448	0.000	0.000	0.000	0.000	0.000	-287.352	
		7.400	10.782	36.568	0.000	0.000	0.000	0.000	0.000	-2.14E+3	
		11.100	10.782	24.748	0.000	0.000	0.000	0.000	0.000	-3.5E+3	
		14.800	10.782	8.988	0.000	0.000	0.000	0.000	0.000	-4.33E+3	
		18.500	10.782	5.048	0.000	0.000	0.000	0.000	0.000	-4.64E+3	
		22.200	10.782	-14.652	0.000	0.000	0.000	0.000	0.000	-4.34E+3	
		25.900	10.782	-22.532	0.000	0.000	0.000	0.000	0.000	-3.52E+3	
		29.600	10.782	-34.352	0.000	0.000	0.000	0.000	0.000	-2.19E+3	
		33.300	10.782	-50.112	0.000	0.000	0.000	0.000	0.000	-299.424	
		37.000	10.782	-54.052	0.000	0.000	0.000	0.000	0.000	2.05E+3	
	7:LIVE LOAD 5	0.000	10.781	54.558	0.000	0.000	0.000	0.000	0.000	2.16E+3	
		3.700	10.781	50.618	0.000	0.000	0.000	0.000	0.000	-209.763	
		7.400	10.781	34.858	0.000	0.000	0.000	0.000	0.000	-2.12E+3	
		11.100	10.781	23.038	0.000	0.000	0.000	0.000	0.000	-3.48E+3	
		14.800	10.781	15.158	0.000	0.000	0.000	0.000	0.000	-4.32E+3	
		18.500	10.781	-4.542	0.000	0.000	0.000	0.000	0.000	-4.64E+3	
		22.200	10.781	-8.482	0.000	0.000	0.000	0.000	0.000	-4.35E+3	
		25.900	10.781	-24.242	0.000	0.000	0.000	0.000	0.000	-3.55E+3	
		29.600	10.781	-36.062	0.000	0.000	0.000	0.000	0.000	-2.21E+3	



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Job No  
**P402110046**

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Part Section D, Frame 16

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 16.std Date/Time 01-Mar-2012 09:32

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	10.781	-43.942	0.000	0.000	0.000	0.000	0.000	-377.185	
		37.000	10.781	-63.642	0.000	0.000	0.000	0.000	0.000	2.05E+3	
	8:LIVE LOAD 6	0.000	10.481	44.047	0.000	0.000	0.000	0.000	0.000	2.1E+3	
		3.700	10.481	44.047	0.000	0.000	0.000	0.000	0.000	142.729	
		7.400	10.481	44.047	0.000	0.000	0.000	0.000	0.000	-1.81E+3	
		11.100	10.481	30.907	0.000	0.000	0.000	0.000	0.000	-3.48E+3	
		14.800	10.481	22.147	0.000	0.000	0.000	0.000	0.000	-4.59E+3	
		18.500	10.481	0.247	0.000	0.000	0.000	0.000	0.000	-5.05E+3	
		22.200	10.481	-21.653	0.000	0.000	0.000	0.000	0.000	-4.62E+3	
		25.900	10.481	-30.413	0.000	0.000	0.000	0.000	0.000	-3.52E+3	
		29.600	10.481	-43.553	0.000	0.000	0.000	0.000	0.000	-1.88E+3	
		33.300	10.481	-43.553	0.000	0.000	0.000	0.000	0.000	54.861	
		37.000	10.481	-43.553	0.000	0.000	0.000	0.000	0.000	1.99E+3	
	2:SOIL LOAD	0.000	0.388	0.148	0.000	0.000	0.000	0.000	0.000	52.455	
		3.700	0.388	0.148	0.000	0.000	0.000	0.000	0.000	45.906	
		7.400	0.388	0.148	0.000	0.000	0.000	0.000	0.000	39.357	
		11.100	0.388	0.148	0.000	0.000	0.000	0.000	0.000	32.808	
		14.800	0.388	0.148	0.000	0.000	0.000	0.000	0.000	26.259	
		18.500	0.388	0.148	0.000	0.000	0.000	0.000	0.000	19.710	
		22.200	0.388	0.148	0.000	0.000	0.000	0.000	0.000	13.161	
		25.900	0.388	0.148	0.000	0.000	0.000	0.000	0.000	6.611	
		29.600	0.388	0.148	0.000	0.000	0.000	0.000	0.000	0.062	
		33.300	0.388	0.148	0.000	0.000	0.000	0.000	0.000	-6.487	
		37.000	0.388	0.148	0.000	0.000	0.000	0.000	0.000	-13.036	
	9:DEAD PLUS	0.000	8.302	43.117	0.000	0.000	0.000	0.000	0.000	1.63E+3	
		3.700	8.302	35.134	0.000	0.000	0.000	0.000	0.000	-87.824	
		7.400	8.302	27.037	0.000	0.000	0.000	0.000	0.000	-1.46E+3	
		11.100	8.302	18.826	0.000	0.000	0.000	0.000	0.000	-2.48E+3	
		14.800	8.302	10.501	0.000	0.000	0.000	0.000	0.000	-3.14E+3	
		18.500	8.302	2.062	0.000	0.000	0.000	0.000	0.000	-3.44E+3	
		22.200	8.302	-8.977	0.000	0.000	0.000	0.000	0.000	-3.21E+3	
		25.900	8.302	-17.660	0.000	0.000	0.000	0.000	0.000	-2.61E+3	
		29.600	8.302	-26.457	0.000	0.000	0.000	0.000	0.000	-1.63E+3	
		33.300	8.302	-35.369	0.000	0.000	0.000	0.000	0.000	-268.432	
		37.000	8.302	-44.394	0.000	0.000	0.000	0.000	0.000	1.48E+3	
	10:DL PLUS S	0.000	8.050	43.021	0.000	0.000	0.000	0.000	0.000	1.6E+3	
		3.700	8.050	35.038	0.000	0.000	0.000	0.000	0.000	-117.663	
		7.400	8.050	26.941	0.000	0.000	0.000	0.000	0.000	-1.48E+3	
		11.100	8.050	18.730	0.000	0.000	0.000	0.000	0.000	-2.5E+3	
		14.800	8.050	10.406	0.000	0.000	0.000	0.000	0.000	-3.16E+3	
		18.500	8.050	1.967	0.000	0.000	0.000	0.000	0.000	-3.45E+3	
		22.200	8.050	-9.073	0.000	0.000	0.000	0.000	0.000	-3.22E+3	
		25.900	8.050	-17.756	0.000	0.000	0.000	0.000	0.000	-2.61E+3	
		29.600	8.050	-26.553	0.000	0.000	0.000	0.000	0.000	-1.63E+3	



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Rev

Part Section D, Frame 16

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 16.std Date/Time 01-Mar-2012 09:32

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	
		33.300	8.050	-35.464	0.000	0.000	0.000	0.000	-264.216
		37.000	8.050	-44.490	0.000	0.000	0.000	0.000	1.49E+3
3	1:DEAD LOAD	0.000	62.290	7.856	0.000	0.000	0.000	0.000	622.799
		2.246	60.518	7.856	0.000	0.000	0.000	0.000	411.057
		4.492	58.745	7.856	0.000	0.000	0.000	0.000	199.315
		6.738	56.972	7.856	0.000	0.000	0.000	0.000	-12.428
		8.984	55.200	7.856	0.000	0.000	0.000	0.000	-224.170
		11.230	53.427	7.856	0.000	0.000	0.000	0.000	-435.912
		13.476	51.654	7.856	0.000	0.000	0.000	0.000	-647.654
		15.722	49.882	7.856	0.000	0.000	0.000	0.000	-859.396
		17.968	48.109	7.856	0.000	0.000	0.000	0.000	-1.07E+3
		20.214	46.336	7.856	0.000	0.000	0.000	0.000	-1.28E+3
		22.460	44.564	7.856	0.000	0.000	0.000	0.000	-1.49E+3
	3:LIVE LOAD 1	0.000	47.682	10.322	0.000	0.000	0.000	0.000	821.886
		2.246	47.682	10.322	0.000	0.000	0.000	0.000	543.699
		4.492	47.682	10.322	0.000	0.000	0.000	0.000	265.511
		6.738	47.682	10.322	0.000	0.000	0.000	0.000	-12.677
		8.984	47.682	10.322	0.000	0.000	0.000	0.000	-290.864
		11.230	47.682	10.322	0.000	0.000	0.000	0.000	-569.052
		13.476	47.682	10.322	0.000	0.000	0.000	0.000	-847.239
		15.722	47.682	10.322	0.000	0.000	0.000	0.000	-1.13E+3
		17.968	47.682	10.322	0.000	0.000	0.000	0.000	-1.4E+3
		20.214	47.682	10.322	0.000	0.000	0.000	0.000	-1.68E+3
		22.460	47.682	10.322	0.000	0.000	0.000	0.000	-1.96E+3
	4:LIVE LOAD 2	0.000	70.035	10.324	0.000	0.000	0.000	0.000	824.396
		2.246	70.035	10.324	0.000	0.000	0.000	0.000	546.155
		4.492	70.035	10.324	0.000	0.000	0.000	0.000	267.914
		6.738	70.035	10.324	0.000	0.000	0.000	0.000	-10.327
		8.984	70.035	10.324	0.000	0.000	0.000	0.000	-288.568
		11.230	70.035	10.324	0.000	0.000	0.000	0.000	-566.809
		13.476	70.035	10.324	0.000	0.000	0.000	0.000	-845.050
		15.722	70.035	10.324	0.000	0.000	0.000	0.000	-1.12E+3
		17.968	70.035	10.324	0.000	0.000	0.000	0.000	-1.4E+3
		20.214	70.035	10.324	0.000	0.000	0.000	0.000	-1.68E+3
		22.460	70.035	10.324	0.000	0.000	0.000	0.000	-1.96E+3
	5:LIVE LOAD 3	0.000	58.845	10.885	0.000	0.000	0.000	0.000	868.066
		2.246	58.845	10.885	0.000	0.000	0.000	0.000	574.702
		4.492	58.845	10.885	0.000	0.000	0.000	0.000	281.338
		6.738	58.845	10.885	0.000	0.000	0.000	0.000	-12.025
		8.984	58.845	10.885	0.000	0.000	0.000	0.000	-305.389
		11.230	58.845	10.885	0.000	0.000	0.000	0.000	-598.753
		13.476	58.845	10.885	0.000	0.000	0.000	0.000	-892.117
		15.722	58.845	10.885	0.000	0.000	0.000	0.000	-1.19E+3
		17.968	58.845	10.885	0.000	0.000	0.000	0.000	-1.48E+3



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By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 16.std Date/Time 01-Mar-2012 09:32

## Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		20.214	58.845	10.885	0.000	0.000	0.000	0.000	0.000	-1.77E+3	
		22.460	58.845	10.885	0.000	0.000	0.000	0.000	0.000	-2.07E+3	
	6:LIVE LOAD 4	0.000	54.052	10.782	0.000	0.000	0.000	0.000	0.000	860.656	
		2.246	54.052	10.782	0.000	0.000	0.000	0.000	0.000	570.057	
		4.492	54.052	10.782	0.000	0.000	0.000	0.000	0.000	279.457	
		6.738	54.052	10.782	0.000	0.000	0.000	0.000	0.000	-11.142	
		8.984	54.052	10.782	0.000	0.000	0.000	0.000	0.000	-301.741	
		11.230	54.052	10.782	0.000	0.000	0.000	0.000	0.000	-592.340	
		13.476	54.052	10.782	0.000	0.000	0.000	0.000	0.000	-882.939	
		15.722	54.052	10.782	0.000	0.000	0.000	0.000	0.000	-1.17E+3	
		17.968	54.052	10.782	0.000	0.000	0.000	0.000	0.000	-1.46E+3	
		20.214	54.052	10.782	0.000	0.000	0.000	0.000	0.000	-1.75E+3	
		22.460	54.052	10.782	0.000	0.000	0.000	0.000	0.000	-2.05E+3	
	7:LIVE LOAD 5	0.000	63.642	10.781	0.000	0.000	0.000	0.000	0.000	858.973	
		2.246	63.642	10.781	0.000	0.000	0.000	0.000	0.000	568.410	
		4.492	63.642	10.781	0.000	0.000	0.000	0.000	0.000	277.847	
		6.738	63.642	10.781	0.000	0.000	0.000	0.000	0.000	-12.717	
		8.984	63.642	10.781	0.000	0.000	0.000	0.000	0.000	-303.280	
		11.230	63.642	10.781	0.000	0.000	0.000	0.000	0.000	-593.843	
		13.476	63.642	10.781	0.000	0.000	0.000	0.000	0.000	-884.407	
		15.722	63.642	10.781	0.000	0.000	0.000	0.000	0.000	-1.17E+3	
		17.968	63.642	10.781	0.000	0.000	0.000	0.000	0.000	-1.47E+3	
		20.214	63.642	10.781	0.000	0.000	0.000	0.000	0.000	-1.76E+3	
		22.460	63.642	10.781	0.000	0.000	0.000	0.000	0.000	-2.05E+3	
	8:LIVE LOAD 6	0.000	43.553	10.481	0.000	0.000	0.000	0.000	0.000	836.312	
		2.246	43.553	10.481	0.000	0.000	0.000	0.000	0.000	553.820	
		4.492	43.553	10.481	0.000	0.000	0.000	0.000	0.000	271.330	
		6.738	43.553	10.481	0.000	0.000	0.000	0.000	0.000	-11.161	
		8.984	43.553	10.481	0.000	0.000	0.000	0.000	0.000	-293.652	
		11.230	43.553	10.481	0.000	0.000	0.000	0.000	0.000	-576.143	
		13.476	43.553	10.481	0.000	0.000	0.000	0.000	0.000	-858.634	
		15.722	43.553	10.481	0.000	0.000	0.000	0.000	0.000	-1.14E+3	
		17.968	43.553	10.481	0.000	0.000	0.000	0.000	0.000	-1.42E+3	
		20.214	43.553	10.481	0.000	0.000	0.000	0.000	0.000	-1.71E+3	
		22.460	43.553	10.481	0.000	0.000	0.000	0.000	0.000	-1.99E+3	
	2:SOIL LOAD	0.000	-0.148	-14.732	0.000	0.000	0.000	0.000	0.000	-489.024	
		2.246	-0.148	-9.394	0.000	0.000	0.000	0.000	0.000	-172.648	
		4.492	-0.148	-4.332	0.000	0.000	0.000	0.000	0.000	5.350	
		6.738	-0.148	-0.973	0.000	0.000	0.000	0.000	0.000	70.522	
		8.984	-0.148	0.277	0.000	0.000	0.000	0.000	0.000	75.100	
		11.230	-0.148	0.388	0.000	0.000	0.000	0.000	0.000	65.270	
		13.476	-0.148	0.388	0.000	0.000	0.000	0.000	0.000	54.824	
		15.722	-0.148	0.388	0.000	0.000	0.000	0.000	0.000	44.377	
		17.968	-0.148	0.388	0.000	0.000	0.000	0.000	0.000	33.930	



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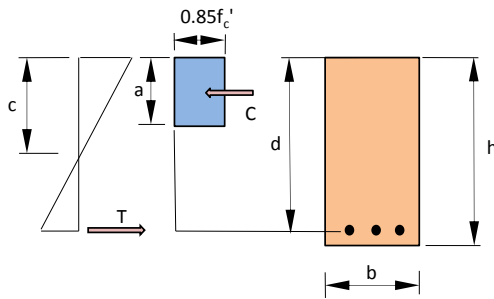
Client ODOT

File Section D Frame 16.std Date/Time 01-Mar-2012 09:32

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	
		20.214	-0.148	0.388	0.000	0.000	0.000	0.000	23.484
		22.460	-0.148	0.388	0.000	0.000	0.000	0.000	13.036
	9:DEAD PLUS	0.000	62.121	-9.086	0.000	0.000	0.000	0.000	60.421
		2.246	60.348	-2.947	0.000	0.000	0.000	0.000	212.511
		4.492	58.575	2.875	0.000	0.000	0.000	0.000	205.467
		6.738	56.803	6.737	0.000	0.000	0.000	0.000	68.673
		8.984	55.030	8.175	0.000	0.000	0.000	0.000	-137.804
		11.230	53.257	8.302	0.000	0.000	0.000	0.000	-360.851
		13.476	51.485	8.302	0.000	0.000	0.000	0.000	-584.607
		15.722	49.712	8.302	0.000	0.000	0.000	0.000	-808.363
		17.968	47.939	8.302	0.000	0.000	0.000	0.000	-1.03E+3
		20.214	46.167	8.302	0.000	0.000	0.000	0.000	-1.26E+3
		22.460	44.394	8.302	0.000	0.000	0.000	0.000	-1.48E+3
	10:DL PLUS S	0.000	62.217	0.490	0.000	0.000	0.000	0.000	378.287
		2.246	60.444	3.159	0.000	0.000	0.000	0.000	324.733
		4.492	58.671	5.690	0.000	0.000	0.000	0.000	201.989
		6.738	56.899	7.370	0.000	0.000	0.000	0.000	22.833
		8.984	55.126	7.995	0.000	0.000	0.000	0.000	-186.620
		11.230	53.353	8.050	0.000	0.000	0.000	0.000	-403.277
		13.476	51.581	8.050	0.000	0.000	0.000	0.000	-620.242
		15.722	49.808	8.050	0.000	0.000	0.000	0.000	-837.208
		17.968	48.035	8.050	0.000	0.000	0.000	0.000	-1.05E+3
		20.214	46.263	8.050	0.000	0.000	0.000	0.000	-1.27E+3
		22.460	44.490	8.050	0.000	0.000	0.000	0.000	-1.49E+3

### Floor Beam Postive Moment Section



b =	98.9	in
d =	48	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	12.7	in <sup>2</sup>
% Steel Loss =	0%	

(10-1 1/8")  
from 159/246  
of original  
plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	12.700	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	239.42	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	1.108	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1491.4	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Plus Soil Load Moment

(Soil Load Moment has been factored by 0.5)

Total Service Positive Moment = 287.7 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	33.7	28.5	20.2	29.7	31.2	31.3	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	43.8	37.1	26.3	38.6	40.6	40.7	kips
Reaction per Wheel (LL+I) =	21.9	18.5	13.1	19.3	20.3	20.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

From STAAD							
Max. Positive LL+I Moment =	421.00	356.0	252.4	371.0	389.8	391.0	ft*kips

Maximum Positive Moment results from 3 lanes loaded.

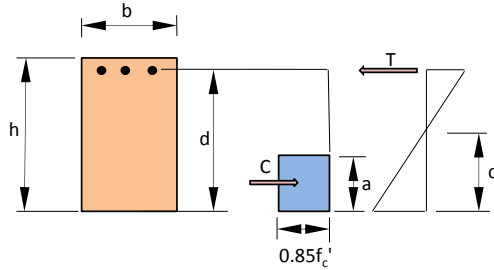
#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.22	44.0 Tons	HS24.5
	HS20	36 Tons	RF=2.04	73.5 Tons	HS40.8
Operating	2F1	15 Tons	RF=3.41	51.1 Tons	
	3F1	23 Tons	RF=2.32	53.3 Tons	
	4F1	27 Tons	RF=2.21	59.5 Tons	
	5C1	40 Tons	RF=2.20	87.9 Tons	
	Ohio Legal %	220%			



### Floor Beam Negative Moment Section

(South end of floorbeam controls)



b =	21	in
d =	66	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	10.16	in <sup>2</sup>
% Steel Loss =	0%	

(8-1 1/8") from  
159/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	10.160	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	49.50	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.85		
a =	6.261	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1580.9	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

Taken at face of column (Soil Load Moment has been increased by 1.15 factor)

Total Service Negative Moment = 59.4 ft\*kips From Staad

#### Live Load Moment

Taken at face of column

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. Negative LL+I Moment =	100.42	84.9	60.2	88.5	93.0	93.3	ft*kips	

Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=6.90	248.4 Tons	HS138.0
Operating	HS20	36 Tons	RF=11.52	414.7 Tons	HS230.4
	2F1	15 Tons	RF=19.22	288.3 Tons	
	3F1	23 Tons	RF=13.07	300.6 Tons	
	4F1	27 Tons	RF=12.44	335.9 Tons	
	5C1	40 Tons	RF=12.40	496.1 Tons	
	Ohio Legal %	1240%			



## Floor Beam Shear Section

### Section Capacity

Taken at face of column (South end of cap controls)

$$A_{sh} = 0.62 \text{ in}^2$$

$$s = 12 \text{ in}$$

$$d = 66 \text{ in}$$

$$\alpha = 30 \text{ degrees}$$

$$V_c = 151.8 \text{ kips}$$

Total Bar area per space (assumed double leg #5's)

Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)

$d$  used for shear

angle of shear reinforcement (30 degrees assumed)

Shear strength provided by concrete (AASHTO 8-49)

$$V_s = 153.7 \text{ kips}$$

(AASHTO Eq. 8-54)

$$\phi V_n = 259.7 \text{ kips}$$

Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column) (Soil Load Moment has been increased by 1.15 factor)

$$\text{Total Service Shear} = 40.7 \text{ kips} \quad \text{From Staad}$$

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	63.6	53.8	38.1	56.1	58.9	59.1	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.50	53.9 Tons	HS30.0
Operating	HS20	36 Tons	RF=2.50	90.0 Tons	HS50.0
	2F1	15 Tons	RF=4.17	62.6 Tons	
	3F1	23 Tons	RF=2.84	65.3 Tons	
	4F1	27 Tons	RF=2.70	72.9 Tons	
	5C1	40 Tons	RF=2.69	107.7 Tons	
	Ohio Legal %	270%			



**Column Section** (Top of South Column controls)

h =	36	in	Column Depth
b =	21	in	Column Width
A <sub>s</sub> =	8.08	in <sup>2</sup>	Area of Tension Steel (4 - 1 1/8" bars, 3 - 1" bars)
A' <sub>s</sub> =	4	in <sup>2</sup>	Area of Compression Steel (4 - 1" bars)
d =	33	in	Distance from compression face to centroid of tension steel
d' =	3	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	3	ksi	Concrete Strength
f <sub>y</sub> =	33	ksi	Steel Yield Stress
E <sub>s</sub> =	29000	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	0.003	in/in	Ultimate concrete strain
β <sub>1</sub> =	0.85		
d" =	15	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads plus Soil Loads** (Moment taken below chamfer) (Soil Load has been increased by 1.15 factor)

Total Service Moment =	92.2	ft-kips	From Staad
Total Service Axial Force =	46	kips	From Staad

**Live Loads** (Moment taken below chamfer)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	131.3	111.0	78.7	115.7	121.5	121.9	ft-kips	
Max. LL+I Axial Force =	58.8	49.7	41.7	86.5	61.8	59.0	kips	

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	20.34	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	23.93	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	33	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	954.4	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	1209.0	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	2295.6	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	1606.9	kips		



Made by:	MJJ	Date:	2/21/2012	Job No:	P402110046
Checked by:	DBH	Date:	2/29/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	As-Built Concrete Frame Rating Section D (Frame 16)				

**Pure Bending Capacity** (Ignoring compression steel)

$a =$	4.979	in	$a = A_s * f_y / 0.85 * f'_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	677.9	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	610.1	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **15.51** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a =$	13.18613994	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	706.1	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	400.0	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	818.7	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	24.56	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	187.4	167.7	150.2	247.4	193.8	187.8	kips
$M_u =$	404.6	360.7	290.5	370.8	383.5	384.3	ft-kips
$e =$	25.91	25.81	23.21	17.99	23.74	24.56	in
$\phi P_n =$	374.0	375.9	428.8	570.2	417.1	400.0	kips
$\phi M_n =$	807.4	808.3	829.3	854.7	825.2	818.7	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

Column Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.41	86.9 Tons	HS48.3
Operating	HS20	36 Tons	RF=4.03	145.1 Tons	HS80.6
	2F1	15 Tons	RF=6.81	102.2 Tons	
	3F1	23 Tons	RF=4.54	104.5 Tons	
	4F1	27 Tons	RF=4.45	120.1 Tons	
	5C1	40 Tons	RF=4.41	176.4 Tons	
Ohio Legal %	440%				

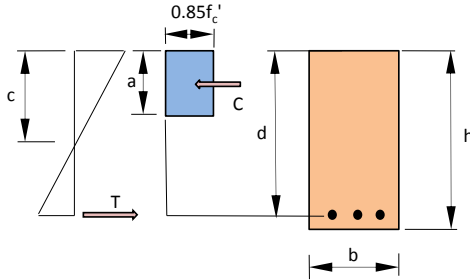
Floor Beam Load Rating Summary:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.22	44.0 Tons	HS24.5
Operating	HS20	36 Tons	RF=2.04	73.5 Tons	HS40.8
	2F1	15 Tons	RF=3.41	51.1 Tons	
	3F1	23 Tons	RF=2.32	53.3 Tons	
	4F1	27 Tons	RF=2.21	59.5 Tons	
	5C1	40 Tons	RF=2.20	87.9 Tons	
Ohio Legal %	220%				

Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment



Made by: **MJJ** Date: **2/21/2012** Job No: **P402110046**  
 Checked by: **DBH** Date: **2/29/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Inspected Concrete Frame Rating Section D (Frame 16)**

### Floor Beam Postive Moment Section



b =	98.9	in
d =	48	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	12.7	in <sup>2</sup>
% Steel Loss =	8%	

(10-1 1/8")  
from 159/246  
of original  
plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

$A_s = 11.684$  in<sup>2</sup>

Area of reinforcing steel minus any loss noted

$\rho_b = 0.067$

Balanced reinforcement ratio, AASHTO Eq. 8-18

$0.75 \cdot A_{sb} = 239.42$  in<sup>2</sup>

75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2

$\beta_1 = 0.8$

a = 1.019 in

Depth of equivalent compressive stress block, AASHTO Eq. 8-17

$\phi M_n = 1373.3$  ft\*kips

Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Plus Soil Load Moment

(Soil Load Moment has been factored by 0.5)

Total Service Positive Moment = 287.7 ft\*kips

From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	33.7	28.5	20.2	29.7	31.2	31.3	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	43.8	37.1	26.3	38.6	40.6	40.7	kips
Reaction per Wheel (LL+I) =	21.9	18.5	13.1	19.3	20.3	20.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions.

HS20 Lane Load assumes 26k concentrated Force is used.

#### From STAAD

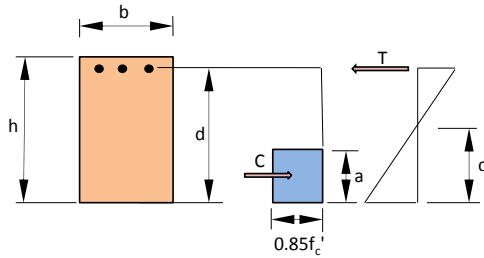
Max. Positive LL+I Moment = 421.00 356.0 252.4 371.0 389.8 391.0 ft\*kips

Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.09	39.4 Tons	HS21.9
	Operating	HS20	36 Tons	RF=1.83	65.7 Tons
	2F1	15 Tons	RF=3.05	45.7 Tons	
	3F1	23 Tons	RF=2.07	47.7 Tons	
	4F1	27 Tons	RF=1.97	53.3 Tons	
	5C1	40 Tons	RF=1.97	78.6 Tons	
	Ohio Legal %		195%		

## Floor Beam Negative Moment Section



b =	21	in
d =	66	in
f <sub>c</sub> =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	9.35	in <sup>2</sup>
% Steel Loss =	0%	

(5-1 1/8", 3-1")  
from 49/246 of  
original plans

### Section Capacity

b = Frame width for negative moment

$$A_s = 9.350 \text{ in}^2$$

Area of reinforcing steel minus any loss noted

$$\rho_b = 0.048$$

Balanced reinforcement ratio, AASHTO Eq. 8-18

$$0.75 \cdot A_{sb} = 49.50 \text{ in}^2$$

75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2

$$\beta_1 = 0.85$$

$$a = 5.762 \text{ in}$$

Depth of equivalent compressive stress block, AASHTO Eq. 8-17

$$\phi M_n = 1460.7 \text{ ft} \cdot \text{kips}$$

Design Moment Strength, AASHTO Eq. 8-16

### Dead Load plus Soil Load Moment

(Soil Load Moment has been increased by 1.15 factor)

$$\text{Total Service Negative Moment} = 59.4 \text{ ft} \cdot \text{kips}$$

From Staad

### Live Load Moment

Max. Negative LL+I Moment =

From STAAD					
HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
100.42	84.9	60.2	88.5	93.0	93.3

ft\*kips

Maximum Negative Moment results from 3 lanes loaded.

### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=6.35	228.6 Tons	HS127.0
	HS20	36 Tons	RF=10.60	381.5 Tons	HS211.9
Operating	2F1	15 Tons	RF=17.68	265.2 Tons	
	3F1	23 Tons	RF=12.02	276.6 Tons	
	4F1	27 Tons	RF=11.45	309.1 Tons	
	5C1	40 Tons	RF=11.41	456.4 Tons	
	Ohio Legal %	1140%			

## Floor Beam Shear Section

### Section Capacity

Taken at face of column

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)
$d =$	<input type="text" value="66"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="151.8"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="259.7"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

(Soil Load Moment has been increased by 1.15 factor)

Total Service Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="63.6"/>	53.8	38.1	56.1	58.9	59.1	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.50	53.9 Tons	HS30.0
Operating	HS20	36 Tons	RF=2.50	90.0 Tons	HS50.0
	2F1	15 Tons	RF=4.17	62.6 Tons	
	3F1	23 Tons	RF=2.84	65.3 Tons	
	4F1	27 Tons	RF=2.70	72.9 Tons	
	5C1	40 Tons	RF=2.69	107.7 Tons	
	Ohio Legal %			270%	

## Column Section

(North Column at bottom of footing controls)

$h =$	<input type="text" value="36"/>	in	Column Depth
$b =$	<input type="text" value="21"/>	in	Column Width
$A_s =$	<input type="text" value="8.08"/>	in <sup>2</sup>	Area of Tension Steel (4 - 1 1/8" bars, 3 - 1" bars)
$A'_s =$	<input type="text" value="4"/>	in <sup>2</sup>	Area of Compression Steel (4 - 1" bars)
$d =$	<input type="text" value="33"/>	in	Distance from compression face to centroid of tension steel
$d' =$	<input type="text" value="3"/>	in	Distance from compression face to centroid of compression steel
$f_c =$	<input type="text" value="3"/>	ksi	Concrete Strength
$f_y =$	<input type="text" value="33"/>	ksi	Steel Yield Stress
$E_s =$	<input type="text" value="29000"/>	ksi	Modulus of elasticity of steel
$\epsilon_u =$	<input type="text" value="0.003"/>	in/in	Ultimate concrete strain
$\beta_1 =$	<input type="text" value="0.85"/>		
$d'' =$	<input type="text" value="15"/>	in	Distance from centroid of gross section to centroid of tension steel

### Dead Loads plus Soil Loads

(Moment taken at the center of cap)

(Soil Loads has been increased by 1.15 factor)

Total Service Dead Load Moment=	<input type="text" value="92.2"/>	ft-kips	From Staad
Total Service Dead Load Axial Force=	<input type="text" value="46"/>	kips	From Staad

### Live Loads (Moment taken at the center of cap)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	<input type="text" value="131.3"/>		111.0	78.7	115.7	121.5	121.9	ft-kips
Max. LL+I Axial Force =	<input type="text" value="58.8"/>		49.7	41.7	86.5	61.8	59.0	kips

Maximum Moment and Axial load results from 3 lanes loaded..

## Section Capacity

### Balanced Condition

$a_b =$	<input type="text" value="20.34"/>	in	$a_b = (87 / (87 + f_y)) * \beta_1 * d$	Depth of stress block for balanced conditions, AASHTO 8-34
$c_b =$	<input type="text" value="23.93"/>	in	$c_b = a_b / \beta_1$	Depth to neutral axis for balanced conditions
$f'_s =$	<input type="text" value="33"/>	ksi	$f'_s = 87 * (1 - (d'/d)) * ((87 + f_y) / 87)$	Stress in comp. steel at balanced condition ( $\leq f_y$ ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

$P_b =$	<input type="text" value="954.4"/>	kip	$P_b = .85 * f'_c * b * a_b + A'_s * f'_s - A_s * f_y$
$M_b =$	<input type="text" value="1209.0"/>	ft-kip	$M_b = 0.85 * f'_c * b * a_b * (d - d'' - a_b / 2) + A'_s * f'_s * (d - d'' - a_b / 2) + A_s * f_y * d''$

Any choice of  $c$  smaller than  $c_b$  will result in tension failure of the column, any choice greater than  $c_b$  will result in compression failure of the column.

### Pure Axial Compression Capacity

$P_o =$	<input type="text" value="2295.6"/>	kips	$P_o = .85 * f'_c * (A_g - A_{st}) + A_{st} * f_y$	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
$\phi P_o =$	<input type="text" value="1606.9"/>	kips		

### Pure Bending Capacity (Ignoring compression steel)

$a =$	<input type="text" value="4.979"/>	in	$a = A_s * f_y / (0.85 * f'_c * b)$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	<input type="text" value="677.9"/>	ft-kips	$M_n = A_s * f_y * (d - a / 2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	<input type="text" value="610.1"/>	ft-kips		



**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$    $\text{in}$

**Tension Failure**

$f_s = $ <input type="text" value="33.00"/> $\text{ksi}$	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s = $ <input type="text" value="33.00"/> $\text{ksi}$	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a = $ <input type="text" value="13.18613994"/> $\text{in}$	$a = \beta_1 * c$	Depth of concrete stress block
$C = $ <input type="text" value="706.1"/> $\text{kip}$	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n = $ <input type="text" value="400.0"/> $\text{kips}$	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n = $ <input type="text" value="818.7"/> $\text{ft-kips}$	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e = $ <input type="text" value="24.56"/> $\text{in}$	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	187.4	167.7	150.2	247.4	193.8	187.8	kips
$M_u =$	404.6	360.7	290.5	370.8	383.5	384.3	ft-kips
$e =$	25.91	25.81	23.21	17.99	23.74	24.56	in
$\phi P_n =$	373.95	375.85	428.83	570.25	417.09	400.03	kips
$\phi M_n =$	807.4	808.3	829.3	854.7	825.2	818.7	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.41	86.9 Tons	HS48.3
Operating	HS20	36 Tons	RF=4.03	145.1 Tons	HS80.6
	2F1	15 Tons	RF=6.81	102.2 Tons	
	3F1	23 Tons	RF=4.54	104.5 Tons	
	4F1	27 Tons	RF=4.45	120.1 Tons	
	5C1	40 Tons	RF=4.41	176.4 Tons	
Ohio Legal %	440%				

	Load	GVW	Rating Factor	Safe Load	HS Rating	
Inventory	HS20	36 Tons	RF=1.09	39.4 Tons	HS21.9	Positive Moment
Operating	HS20	36 Tons	RF=1.83	65.7 Tons	HS36.5	Positive Moment
	2F1	15 Tons	RF=3.05	45.7 Tons		Positive Moment
	3F1	23 Tons	RF=2.07	47.7 Tons		Positive Moment
	4F1	27 Tons	RF=1.97	53.3 Tons		Positive Moment
	5C1	40 Tons	RF=1.97	78.6 Tons		Positive Moment
Ohio Legal %	195%					



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Job No  
**P402110046**Sheet No  
**1**

Rev

Part Section D, Frame 21

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 21.std Date/Time 01-Mar-2012 09:32

## Job Information

	Engineer	Checked	Approved
Name:	M Johnson	D Hoff	
Date:	21-Feb-12	29-Feb-12	

Structure Type SPACE FRAME

Number of Nodes	4	Highest Node	4
Number of Elements	3	Highest Beam	3

Number of Basic Load Cases	8
Number of Combination Load Cases	2

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	DEAD LOAD
Primary	3	LIVE LOAD 1
Primary	4	LIVE LOAD 2
Primary	5	LIVE LOAD 3
Primary	6	LIVE LOAD 4
Primary	7	LIVE LOAD 5
Primary	8	LIVE LOAD 6
Primary	2	SOIL LOAD
Combination	9	DEAD PLUS SOIL
Combination	10	DL PLUS SOIL POS MOM

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	0.000	0.000
2	0.000	24.320	0.000
3	37.000	24.320	0.000
4	37.000	1.000	0.000

## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	2	24.320	2	0
2	2	3	37.000	1	0
3	4	3	23.320	2	0



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Job No  
**P402110046**Sheet No  
**2**

Rev

Part Section D, Frame 21

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 21.std Date/Time 01-Mar-2012 09:32

## Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE
2	Rect 36.00x21.00	756.000	27.8E+3	81.6E+3	70.7E+3	CONCRETE

## Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

## Basic Load Cases

Number	Name
1	DEAD LOAD
3	LIVE LOAD 1
4	LIVE LOAD 2
5	LIVE LOAD 3
6	LIVE LOAD 4
7	LIVE LOAD 5
8	LIVE LOAD 6
2	SOIL LOAD

## Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	DEAD PLUS SOIL	1	DEAD LOAD	1.00
		2	SOIL LOAD	1.15
10	DL PLUS SOIL POS MOM	1	DEAD LOAD	1.00
		2	SOIL LOAD	0.50



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Job No  
**P402110046**

Sheet No  
**3**

Rev

Part Section D, Frame 21

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 21.std Date/Time 01-Mar-2012 09:32

## Beam Force Detail

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	Shear		Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)
1	1:DEAD LOAD	0.000	62.171	-8.011	0.000	0.000	0.000	-779.676
		2.432	60.251	-8.011	0.000	0.000	0.000	-545.869
		4.864	58.332	-8.011	0.000	0.000	0.000	-312.062
		7.296	56.412	-8.011	0.000	0.000	0.000	-78.255
		9.728	54.493	-8.011	0.000	0.000	0.000	155.552
		12.160	52.573	-8.011	0.000	0.000	0.000	389.359
		14.592	50.654	-8.011	0.000	0.000	0.000	623.166
		17.024	48.734	-8.011	0.000	0.000	0.000	856.973
		19.456	46.815	-8.011	0.000	0.000	0.000	1.09E+3
		21.888	44.895	-8.011	0.000	0.000	0.000	1.32E+3
	24.320	42.976	-8.011	0.000	0.000	0.000	1.56E+3	
	3:LIVE LOAD 1	0.000	86.788	-12.937	0.000	0.000	0.000	-1.26E+3
		2.432	86.788	-12.937	0.000	0.000	0.000	-878.163
		4.864	86.788	-12.937	0.000	0.000	0.000	-500.600
		7.296	86.788	-12.937	0.000	0.000	0.000	-123.036
		9.728	86.788	-12.937	0.000	0.000	0.000	254.527
		12.160	86.788	-12.937	0.000	0.000	0.000	632.091
		14.592	86.788	-12.937	0.000	0.000	0.000	1.01E+3
		17.024	86.788	-12.937	0.000	0.000	0.000	1.39E+3
		19.456	86.788	-12.937	0.000	0.000	0.000	1.76E+3
		21.888	86.788	-12.937	0.000	0.000	0.000	2.14E+3
	24.320	86.788	-12.937	0.000	0.000	0.000	2.52E+3	
	4:LIVE LOAD 2	0.000	59.215	-12.938	0.000	0.000	0.000	-1.25E+3
		2.432	59.215	-12.938	0.000	0.000	0.000	-875.820
		4.864	59.215	-12.938	0.000	0.000	0.000	-498.233
		7.296	59.215	-12.938	0.000	0.000	0.000	-120.645
		9.728	59.215	-12.938	0.000	0.000	0.000	256.942
		12.160	59.215	-12.938	0.000	0.000	0.000	634.529
		14.592	59.215	-12.938	0.000	0.000	0.000	1.01E+3
		17.024	59.215	-12.938	0.000	0.000	0.000	1.39E+3
		19.456	59.215	-12.938	0.000	0.000	0.000	1.77E+3
		21.888	59.215	-12.938	0.000	0.000	0.000	2.14E+3
	24.320	59.215	-12.938	0.000	0.000	0.000	2.52E+3	
	5:LIVE LOAD 3	0.000	73.007	-13.642	0.000	0.000	0.000	-1.32E+3
		2.432	73.007	-13.642	0.000	0.000	0.000	-924.703
		4.864	73.007	-13.642	0.000	0.000	0.000	-526.571
		7.296	73.007	-13.642	0.000	0.000	0.000	-128.438
		9.728	73.007	-13.642	0.000	0.000	0.000	269.694
		12.160	73.007	-13.642	0.000	0.000	0.000	667.827
		14.592	73.007	-13.642	0.000	0.000	0.000	1.07E+3
		17.024	73.007	-13.642	0.000	0.000	0.000	1.46E+3
	19.456	73.007	-13.642	0.000	0.000	0.000	1.86E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**4**

Rev

Part Section D, Frame 21

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 21.std Date/Time 01-Mar-2012 09:32

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		21.888	73.007	-13.642	0.000	0.000	0.000	0.000	0.000	2.26E+3	
		24.320	73.007	-13.642	0.000	0.000	0.000	0.000	0.000	2.66E+3	
	6:LIVE LOAD 4	0.000	78.921	-13.513	0.000	0.000	0.000	0.000	0.000	-1.31E+3	
		2.432	78.921	-13.513	0.000	0.000	0.000	0.000	0.000	-915.117	
		4.864	78.921	-13.513	0.000	0.000	0.000	0.000	0.000	-520.752	
		7.296	78.921	-13.513	0.000	0.000	0.000	0.000	0.000	-126.387	
		9.728	78.921	-13.513	0.000	0.000	0.000	0.000	0.000	267.978	
		12.160	78.921	-13.513	0.000	0.000	0.000	0.000	0.000	662.343	
		14.592	78.921	-13.513	0.000	0.000	0.000	0.000	0.000	1.06E+3	
		17.024	78.921	-13.513	0.000	0.000	0.000	0.000	0.000	1.45E+3	
		19.456	78.921	-13.513	0.000	0.000	0.000	0.000	0.000	1.85E+3	
		21.888	78.921	-13.513	0.000	0.000	0.000	0.000	0.000	2.24E+3	
		24.320	78.921	-13.513	0.000	0.000	0.000	0.000	0.000	2.63E+3	
	7:LIVE LOAD 5	0.000	67.092	-13.512	0.000	0.000	0.000	0.000	0.000	-1.31E+3	
		2.432	67.092	-13.512	0.000	0.000	0.000	0.000	0.000	-916.763	
		4.864	67.092	-13.512	0.000	0.000	0.000	0.000	0.000	-522.414	
		7.296	67.092	-13.512	0.000	0.000	0.000	0.000	0.000	-128.066	
		9.728	67.092	-13.512	0.000	0.000	0.000	0.000	0.000	266.282	
		12.160	67.092	-13.512	0.000	0.000	0.000	0.000	0.000	660.631	
		14.592	67.092	-13.512	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		17.024	67.092	-13.512	0.000	0.000	0.000	0.000	0.000	1.45E+3	
		19.456	67.092	-13.512	0.000	0.000	0.000	0.000	0.000	1.84E+3	
		21.888	67.092	-13.512	0.000	0.000	0.000	0.000	0.000	2.24E+3	
		24.320	67.092	-13.512	0.000	0.000	0.000	0.000	0.000	2.63E+3	
	8:LIVE LOAD 6	0.000	54.104	-13.129	0.000	0.000	0.000	0.000	0.000	-1.27E+3	
		2.432	54.104	-13.129	0.000	0.000	0.000	0.000	0.000	-889.807	
		4.864	54.104	-13.129	0.000	0.000	0.000	0.000	0.000	-506.636	
		7.296	54.104	-13.129	0.000	0.000	0.000	0.000	0.000	-123.465	
		9.728	54.104	-13.129	0.000	0.000	0.000	0.000	0.000	259.705	
		12.160	54.104	-13.129	0.000	0.000	0.000	0.000	0.000	642.876	
		14.592	54.104	-13.129	0.000	0.000	0.000	0.000	0.000	1.03E+3	
		17.024	54.104	-13.129	0.000	0.000	0.000	0.000	0.000	1.41E+3	
		19.456	54.104	-13.129	0.000	0.000	0.000	0.000	0.000	1.79E+3	
		21.888	54.104	-13.129	0.000	0.000	0.000	0.000	0.000	2.18E+3	
		24.320	54.104	-13.129	0.000	0.000	0.000	0.000	0.000	2.56E+3	
	2:SOIL LOAD	0.000	0.626	-1.797	0.000	0.000	0.000	0.000	0.000	-294.071	
		2.432	0.626	-1.797	0.000	0.000	0.000	0.000	0.000	-241.617	
		4.864	0.626	-1.797	0.000	0.000	0.000	0.000	0.000	-189.162	
		7.296	0.626	-1.797	0.000	0.000	0.000	0.000	0.000	-136.708	
		9.728	0.626	-1.797	0.000	0.000	0.000	0.000	0.000	-84.253	
		12.160	0.626	-1.797	0.000	0.000	0.000	0.000	0.000	-31.799	
		14.592	0.626	-1.797	0.000	0.000	0.000	0.000	0.000	20.656	
		17.024	0.626	-1.797	0.000	0.000	0.000	0.000	0.000	73.110	
		19.456	0.626	-1.797	0.000	0.000	0.000	0.000	0.000	125.565	



Software licensed to TranSystems

Job No  
**P402110046**

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Rev

Part Section D, Frame 21

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 21.std Date/Time 01-Mar-2012 09:32

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		21.888	0.626	-1.797	0.000	0.000	0.000	0.000	0.000	178.019	
		24.320	0.626	-1.797	0.000	0.000	0.000	0.000	0.000	230.474	
	9:DEAD PLUS	0.000	62.890	-10.078	0.000	0.000	0.000	0.000	0.000	-1.12E+3	
		2.432	60.971	-10.078	0.000	0.000	0.000	0.000	0.000	-823.728	
		4.864	59.051	-10.078	0.000	0.000	0.000	0.000	0.000	-529.599	
		7.296	57.132	-10.078	0.000	0.000	0.000	0.000	0.000	-235.469	
		9.728	55.212	-10.078	0.000	0.000	0.000	0.000	0.000	58.660	
		12.160	53.293	-10.078	0.000	0.000	0.000	0.000	0.000	352.790	
		14.592	51.373	-10.078	0.000	0.000	0.000	0.000	0.000	646.920	
		17.024	49.454	-10.078	0.000	0.000	0.000	0.000	0.000	941.049	
		19.456	47.534	-10.078	0.000	0.000	0.000	0.000	0.000	1.24E+3	
		21.888	45.615	-10.078	0.000	0.000	0.000	0.000	0.000	1.53E+3	
		24.320	43.695	-10.078	0.000	0.000	0.000	0.000	0.000	1.82E+3	
	10:DL PLUS S	0.000	62.483	-8.910	0.000	0.000	0.000	0.000	0.000	-926.712	
		2.432	60.564	-8.910	0.000	0.000	0.000	0.000	0.000	-666.678	
		4.864	58.644	-8.910	0.000	0.000	0.000	0.000	0.000	-406.643	
		7.296	56.725	-8.910	0.000	0.000	0.000	0.000	0.000	-146.609	
		9.728	54.805	-8.910	0.000	0.000	0.000	0.000	0.000	113.425	
		12.160	52.886	-8.910	0.000	0.000	0.000	0.000	0.000	373.459	
		14.592	50.966	-8.910	0.000	0.000	0.000	0.000	0.000	633.493	
		17.024	49.047	-8.910	0.000	0.000	0.000	0.000	0.000	893.528	
		19.456	47.128	-8.910	0.000	0.000	0.000	0.000	0.000	1.15E+3	
		21.888	45.208	-8.910	0.000	0.000	0.000	0.000	0.000	1.41E+3	
		24.320	43.289	-8.910	0.000	0.000	0.000	0.000	0.000	1.67E+3	
2	1:DEAD LOAD	0.000	8.011	42.976	0.000	0.000	0.000	0.000	0.000	1.56E+3	
		3.700	8.011	34.963	0.000	0.000	0.000	0.000	0.000	-152.491	
		7.400	8.011	26.837	0.000	0.000	0.000	0.000	0.000	-1.51E+3	
		11.100	8.011	18.596	0.000	0.000	0.000	0.000	0.000	-2.52E+3	
		14.800	8.011	10.242	0.000	0.000	0.000	0.000	0.000	-3.17E+3	
		18.500	8.011	1.773	0.000	0.000	0.000	0.000	0.000	-3.46E+3	
		22.200	8.011	-9.295	0.000	0.000	0.000	0.000	0.000	-3.22E+3	
		25.900	8.011	-18.008	0.000	0.000	0.000	0.000	0.000	-2.6E+3	
		29.600	8.011	-26.835	0.000	0.000	0.000	0.000	0.000	-1.61E+3	
		33.300	8.011	-35.776	0.000	0.000	0.000	0.000	0.000	-230.450	
		37.000	8.011	-44.831	0.000	0.000	0.000	0.000	0.000	1.54E+3	
	3:LIVE LOAD 1	0.000	12.937	86.788	0.000	0.000	0.000	0.000	0.000	2.52E+3	
		3.700	12.937	57.628	0.000	0.000	0.000	0.000	0.000	-244.839	
		7.400	12.937	38.188	0.000	0.000	0.000	0.000	0.000	-2.62E+3	
		11.100	12.937	23.608	0.000	0.000	0.000	0.000	0.000	-4.26E+3	
		14.800	12.937	13.888	0.000	0.000	0.000	0.000	0.000	-5.2E+3	
		18.500	12.937	-10.412	0.000	0.000	0.000	0.000	0.000	-5.67E+3	
		22.200	12.937	-15.272	0.000	0.000	0.000	0.000	0.000	-5.17E+3	
		25.900	12.937	-34.712	0.000	0.000	0.000	0.000	0.000	-4.19E+3	
		29.600	12.937	-49.292	0.000	0.000	0.000	0.000	0.000	-2.5E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
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Rev

Part Section D, Frame 21

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 21.std Date/Time 01-Mar-2012 09:32

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	12.937	-59.012	0.000	0.000	0.000	0.000	0.000	-142.885	
		37.000	12.937	-59.012	0.000	0.000	0.000	0.000	0.000	2.48E+3	
	4:LIVE LOAD 2	0.000	12.938	59.215	0.000	0.000	0.000	0.000	0.000	2.52E+3	
		3.700	12.938	59.215	0.000	0.000	0.000	0.000	0.000	-106.702	
		7.400	12.938	49.495	0.000	0.000	0.000	0.000	0.000	-2.47E+3	
		11.100	12.938	34.915	0.000	0.000	0.000	0.000	0.000	-4.17E+3	
		14.800	12.938	15.475	0.000	0.000	0.000	0.000	0.000	-5.16E+3	
		18.500	12.938	10.615	0.000	0.000	0.000	0.000	0.000	-5.67E+3	
		22.200	12.938	-13.685	0.000	0.000	0.000	0.000	0.000	-5.2E+3	
		25.900	12.938	-23.405	0.000	0.000	0.000	0.000	0.000	-4.28E+3	
		29.600	12.938	-37.985	0.000	0.000	0.000	0.000	0.000	-2.65E+3	
		33.300	12.938	-57.425	0.000	0.000	0.000	0.000	0.000	-280.920	
		37.000	12.938	-86.585	0.000	0.000	0.000	0.000	0.000	2.47E+3	
	5:LIVE LOAD 3	0.000	13.642	73.007	0.000	0.000	0.000	0.000	0.000	2.66E+3	
		3.700	13.642	68.147	0.000	0.000	0.000	0.000	0.000	-427.521	
		7.400	13.642	48.707	0.000	0.000	0.000	0.000	0.000	-2.69E+3	
		11.100	13.642	34.127	0.000	0.000	0.000	0.000	0.000	-4.35E+3	
		14.800	13.642	24.407	0.000	0.000	0.000	0.000	0.000	-5.47E+3	
		18.500	13.642	0.107	0.000	0.000	0.000	0.000	0.000	-5.68E+3	
		22.200	13.642	-24.193	0.000	0.000	0.000	0.000	0.000	-5.48E+3	
		25.900	13.642	-33.913	0.000	0.000	0.000	0.000	0.000	-4.37E+3	
		29.600	13.642	-48.493	0.000	0.000	0.000	0.000	0.000	-2.72E+3	
		33.300	13.642	-67.933	0.000	0.000	0.000	0.000	0.000	-465.682	
		37.000	13.642	-72.793	0.000	0.000	0.000	0.000	0.000	2.61E+3	
	6:LIVE LOAD 4	0.000	13.513	78.921	0.000	0.000	0.000	0.000	0.000	2.63E+3	
		3.700	13.513	54.621	0.000	0.000	0.000	0.000	0.000	-374.211	
		7.400	13.513	44.901	0.000	0.000	0.000	0.000	0.000	-2.65E+3	
		11.100	13.513	30.321	0.000	0.000	0.000	0.000	0.000	-4.32E+3	
		14.800	13.513	10.881	0.000	0.000	0.000	0.000	0.000	-5.34E+3	
		18.500	13.513	6.021	0.000	0.000	0.000	0.000	0.000	-5.7E+3	
		22.200	13.513	-18.279	0.000	0.000	0.000	0.000	0.000	-5.33E+3	
		25.900	13.513	-27.999	0.000	0.000	0.000	0.000	0.000	-4.31E+3	
		29.600	13.513	-42.579	0.000	0.000	0.000	0.000	0.000	-2.65E+3	
		33.300	13.513	-62.019	0.000	0.000	0.000	0.000	0.000	-316.202	
		37.000	13.513	-66.879	0.000	0.000	0.000	0.000	0.000	2.59E+3	
	7:LIVE LOAD 5	0.000	13.512	67.092	0.000	0.000	0.000	0.000	0.000	2.63E+3	
		3.700	13.512	62.232	0.000	0.000	0.000	0.000	0.000	-278.455	
		7.400	13.512	42.792	0.000	0.000	0.000	0.000	0.000	-2.63E+3	
		11.100	13.512	28.212	0.000	0.000	0.000	0.000	0.000	-4.29E+3	
		14.800	13.512	18.492	0.000	0.000	0.000	0.000	0.000	-5.32E+3	
		18.500	13.512	-5.808	0.000	0.000	0.000	0.000	0.000	-5.7E+3	
		22.200	13.512	-10.668	0.000	0.000	0.000	0.000	0.000	-5.35E+3	
		25.900	13.512	-30.108	0.000	0.000	0.000	0.000	0.000	-4.34E+3	
		29.600	13.512	-44.688	0.000	0.000	0.000	0.000	0.000	-2.68E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**7**

Rev

Part Section D, Frame 21

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 21.std Date/Time 01-Mar-2012 09:32

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	13.512	-54.408	0.000	0.000	0.000	0.000	0.000	-412.037	
		37.000	13.512	-78.708	0.000	0.000	0.000	0.000	0.000	2.59E+3	
	8:LIVE LOAD 6	0.000	13.129	54.104	0.000	0.000	0.000	0.000	0.000	2.56E+3	
		3.700	13.129	54.104	0.000	0.000	0.000	0.000	0.000	156.509	
		7.400	13.129	54.104	0.000	0.000	0.000	0.000	0.000	-2.25E+3	
		11.100	13.129	37.904	0.000	0.000	0.000	0.000	0.000	-4.29E+3	
		14.800	13.129	27.104	0.000	0.000	0.000	0.000	0.000	-5.66E+3	
		18.500	13.129	0.104	0.000	0.000	0.000	0.000	0.000	-6.21E+3	
		22.200	13.129	-26.896	0.000	0.000	0.000	0.000	0.000	-5.67E+3	
		25.900	13.129	-37.696	0.000	0.000	0.000	0.000	0.000	-4.31E+3	
		29.600	13.129	-53.896	0.000	0.000	0.000	0.000	0.000	-2.27E+3	
		33.300	13.129	-53.896	0.000	0.000	0.000	0.000	0.000	119.540	
		37.000	13.129	-53.896	0.000	0.000	0.000	0.000	0.000	2.51E+3	
	2:SOIL LOAD	0.000	1.797	0.626	0.000	0.000	0.000	0.000	0.000	230.474	
		3.700	1.797	0.626	0.000	0.000	0.000	0.000	0.000	202.694	
		7.400	1.797	0.626	0.000	0.000	0.000	0.000	0.000	174.915	
		11.100	1.797	0.626	0.000	0.000	0.000	0.000	0.000	147.135	
		14.800	1.797	0.626	0.000	0.000	0.000	0.000	0.000	119.356	
		18.500	1.797	0.626	0.000	0.000	0.000	0.000	0.000	91.577	
		22.200	1.797	0.626	0.000	0.000	0.000	0.000	0.000	63.797	
		25.900	1.797	0.626	0.000	0.000	0.000	0.000	0.000	36.018	
		29.600	1.797	0.626	0.000	0.000	0.000	0.000	0.000	8.239	
		33.300	1.797	0.626	0.000	0.000	0.000	0.000	0.000	-19.541	
		37.000	1.797	0.626	0.000	0.000	0.000	0.000	0.000	-47.320	
	9:DEAD PLUS	0.000	10.078	43.695	0.000	0.000	0.000	0.000	0.000	1.82E+3	
		3.700	10.078	35.683	0.000	0.000	0.000	0.000	0.000	80.608	
		7.400	10.078	27.556	0.000	0.000	0.000	0.000	0.000	-1.31E+3	
		11.100	10.078	19.316	0.000	0.000	0.000	0.000	0.000	-2.35E+3	
		14.800	10.078	10.962	0.000	0.000	0.000	0.000	0.000	-3.04E+3	
		18.500	10.078	2.493	0.000	0.000	0.000	0.000	0.000	-3.36E+3	
		22.200	10.078	-8.576	0.000	0.000	0.000	0.000	0.000	-3.15E+3	
		25.900	10.078	-17.289	0.000	0.000	0.000	0.000	0.000	-2.56E+3	
		29.600	10.078	-26.116	0.000	0.000	0.000	0.000	0.000	-1.6E+3	
		33.300	10.078	-35.056	0.000	0.000	0.000	0.000	0.000	-252.922	
		37.000	10.078	-44.111	0.000	0.000	0.000	0.000	0.000	1.48E+3	
	10:DL PLUS S	0.000	8.910	43.289	0.000	0.000	0.000	0.000	0.000	1.67E+3	
		3.700	8.910	35.276	0.000	0.000	0.000	0.000	0.000	-51.144	
		7.400	8.910	27.150	0.000	0.000	0.000	0.000	0.000	-1.43E+3	
		11.100	8.910	18.909	0.000	0.000	0.000	0.000	0.000	-2.45E+3	
		14.800	8.910	10.555	0.000	0.000	0.000	0.000	0.000	-3.12E+3	
		18.500	8.910	2.086	0.000	0.000	0.000	0.000	0.000	-3.42E+3	
		22.200	8.910	-8.982	0.000	0.000	0.000	0.000	0.000	-3.19E+3	
		25.900	8.910	-17.695	0.000	0.000	0.000	0.000	0.000	-2.59E+3	
		29.600	8.910	-26.522	0.000	0.000	0.000	0.000	0.000	-1.6E+3	





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Job No <b>P402110046</b>	Sheet No <b>8</b>	Rev
Part Section D, Frame 21		
Ref		
By M Johnson	Date 21-Feb-12	Chd D Hoff
Client ODOT	File Section D Frame 21.std	Date/Time 01-Mar-2012 09:32

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	8.910	-35.463	0.000	0.000	0.000	0.000	0.000	-240.220	
		37.000	8.910	-44.518	0.000	0.000	0.000	0.000	0.000	1.51E+3	
3	1:DEAD LOAD	0.000	63.237	8.011	0.000	0.000	0.000	0.000	0.000	705.645	
		2.332	61.396	8.011	0.000	0.000	0.000	0.000	0.000	481.452	
		4.664	59.555	8.011	0.000	0.000	0.000	0.000	0.000	257.258	
		6.996	57.715	8.011	0.000	0.000	0.000	0.000	0.000	33.065	
		9.328	55.874	8.011	0.000	0.000	0.000	0.000	0.000	-191.128	
		11.660	54.034	8.011	0.000	0.000	0.000	0.000	0.000	-415.321	
		13.992	52.193	8.011	0.000	0.000	0.000	0.000	0.000	-639.514	
		16.324	50.353	8.011	0.000	0.000	0.000	0.000	0.000	-863.708	
		18.656	48.512	8.011	0.000	0.000	0.000	0.000	0.000	-1.09E+3	
		20.988	46.672	8.011	0.000	0.000	0.000	0.000	0.000	-1.31E+3	
		23.320	44.831	8.011	0.000	0.000	0.000	0.000	0.000	-1.54E+3	
	3:LIVE LOAD 1	0.000	59.012	12.937	0.000	0.000	0.000	0.000	0.000	1.14E+3	
		2.332	59.012	12.937	0.000	0.000	0.000	0.000	0.000	781.100	
		4.664	59.012	12.937	0.000	0.000	0.000	0.000	0.000	419.061	
		6.996	59.012	12.937	0.000	0.000	0.000	0.000	0.000	57.022	
		9.328	59.012	12.937	0.000	0.000	0.000	0.000	0.000	-305.017	
		11.660	59.012	12.937	0.000	0.000	0.000	0.000	0.000	-667.055	
		13.992	59.012	12.937	0.000	0.000	0.000	0.000	0.000	-1.03E+3	
		16.324	59.012	12.937	0.000	0.000	0.000	0.000	0.000	-1.39E+3	
		18.656	59.012	12.937	0.000	0.000	0.000	0.000	0.000	-1.75E+3	
		20.988	59.012	12.937	0.000	0.000	0.000	0.000	0.000	-2.12E+3	
		23.320	59.012	12.937	0.000	0.000	0.000	0.000	0.000	-2.48E+3	
	4:LIVE LOAD 2	0.000	86.585	12.938	0.000	0.000	0.000	0.000	0.000	1.15E+3	
		2.332	86.585	12.938	0.000	0.000	0.000	0.000	0.000	783.757	
		4.664	86.585	12.938	0.000	0.000	0.000	0.000	0.000	421.695	
		6.996	86.585	12.938	0.000	0.000	0.000	0.000	0.000	59.634	
		9.328	86.585	12.938	0.000	0.000	0.000	0.000	0.000	-302.427	
		11.660	86.585	12.938	0.000	0.000	0.000	0.000	0.000	-664.489	
		13.992	86.585	12.938	0.000	0.000	0.000	0.000	0.000	-1.03E+3	
		16.324	86.585	12.938	0.000	0.000	0.000	0.000	0.000	-1.39E+3	
		18.656	86.585	12.938	0.000	0.000	0.000	0.000	0.000	-1.75E+3	
		20.988	86.585	12.938	0.000	0.000	0.000	0.000	0.000	-2.11E+3	
		23.320	86.585	12.938	0.000	0.000	0.000	0.000	0.000	-2.47E+3	
	5:LIVE LOAD 3	0.000	72.793	13.642	0.000	0.000	0.000	0.000	0.000	1.21E+3	
		2.332	72.793	13.642	0.000	0.000	0.000	0.000	0.000	825.067	
		4.664	72.793	13.642	0.000	0.000	0.000	0.000	0.000	443.305	
		6.996	72.793	13.642	0.000	0.000	0.000	0.000	0.000	61.543	
		9.328	72.793	13.642	0.000	0.000	0.000	0.000	0.000	-320.219	
		11.660	72.793	13.642	0.000	0.000	0.000	0.000	0.000	-701.981	
		13.992	72.793	13.642	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		16.324	72.793	13.642	0.000	0.000	0.000	0.000	0.000	-1.47E+3	
		18.656	72.793	13.642	0.000	0.000	0.000	0.000	0.000	-1.85E+3	



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Job No  
**P402110046**

Sheet No  
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Rev

Part Section D, Frame 21

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 21.std Date/Time 01-Mar-2012 09:32

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		20.988	72.793	13.642	0.000	0.000	0.000	0.000	0.000	-2.23E+3	
		23.320	72.793	13.642	0.000	0.000	0.000	0.000	0.000	-2.61E+3	
	6:LIVE LOAD 4	0.000	66.879	13.513	0.000	0.000	0.000	0.000	0.000	1.2E+3	
		2.332	66.879	13.513	0.000	0.000	0.000	0.000	0.000	818.168	
		4.664	66.879	13.513	0.000	0.000	0.000	0.000	0.000	440.019	
		6.996	66.879	13.513	0.000	0.000	0.000	0.000	0.000	61.870	
		9.328	66.879	13.513	0.000	0.000	0.000	0.000	0.000	-316.280	
		11.660	66.879	13.513	0.000	0.000	0.000	0.000	0.000	-694.429	
		13.992	66.879	13.513	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		16.324	66.879	13.513	0.000	0.000	0.000	0.000	0.000	-1.45E+3	
		18.656	66.879	13.513	0.000	0.000	0.000	0.000	0.000	-1.83E+3	
		20.988	66.879	13.513	0.000	0.000	0.000	0.000	0.000	-2.21E+3	
		23.320	66.879	13.513	0.000	0.000	0.000	0.000	0.000	-2.59E+3	
	7:LIVE LOAD 5	0.000	78.708	13.512	0.000	0.000	0.000	0.000	0.000	1.19E+3	
		2.332	78.708	13.512	0.000	0.000	0.000	0.000	0.000	816.302	
		4.664	78.708	13.512	0.000	0.000	0.000	0.000	0.000	438.168	
		6.996	78.708	13.512	0.000	0.000	0.000	0.000	0.000	60.035	
		9.328	78.708	13.512	0.000	0.000	0.000	0.000	0.000	-318.098	
		11.660	78.708	13.512	0.000	0.000	0.000	0.000	0.000	-696.232	
		13.992	78.708	13.512	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		16.324	78.708	13.512	0.000	0.000	0.000	0.000	0.000	-1.45E+3	
		18.656	78.708	13.512	0.000	0.000	0.000	0.000	0.000	-1.83E+3	
		20.988	78.708	13.512	0.000	0.000	0.000	0.000	0.000	-2.21E+3	
		23.320	78.708	13.512	0.000	0.000	0.000	0.000	0.000	-2.59E+3	
	8:LIVE LOAD 6	0.000	53.896	13.129	0.000	0.000	0.000	0.000	0.000	1.16E+3	
		2.332	53.896	13.129	0.000	0.000	0.000	0.000	0.000	794.220	
		4.664	53.896	13.129	0.000	0.000	0.000	0.000	0.000	426.804	
		6.996	53.896	13.129	0.000	0.000	0.000	0.000	0.000	59.389	
		9.328	53.896	13.129	0.000	0.000	0.000	0.000	0.000	-308.026	
		11.660	53.896	13.129	0.000	0.000	0.000	0.000	0.000	-675.442	
		13.992	53.896	13.129	0.000	0.000	0.000	0.000	0.000	-1.04E+3	
		16.324	53.896	13.129	0.000	0.000	0.000	0.000	0.000	-1.41E+3	
		18.656	53.896	13.129	0.000	0.000	0.000	0.000	0.000	-1.78E+3	
		20.988	53.896	13.129	0.000	0.000	0.000	0.000	0.000	-2.15E+3	
		23.320	53.896	13.129	0.000	0.000	0.000	0.000	0.000	-2.51E+3	
	2:SOIL LOAD	0.000	-0.626	-32.392	0.000	0.000	0.000	0.000	0.000	-1.43E+3	
		2.332	-0.626	-23.301	0.000	0.000	0.000	0.000	0.000	-657.966	
		4.664	-0.626	-14.935	0.000	0.000	0.000	0.000	0.000	-132.060	
		6.996	-0.626	-7.225	0.000	0.000	0.000	0.000	0.000	166.997	
		9.328	-0.626	-2.452	0.000	0.000	0.000	0.000	0.000	287.937	
		11.660	-0.626	1.630	0.000	0.000	0.000	0.000	0.000	295.127	
		13.992	-0.626	1.797	0.000	0.000	0.000	0.000	0.000	248.512	
		16.324	-0.626	1.797	0.000	0.000	0.000	0.000	0.000	198.214	
		18.656	-0.626	1.797	0.000	0.000	0.000	0.000	0.000	147.917	



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Job No  
**P402110046**

Sheet No  
**10**

Rev

Part Section D, Frame 21

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

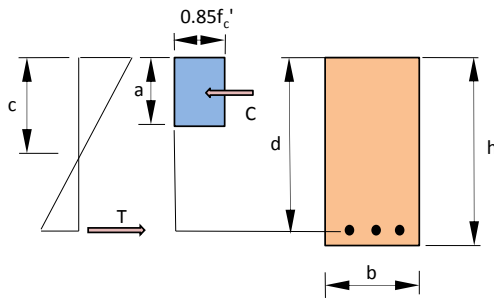
Client ODOT

File Section D Frame 21.std Date/Time 01-Mar-2012 09:32

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	
		20.988	-0.626	1.797	0.000	0.000	0.000	0.000	97.619
		23.320	-0.626	1.797	0.000	0.000	0.000	0.000	47.320
	9:DEAD PLUS	0.000	62.517	-29.239	0.000	0.000	0.000	0.000	-933.768
		2.332	60.677	-18.784	0.000	0.000	0.000	0.000	-275.209
		4.664	58.836	-9.164	0.000	0.000	0.000	0.000	105.390
		6.996	56.995	-0.298	0.000	0.000	0.000	0.000	225.112
		9.328	55.155	5.191	0.000	0.000	0.000	0.000	139.999
		11.660	53.314	9.886	0.000	0.000	0.000	0.000	-75.925
		13.992	51.474	10.078	0.000	0.000	0.000	0.000	-353.726
		16.324	49.633	10.078	0.000	0.000	0.000	0.000	-635.762
		18.656	47.793	10.078	0.000	0.000	0.000	0.000	-917.797
		20.988	45.952	10.078	0.000	0.000	0.000	0.000	-1.2E+3
		23.320	44.111	10.078	0.000	0.000	0.000	0.000	-1.48E+3
	10:DL PLUS S	0.000	62.924	-8.185	0.000	0.000	0.000	0.000	-7.143
		2.332	61.083	-3.639	0.000	0.000	0.000	0.000	152.469
		4.664	59.243	0.544	0.000	0.000	0.000	0.000	191.228
		6.996	57.402	4.399	0.000	0.000	0.000	0.000	116.564
		9.328	55.562	6.785	0.000	0.000	0.000	0.000	-47.160
		11.660	53.721	8.826	0.000	0.000	0.000	0.000	-267.758
		13.992	51.880	8.910	0.000	0.000	0.000	0.000	-515.259
		16.324	50.040	8.910	0.000	0.000	0.000	0.000	-764.601
		18.656	48.199	8.910	0.000	0.000	0.000	0.000	-1.01E+3
		20.988	46.359	8.910	0.000	0.000	0.000	0.000	-1.26E+3
		23.320	44.518	8.910	0.000	0.000	0.000	0.000	-1.51E+3

### Floor Beam Postive Moment Section



b =	98.9	in	
d =	48	in	
f'c =	4.5	ksi	
fy =	33	ksi	
φ =	0.9		
Area of Steel =	14.1	in <sup>2</sup>	(5-1 1/8", 5-1 1/4") from original plans
% Steel Loss =	0%		

#### Section Capacity

b = Tributary Slab Width for Positive Moment

As =	14.141	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρb =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*Asb =	239.42	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β1 =	0.8		
a =	1.233	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φMn =	1658.3	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Plus Soil Load Moment

(Soil Load Moment has been factored by 0.5)

Total Service Positive Moment = 284.8 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	41.6	44.7	30.2	39	38	39	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	54.1	58.1	39.3	50.7	49.4	50.7	kips
Reaction per Wheel (LL+I) =	27.0	29.1	19.6	25.4	24.7	25.4	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

From STAAD							
Max. Positive LL+I Moment =	517.67	556.2	375.8	485.3	472.9	485.3	ft*kips

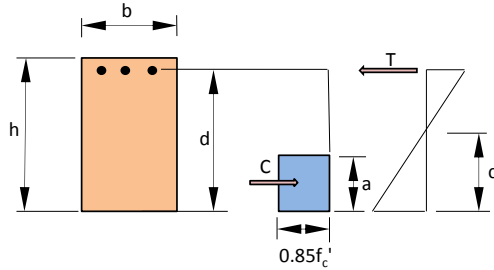
Maximum Positive Moment results from 3 lanes loaded.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.07	38.4 Tons	HS21.3
Operating	HS20	36 Tons	RF=1.78	64.1 Tons	HS35.6
	2F1	15 Tons	RF=2.64	39.6 Tons	
	3F1	23 Tons	RF=2.04	47.0 Tons	
	4F1	27 Tons	RF=2.10	56.6 Tons	
	5C1	40 Tons	RF=2.04	81.7 Tons	
	Ohio Legal %	205%			

### Floor Beam Negative Moment Section

(South end of floorbeam controls)



b =	21	in
d =	66	in
f' <sub>c</sub> =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	10.16	in <sup>2</sup>
% Steel Loss =	0%	

(8-1 1/8") from  
159/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	10.160	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	49.50	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.85		
a =	6.261	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1580.9	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

Taken at face of column (Soil Load Moment has been increased by 1.15 factor)

Total Service Negative Moment = **60.1** ft\*kips From Staad

#### Live Load Moment

Taken at face of column

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Negative LL+I Moment =	<b>128.50</b>	138.1	93.3	120.5	117.4	120.5	ft*kips

Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=5.02	180.6 Tons	HS100.3
	HS20	36 Tons	RF=8.37	301.4 Tons	HS167.4
Operating	2F1	15 Tons	RF=12.39	185.9 Tons	
	3F1	23 Tons	RF=9.60	220.7 Tons	
	4F1	27 Tons	RF=9.85	265.9 Tons	
	5C1	40 Tons	RF=9.60	383.8 Tons	
	Ohio Legal %	960%			



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 Subject: **As-Built Concrete Frame Rating Section D (Frame 21)**

## Floor Beam Shear Section

### Section Capacity

Taken at face of column (South end of cap controls)

$$A_{sh} = 0.62 \text{ in}^2$$

$$s = 12 \text{ in}$$

$$d = 66 \text{ in}$$

$$\alpha = 30 \text{ degrees}$$

$$V_c = 151.8 \text{ kips}$$

Total Bar area per space (assumed double leg #5's)  
 Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)  
 d used for shear  
 angle of shear reinforcement (30 degrees assumed)  
 Shear strength provided by concrete (AASHTO 8-49)

$$V_s = 153.7 \text{ kips} \quad (\text{AASHTO Eq. 8-54})$$

$$\phi V_n = 259.7 \text{ kips} \quad \text{Shear Capacity of Section}$$

**Dead Load plus Soil Load Shear** (Taken at face of column) (Soil Load Moment has been increased by 1.15 factor)

$$\text{Total Service Shear} = 40.4 \text{ kips} \quad \text{From Staad}$$

**Live Load Shear** (Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =		78.7	84.6	57.1	73.8	71.9	73.8

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.13	40.6 Tons	HS22.6
Operating	HS20	36 Tons	RF=1.88	67.9 Tons	HS37.7
	2F1	15 Tons	RF=2.79	41.8 Tons	
	3F1	23 Tons	RF=2.16	49.7 Tons	
	4F1	27 Tons	RF=2.22	59.9 Tons	
	5C1	40 Tons	RF=2.16	86.4 Tons	
	Ohio Legal %	215%			



**Column Section** (Top of North Column controls)

h =	36	in	Column Depth
b =	21	in	Column Width
A <sub>s</sub> =	10.35	in <sup>2</sup>	Area of Tension Steel (5 - 1 1/8" bars, 4 - 1" bars)
A' <sub>s</sub> =	4	in <sup>2</sup>	Area of Compression Steel (4 - 1" bars)
d =	33	in	Distance from compression face to centroid of tension steel
d' =	3	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	3	ksi	Concrete Strength
f <sub>y</sub> =	33	ksi	Steel Yield Stress
E <sub>s</sub> =	29000	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	0.003	in/in	Ultimate concrete strain
β <sub>1</sub> =	0.85		
d" =	15	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads plus Soil Loads** (Moment taken below chamfer) (Soil Load has been increased by 1.15 factor)

Total Service Moment =	104.0	ft-kips	From Staad
Total Service Axial Force =	46	kips	From Staad

**Live Loads** (Moment taken below chamfer)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	156.7	168.3	113.7	146.9	143.1	146.9	ft-kips	
Max. LL+I Axial Force =	73	78.4	49.3	94.3	71.1	74.9	kips	

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	20.34	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	23.93	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	33	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	879.5	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	1302.7	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	2364.8	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	1655.3	kips		



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**Pure Bending Capacity** (Ignoring compression steel)

$a =$	6.378	in	$a = A_s * f_y / 0.85 * f_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	848.5	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	763.6	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **18.64** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a =$	15.84777986	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	848.6	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	447.4	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	913.2	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	24.49	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	218.2	230.0	166.8	264.4	214.1	222.4	kips
$M_u =$	475.2	500.5	382.0	453.9	445.7	453.9	ft-kips
$e =$	26.13	26.11	27.48	20.60	24.98	24.49	in
$\phi P_n =$	416.3	416.7	393.1	536.0	437.8	447.4	kips
$\phi M_n =$	906.5	906.6	900.2	920.3	911.4	913.2	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.10	75.5 Tons	HS41.9
Operating	HS20	36 Tons	RF=3.50	126.0 Tons	HS70.0
	2F1	15 Tons	RF=5.17	77.6 Tons	
	3F1	23 Tons	RF=3.89	89.4 Tons	
	4F1	27 Tons	RF=4.09	110.4 Tons	
	5C1	40 Tons	RF=3.98	159.2 Tons	
Ohio Legal %	390%				

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.07	38.4 Tons	HS21.3
Operating	HS20	36 Tons	RF=1.78	64.1 Tons	HS35.6
	2F1	15 Tons	RF=2.64	39.6 Tons	
	3F1	23 Tons	RF=2.04	47.0 Tons	
	4F1	27 Tons	RF=2.10	56.6 Tons	
	5C1	40 Tons	RF=2.04	81.7 Tons	
Ohio Legal %	205%				

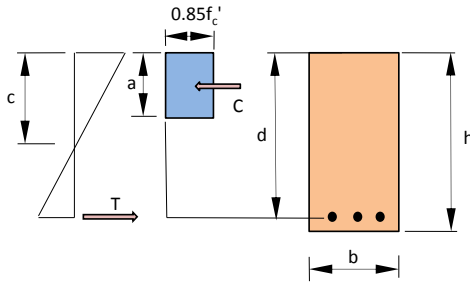
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment





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### Floor Beam Postive Moment Section



b =	98.9	in
d =	48	in
f' <sub>c</sub> =	4.5	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	14.1	in <sup>2</sup>
% Steel Loss =	0%	

(5-1 1/8", 5-1 1/4") from 159/246 of original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	14.141	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	239.42	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	1.233	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1658.3	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Plus Soil Load Moment

(Soil Load Moment has been factored by 0.5)

Total Service Positive Moment = 284.8 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	41.6	44.7	30.2	39	38	39	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	54.1	58.1	39.3	50.7	49.4	50.7	kips
Reaction per Wheel (LL+I) =	27.0	29.1	19.6	25.4	24.7	25.4	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

		From STAAD					
Max. Positive LL+I Moment =	517.67	556.2	375.8	485.3	472.9	485.3	ft*kips

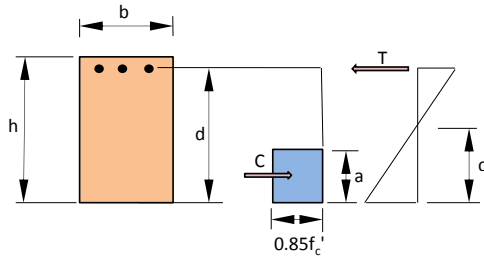
Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

#### Positive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.07	38.4 Tons	HS21.3
	Operating	HS20	36 Tons	RF=1.78	64.1 Tons
	2F1	15 Tons	RF=2.64	39.6 Tons	
	3F1	23 Tons	RF=2.04	47.0 Tons	
	4F1	27 Tons	RF=2.10	56.6 Tons	
	5C1	40 Tons	RF=2.04	81.7 Tons	
	Ohio Legal %	205%			

### Floor Beam Negative Moment Section

(Check of North end with loss noted) (2" off b and 3" off d)



b =	19	in
d =	75	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	9.35	in <sup>2</sup>
% Steel Loss =	0%	

(5-1 1/8", 3-1")  
from 49/246 of  
original plans

### Section Capacity

b = Frame width for negative moment

A<sub>s</sub> = 9.350 in<sup>2</sup>

Area of reinforcing steel minus any loss noted

ρ<sub>b</sub> = 0.048

Balanced reinforcement ratio, AASHTO Eq. 8-18

0.75\*A<sub>sb</sub> = 50.89 in<sup>2</sup>

75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2

β<sub>1</sub> = 0.85

a = 6.368 in

Depth of equivalent compressive stress block, AASHTO Eq. 8-17

φM<sub>n</sub> = 1661.9 ft\*kips

Design Moment Strength, AASHTO Eq. 8-16

### Dead Load plus Soil Load Moment

(Soil Load Moment has been increased by 1.15 factor)

Total Service Negative Moment = 88.8 ft\*kips

From Staad

### Live Load Moment

From STAAD					
HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
121.33	130.4	88.1	113.8	110.8	113.8

Max. Negative LL+I Moment = 121.33 ft\*kips

Maximum Negative Moment results from 3 lanes loaded.

### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=5.47	196.8 Tons	HS109.3
	HS20	36 Tons	RF=9.12	328.5 Tons	HS182.5
Operating	2F1	15 Tons	RF=13.51	202.6 Tons	
	3F1	23 Tons	RF=10.46	240.5 Tons	
	4F1	27 Tons	RF=10.73	289.8 Tons	
	5C1	40 Tons	RF=10.46	418.3 Tons	
	Ohio Legal %			1045%	

## Floor Beam Shear Section

### Section Capacity

Taken at face of column

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)
$d =$	<input type="text" value="75"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="156.1"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="174.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="281.2"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

(Soil Load Moment has been increased by 1.15 factor)

Total Service Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="78.9"/>	84.8	57.3	74.0	72.1	74.0	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.24	44.7 Tons	HS24.8
Operating	HS20	36 Tons	RF=2.07	74.6 Tons	HS41.5
	2F1	15 Tons	RF=3.07	46.0 Tons	
	3F1	23 Tons	RF=2.38	54.7 Tons	
	4F1	27 Tons	RF=2.44	65.9 Tons	
	5C1	40 Tons	RF=2.38	95.1 Tons	
	Ohio Legal %			240%	

**Column Section** (Top of North Column controls)

h =	<input type="text" value="36"/>	in	Column Depth
b =	<input type="text" value="21"/>	in	Column Width
A <sub>s</sub> =	<input type="text" value="10.35"/>	in <sup>2</sup>	Area of Tension Steel (5 - 1 1/8" bars, 4 - 1" bars)
A' <sub>s</sub> =	<input type="text" value="4"/>	in <sup>2</sup>	Area of Compression Steel (4 - 1" bars)
d =	<input type="text" value="33"/>	in	Distance from compression face to centroid of tension steel
d' =	<input type="text" value="3"/>	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	<input type="text" value="3"/>	ksi	Concrete Strength
f <sub>y</sub> =	<input type="text" value="33"/>	ksi	Steel Yield Stress
E <sub>s</sub> =	<input type="text" value="29000"/>	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	<input type="text" value="0.003"/>	in/in	Ultimate concrete strain
β <sub>1</sub> =	<input type="text" value="0.85"/>		
d" =	<input type="text" value="15"/>	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads plus Soil Loads** (Moment taken at the center of cap) (Soil Loads has been increased by 1.15 factor)

Total Service Dead Load Moment =	<input type="text" value="104.0"/>	ft-kips	From Staad
Total Service Dead Load Axial Force =	<input type="text" value="46"/>	kips	From Staad

**Live Loads** (Moment taken at the center of cap)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	<input type="text" value="156.7"/>		168.3	113.7	146.9	143.1	146.9	ft-kips
Max. LL+I Axial Force =	<input type="text" value="73"/>		78.4	49.3	94.3	71.1	74.9	kips

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	<input type="text" value="20.34"/>	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	<input type="text" value="23.93"/>	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f' <sub>s</sub> =	<input type="text" value="33"/>	ksi	f' <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	<input type="text" value="879.5"/>	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f' <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	<input type="text" value="1302.7"/>	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"/2)+A' <sub>s</sub> *f' <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	<input type="text" value="2364.8"/>	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	<input type="text" value="1655.3"/>	kips		

**Pure Bending Capacity** (Ignoring compression steel)

a =	<input type="text" value="6.378"/>	in	a = A <sub>s</sub> *f <sub>y</sub> /0.85*f <sub>c</sub> *b	Depth of equivalent stress block (AASHTO Eq. 8-17)
M <sub>n</sub> =	<input type="text" value="848.5"/>	ft-kips	M <sub>n</sub> = A <sub>s</sub> *f <sub>y</sub> *(d-a/2)	Nominal Moment Strength (AASHTO Eq. 8-15)
φM <sub>n</sub> =	<input type="text" value="763.6"/>	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c = 18.64$  in

**Tension Failure**

$f_s = 33.00$ ksi	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s = 33.00$ ksi	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a = 15.84777986$ in	$a = \beta_1 * c$	Depth of concrete stress block
$C = 848.6$ kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n = 447.4$ kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n = 913.2$ ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e = 24.49$ in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	218.2	230.0	166.8	264.4	214.1	222.4	kips
$M_u =$	475.2	500.5	382.0	453.9	445.7	453.9	ft-kips
$e =$	26.13	26.11	27.48	20.60	24.98	24.49	in
$\phi P_n =$	416.30	416.65	393.11	536.02	437.84	447.37	kips
$\phi M_n =$	906.5	906.6	900.2	920.3	911.4	913.2	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.10	75.5 Tons	HS41.9
Operating	HS20	36 Tons	RF=3.50	126.0 Tons	HS70.0
	2F1	15 Tons	RF=5.17	77.6 Tons	
	3F1	23 Tons	RF=3.89	89.4 Tons	
	4F1	27 Tons	RF=4.09	110.4 Tons	
	5C1	40 Tons	RF=3.98	159.2 Tons	
Ohio Legal %	390%				

	Load	GVW	Rating Factor	Safe Load	HS Rating	
Inventory	HS20	36 Tons	RF=1.07	38.4 Tons	HS21.3	Positive Moment
Operating	HS20	36 Tons	RF=1.78	64.1 Tons	HS35.6	Positive Moment
	2F1	15 Tons	RF=2.64	39.6 Tons		Positive Moment
	3F1	23 Tons	RF=2.04	47.0 Tons		Positive Moment
	4F1	27 Tons	RF=2.10	56.6 Tons		Positive Moment
	5C1	40 Tons	RF=2.04	81.7 Tons		Positive Moment
Ohio Legal %	205%					



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**P402110046**Sheet No  
**1**

Rev

Part Section D, Frame 26

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 26.std Date/Time 01-Mar-2012 09:34

## Job Information

	Engineer	Checked	Approved
<b>Name:</b>	M Johnson	D Hoff	
<b>Date:</b>	21-Feb-12	29-Feb-12	

**Structure Type** SPACE FRAME

Number of Nodes	4	Highest Node	4
Number of Elements	3	Highest Beam	3

Number of Basic Load Cases	8
Number of Combination Load Cases	2

*Included in this printout are data for:*

<b>All</b>	The Whole Structure
------------	---------------------

*Included in this printout are results for load cases:*

Type	L/C	Name
Primary	1	DEAD LOAD
Primary	3	LIVE LOAD 1
Primary	4	LIVE LOAD 2
Primary	5	LIVE LOAD 3
Primary	6	LIVE LOAD 4
Primary	7	LIVE LOAD 5
Primary	8	LIVE LOAD 6
Primary	2	SOIL LOAD
Combination	9	DEAD PLUS SOIL
Combination	10	DL PLUS SOIL POS MOM

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	0.000	0.000
2	0.000	24.990	0.000
3	37.000	24.990	0.000
4	37.000	3.000	0.000

## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	2	24.990	2	0
2	2	3	37.000	1	0
3	4	3	21.990	2	0



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## Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE
2	Rect 42.00x21.00	882.000	32.4E+3	130E+3	89E+3	CONCRETE

## Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

## Basic Load Cases

Number	Name
1	DEAD LOAD
3	LIVE LOAD 1
4	LIVE LOAD 2
5	LIVE LOAD 3
6	LIVE LOAD 4
7	LIVE LOAD 5
8	LIVE LOAD 6
2	SOIL LOAD

## Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	DEAD PLUS SOIL	1	DEAD LOAD	1.00
		2	SOIL LOAD	1.15
10	DL PLUS SOIL POS MOM	1	DEAD LOAD	1.00
		2	SOIL LOAD	0.50



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## Beam Force Detail

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			Shear			Torsion			Bending			
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	
1	1:DEAD LOAD	0.000	66.356	-10.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.03E+3	
		2.499	64.055	-10.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-732.842	
		4.998	61.754	-10.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-432.352	
		7.497	59.453	-10.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-131.861	
		9.996	57.152	-10.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	168.630	
		12.495	54.851	-10.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	469.121	
		14.994	52.550	-10.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	769.612	
		17.493	50.248	-10.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.07E+3	
		19.992	47.947	-10.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.37E+3
		22.491	45.646	-10.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.67E+3
24.990	43.345	-10.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.97E+3		
	3:LIVE LOAD 1	0.000	70.567	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.34E+3	
		2.499	70.567	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-949.437	
		4.998	70.567	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-557.860	
		7.497	70.567	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-166.284	
		9.996	70.567	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	225.293	
		12.495	70.567	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	616.869	
		14.994	70.567	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.01E+3	
		17.493	70.567	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4E+3	
		19.992	70.567	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.79E+3	
		22.491	70.567	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.18E+3	
24.990	70.567	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.57E+3			
	4:LIVE LOAD 2	0.000	48.208	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.34E+3	
		2.499	48.208	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-948.846	
		4.998	48.208	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-557.249	
		7.497	48.208	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-165.653	
		9.996	48.208	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	225.943	
		12.495	48.208	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	617.539	
		14.994	48.208	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.01E+3	
		17.493	48.208	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.4E+3	
		19.992	48.208	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.79E+3	
		22.491	48.208	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.18E+3	
24.990	48.208	-13.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.58E+3			
	5:LIVE LOAD 3	0.000	59.404	-13.769	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.41E+3	
		2.499	59.404	-13.769	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1E+3	
		4.998	59.404	-13.769	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-587.809	
		7.497	59.404	-13.769	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-174.900	
		9.996	59.404	-13.769	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	238.009	
		12.495	59.404	-13.769	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	650.918	
		14.994	59.404	-13.769	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.06E+3	
		17.493	59.404	-13.769	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.48E+3	
		19.992	59.404	-13.769	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.89E+3	





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Rev

Part Section D, Frame 26

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 26.std Date/Time 01-Mar-2012 09:34

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		22.491	59.404	-13.769	0.000	0.000	0.000	0.000	0.000	2.3E+3	
		24.990	59.404	-13.769	0.000	0.000	0.000	0.000	0.000	2.72E+3	
	6:LIVE LOAD 4	0.000	64.200	-13.640	0.000	0.000	0.000	0.000	0.000	-1.4E+3	
		2.499	64.200	-13.640	0.000	0.000	0.000	0.000	0.000	-989.936	
		4.998	64.200	-13.640	0.000	0.000	0.000	0.000	0.000	-580.900	
		7.497	64.200	-13.640	0.000	0.000	0.000	0.000	0.000	-171.863	
		9.996	64.200	-13.640	0.000	0.000	0.000	0.000	0.000	237.174	
		12.495	64.200	-13.640	0.000	0.000	0.000	0.000	0.000	646.210	
		14.994	64.200	-13.640	0.000	0.000	0.000	0.000	0.000	1.06E+3	
		17.493	64.200	-13.640	0.000	0.000	0.000	0.000	0.000	1.46E+3	
		19.992	64.200	-13.640	0.000	0.000	0.000	0.000	0.000	1.87E+3	
		22.491	64.200	-13.640	0.000	0.000	0.000	0.000	0.000	2.28E+3	
		24.990	64.200	-13.640	0.000	0.000	0.000	0.000	0.000	2.69E+3	
	7:LIVE LOAD 5	0.000	54.601	-13.637	0.000	0.000	0.000	0.000	0.000	-1.4E+3	
		2.499	54.601	-13.637	0.000	0.000	0.000	0.000	0.000	-992.554	
		4.998	54.601	-13.637	0.000	0.000	0.000	0.000	0.000	-583.605	
		7.497	54.601	-13.637	0.000	0.000	0.000	0.000	0.000	-174.657	
		9.996	54.601	-13.637	0.000	0.000	0.000	0.000	0.000	234.292	
		12.495	54.601	-13.637	0.000	0.000	0.000	0.000	0.000	643.241	
		14.994	54.601	-13.637	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		17.493	54.601	-13.637	0.000	0.000	0.000	0.000	0.000	1.46E+3	
		19.992	54.601	-13.637	0.000	0.000	0.000	0.000	0.000	1.87E+3	
		22.491	54.601	-13.637	0.000	0.000	0.000	0.000	0.000	2.28E+3	
		24.990	54.601	-13.637	0.000	0.000	0.000	0.000	0.000	2.69E+3	
	8:LIVE LOAD 6	0.000	44.095	-13.259	0.000	0.000	0.000	0.000	0.000	-1.36E+3	
		2.499	44.095	-13.259	0.000	0.000	0.000	0.000	0.000	-963.199	
		4.998	44.095	-13.259	0.000	0.000	0.000	0.000	0.000	-565.593	
		7.497	44.095	-13.259	0.000	0.000	0.000	0.000	0.000	-167.987	
		9.996	44.095	-13.259	0.000	0.000	0.000	0.000	0.000	229.618	
		12.495	44.095	-13.259	0.000	0.000	0.000	0.000	0.000	627.224	
		14.994	44.095	-13.259	0.000	0.000	0.000	0.000	0.000	1.02E+3	
		17.493	44.095	-13.259	0.000	0.000	0.000	0.000	0.000	1.42E+3	
		19.992	44.095	-13.259	0.000	0.000	0.000	0.000	0.000	1.82E+3	
		22.491	44.095	-13.259	0.000	0.000	0.000	0.000	0.000	2.22E+3	
		24.990	44.095	-13.259	0.000	0.000	0.000	0.000	0.000	2.62E+3	
	2:SOIL LOAD	0.000	1.108	-2.665	0.000	0.000	0.000	0.000	0.000	-461.906	
		2.499	1.108	-2.665	0.000	0.000	0.000	0.000	0.000	-381.974	
		4.998	1.108	-2.665	0.000	0.000	0.000	0.000	0.000	-302.042	
		7.497	1.108	-2.665	0.000	0.000	0.000	0.000	0.000	-222.110	
		9.996	1.108	-2.665	0.000	0.000	0.000	0.000	0.000	-142.178	
		12.495	1.108	-2.665	0.000	0.000	0.000	0.000	0.000	-62.246	
		14.994	1.108	-2.665	0.000	0.000	0.000	0.000	0.000	17.686	
		17.493	1.108	-2.665	0.000	0.000	0.000	0.000	0.000	97.618	
		19.992	1.108	-2.665	0.000	0.000	0.000	0.000	0.000	177.550	



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Part Section D, Frame 26		
Ref		
By M Johnson	Date 21-Feb-12	Chd D Hoff
Client ODOT	File Section D Frame 26.std	Date/Time 01-Mar-2012 09:34

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		22.491	1.108	-2.665	0.000	0.000	0.000	0.000	0.000	257.482	
		24.990	1.108	-2.665	0.000	0.000	0.000	0.000	0.000	337.414	
	9:DEAD PLUS	0.000	67.631	-13.086	0.000	0.000	0.000	0.000	0.000	-1.56E+3	
		2.499	65.330	-13.086	0.000	0.000	0.000	0.000	0.000	-1.17E+3	
		4.998	63.029	-13.086	0.000	0.000	0.000	0.000	0.000	-779.700	
		7.497	60.727	-13.086	0.000	0.000	0.000	0.000	0.000	-387.287	
		9.996	58.426	-13.086	0.000	0.000	0.000	0.000	0.000	5.126	
		12.495	56.125	-13.086	0.000	0.000	0.000	0.000	0.000	397.538	
		14.994	53.824	-13.086	0.000	0.000	0.000	0.000	0.000	789.951	
		17.493	51.523	-13.086	0.000	0.000	0.000	0.000	0.000	1.18E+3	
		19.992	49.222	-13.086	0.000	0.000	0.000	0.000	0.000	1.57E+3	
		22.491	46.921	-13.086	0.000	0.000	0.000	0.000	0.000	1.97E+3	
		24.990	44.620	-13.086	0.000	0.000	0.000	0.000	0.000	2.36E+3	
	10:DL PLUS S	0.000	66.910	-11.353	0.000	0.000	0.000	0.000	0.000	-1.26E+3	
		2.499	64.609	-11.353	0.000	0.000	0.000	0.000	0.000	-923.829	
		4.998	62.308	-11.353	0.000	0.000	0.000	0.000	0.000	-583.372	
		7.497	60.007	-11.353	0.000	0.000	0.000	0.000	0.000	-242.916	
		9.996	57.706	-11.353	0.000	0.000	0.000	0.000	0.000	97.541	
		12.495	55.405	-11.353	0.000	0.000	0.000	0.000	0.000	437.998	
		14.994	53.104	-11.353	0.000	0.000	0.000	0.000	0.000	778.455	
		17.493	50.803	-11.353	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		19.992	48.502	-11.353	0.000	0.000	0.000	0.000	0.000	1.46E+3	
		22.491	46.200	-11.353	0.000	0.000	0.000	0.000	0.000	1.8E+3	
		24.990	43.899	-11.353	0.000	0.000	0.000	0.000	0.000	2.14E+3	
2	1:DEAD LOAD	0.000	10.020	43.345	0.000	0.000	0.000	0.000	0.000	1.97E+3	
		3.700	10.020	35.288	0.000	0.000	0.000	0.000	0.000	245.382	
		7.400	10.020	27.118	0.000	0.000	0.000	0.000	0.000	-1.13E+3	
		11.100	10.020	18.833	0.000	0.000	0.000	0.000	0.000	-2.15E+3	
		14.800	10.020	10.434	0.000	0.000	0.000	0.000	0.000	-2.81E+3	
		18.500	10.020	1.921	0.000	0.000	0.000	0.000	0.000	-3.11E+3	
		22.200	10.020	-9.192	0.000	0.000	0.000	0.000	0.000	-2.87E+3	
		25.900	10.020	-17.950	0.000	0.000	0.000	0.000	0.000	-2.26E+3	
		29.600	10.020	-26.821	0.000	0.000	0.000	0.000	0.000	-1.26E+3	
		33.300	10.020	-35.806	0.000	0.000	0.000	0.000	0.000	115.040	
		37.000	10.020	-44.905	0.000	0.000	0.000	0.000	0.000	1.88E+3	
	3:LIVE LOAD 1	0.000	13.058	70.567	0.000	0.000	0.000	0.000	0.000	2.57E+3	
		3.700	13.058	46.927	0.000	0.000	0.000	0.000	0.000	324.145	
		7.400	13.058	31.167	0.000	0.000	0.000	0.000	0.000	-1.61E+3	
		11.100	13.058	19.347	0.000	0.000	0.000	0.000	0.000	-2.95E+3	
		14.800	13.058	11.467	0.000	0.000	0.000	0.000	0.000	-3.72E+3	
		18.500	13.058	-8.233	0.000	0.000	0.000	0.000	0.000	-4.11E+3	
		22.200	13.058	-12.173	0.000	0.000	0.000	0.000	0.000	-3.71E+3	
		25.900	13.058	-27.933	0.000	0.000	0.000	0.000	0.000	-2.93E+3	
		29.600	13.058	-39.753	0.000	0.000	0.000	0.000	0.000	-1.57E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**6**

Rev

Part Section D, Frame 26

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 26.std Date/Time 01-Mar-2012 09:34

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	13.058	-47.633	0.000	0.000	0.000	0.000	0.000	332.992	
		37.000	13.058	-47.633	0.000	0.000	0.000	0.000	0.000	2.45E+3	
	4:LIVE LOAD 2	0.000	13.058	48.208	0.000	0.000	0.000	0.000	0.000	2.58E+3	
		3.700	13.058	48.208	0.000	0.000	0.000	0.000	0.000	435.089	
		7.400	13.058	40.328	0.000	0.000	0.000	0.000	0.000	-1.49E+3	
		11.100	13.058	28.508	0.000	0.000	0.000	0.000	0.000	-2.88E+3	
		14.800	13.058	12.748	0.000	0.000	0.000	0.000	0.000	-3.69E+3	
		18.500	13.058	8.808	0.000	0.000	0.000	0.000	0.000	-4.11E+3	
		22.200	13.058	-10.892	0.000	0.000	0.000	0.000	0.000	-3.74E+3	
		25.900	13.058	-18.772	0.000	0.000	0.000	0.000	0.000	-3E+3	
		29.600	13.058	-30.592	0.000	0.000	0.000	0.000	0.000	-1.69E+3	
		33.300	13.058	-46.352	0.000	0.000	0.000	0.000	0.000	222.116	
		37.000	13.058	-69.992	0.000	0.000	0.000	0.000	0.000	2.45E+3	
	5:LIVE LOAD 3	0.000	13.769	59.404	0.000	0.000	0.000	0.000	0.000	2.72E+3	
		3.700	13.769	55.464	0.000	0.000	0.000	0.000	0.000	204.027	
		7.400	13.769	39.704	0.000	0.000	0.000	0.000	0.000	-1.64E+3	
		11.100	13.769	27.884	0.000	0.000	0.000	0.000	0.000	-3E+3	
		14.800	13.769	20.004	0.000	0.000	0.000	0.000	0.000	-3.91E+3	
		18.500	13.769	0.304	0.000	0.000	0.000	0.000	0.000	-4.09E+3	
		22.200	13.769	-19.396	0.000	0.000	0.000	0.000	0.000	-3.94E+3	
		25.900	13.769	-27.276	0.000	0.000	0.000	0.000	0.000	-3.05E+3	
		29.600	13.769	-39.096	0.000	0.000	0.000	0.000	0.000	-1.72E+3	
		33.300	13.769	-54.856	0.000	0.000	0.000	0.000	0.000	96.214	
		37.000	13.769	-58.796	0.000	0.000	0.000	0.000	0.000	2.58E+3	
	6:LIVE LOAD 4	0.000	13.640	64.200	0.000	0.000	0.000	0.000	0.000	2.69E+3	
		3.700	13.640	44.500	0.000	0.000	0.000	0.000	0.000	242.803	
		7.400	13.640	36.620	0.000	0.000	0.000	0.000	0.000	-1.61E+3	
		11.100	13.640	24.800	0.000	0.000	0.000	0.000	0.000	-2.98E+3	
		14.800	13.640	9.040	0.000	0.000	0.000	0.000	0.000	-3.81E+3	
		18.500	13.640	5.100	0.000	0.000	0.000	0.000	0.000	-4.11E+3	
		22.200	13.640	-14.600	0.000	0.000	0.000	0.000	0.000	-3.82E+3	
		25.900	13.640	-22.480	0.000	0.000	0.000	0.000	0.000	-3.01E+3	
		29.600	13.640	-34.300	0.000	0.000	0.000	0.000	0.000	-1.67E+3	
		33.300	13.640	-50.060	0.000	0.000	0.000	0.000	0.000	212.241	
		37.000	13.640	-54.000	0.000	0.000	0.000	0.000	0.000	2.55E+3	
	7:LIVE LOAD 5	0.000	13.637	54.601	0.000	0.000	0.000	0.000	0.000	2.69E+3	
		3.700	13.637	50.661	0.000	0.000	0.000	0.000	0.000	318.846	
		7.400	13.637	34.901	0.000	0.000	0.000	0.000	0.000	-1.59E+3	
		11.100	13.637	23.081	0.000	0.000	0.000	0.000	0.000	-2.95E+3	
		14.800	13.637	15.201	0.000	0.000	0.000	0.000	0.000	-3.79E+3	
		18.500	13.637	-4.499	0.000	0.000	0.000	0.000	0.000	-4.11E+3	
		22.200	13.637	-8.439	0.000	0.000	0.000	0.000	0.000	-3.84E+3	
		25.900	13.637	-24.199	0.000	0.000	0.000	0.000	0.000	-3.03E+3	
		29.600	13.637	-36.019	0.000	0.000	0.000	0.000	0.000	-1.7E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**7**

Rev

Part Section D, Frame 26

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 26.std Date/Time 01-Mar-2012 09:34

## Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	13.637	-43.899	0.000	0.000	0.000	0.000	0.000	135.892	
		37.000	13.637	-63.599	0.000	0.000	0.000	0.000	0.000	2.56E+3	
	8:LIVE LOAD 6	0.000	13.259	44.095	0.000	0.000	0.000	0.000	0.000	2.62E+3	
		3.700	13.259	44.095	0.000	0.000	0.000	0.000	0.000	657.457	
		7.400	13.259	44.095	0.000	0.000	0.000	0.000	0.000	-1.3E+3	
		11.100	13.259	30.955	0.000	0.000	0.000	0.000	0.000	-2.97E+3	
		14.800	13.259	22.195	0.000	0.000	0.000	0.000	0.000	-4.09E+3	
		18.500	13.259	0.295	0.000	0.000	0.000	0.000	0.000	-4.55E+3	
		22.200	13.259	-21.605	0.000	0.000	0.000	0.000	0.000	-4.11E+3	
		25.900	13.259	-30.365	0.000	0.000	0.000	0.000	0.000	-3.02E+3	
		29.600	13.259	-43.505	0.000	0.000	0.000	0.000	0.000	-1.38E+3	
		33.300	13.259	-43.505	0.000	0.000	0.000	0.000	0.000	552.848	
		37.000	13.259	-43.505	0.000	0.000	0.000	0.000	0.000	2.48E+3	
	2:SOIL LOAD	0.000	2.665	1.108	0.000	0.000	0.000	0.000	0.000	337.414	
		3.700	2.665	1.108	0.000	0.000	0.000	0.000	0.000	288.206	
		7.400	2.665	1.108	0.000	0.000	0.000	0.000	0.000	238.997	
		11.100	2.665	1.108	0.000	0.000	0.000	0.000	0.000	189.788	
		14.800	2.665	1.108	0.000	0.000	0.000	0.000	0.000	140.579	
		18.500	2.665	1.108	0.000	0.000	0.000	0.000	0.000	91.370	
		22.200	2.665	1.108	0.000	0.000	0.000	0.000	0.000	42.162	
		25.900	2.665	1.108	0.000	0.000	0.000	0.000	0.000	-7.047	
		29.600	2.665	1.108	0.000	0.000	0.000	0.000	0.000	-56.256	
		33.300	2.665	1.108	0.000	0.000	0.000	0.000	0.000	-105.465	
		37.000	2.665	1.108	0.000	0.000	0.000	0.000	0.000	-154.674	
	9:DEAD PLUS	0.000	13.086	44.620	0.000	0.000	0.000	0.000	0.000	2.36E+3	
		3.700	13.086	36.563	0.000	0.000	0.000	0.000	0.000	576.818	
		7.400	13.086	28.392	0.000	0.000	0.000	0.000	0.000	-855.570	
		11.100	13.086	20.107	0.000	0.000	0.000	0.000	0.000	-1.93E+3	
		14.800	13.086	11.708	0.000	0.000	0.000	0.000	0.000	-2.65E+3	
		18.500	13.086	3.196	0.000	0.000	0.000	0.000	0.000	-3E+3	
		22.200	13.086	-7.918	0.000	0.000	0.000	0.000	0.000	-2.82E+3	
		25.900	13.086	-16.675	0.000	0.000	0.000	0.000	0.000	-2.27E+3	
		29.600	13.086	-25.546	0.000	0.000	0.000	0.000	0.000	-1.33E+3	
		33.300	13.086	-34.532	0.000	0.000	0.000	0.000	0.000	-6.244	
		37.000	13.086	-43.631	0.000	0.000	0.000	0.000	0.000	1.71E+3	
	10:DL PLUS S	0.000	11.353	43.899	0.000	0.000	0.000	0.000	0.000	2.14E+3	
		3.700	11.353	35.843	0.000	0.000	0.000	0.000	0.000	389.484	
		7.400	11.353	27.672	0.000	0.000	0.000	0.000	0.000	-1.01E+3	
		11.100	11.353	19.387	0.000	0.000	0.000	0.000	0.000	-2.06E+3	
		14.800	11.353	10.988	0.000	0.000	0.000	0.000	0.000	-2.74E+3	
		18.500	11.353	2.475	0.000	0.000	0.000	0.000	0.000	-3.06E+3	
		22.200	11.353	-8.638	0.000	0.000	0.000	0.000	0.000	-2.85E+3	
		25.900	11.353	-17.395	0.000	0.000	0.000	0.000	0.000	-2.26E+3	
		29.600	11.353	-26.267	0.000	0.000	0.000	0.000	0.000	-1.29E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**8**

Rev

Part Section D, Frame 26

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 26.std Date/Time 01-Mar-2012 09:34

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	11.353	-35.252	0.000	0.000	0.000	0.000	0.000	62.308	
		37.000	11.353	-44.351	0.000	0.000	0.000	0.000	0.000	1.81E+3	
3	1:DEAD LOAD	0.000	65.154	10.020	0.000	0.000	0.000	0.000	0.000	760.185	
		2.199	63.129	10.020	0.000	0.000	0.000	0.000	0.000	495.767	
		4.398	61.104	10.020	0.000	0.000	0.000	0.000	0.000	231.350	
		6.597	59.079	10.020	0.000	0.000	0.000	0.000	0.000	-33.068	
		8.796	57.055	10.020	0.000	0.000	0.000	0.000	0.000	-297.485	
		10.995	55.030	10.020	0.000	0.000	0.000	0.000	0.000	-561.903	
		13.194	53.005	10.020	0.000	0.000	0.000	0.000	0.000	-826.320	
		15.393	50.980	10.020	0.000	0.000	0.000	0.000	0.000	-1.09E+3	
		17.592	48.955	10.020	0.000	0.000	0.000	0.000	0.000	-1.36E+3	
		19.791	46.930	10.020	0.000	0.000	0.000	0.000	0.000	-1.62E+3	
		21.990	44.905	10.020	0.000	0.000	0.000	0.000	0.000	-1.88E+3	
	3:LIVE LOAD 1	0.000	47.633	13.058	0.000	0.000	0.000	0.000	0.000	997.777	
		2.199	47.633	13.058	0.000	0.000	0.000	0.000	0.000	653.209	
		4.398	47.633	13.058	0.000	0.000	0.000	0.000	0.000	308.640	
		6.597	47.633	13.058	0.000	0.000	0.000	0.000	0.000	-35.928	
		8.796	47.633	13.058	0.000	0.000	0.000	0.000	0.000	-380.497	
		10.995	47.633	13.058	0.000	0.000	0.000	0.000	0.000	-725.065	
		13.194	47.633	13.058	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		15.393	47.633	13.058	0.000	0.000	0.000	0.000	0.000	-1.41E+3	
		17.592	47.633	13.058	0.000	0.000	0.000	0.000	0.000	-1.76E+3	
		19.791	47.633	13.058	0.000	0.000	0.000	0.000	0.000	-2.1E+3	
		21.990	47.633	13.058	0.000	0.000	0.000	0.000	0.000	-2.45E+3	
	4:LIVE LOAD 2	0.000	69.992	13.058	0.000	0.000	0.000	0.000	0.000	998.653	
		2.199	69.992	13.058	0.000	0.000	0.000	0.000	0.000	654.067	
		4.398	69.992	13.058	0.000	0.000	0.000	0.000	0.000	309.481	
		6.597	69.992	13.058	0.000	0.000	0.000	0.000	0.000	-35.105	
		8.796	69.992	13.058	0.000	0.000	0.000	0.000	0.000	-379.690	
		10.995	69.992	13.058	0.000	0.000	0.000	0.000	0.000	-724.276	
		13.194	69.992	13.058	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		15.393	69.992	13.058	0.000	0.000	0.000	0.000	0.000	-1.41E+3	
		17.592	69.992	13.058	0.000	0.000	0.000	0.000	0.000	-1.76E+3	
		19.791	69.992	13.058	0.000	0.000	0.000	0.000	0.000	-2.1E+3	
		21.990	69.992	13.058	0.000	0.000	0.000	0.000	0.000	-2.45E+3	
	5:LIVE LOAD 3	0.000	58.796	13.769	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		2.199	58.796	13.769	0.000	0.000	0.000	0.000	0.000	689.367	
		4.398	58.796	13.769	0.000	0.000	0.000	0.000	0.000	326.026	
		6.597	58.796	13.769	0.000	0.000	0.000	0.000	0.000	-37.314	
		8.796	58.796	13.769	0.000	0.000	0.000	0.000	0.000	-400.654	
		10.995	58.796	13.769	0.000	0.000	0.000	0.000	0.000	-763.994	
		13.194	58.796	13.769	0.000	0.000	0.000	0.000	0.000	-1.13E+3	
		15.393	58.796	13.769	0.000	0.000	0.000	0.000	0.000	-1.49E+3	
		17.592	58.796	13.769	0.000	0.000	0.000	0.000	0.000	-1.85E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**9**

Rev

Part Section D, Frame 26

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 26.std Date/Time 01-Mar-2012 09:34

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		19.791	58.796	13.769	0.000	0.000	0.000	0.000	0.000	-2.22E+3	
		21.990	58.796	13.769	0.000	0.000	0.000	0.000	0.000	-2.58E+3	
	6:LIVE LOAD 4	0.000	54.000	13.640	0.000	0.000	0.000	0.000	0.000	1.04E+3	
		2.199	54.000	13.640	0.000	0.000	0.000	0.000	0.000	684.705	
		4.398	54.000	13.640	0.000	0.000	0.000	0.000	0.000	324.773	
		6.597	54.000	13.640	0.000	0.000	0.000	0.000	0.000	-35.160	
		8.796	54.000	13.640	0.000	0.000	0.000	0.000	0.000	-395.092	
		10.995	54.000	13.640	0.000	0.000	0.000	0.000	0.000	-755.025	
		13.194	54.000	13.640	0.000	0.000	0.000	0.000	0.000	-1.11E+3	
		15.393	54.000	13.640	0.000	0.000	0.000	0.000	0.000	-1.47E+3	
		17.592	54.000	13.640	0.000	0.000	0.000	0.000	0.000	-1.83E+3	
		19.791	54.000	13.640	0.000	0.000	0.000	0.000	0.000	-2.19E+3	
		21.990	54.000	13.640	0.000	0.000	0.000	0.000	0.000	-2.55E+3	
	7:LIVE LOAD 5	0.000	63.599	13.637	0.000	0.000	0.000	0.000	0.000	1.04E+3	
		2.199	63.599	13.637	0.000	0.000	0.000	0.000	0.000	680.903	
		4.398	63.599	13.637	0.000	0.000	0.000	0.000	0.000	321.048	
		6.597	63.599	13.637	0.000	0.000	0.000	0.000	0.000	-38.808	
		8.796	63.599	13.637	0.000	0.000	0.000	0.000	0.000	-398.663	
		10.995	63.599	13.637	0.000	0.000	0.000	0.000	0.000	-758.518	
		13.194	63.599	13.637	0.000	0.000	0.000	0.000	0.000	-1.12E+3	
		15.393	63.599	13.637	0.000	0.000	0.000	0.000	0.000	-1.48E+3	
		17.592	63.599	13.637	0.000	0.000	0.000	0.000	0.000	-1.84E+3	
		19.791	63.599	13.637	0.000	0.000	0.000	0.000	0.000	-2.2E+3	
		21.990	63.599	13.637	0.000	0.000	0.000	0.000	0.000	-2.56E+3	
	8:LIVE LOAD 6	0.000	43.505	13.259	0.000	0.000	0.000	0.000	0.000	1.01E+3	
		2.199	43.505	13.259	0.000	0.000	0.000	0.000	0.000	664.373	
		4.398	43.505	13.259	0.000	0.000	0.000	0.000	0.000	314.499	
		6.597	43.505	13.259	0.000	0.000	0.000	0.000	0.000	-35.375	
		8.796	43.505	13.259	0.000	0.000	0.000	0.000	0.000	-385.249	
		10.995	43.505	13.259	0.000	0.000	0.000	0.000	0.000	-735.123	
		13.194	43.505	13.259	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		15.393	43.505	13.259	0.000	0.000	0.000	0.000	0.000	-1.43E+3	
		17.592	43.505	13.259	0.000	0.000	0.000	0.000	0.000	-1.78E+3	
		19.791	43.505	13.259	0.000	0.000	0.000	0.000	0.000	-2.13E+3	
		21.990	43.505	13.259	0.000	0.000	0.000	0.000	0.000	-2.48E+3	
	2:SOIL LOAD	0.000	-1.108	-44.933	0.000	0.000	0.000	0.000	0.000	-2.09E+3	
		2.199	-1.108	-33.409	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		4.398	-1.108	-22.457	0.000	0.000	0.000	0.000	0.000	-350.408	
		6.597	-1.108	-13.426	0.000	0.000	0.000	0.000	0.000	109.991	
		8.796	-1.108	-6.569	0.000	0.000	0.000	0.000	0.000	359.266	
		10.995	-1.108	-1.888	0.000	0.000	0.000	0.000	0.000	449.913	
		13.194	-1.108	0.308	0.000	0.000	0.000	0.000	0.000	426.755	
		15.393	-1.108	1.508	0.000	0.000	0.000	0.000	0.000	363.668	
		17.592	-1.108	2.665	0.000	0.000	0.000	0.000	0.000	295.346	



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Job No  
**P402110046**

Sheet No  
**10**

Rev

Part Section D, Frame 26

Job Title Main Avenue Rating

Ref

By M Johnson Date 21-Feb-12 Chd D Hoff

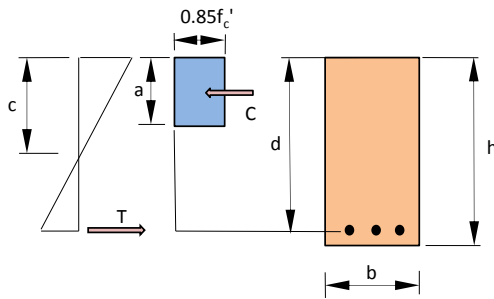
Client ODOT

File Section D Frame 26.std Date/Time 01-Mar-2012 09:34

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	
		19.791	-1.108	2.665	0.000	0.000	0.000	0.000	225.008
		21.990	-1.108	2.665	0.000	0.000	0.000	0.000	154.674
	9:DEAD PLUS	0.000	63.879	-41.653	0.000	0.000	0.000	0.000	-1.64E+3
		2.199	61.855	-28.400	0.000	0.000	0.000	0.000	-738.224
		4.398	59.830	-15.805	0.000	0.000	0.000	0.000	-171.620
		6.597	57.805	-5.419	0.000	0.000	0.000	0.000	93.422
		8.796	55.780	2.466	0.000	0.000	0.000	0.000	115.671
		10.995	53.755	7.849	0.000	0.000	0.000	0.000	-44.503
		13.194	51.730	10.375	0.000	0.000	0.000	0.000	-335.552
		15.393	49.705	11.755	0.000	0.000	0.000	0.000	-672.519
		17.592	47.681	13.086	0.000	0.000	0.000	0.000	-1.02E+3
		19.791	45.656	13.086	0.000	0.000	0.000	0.000	-1.36E+3
		21.990	43.631	13.086	0.000	0.000	0.000	0.000	-1.71E+3
	10:DL PLUS S	0.000	64.600	-12.446	0.000	0.000	0.000	0.000	-284.092
		2.199	62.575	-6.684	0.000	0.000	0.000	0.000	-40.751
		4.398	60.550	-1.208	0.000	0.000	0.000	0.000	56.146
		6.597	58.525	3.308	0.000	0.000	0.000	0.000	21.928
		8.796	56.500	6.736	0.000	0.000	0.000	0.000	-117.852
		10.995	54.476	9.077	0.000	0.000	0.000	0.000	-336.947
		13.194	52.451	10.175	0.000	0.000	0.000	0.000	-612.943
		15.393	50.426	10.775	0.000	0.000	0.000	0.000	-908.904
		17.592	48.401	11.353	0.000	0.000	0.000	0.000	-1.21E+3
		19.791	46.376	11.353	0.000	0.000	0.000	0.000	-1.51E+3
		21.990	44.351	11.353	0.000	0.000	0.000	0.000	-1.81E+3

### Floor Beam Postive Moment Section



b =	98.9	in
d =	48	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	12.7	in <sup>2</sup>
% Steel Loss =	0%	

(10-1 1/8")  
from 159/246  
of original  
plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	12.700	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	239.42	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	1.108	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1491.4	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Plus Soil Load Moment

(Soil Load Moment has been factored by 0.5)

Total Service Positive Moment = 255.2 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	33.7	28.5	20.2	29.7	31.2	31.3	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	43.8	37.1	26.3	38.6	40.6	40.7	kips
Reaction per Wheel (LL+I) =	21.9	18.5	13.1	19.3	20.3	20.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

		From STAAD					
Max. Positive LL+I Moment =	378.83	320.4	227.1	333.9	350.7	351.9	ft*kips

Maximum Positive Moment results from 3 lanes loaded.

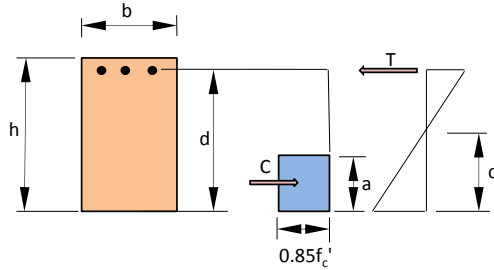
#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.41	50.8 Tons	HS28.2
Operating	HS20	36 Tons	RF=2.35	84.8 Tons	HS47.1
	2F1	15 Tons	RF=3.93	58.9 Tons	
	3F1	23 Tons	RF=2.67	61.5 Tons	
	4F1	27 Tons	RF=2.54	68.7 Tons	
	5C1	40 Tons	RF=2.54	101.4 Tons	
	Ohio Legal %	255%			



### Floor Beam Negative Moment Section

(South end of floorbeam controls)



b =	21	in	
d =	66	in	
f <sub>c</sub> ' =	3	ksi	
f <sub>y</sub> =	33	ksi	
φ =	0.9		(5-1 1/8", 3-1")
Area of Steel =	9.35	in <sup>2</sup>	from 158/246
% Steel Loss =	0%		of original

### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	9.350	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	49.50	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.85		
a =	5.762	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1460.7	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

### Dead Load plus Soil Load Moment

Taken at face of column (Soil Load Moment has been increased by 1.15 factor)

Total Service Negative Moment = 79.5 ft\*kips From Staad

### Live Load Moment

Taken at face of column

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. Negative LL+I Moment =		141.75	119.9	85.0	124.9	131.2	131.7	ft*kips

Maximum Negative Moment results from 3 lanes loaded.

### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=4.41	158.9 Tons	HS88.3
Operating	HS20	36 Tons	RF=7.37	265.2 Tons	HS147.3
	2F1	15 Tons	RF=12.29	184.3 Tons	
	3F1	23 Tons	RF=8.36	192.2 Tons	
	4F1	27 Tons	RF=7.96	214.8 Tons	
	5C1	40 Tons	RF=7.93	317.2 Tons	
	Ohio Legal %	795%			



Made by: **MJJ** Date: **2/21/2012** Job No: **P402110046**  
 Checked by: **GBH** Date: **2/29/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Built Concrete Frame Rating Section D (Frame 26)**

## Floor Beam Shear Section

### Section Capacity

Taken at face of column (South end of cap controls)

$A_{sh} = 0.62$  in<sup>2</sup>  
 $s = 12$  in  
 $d = 66$  in  
 $\alpha = 30$  degrees  
 $V_c = 151.8$  kips

Total Bar area per space (assumed double leg #5's)  
 Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)  
 $d$  used for shear  
 angle of shear reinforcement (30 degrees assumed)  
 Shear strength provided by concrete (AASHTO 8-49)

$V_s = 153.7$  kips

(AASHTO Eq. 8-54)

$\phi V_n = 259.7$  kips

Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column) (Soil Load Moment has been increased by 1.15 factor)

Total Service Shear = **39.9** kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<b>64</b>	54.1	38.4	56.4	59.3	59.4	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.50	53.9 Tons	HS29.9
Operating	HS20	36 Tons	RF=2.50	89.9 Tons	HS50.0
	2F1	15 Tons	RF=4.17	62.5 Tons	
	3F1	23 Tons	RF=2.83	65.2 Tons	
	4F1	27 Tons	RF=2.70	72.9 Tons	
	5C1	40 Tons	RF=2.69	107.6 Tons	
	Ohio Legal %	270%			



**Column Section** (Bottom of North Column controls)

h =	42	in	Column Depth
b =	21	in	Column Width
A <sub>s</sub> =	4	in <sup>2</sup>	Area of Tension Steel (4-1" bars)
A' <sub>s</sub> =	5	in <sup>2</sup>	Area of Compression Steel (5-1" bars)
d =	39	in	Distance from compression face to centroid of tension steel
d' =	3	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	3	ksi	Concrete Strength
f <sub>y</sub> =	33	ksi	Steel Yield Stress
E <sub>s</sub> =	29000	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	0.003	in/in	Ultimate concrete strain
β <sub>1</sub> =	0.85		
d" =	18	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads plus Soil Loads** (Moment taken at top of footing) (Soil Load has been increased by 1.15 factor)

Total Service Moment =	130.4	ft-kips	From Staad
Total Service Axial Force =	67.6	kips	From Staad

**Live Loads** (Moment taken at top of footing)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	117.8	99.7	70.6	103.8	109.1	109.4		ft-kips
Max. LL+I Axial Force =	59.4	50.2	42.1	87.3	62.4	59.6		kips

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	24.03	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	28.28	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	33	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	1320.0	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	1408.9	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	2523.2	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	1766.2	kips		



Made by:	MJJ	Date:	2/21/2012	Job No:	P402110046
Checked by:	GBH	Date:	2/29/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	As-Built Concrete Frame Rating Section D (Frame 26)				

**Pure Bending Capacity** (Ignoring compression steel)

$a =$	2.465	in	$a = A_s * f_y / 0.85 * f'_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	415.4	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	373.9	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **13.77** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a =$	11.7086007	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	627.0	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	462.0	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	865.8	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	22.49	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	216.8	196.9	179.2	277.4	223.3	217.2	kips
$M_u =$	425.2	385.8	322.8	394.9	406.3	407.0	ft-kips
$e =$	23.54	23.51	21.61	17.08	21.83	22.49	in
$\phi P_n =$	426.7	427.6	493.7	692.0	485.5	462.0	kips
$\phi M_n =$	837.1	837.9	889.3	985.1	883.4	865.8	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.61	94.0 Tons	HS52.2
Operating	HS20	36 Tons	RF=4.36	156.9 Tons	HS87.2
	2F1	15 Tons	RF=7.42	111.2 Tons	
	3F1	23 Tons	RF=5.32	122.4 Tons	
	4F1	27 Tons	RF=4.90	132.3 Tons	
	5C1	40 Tons	RF=4.83	193.2 Tons	
Ohio Legal %	485%				

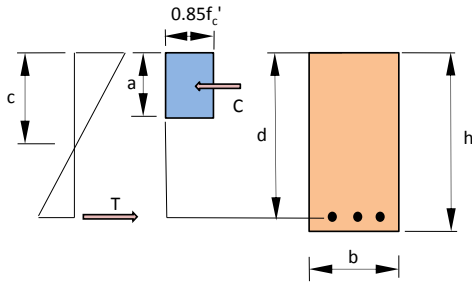
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.41	50.8 Tons	HS28.2
Operating	HS20	36 Tons	RF=2.35	84.8 Tons	HS47.1
	2F1	15 Tons	RF=3.93	58.9 Tons	
	3F1	23 Tons	RF=2.67	61.5 Tons	
	4F1	27 Tons	RF=2.54	68.7 Tons	
	5C1	40 Tons	RF=2.54	101.4 Tons	
Ohio Legal %	255%				

Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment



Made by: **MJJ** Date: **2/21/2012** Job No: **P402110046**  
 Checked by: **GBH** Date: **2/29/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Inspected Concrete Frame Rating Section D (Frame 26)**

### Floor Beam Postive Moment Section



b =	98.9	in
d =	48	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	12.7	in <sup>2</sup>
% Steel Loss =	8%	

(10-1 1/8")  
from 159/246  
of original  
plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	11.684	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	239.42	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	1.019	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1373.3	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Plus Soil Load Moment

(Soil Load Moment has been factored by 0.5)

Total Service Positive Moment = 255.2 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	33.7	28.5	20.2	29.7	31.2	31.3	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	43.8	37.1	26.3	38.6	40.6	40.7	kips
Reaction per Wheel (LL+I) =	21.9	18.5	13.1	19.3	20.3	20.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

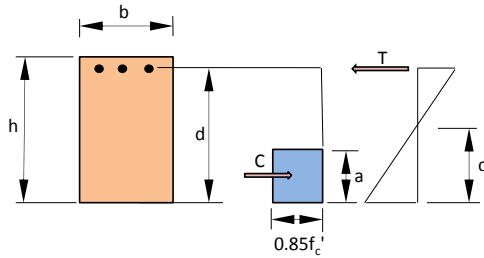
		From STAAD					
Max. Positive LL+I Moment =	378.83	320.4	227.1	333.9	350.7	351.9	ft*kips

Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

#### Positive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.27	45.6 Tons	HS25.3
	Operating	HS20	36 Tons	RF=2.12	76.1 Tons
	2F1	15 Tons	RF=3.53	52.9 Tons	
	3F1	23 Tons	RF=2.40	55.2 Tons	
	4F1	27 Tons	RF=2.28	61.7 Tons	
	5C1	40 Tons	RF=2.28	91.1 Tons	
	Ohio Legal %		230%		

## Floor Beam Negative Moment Section



b =	21	in
d =	66	in
$f'_c$ =	3	ksi
$f_y$ =	33	ksi
$\phi$ =	0.9	
Area of Steel =	9.35	in <sup>2</sup>
% Steel Loss =	0%	

(5-1 1/8", 3-1")  
from 49/246 of  
original plans

### Section Capacity

b = Frame width for negative moment

$$A_s = 9.350 \text{ in}^2$$

Area of reinforcing steel minus any loss noted

$$\rho_b = 0.048$$

Balanced reinforcement ratio, AASHTO Eq. 8-18

$$0.75 \cdot A_{sb} = 49.50 \text{ in}^2$$

75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2

$$\beta_1 = 0.85$$

$$a = 5.762 \text{ in}$$

Depth of equivalent compressive stress block, AASHTO Eq. 8-17

$$\phi M_n = 1460.7 \text{ ft} \cdot \text{kips}$$

Design Moment Strength, AASHTO Eq. 8-16

### Dead Load plus Soil Load Moment

(Soil Load Moment has been increased by 1.15 factor)

$$\text{Total Service Negative Moment} = 79.5 \text{ ft} \cdot \text{kips}$$

From Staad

### Live Load Moment

From STAAD					
HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
141.75	119.9	85.0	124.9	131.2	131.7

Max. Negative LL+I Moment = 141.75 ft\*kips

Maximum Negative Moment results from 3 lanes loaded.

### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=4.41	158.9 Tons	HS88.3
	HS20	36 Tons	RF=7.37	265.2 Tons	HS147.3
Operating	2F1	15 Tons	RF=12.29	184.3 Tons	
	3F1	23 Tons	RF=8.36	192.2 Tons	
	4F1	27 Tons	RF=7.96	214.8 Tons	
	5C1	40 Tons	RF=7.93	317.2 Tons	
	Ohio Legal %			795%	

## Floor Beam Shear Section

### Section Capacity

Taken at face of column

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)
$d =$	<input type="text" value="66"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="151.8"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="259.7"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

(Soil Load Moment has been increased by 1.15 factor)

Total Service Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="64"/>	54.1	38.4	56.4	59.3	59.4	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.50	53.9 Tons	HS29.9
Operating	HS20	36 Tons	RF=2.50	89.9 Tons	HS50.0
	2F1	15 Tons	RF=4.17	62.5 Tons	
	3F1	23 Tons	RF=2.83	65.2 Tons	
	4F1	27 Tons	RF=2.70	72.9 Tons	
	5C1	40 Tons	RF=2.69	107.6 Tons	
	Ohio Legal %			270%	

## Column Section

(Bottom of North Column controls)

h =	<input type="text" value="42"/>	in	Column Depth
b =	<input type="text" value="21"/>	in	Column Width
A <sub>s</sub> =	<input type="text" value="4"/>	in <sup>2</sup>	Area of Tension Steel (4-1" bars)
A' <sub>s</sub> =	<input type="text" value="5"/>	in <sup>2</sup>	Area of Compression Steel (5-1" bars)
d =	<input type="text" value="39"/>	in	Distance from compression face to centroid of tension steel
d' =	<input type="text" value="3"/>	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	<input type="text" value="3"/>	ksi	Concrete Strength
f <sub>y</sub> =	<input type="text" value="33"/>	ksi	Steel Yield Stress
E <sub>s</sub> =	<input type="text" value="29000"/>	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	<input type="text" value="0.003"/>	in/in	Ultimate concrete strain
β <sub>1</sub> =	<input type="text" value="0.85"/>		
d" =	<input type="text" value="18"/>	in	Distance from centroid of gross section to centroid of tension steel

## Dead Loads plus Soil Loads

(Moment taken at the center of cap)

(Soil Loads has been increased by 1.15 factor)

Total Service Dead Load Moment =	<input type="text" value="130.4"/>	ft-kips	From Staad
Total Service Dead Load Axial Force =	<input type="text" value="67.6"/>	kips	From Staad

## Live Loads (Moment taken at the center of cap)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	<input type="text" value="117.8"/>		99.7	70.6	103.8	109.1	109.4	ft-kips
Max. LL+I Axial Force =	<input type="text" value="59.4"/>		50.2	42.1	87.3	62.4	59.6	kips

Maximum Moment and Axial load results from 3 lanes loaded..

## Section Capacity

### Balanced Condition

a <sub>b</sub> =	<input type="text" value="24.03"/>	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	<input type="text" value="28.28"/>	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f' <sub>s</sub> =	<input type="text" value="33"/>	ksi	f' <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	<input type="text" value="1320.0"/>	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f' <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	<input type="text" value="1408.9"/>	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"/2)+A' <sub>s</sub> *f' <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

### Pure Axial Compression Capacity

P <sub>o</sub> =	<input type="text" value="2523.2"/>	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	<input type="text" value="1766.2"/>	kips		

### Pure Bending Capacity (Ignoring compression steel)

a =	<input type="text" value="2.465"/>	in	a = A <sub>s</sub> *f <sub>y</sub> /0.85*f <sub>c</sub> *b	Depth of equivalent stress block (AASHTO Eq. 8-17)
M <sub>n</sub> =	<input type="text" value="415.4"/>	ft-kips	M <sub>n</sub> = A <sub>s</sub> *f <sub>y</sub> *(d-a/2)	Nominal Moment Strength (AASHTO Eq. 8-15)
φM <sub>n</sub> =	<input type="text" value="373.9"/>	ft-kips		



**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$    $\text{in}$

**Tension Failure**

$f_s = $ <input type="text" value="33.00"/> $\text{ksi}$	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s = $ <input type="text" value="33.00"/> $\text{ksi}$	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a = $ <input type="text" value="11.7086007"/> $\text{in}$	$a = \beta_1 * c$	Depth of concrete stress block
$C = $ <input type="text" value="627.0"/> $\text{kip}$	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n = $ <input type="text" value="462.0"/> $\text{kips}$	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n = $ <input type="text" value="865.8"/> $\text{ft-kips}$	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e = $ <input type="text" value="22.49"/> $\text{in}$	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	216.8	196.9	179.2	277.4	223.3	217.2	kips
$M_u =$	425.2	385.8	322.8	394.9	406.3	407.0	ft-kips
$e =$	23.54	23.51	21.61	17.08	21.83	22.49	in
$\phi P_n =$	426.75	427.61	493.74	691.99	485.52	462.00	kips
$\phi M_n =$	837.1	837.9	889.3	985.1	883.4	865.8	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.61	94.0 Tons	HS52.2
Operating	HS20	36 Tons	RF=4.36	156.9 Tons	HS87.2
	2F1	15 Tons	RF=7.42	111.2 Tons	
	3F1	23 Tons	RF=5.32	122.4 Tons	
	4F1	27 Tons	RF=4.90	132.3 Tons	
	5C1	40 Tons	RF=4.83	193.2 Tons	
Ohio Legal %	485%				

	Load	GVW	Rating Factor	Safe Load	HS Rating	
Inventory	HS20	36 Tons	RF=1.27	45.6 Tons	HS25.3	Positive Moment
Operating	HS20	36 Tons	RF=2.12	76.1 Tons	HS42.3	Positive Moment
	2F1	15 Tons	RF=3.53	52.9 Tons		Positive Moment
	3F1	23 Tons	RF=2.40	55.2 Tons		Positive Moment
	4F1	27 Tons	RF=2.28	61.7 Tons		Positive Moment
	5C1	40 Tons	RF=2.28	91.1 Tons		Positive Moment
Ohio Legal %	230%					



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**P402110046**Sheet No  
**1**

Rev

Part Section D, Frame 36

Job Title Main Avenue Rating

Ref

By M Johnson Date 24-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 36.std Date/Time 01-Mar-2012 09:35

## Job Information

	Engineer	Checked	Approved
<b>Name:</b>	M Johnson	D Hoff	
<b>Date:</b>	24-Feb-12	1-Mar-12	

**Structure Type** SPACE FRAME

Number of Nodes	4	Highest Node	4
Number of Elements	3	Highest Beam	3

Number of Basic Load Cases	8
Number of Combination Load Cases	2

*Included in this printout are data for:*

<b>All</b>	The Whole Structure
------------	---------------------

*Included in this printout are results for load cases:*

Type	L/C	Name
Primary	1	DEAD LOAD
Primary	3	LIVE LOAD 1
Primary	4	LIVE LOAD 2
Primary	5	LIVE LOAD 3
Primary	6	LIVE LOAD 4
Primary	7	LIVE LOAD 5
Primary	8	LIVE LOAD 6
Primary	2	SOIL LOAD
Combination	9	DEAD PLUS SOIL
Combination	10	DL PLUS SOIL POS MOM

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	0.000	0.000
2	0.000	24.700	0.000
3	37.000	24.700	0.000
4	37.000	3.000	0.000

## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	2	24.700	3	0
2	2	3	37.000	1	0
3	4	3	21.700	2	0



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### Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE
2	Rect 42.00x21.00	882.000	32.4E+3	130E+3	89E+3	CONCRETE
3	Rect 48.00x21.00	1.01E+3	37E+3	194E+3	107E+3	CONCRETE

### Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

### Basic Load Cases

Number	Name
1	DEAD LOAD
3	LIVE LOAD 1
4	LIVE LOAD 2
5	LIVE LOAD 3
6	LIVE LOAD 4
7	LIVE LOAD 5
8	LIVE LOAD 6
2	SOIL LOAD

### Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	DEAD PLUS SOIL	1	DEAD LOAD	1.00
		2	SOIL LOAD	1.15
10	DL PLUS SOIL POS MOM	1	DEAD LOAD	1.00
		2	SOIL LOAD	0.50



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## Beam Force Detail

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			Shear			Torsion			Bending		
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	Mx (kip'in)	My (kip'in)	Mz (kip'in)
1	1:DEAD LOAD	0.000	69.559	-10.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.03E+3
		2.470	66.960	-10.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-702.176
		4.940	64.361	-10.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-376.481
		7.410	61.761	-10.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-50.787
		9.880	59.162	-10.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	274.908
		12.350	56.563	-10.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	600.603
		14.820	53.963	-10.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	926.298
		17.290	51.364	-10.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.25E+3
		19.760	48.765	-10.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.58E+3
		22.230	46.166	-10.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.9E+3
24.700	43.566	-10.988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.23E+3		
	3:LIVE LOAD 1	0.000	71.165	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.34E+3
		2.470	71.165	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-910.527
		4.940	71.165	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-484.031
		7.410	71.165	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-57.536
		9.880	71.165	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	368.960
		12.350	71.165	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	795.456
		14.820	71.165	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.22E+3
		17.290	71.165	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.65E+3
		19.760	71.165	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.07E+3
		22.230	71.165	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.5E+3
24.700	71.165	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.93E+3		
	4:LIVE LOAD 2	0.000	48.802	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.34E+3
		2.470	48.802	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-910.903
		4.940	48.802	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-484.410
		7.410	48.802	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-57.916
		9.880	48.802	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	368.577
		12.350	48.802	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	795.071
		14.820	48.802	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.22E+3
		17.290	48.802	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.65E+3
		19.760	48.802	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.07E+3
		22.230	48.802	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.5E+3
24.700	48.802	-14.389	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.93E+3		
	5:LIVE LOAD 3	0.000	60.032	-15.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.41E+3
		2.470	60.032	-15.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-960.303
		4.940	60.032	-15.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-510.588
		7.410	60.032	-15.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-60.873
		9.880	60.032	-15.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	388.841
		12.350	60.032	-15.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	838.556
		14.820	60.032	-15.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.29E+3
		17.290	60.032	-15.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.74E+3
19.760	60.032	-15.173	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.19E+3		



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Job No  
**P402110046**

Sheet No  
**4**

Rev

Part Section D, Frame 36

Job Title Main Avenue Rating

Ref

By M Johnson Date 24-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 36.std Date/Time 01-Mar-2012 09:35

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		22.230	60.032	-15.173	0.000	0.000	0.000	0.000	0.000	2.64E+3	
		24.700	60.032	-15.173	0.000	0.000	0.000	0.000	0.000	3.09E+3	
	6:LIVE LOAD 4	0.000	64.825	-15.029	0.000	0.000	0.000	0.000	0.000	-1.39E+3	
		2.470	64.825	-15.029	0.000	0.000	0.000	0.000	0.000	-948.865	
		4.940	64.825	-15.029	0.000	0.000	0.000	0.000	0.000	-503.400	
		7.410	64.825	-15.029	0.000	0.000	0.000	0.000	0.000	-57.934	
		9.880	64.825	-15.029	0.000	0.000	0.000	0.000	0.000	387.531	
		12.350	64.825	-15.029	0.000	0.000	0.000	0.000	0.000	832.996	
		14.820	64.825	-15.029	0.000	0.000	0.000	0.000	0.000	1.28E+3	
		17.290	64.825	-15.029	0.000	0.000	0.000	0.000	0.000	1.72E+3	
		19.760	64.825	-15.029	0.000	0.000	0.000	0.000	0.000	2.17E+3	
		22.230	64.825	-15.029	0.000	0.000	0.000	0.000	0.000	2.61E+3	
		24.700	64.825	-15.029	0.000	0.000	0.000	0.000	0.000	3.06E+3	
	7:LIVE LOAD 5	0.000	55.221	-15.028	0.000	0.000	0.000	0.000	0.000	-1.4E+3	
		2.470	55.221	-15.028	0.000	0.000	0.000	0.000	0.000	-953.525	
		4.940	55.221	-15.028	0.000	0.000	0.000	0.000	0.000	-508.090	
		7.410	55.221	-15.028	0.000	0.000	0.000	0.000	0.000	-62.656	
		9.880	55.221	-15.028	0.000	0.000	0.000	0.000	0.000	382.779	
		12.350	55.221	-15.028	0.000	0.000	0.000	0.000	0.000	828.213	
		14.820	55.221	-15.028	0.000	0.000	0.000	0.000	0.000	1.27E+3	
		17.290	55.221	-15.028	0.000	0.000	0.000	0.000	0.000	1.72E+3	
		19.760	55.221	-15.028	0.000	0.000	0.000	0.000	0.000	2.16E+3	
		22.230	55.221	-15.028	0.000	0.000	0.000	0.000	0.000	2.61E+3	
		24.700	55.221	-15.028	0.000	0.000	0.000	0.000	0.000	3.06E+3	
	8:LIVE LOAD 6	0.000	44.697	-14.610	0.000	0.000	0.000	0.000	0.000	-1.36E+3	
		2.470	44.697	-14.610	0.000	0.000	0.000	0.000	0.000	-924.699	
		4.940	44.697	-14.610	0.000	0.000	0.000	0.000	0.000	-491.666	
		7.410	44.697	-14.610	0.000	0.000	0.000	0.000	0.000	-58.633	
		9.880	44.697	-14.610	0.000	0.000	0.000	0.000	0.000	374.399	
		12.350	44.697	-14.610	0.000	0.000	0.000	0.000	0.000	807.432	
		14.820	44.697	-14.610	0.000	0.000	0.000	0.000	0.000	1.24E+3	
		17.290	44.697	-14.610	0.000	0.000	0.000	0.000	0.000	1.67E+3	
		19.760	44.697	-14.610	0.000	0.000	0.000	0.000	0.000	2.11E+3	
		22.230	44.697	-14.610	0.000	0.000	0.000	0.000	0.000	2.54E+3	
		24.700	44.697	-14.610	0.000	0.000	0.000	0.000	0.000	2.97E+3	
	2:SOIL LOAD	0.000	3.693	-9.670	0.000	0.000	0.000	0.000	0.000	-1.74E+3	
		2.470	3.693	-9.670	0.000	0.000	0.000	0.000	0.000	-1.46E+3	
		4.940	3.693	-9.670	0.000	0.000	0.000	0.000	0.000	-1.17E+3	
		7.410	3.693	-9.670	0.000	0.000	0.000	0.000	0.000	-884.817	
		9.880	3.693	-9.670	0.000	0.000	0.000	0.000	0.000	-598.186	
		12.350	3.693	-9.670	0.000	0.000	0.000	0.000	0.000	-311.554	
		14.820	3.693	-9.670	0.000	0.000	0.000	0.000	0.000	-24.923	
		17.290	3.693	-9.670	0.000	0.000	0.000	0.000	0.000	261.709	
		19.760	3.693	-9.670	0.000	0.000	0.000	0.000	0.000	548.340	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**5**

Rev

Part Section D, Frame 36

Job Title Main Avenue Rating

Ref

By M Johnson Date 24-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 36.std Date/Time 01-Mar-2012 09:35

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		22.230	3.693	-9.670	0.000	0.000	0.000	0.000	0.000	834.972	
		24.700	3.693	-9.670	0.000	0.000	0.000	0.000	0.000	1.12E+3	
	9:DEAD PLUS	0.000	73.806	-22.109	0.000	0.000	0.000	0.000	0.000	-3.03E+3	
		2.470	71.207	-22.109	0.000	0.000	0.000	0.000	0.000	-2.38E+3	
		4.940	68.607	-22.109	0.000	0.000	0.000	0.000	0.000	-1.72E+3	
		7.410	66.008	-22.109	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		9.880	63.409	-22.109	0.000	0.000	0.000	0.000	0.000	-413.006	
		12.350	60.810	-22.109	0.000	0.000	0.000	0.000	0.000	242.316	
		14.820	58.210	-22.109	0.000	0.000	0.000	0.000	0.000	897.637	
		17.290	55.611	-22.109	0.000	0.000	0.000	0.000	0.000	1.55E+3	
		19.760	53.012	-22.109	0.000	0.000	0.000	0.000	0.000	2.21E+3	
		22.230	50.412	-22.109	0.000	0.000	0.000	0.000	0.000	2.86E+3	
		24.700	47.813	-22.109	0.000	0.000	0.000	0.000	0.000	3.52E+3	
	10:DL PLUS S	0.000	71.406	-15.824	0.000	0.000	0.000	0.000	0.000	-1.9E+3	
		2.470	68.806	-15.824	0.000	0.000	0.000	0.000	0.000	-1.43E+3	
		4.940	66.207	-15.824	0.000	0.000	0.000	0.000	0.000	-962.206	
		7.410	63.608	-15.824	0.000	0.000	0.000	0.000	0.000	-493.195	
		9.880	61.009	-15.824	0.000	0.000	0.000	0.000	0.000	-24.185	
		12.350	58.409	-15.824	0.000	0.000	0.000	0.000	0.000	444.826	
		14.820	55.810	-15.824	0.000	0.000	0.000	0.000	0.000	913.836	
		17.290	53.211	-15.824	0.000	0.000	0.000	0.000	0.000	1.38E+3	
		19.760	50.611	-15.824	0.000	0.000	0.000	0.000	0.000	1.85E+3	
		22.230	48.012	-15.824	0.000	0.000	0.000	0.000	0.000	2.32E+3	
		24.700	45.413	-15.824	0.000	0.000	0.000	0.000	0.000	2.79E+3	
2	1:DEAD LOAD	0.000	10.988	43.566	0.000	0.000	0.000	0.000	0.000	2.23E+3	
		3.700	10.988	35.554	0.000	0.000	0.000	0.000	0.000	491.971	
		7.400	10.988	27.428	0.000	0.000	0.000	0.000	0.000	-896.673	
		11.100	10.988	19.189	0.000	0.000	0.000	0.000	0.000	-1.93E+3	
		14.800	10.988	10.835	0.000	0.000	0.000	0.000	0.000	-2.61E+3	
		18.500	10.988	2.369	0.000	0.000	0.000	0.000	0.000	-2.92E+3	
		22.200	10.988	-8.698	0.000	0.000	0.000	0.000	0.000	-2.71E+3	
		25.900	10.988	-17.409	0.000	0.000	0.000	0.000	0.000	-2.12E+3	
		29.600	10.988	-26.233	0.000	0.000	0.000	0.000	0.000	-1.15E+3	
		33.300	10.988	-35.171	0.000	0.000	0.000	0.000	0.000	202.267	
		37.000	10.988	-44.222	0.000	0.000	0.000	0.000	0.000	1.94E+3	
	3:LIVE LOAD 1	0.000	14.389	71.165	0.000	0.000	0.000	0.000	0.000	2.93E+3	
		3.700	14.389	47.525	0.000	0.000	0.000	0.000	0.000	650.753	
		7.400	14.389	31.765	0.000	0.000	0.000	0.000	0.000	-1.31E+3	
		11.100	14.389	19.945	0.000	0.000	0.000	0.000	0.000	-2.67E+3	
		14.800	14.389	12.065	0.000	0.000	0.000	0.000	0.000	-3.47E+3	
		18.500	14.389	-7.635	0.000	0.000	0.000	0.000	0.000	-3.89E+3	
		22.200	14.389	-11.575	0.000	0.000	0.000	0.000	0.000	-3.52E+3	
		25.900	14.389	-27.335	0.000	0.000	0.000	0.000	0.000	-2.76E+3	
		29.600	14.389	-39.155	0.000	0.000	0.000	0.000	0.000	-1.43E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**6**

Rev

Part Section D, Frame 36

Job Title Main Avenue Rating

Ref

By M Johnson Date 24-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 36.std Date/Time 01-Mar-2012 09:35

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	14.389	-47.035	0.000	0.000	0.000	0.000	0.000	446.985	
		37.000	14.389	-47.035	0.000	0.000	0.000	0.000	0.000	2.54E+3	
	4:LIVE LOAD 2	0.000	14.389	48.802	0.000	0.000	0.000	0.000	0.000	2.93E+3	
		3.700	14.389	48.802	0.000	0.000	0.000	0.000	0.000	760.748	
		7.400	14.389	40.922	0.000	0.000	0.000	0.000	0.000	-1.19E+3	
		11.100	14.389	29.102	0.000	0.000	0.000	0.000	0.000	-2.6E+3	
		14.800	14.389	13.342	0.000	0.000	0.000	0.000	0.000	-3.44E+3	
		18.500	14.389	9.402	0.000	0.000	0.000	0.000	0.000	-3.89E+3	
		22.200	14.389	-10.298	0.000	0.000	0.000	0.000	0.000	-3.55E+3	
		25.900	14.389	-18.178	0.000	0.000	0.000	0.000	0.000	-2.83E+3	
		29.600	14.389	-29.998	0.000	0.000	0.000	0.000	0.000	-1.55E+3	
		33.300	14.389	-45.758	0.000	0.000	0.000	0.000	0.000	336.906	
		37.000	14.389	-69.398	0.000	0.000	0.000	0.000	0.000	2.54E+3	
	5:LIVE LOAD 3	0.000	15.173	60.032	0.000	0.000	0.000	0.000	0.000	3.09E+3	
		3.700	15.173	56.092	0.000	0.000	0.000	0.000	0.000	547.810	
		7.400	15.173	40.332	0.000	0.000	0.000	0.000	0.000	-1.32E+3	
		11.100	15.173	28.512	0.000	0.000	0.000	0.000	0.000	-2.71E+3	
		14.800	15.173	20.632	0.000	0.000	0.000	0.000	0.000	-3.65E+3	
		18.500	15.173	0.932	0.000	0.000	0.000	0.000	0.000	-3.86E+3	
		22.200	15.173	-18.768	0.000	0.000	0.000	0.000	0.000	-3.73E+3	
		25.900	15.173	-26.648	0.000	0.000	0.000	0.000	0.000	-2.88E+3	
		29.600	15.173	-38.468	0.000	0.000	0.000	0.000	0.000	-1.57E+3	
		33.300	15.173	-54.228	0.000	0.000	0.000	0.000	0.000	216.927	
		37.000	15.173	-58.168	0.000	0.000	0.000	0.000	0.000	2.67E+3	
	6:LIVE LOAD 4	0.000	15.029	64.825	0.000	0.000	0.000	0.000	0.000	3.06E+3	
		3.700	15.029	45.125	0.000	0.000	0.000	0.000	0.000	583.991	
		7.400	15.029	37.245	0.000	0.000	0.000	0.000	0.000	-1.3E+3	
		11.100	15.029	25.425	0.000	0.000	0.000	0.000	0.000	-2.69E+3	
		14.800	15.029	9.665	0.000	0.000	0.000	0.000	0.000	-3.55E+3	
		18.500	15.029	5.725	0.000	0.000	0.000	0.000	0.000	-3.88E+3	
		22.200	15.029	-13.975	0.000	0.000	0.000	0.000	0.000	-3.62E+3	
		25.900	15.029	-21.855	0.000	0.000	0.000	0.000	0.000	-2.83E+3	
		29.600	15.029	-33.675	0.000	0.000	0.000	0.000	0.000	-1.53E+3	
		33.300	15.029	-49.435	0.000	0.000	0.000	0.000	0.000	331.505	
		37.000	15.029	-53.375	0.000	0.000	0.000	0.000	0.000	2.65E+3	
	7:LIVE LOAD 5	0.000	15.028	55.221	0.000	0.000	0.000	0.000	0.000	3.06E+3	
		3.700	15.028	51.281	0.000	0.000	0.000	0.000	0.000	658.740	
		7.400	15.028	35.521	0.000	0.000	0.000	0.000	0.000	-1.28E+3	
		11.100	15.028	23.701	0.000	0.000	0.000	0.000	0.000	-2.67E+3	
		14.800	15.028	15.821	0.000	0.000	0.000	0.000	0.000	-3.54E+3	
		18.500	15.028	-3.879	0.000	0.000	0.000	0.000	0.000	-3.88E+3	
		22.200	15.028	-7.819	0.000	0.000	0.000	0.000	0.000	-3.63E+3	
		25.900	15.028	-23.579	0.000	0.000	0.000	0.000	0.000	-2.85E+3	
		29.600	15.028	-35.399	0.000	0.000	0.000	0.000	0.000	-1.55E+3	



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Job No  
**P402110046**

Sheet No  
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Rev

Part Section D, Frame 36

Job Title Main Avenue Rating

Ref

By M Johnson Date 24-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 36.std Date/Time 01-Mar-2012 09:35

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	15.028	-43.279	0.000	0.000	0.000	0.000	0.000	255.734	
		37.000	15.028	-62.979	0.000	0.000	0.000	0.000	0.000	2.65E+3	
	8:LIVE LOAD 6	0.000	14.610	44.697	0.000	0.000	0.000	0.000	0.000	2.97E+3	
		3.700	14.610	44.697	0.000	0.000	0.000	0.000	0.000	988.051	
		7.400	14.610	44.697	0.000	0.000	0.000	0.000	0.000	-996.491	
		11.100	14.610	31.557	0.000	0.000	0.000	0.000	0.000	-2.69E+3	
		14.800	14.610	22.797	0.000	0.000	0.000	0.000	0.000	-3.84E+3	
		18.500	14.610	0.897	0.000	0.000	0.000	0.000	0.000	-4.32E+3	
		22.200	14.610	-21.003	0.000	0.000	0.000	0.000	0.000	-3.92E+3	
		25.900	14.610	-29.763	0.000	0.000	0.000	0.000	0.000	-2.85E+3	
		29.600	14.610	-42.903	0.000	0.000	0.000	0.000	0.000	-1.24E+3	
		33.300	14.610	-42.903	0.000	0.000	0.000	0.000	0.000	669.470	
		37.000	14.610	-42.903	0.000	0.000	0.000	0.000	0.000	2.57E+3	
	2:SOIL LOAD	0.000	9.670	3.693	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		3.700	9.670	3.693	0.000	0.000	0.000	0.000	0.000	957.639	
		7.400	9.670	3.693	0.000	0.000	0.000	0.000	0.000	793.674	
		11.100	9.670	3.693	0.000	0.000	0.000	0.000	0.000	629.709	
		14.800	9.670	3.693	0.000	0.000	0.000	0.000	0.000	465.744	
		18.500	9.670	3.693	0.000	0.000	0.000	0.000	0.000	301.779	
		22.200	9.670	3.693	0.000	0.000	0.000	0.000	0.000	137.814	
		25.900	9.670	3.693	0.000	0.000	0.000	0.000	0.000	-26.150	
		29.600	9.670	3.693	0.000	0.000	0.000	0.000	0.000	-190.115	
		33.300	9.670	3.693	0.000	0.000	0.000	0.000	0.000	-354.080	
		37.000	9.670	3.693	0.000	0.000	0.000	0.000	0.000	-518.045	
	9:DEAD PLUS	0.000	22.109	47.813	0.000	0.000	0.000	0.000	0.000	3.52E+3	
		3.700	22.109	39.801	0.000	0.000	0.000	0.000	0.000	1.59E+3	
		7.400	22.109	31.675	0.000	0.000	0.000	0.000	0.000	16.052	
		11.100	22.109	23.436	0.000	0.000	0.000	0.000	0.000	-1.21E+3	
		14.800	22.109	15.082	0.000	0.000	0.000	0.000	0.000	-2.07E+3	
		18.500	22.109	6.615	0.000	0.000	0.000	0.000	0.000	-2.58E+3	
		22.200	22.109	-4.451	0.000	0.000	0.000	0.000	0.000	-2.55E+3	
		25.900	22.109	-13.162	0.000	0.000	0.000	0.000	0.000	-2.15E+3	
		29.600	22.109	-21.986	0.000	0.000	0.000	0.000	0.000	-1.37E+3	
		33.300	22.109	-30.924	0.000	0.000	0.000	0.000	0.000	-204.925	
		37.000	22.109	-39.975	0.000	0.000	0.000	0.000	0.000	1.35E+3	
	10:DL PLUS S	0.000	15.824	45.413	0.000	0.000	0.000	0.000	0.000	2.79E+3	
		3.700	15.824	37.400	0.000	0.000	0.000	0.000	0.000	970.790	
		7.400	15.824	29.275	0.000	0.000	0.000	0.000	0.000	-499.836	
		11.100	15.824	21.035	0.000	0.000	0.000	0.000	0.000	-1.62E+3	
		14.800	15.824	12.682	0.000	0.000	0.000	0.000	0.000	-2.38E+3	
		18.500	15.824	4.215	0.000	0.000	0.000	0.000	0.000	-2.77E+3	
		22.200	15.824	-6.852	0.000	0.000	0.000	0.000	0.000	-2.64E+3	
		25.900	15.824	-15.562	0.000	0.000	0.000	0.000	0.000	-2.13E+3	
		29.600	15.824	-24.386	0.000	0.000	0.000	0.000	0.000	-1.24E+3	





Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**8**

Rev

Part Section D, Frame 36

Job Title Main Avenue Rating

Ref

By M Johnson Date 24-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 36.std Date/Time 01-Mar-2012 09:35

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	15.824	-33.324	0.000	0.000	0.000	0.000	0.000	25.227	
		37.000	15.824	-42.376	0.000	0.000	0.000	0.000	0.000	1.68E+3	
3	1:DEAD LOAD	0.000	64.203	10.988	0.000	0.000	0.000	0.000	0.000	919.316	
		2.170	62.205	10.988	0.000	0.000	0.000	0.000	0.000	633.179	
		4.340	60.207	10.988	0.000	0.000	0.000	0.000	0.000	347.043	
		6.510	58.209	10.988	0.000	0.000	0.000	0.000	0.000	60.906	
		8.680	56.211	10.988	0.000	0.000	0.000	0.000	0.000	-225.231	
		10.850	54.213	10.988	0.000	0.000	0.000	0.000	0.000	-511.368	
		13.020	52.215	10.988	0.000	0.000	0.000	0.000	0.000	-797.504	
		15.190	50.216	10.988	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		17.360	48.218	10.988	0.000	0.000	0.000	0.000	0.000	-1.37E+3	
		19.530	46.220	10.988	0.000	0.000	0.000	0.000	0.000	-1.66E+3	
		21.700	44.222	10.988	0.000	0.000	0.000	0.000	0.000	-1.94E+3	
	3:LIVE LOAD 1	0.000	47.035	14.389	0.000	0.000	0.000	0.000	0.000	1.21E+3	
		2.170	47.035	14.389	0.000	0.000	0.000	0.000	0.000	836.931	
		4.340	47.035	14.389	0.000	0.000	0.000	0.000	0.000	462.236	
		6.510	47.035	14.389	0.000	0.000	0.000	0.000	0.000	87.541	
		8.680	47.035	14.389	0.000	0.000	0.000	0.000	0.000	-287.154	
		10.850	47.035	14.389	0.000	0.000	0.000	0.000	0.000	-661.848	
		13.020	47.035	14.389	0.000	0.000	0.000	0.000	0.000	-1.04E+3	
		15.190	47.035	14.389	0.000	0.000	0.000	0.000	0.000	-1.41E+3	
		17.360	47.035	14.389	0.000	0.000	0.000	0.000	0.000	-1.79E+3	
		19.530	47.035	14.389	0.000	0.000	0.000	0.000	0.000	-2.16E+3	
		21.700	47.035	14.389	0.000	0.000	0.000	0.000	0.000	-2.54E+3	
	4:LIVE LOAD 2	0.000	69.398	14.389	0.000	0.000	0.000	0.000	0.000	1.21E+3	
		2.170	69.398	14.389	0.000	0.000	0.000	0.000	0.000	836.595	
		4.340	69.398	14.389	0.000	0.000	0.000	0.000	0.000	461.903	
		6.510	69.398	14.389	0.000	0.000	0.000	0.000	0.000	87.210	
		8.680	69.398	14.389	0.000	0.000	0.000	0.000	0.000	-287.483	
		10.850	69.398	14.389	0.000	0.000	0.000	0.000	0.000	-662.175	
		13.020	69.398	14.389	0.000	0.000	0.000	0.000	0.000	-1.04E+3	
		15.190	69.398	14.389	0.000	0.000	0.000	0.000	0.000	-1.41E+3	
		17.360	69.398	14.389	0.000	0.000	0.000	0.000	0.000	-1.79E+3	
		19.530	69.398	14.389	0.000	0.000	0.000	0.000	0.000	-2.16E+3	
		21.700	69.398	14.389	0.000	0.000	0.000	0.000	0.000	-2.54E+3	
	5:LIVE LOAD 3	0.000	58.168	15.173	0.000	0.000	0.000	0.000	0.000	1.28E+3	
		2.170	58.168	15.173	0.000	0.000	0.000	0.000	0.000	882.316	
		4.340	58.168	15.173	0.000	0.000	0.000	0.000	0.000	487.222	
		6.510	58.168	15.173	0.000	0.000	0.000	0.000	0.000	92.129	
		8.680	58.168	15.173	0.000	0.000	0.000	0.000	0.000	-302.965	
		10.850	58.168	15.173	0.000	0.000	0.000	0.000	0.000	-698.058	
		13.020	58.168	15.173	0.000	0.000	0.000	0.000	0.000	-1.09E+3	
		15.190	58.168	15.173	0.000	0.000	0.000	0.000	0.000	-1.49E+3	
		17.360	58.168	15.173	0.000	0.000	0.000	0.000	0.000	-1.88E+3	



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Job No  
**P402110046**

Sheet No  
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Rev

Part Section D, Frame 36

Job Title Main Avenue Rating

Ref

By M Johnson Date 24-Feb-12 Chd D Hoff

Client ODOT

File Section D Frame 36.std Date/Time 01-Mar-2012 09:35

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		19.530	58.168	15.173	0.000	0.000	0.000	0.000	0.000	-2.28E+3	
		21.700	58.168	15.173	0.000	0.000	0.000	0.000	0.000	-2.67E+3	
	6:LIVE LOAD 4	0.000	53.375	15.029	0.000	0.000	0.000	0.000	0.000	1.27E+3	
		2.170	53.375	15.029	0.000	0.000	0.000	0.000	0.000	876.030	
		4.340	53.375	15.029	0.000	0.000	0.000	0.000	0.000	484.670	
		6.510	53.375	15.029	0.000	0.000	0.000	0.000	0.000	93.309	
		8.680	53.375	15.029	0.000	0.000	0.000	0.000	0.000	-298.051	
		10.850	53.375	15.029	0.000	0.000	0.000	0.000	0.000	-689.411	
		13.020	53.375	15.029	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		15.190	53.375	15.029	0.000	0.000	0.000	0.000	0.000	-1.47E+3	
		17.360	53.375	15.029	0.000	0.000	0.000	0.000	0.000	-1.86E+3	
		19.530	53.375	15.029	0.000	0.000	0.000	0.000	0.000	-2.25E+3	
		21.700	53.375	15.029	0.000	0.000	0.000	0.000	0.000	-2.65E+3	
	7:LIVE LOAD 5	0.000	62.979	15.028	0.000	0.000	0.000	0.000	0.000	1.26E+3	
		2.170	62.979	15.028	0.000	0.000	0.000	0.000	0.000	871.868	
		4.340	62.979	15.028	0.000	0.000	0.000	0.000	0.000	480.535	
		6.510	62.979	15.028	0.000	0.000	0.000	0.000	0.000	89.202	
		8.680	62.979	15.028	0.000	0.000	0.000	0.000	0.000	-302.131	
		10.850	62.979	15.028	0.000	0.000	0.000	0.000	0.000	-693.465	
		13.020	62.979	15.028	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		15.190	62.979	15.028	0.000	0.000	0.000	0.000	0.000	-1.48E+3	
		17.360	62.979	15.028	0.000	0.000	0.000	0.000	0.000	-1.87E+3	
		19.530	62.979	15.028	0.000	0.000	0.000	0.000	0.000	-2.26E+3	
		21.700	62.979	15.028	0.000	0.000	0.000	0.000	0.000	-2.65E+3	
	8:LIVE LOAD 6	0.000	42.903	14.610	0.000	0.000	0.000	0.000	0.000	1.23E+3	
		2.170	42.903	14.610	0.000	0.000	0.000	0.000	0.000	849.570	
		4.340	42.903	14.610	0.000	0.000	0.000	0.000	0.000	469.133	
		6.510	42.903	14.610	0.000	0.000	0.000	0.000	0.000	88.695	
		8.680	42.903	14.610	0.000	0.000	0.000	0.000	0.000	-291.742	
		10.850	42.903	14.610	0.000	0.000	0.000	0.000	0.000	-672.180	
		13.020	42.903	14.610	0.000	0.000	0.000	0.000	0.000	-1.05E+3	
		15.190	42.903	14.610	0.000	0.000	0.000	0.000	0.000	-1.43E+3	
		17.360	42.903	14.610	0.000	0.000	0.000	0.000	0.000	-1.81E+3	
		19.530	42.903	14.610	0.000	0.000	0.000	0.000	0.000	-2.19E+3	
		21.700	42.903	14.610	0.000	0.000	0.000	0.000	0.000	-2.57E+3	
	2:SOIL LOAD	0.000	-3.693	-79.451	0.000	0.000	0.000	0.000	0.000	-4.46E+3	
		2.170	-3.693	-63.556	0.000	0.000	0.000	0.000	0.000	-2.62E+3	
		4.340	-3.693	-47.831	0.000	0.000	0.000	0.000	0.000	-1.18E+3	
		6.510	-3.693	-33.305	0.000	0.000	0.000	0.000	0.000	-131.516	
		8.680	-3.693	-20.826	0.000	0.000	0.000	0.000	0.000	580.562	
		10.850	-3.693	-10.364	0.000	0.000	0.000	0.000	0.000	1E+3	
		13.020	-3.693	-2.206	0.000	0.000	0.000	0.000	0.000	1.16E+3	
		15.190	-3.693	3.935	0.000	0.000	0.000	0.000	0.000	1.14E+3	
		17.360	-3.693	8.059	0.000	0.000	0.000	0.000	0.000	989.786	



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Job No  
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Rev

Part Section D, Frame 36

Job Title Main Avenue Rating

Ref

By M Johnson Date 24-Feb-12 Chd D Hoff

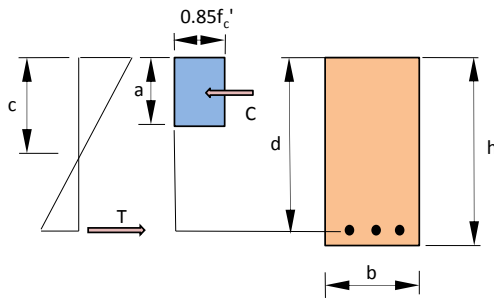
Client ODOT

File Section D Frame 36.std Date/Time 01-Mar-2012 09:35

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	
		19.530	-3.693	10.167	0.000	0.000	0.000	0.000	767.136
		21.700	-3.693	9.670	0.000	0.000	0.000	0.000	518.045
	9:DEAD PLUS	0.000	59.957	-80.380	0.000	0.000	0.000	0.000	-4.21E+3
		2.170	57.958	-62.102	0.000	0.000	0.000	0.000	-2.38E+3
		4.340	55.960	-44.017	0.000	0.000	0.000	0.000	-1.01E+3
		6.510	53.962	-27.313	0.000	0.000	0.000	0.000	-90.337
		8.680	51.964	-12.962	0.000	0.000	0.000	0.000	442.415
		10.850	49.966	-0.930	0.000	0.000	0.000	0.000	641.592
		13.020	47.968	8.452	0.000	0.000	0.000	0.000	534.174
		15.190	45.970	15.514	0.000	0.000	0.000	0.000	223.786
		17.360	43.971	20.256	0.000	0.000	0.000	0.000	-231.524
		19.530	41.973	22.680	0.000	0.000	0.000	0.000	-773.708
		21.700	39.975	22.109	0.000	0.000	0.000	0.000	-1.35E+3
	10:DL PLUS S	0.000	62.357	-28.737	0.000	0.000	0.000	0.000	-1.31E+3
		2.170	60.359	-20.790	0.000	0.000	0.000	0.000	-677.438
		4.340	58.361	-12.927	0.000	0.000	0.000	0.000	-245.015
		6.510	56.363	-5.664	0.000	0.000	0.000	0.000	-4.852
		8.680	54.364	0.575	0.000	0.000	0.000	0.000	65.050
		10.850	52.366	5.807	0.000	0.000	0.000	0.000	-10.081
		13.020	50.368	9.885	0.000	0.000	0.000	0.000	-218.514
		15.190	48.370	12.956	0.000	0.000	0.000	0.000	-515.195
		17.360	46.372	15.018	0.000	0.000	0.000	0.000	-874.885
		19.530	44.374	16.072	0.000	0.000	0.000	0.000	-1.27E+3
		21.700	42.376	15.824	0.000	0.000	0.000	0.000	-1.68E+3

### Floor Beam Postive Moment Section



b =	98.9	in
d =	48	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	12.7	in <sup>2</sup>
% Steel Loss =	0%	

(10-1 1/8")  
from 159/246  
of original  
plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	12.700	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	239.42	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	1.108	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1491.4	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Plus Soil Load Moment

(Soil Load Moment has been factored by 0.5)

Total Service Positive Moment = 227.8 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	33.7	28.5	20.2	29.7	31.2	31.3	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	43.8	37.1	26.3	38.6	40.6	40.7	kips
Reaction per Wheel (LL+I) =	21.9	18.5	13.1	19.3	20.3	20.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

From STAAD							
Max. Positive LL+I Moment =	360.17	304.6	215.9	317.4	333.4	334.5	ft*kips

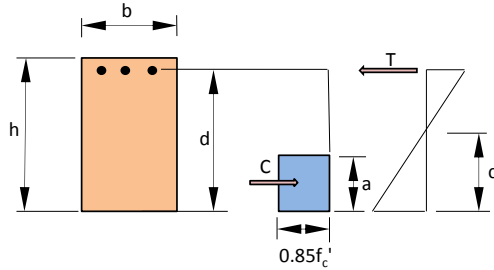
Maximum Positive Moment results from 3 lanes loaded.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.53	55.1 Tons	HS30.6
	HS20	36 Tons	RF=2.55	91.9 Tons	HSS1.1
Operating	2F1	15 Tons	RF=4.26	63.9 Tons	
	3F1	23 Tons	RF=2.90	66.6 Tons	
	4F1	27 Tons	RF=2.76	74.4 Tons	
	5C1	40 Tons	RF=2.75	109.9 Tons	
	Ohio Legal %	275%			

### Floor Beam Negative Moment Section

(South end of floorbeam controls)



b =	21	in
d =	66	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	8	in <sup>2</sup>
% Steel Loss =	0%	

(8-1") from  
158/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	8.000	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	49.50	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.85		
a =	4.930	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1258.0	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

Taken at face of column (Soil Load Moment has been increased by 1.15 factor)

Total Service Negative Moment = **55** ft\*kips From Staad

#### Live Load Moment

Taken at face of column

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. Negative LL+I Moment =	<b>150.2</b>	127.0	90.0	132.3	139.0	139.5	ft*kips	

Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=3.64	131.1 Tons	HS72.8
Operating	HS20	36 Tons	RF=6.08	218.8 Tons	HS121.6
	2F1	15 Tons	RF=10.14	152.1 Tons	
	3F1	23 Tons	RF=6.90	158.6 Tons	
	4F1	27 Tons	RF=6.56	177.3 Tons	
	5C1	40 Tons	RF=6.54	261.8 Tons	
	Ohio Legal %	655%			



## Floor Beam Shear Section

### Section Capacity

Taken at face of column (South end of cap controls)

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)
$d =$	<input type="text" value="66"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="151.8"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="259.7"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column) (Soil Load Moment has been increased by 1.15 factor)

Total Service Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="63"/>		53.3	37.8	55.5	58.3	58.5

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.55	56.0 Tons	HS31.1
Operating	HS20	36 Tons	RF=2.59	93.4 Tons	HS51.9
	2F1	15 Tons	RF=4.33	64.9 Tons	
	3F1	23 Tons	RF=2.94	67.7 Tons	
	4F1	27 Tons	RF=2.80	75.7 Tons	
	5C1	40 Tons	RF=2.79	111.8 Tons	
	Ohio Legal %	280%			



**Column Section** (Bottom of North Column controls)

h =	48	in	Column Depth
b =	21	in	Column Width
A <sub>s</sub> =	4	in <sup>2</sup>	Area of Tension Steel (4-1" bars)
A' <sub>s</sub> =	5	in <sup>2</sup>	Area of Compression Steel (5-1" bars)
d =	45	in	Distance from compression face to centroid of tension steel
d' =	3	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	3	ksi	Concrete Strength
f <sub>y</sub> =	33	ksi	Steel Yield Stress
E <sub>s</sub> =	29000	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	0.003	in/in	Ultimate concrete strain
β <sub>1</sub> =	0.85		
d" =	21	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads plus Soil Loads** (Moment taken at top of footing) (Soil Load has been increased by 1.15 factor)

Total Service Moment =	252.8	ft-kips	From Staad
Total Service Axial Force =	73.8	kips	From Staad

**Live Loads** (Moment taken at top of footing)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	117.5	99.4	70.4	103.6	108.8	109.1		ft-kips
Max. LL+I Axial Force =	60	50.7	42.5	88.2	63.0	60.2		kips

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	27.73	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	32.63	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	33	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	1518.0	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	1773.9	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	2844.5	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	1991.1	kips		



Made by:	MJJ	Date:	2/24/2012	Job No:	P402110046
Checked by:	DBH	Date:	3/1/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	As-Built Concrete Frame Rating Section D (Frame 36)				

**Pure Bending Capacity** (Ignoring compression steel)

$a =$	2.465	in	$a = A_s * f_y / 0.85 * f_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	481.4	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	433.3	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **10.90** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d - c) / c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c - d') / c, f_y)$	Stress in compression steel
$a =$	9.261633199	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	496.0	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	370.3	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	924.2	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	29.95	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	226.1	206.0	188.2	287.4	232.7	226.6	kips
$M_u =$	583.7	544.3	481.5	553.4	564.7	565.5	ft-kips
$e =$	30.97	31.70	30.70	23.11	29.12	29.95	in
$\phi P_n =$	346.6	330.9	352.7	593.6	391.3	370.3	kips
$\phi M_n =$	894.4	874.1	902.2	1143.0	949.5	924.2	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

Column Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.92	69.3 Tons	HS38.5
Operating	HS20	36 Tons	RF=3.21	115.7 Tons	HS64.3
	2F1	15 Tons	RF=4.64	69.7 Tons	
	3F1	23 Tons	RF=4.34	99.8 Tons	
	4F1	27 Tons	RF=3.60	97.3 Tons	
	5C1	40 Tons	RF=3.51	140.2 Tons	
Ohio Legal %	350%				

Floor Beam Load Rating Summary:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.53	55.1 Tons	HS30.6
Operating	HS20	36 Tons	RF=2.55	91.9 Tons	HS51.1
	2F1	15 Tons	RF=4.26	63.9 Tons	
	3F1	23 Tons	RF=2.90	66.6 Tons	
	4F1	27 Tons	RF=2.76	74.4 Tons	
	5C1	40 Tons	RF=2.75	109.9 Tons	
Ohio Legal %	275%				

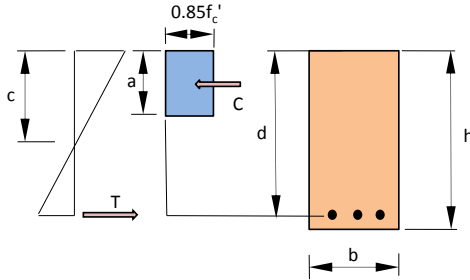
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment





Made by: **MJJ** Date: **2/24/2012** Job No: **P402110046**  
 Checked by: **DBH** Date: **3/1/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Inspected Concrete Frame Rating Section D (Frame 36)**

### Floor Beam Postive Moment Section



b =	98.9	in
d =	48	in
f' <sub>c</sub> =	4.5	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	12.7	in <sup>2</sup>
% Steel Loss =	2%	

(10-1 1/8")  
from 159/246  
of original  
plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A<sub>s</sub> =  in<sup>2</sup>

Area of reinforcing steel minus any loss noted

ρ<sub>b</sub> =

Balanced reinforcement ratio, AASHTO Eq. 8-18

0.75\*A<sub>sb</sub> =  in<sup>2</sup>

75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2

β<sub>1</sub> =

a =  in

Depth of equivalent compressive stress block, AASHTO Eq. 8-17

φM<sub>n</sub> =  ft\*kips

Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Plus Soil Load Moment

(Soil Load Moment has been factored by 0.5)

Total Service Positive Moment =  ft\*kips

From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	33.7	28.5	20.2	29.7	31.2	31.3	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	43.8	37.1	26.3	38.6	40.6	40.7	kips
Reaction per Wheel (LL+I) =	21.9	18.5	13.1	19.3	20.3	20.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions.

HS20 Lane Load assumes 26k concentrated Force is used.

#### From STAAD

Max. Positive LL+I Moment =       ft\*kips

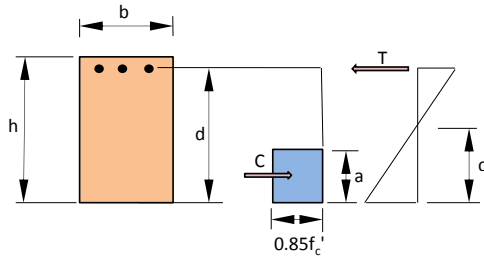
Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

#### Positive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.49	53.5 Tons	HS29.7
Operating	HS20	36 Tons	RF=2.48	89.3 Tons	HS49.6
	2F1	15 Tons	RF=4.14	62.0 Tons	
	3F1	23 Tons	RF=2.81	64.7 Tons	
	4F1	27 Tons	RF=2.68	72.3 Tons	
	5C1	40 Tons	RF=2.67	106.8 Tons	
	Ohio Legal %	265%			

### Floor Beam Negative Moment Section

(Check of North side with 3" Spall noted in inspection notes)



b =	18	in
d =	75	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	12.66	in <sup>2</sup>
% Steel Loss =	0%	

Reduced 3"  
Reduced 3"

(10-1 1/8) from  
49/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

A<sub>s</sub> = 12.656 in<sup>2</sup>

Area of reinforcing steel minus any loss noted

ρ<sub>b</sub> = 0.048

Balanced reinforcement ratio, AASHTO Eq. 8-18

0.75\*A<sub>sb</sub> = 48.21 in<sup>2</sup>

75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2

β<sub>1</sub> = 0.85

a = 9.099 in

Depth of equivalent compressive stress block, AASHTO Eq. 8-17

φM<sub>n</sub> = 2206.8 ft\*kips

Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

(Soil Load Moment has been increased by 1.15 factor)

Total Service Negative Moment = 223.9 ft\*kips

From Staad

#### Live Load Moment

From STAAD					
HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
180.67	152.8	108.3	159.2	167.3	167.8

Max. Negative LL+I Moment = 180.67 ft\*kips

Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=4.89	175.9 Tons	HS97.7
	HS20	36 Tons	RF=8.16	293.6 Tons	HS163.1
Operating	2F1	15 Tons	RF=13.61	204.1 Tons	
	3F1	23 Tons	RF=9.26	212.9 Tons	
	4F1	27 Tons	RF=8.81	237.9 Tons	
	5C1	40 Tons	RF=8.78	351.3 Tons	
	Ohio Legal %			880%	

## Floor Beam Shear Section

**(Check of North side with 3" Spall noted in inspection notes)**

### Section Capacity

Taken at face of column

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)
$d =$	<input type="text" value="75"/>	in	$d$ used for shear <b>Reduced 3"</b>
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="147.9"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="174.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="274.2"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

(Soil Load Moment has been increased by 1.15 factor)

Total Service Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="64.8"/>	54.8	38.8	57.1	60.0	60.2	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.54	55.4 Tons	HS30.8
Operating	HS20	36 Tons	RF=2.57	92.4 Tons	HS51.3
	2F1	15 Tons	RF=4.28	64.2 Tons	
	3F1	23 Tons	RF=2.91	67.0 Tons	
	4F1	27 Tons	RF=2.77	74.8 Tons	
	5C1	40 Tons	RF=2.76	110.5 Tons	
	Ohio Legal %			275%	

## Column Section

(Bottom of North Column controls)

h =	<input type="text" value="42"/>	in	Column Depth
b =	<input type="text" value="21"/>	in	Column Width
A <sub>s</sub> =	<input type="text" value="4"/>	in <sup>2</sup>	Area of Tension Steel (4-1" bars)
A' <sub>s</sub> =	<input type="text" value="5"/>	in <sup>2</sup>	Area of Compression Steel (5-1" bars)
d =	<input type="text" value="39"/>	in	Distance from compression face to centroid of tension steel
d' =	<input type="text" value="3"/>	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	<input type="text" value="3"/>	ksi	Concrete Strength
f <sub>y</sub> =	<input type="text" value="33"/>	ksi	Steel Yield Stress
E <sub>s</sub> =	<input type="text" value="29000"/>	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	<input type="text" value="0.003"/>	in/in	Ultimate concrete strain
β <sub>1</sub> =	<input type="text" value="0.85"/>		
d" =	<input type="text" value="18"/>	in	Distance from centroid of gross section to centroid of tension steel

## Dead Loads plus Soil Loads

(Moment taken at the center of cap)

(Soil Loads has been increased by 1.15 factor)

Total Service Dead Load Moment =	<input type="text" value="252.8"/>	ft-kips	From Staad
Total Service Dead Load Axial Force =	<input type="text" value="73.8"/>	kips	From Staad

## Live Loads (Moment taken at the center of cap)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	<input type="text" value="117.5"/>		99.4	70.4	103.6	108.8	109.1	ft-kips
Max. LL+I Axial Force =	<input type="text" value="60"/>		50.7	42.5	88.2	63.0	60.2	kips

Maximum Moment and Axial load results from 3 lanes loaded..

## Section Capacity

### Balanced Condition

a <sub>b</sub> =	<input type="text" value="24.03"/>	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	<input type="text" value="28.28"/>	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f' <sub>s</sub> =	<input type="text" value="33"/>	ksi	f' <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	<input type="text" value="1320.0"/>	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f' <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	<input type="text" value="1408.9"/>	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"/2)+A' <sub>s</sub> *f' <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

### Pure Axial Compression Capacity

P <sub>o</sub> =	<input type="text" value="2523.2"/>	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	<input type="text" value="1766.2"/>	kips		

### Pure Bending Capacity (Ignoring compression steel)

a =	<input type="text" value="2.465"/>	in	a = A <sub>s</sub> *f <sub>y</sub> /0.85*f <sub>c</sub> *b	Depth of equivalent stress block (AASHTO Eq. 8-17)
M <sub>n</sub> =	<input type="text" value="415.4"/>	ft-kips	M <sub>n</sub> = A <sub>s</sub> *f <sub>y</sub> *(d-a/2)	Nominal Moment Strength (AASHTO Eq. 8-15)
φM <sub>n</sub> =	<input type="text" value="373.9"/>	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c = 13.77$  in

**Tension Failure**

$f_s = 33.00$ ksi	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s = 33.00$ ksi	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a = 11.7086007$ in	$a = \beta_1 * c$	Depth of concrete stress block
$C = 627.0$ kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n = 462.0$ kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n = 865.8$ ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e = 22.49$ in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	226.1	206.0	188.2	287.4	232.7	226.6	kips
$M_u =$	583.7	544.3	481.5	553.4	564.7	565.5	ft-kips
$e =$	30.97	31.70	30.70	23.11	29.12	29.95	in
$\phi P_n =$	426.75	427.61	493.74	691.99	485.52	462.00	kips
$\phi M_n =$	837.1	837.9	889.3	985.1	883.4	865.8	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.99	71.8 Tons	HS39.9
Operating	HS20	36 Tons	RF=3.33	119.8 Tons	HS66.6
	2F1	15 Tons	RF=6.12	91.8 Tons	
	3F1	23 Tons	RF=4.88	112.1 Tons	
	4F1	27 Tons	RF=3.92	105.9 Tons	
	5C1	40 Tons	RF=3.79	151.4 Tons	
Ohio Legal %	380%				

	Load	GVW	Rating Factor	Safe Load	HS Rating	
Inventory	HS20	36 Tons	RF=1.49	53.5 Tons	HS29.7	Positive Moment
Operating	HS20	36 Tons	RF=2.48	89.3 Tons	HS49.6	Positive Moment
	2F1	15 Tons	RF=4.14	62.0 Tons		Positive Moment
	3F1	23 Tons	RF=2.81	64.7 Tons		Positive Moment
	4F1	27 Tons	RF=2.68	72.3 Tons		Positive Moment
	5C1	40 Tons	RF=2.67	106.8 Tons		Positive Moment
Ohio Legal %	265%					



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**BRIDGE LOAD RATING SUMMARY REPORT**

**CUY-2-1441**

**SECTION J'**

SFN	BRIDGE NUMBER	DISTRICT
1800035	CUY-2-1441	12
ORIGINAL CONSTRUCTION YEAR	REHABILITATION YEAR	OVERALL STRUCTURE LENGTH (FT)
1938 - 1940	1991 - 1992	6580
<b>FEATURE INTERSECTED:</b>	NUMEROUS LOCAL STREETS, RTA RAILROAD TRACKS AND THE CUYAHOGA RIVER	
<b>SPECIAL ASSUMPTIONS &amp; COMMENTS</b>		
<b>RATING &amp; ANALYSIS OPTION:</b>		
<b>LOAD RATING PURPOSE:</b>	LOAD RATING FOR FUTURE REHABILITATION RECOMMENDATIONS	
<b>RATING SOFTWARE:</b>	STAAD, CONSYS	
<b>BASIS OF ANALYSIS:</b>	EXISTING PLANS AND FIELD MEASUREMENTS	
<b>METHOD OF ANALYSIS:</b>	LOAD FACTOR	
<b>DESIGN LOADING (ORIGINAL):</b>	H20-33	
<b>STRUCTURE RATING SUMMARY</b>		
LOADING & RATING TYPE	RATING FACTOR - RF (ROUNDED TO 2 DECIMAL POINTS)	RATING LOAD
INVENTORY CURRENT DESIGN	1.02	HS20.4
OPERATING CURRENT DESIGN	1.70	
OHIO LEGAL - 2F1	2.25	<b>OHIO LEGAL LOADS OVERALL MINIMUM RATING FACTOR</b>
OHIO LEGAL - 3F1	1.94	1.94
OHIO LEGAL - 4F1	1.96	<b>OHIO LEGAL LOADS OVERALL CONTROLLING TRUCK</b>
OHIO LEGAL - 5C1	1.94	3F1 & 5C1
RATED BY, PE#	REVIEWED BY, PE#	REPORT DATE
Matt Johnson, PE	Jason Kemnitz, PE	3/2/2012
AGENCY/FIRM	PHONE NUMBER	EMAIL
Transsystems	216-861-1780	mjohnson@transystems.com

**SFN: 1800035 BRIDGE NO.: CUY-2-1441**

# SUMMARY SHEET

## West Approach - Section J'

**CUY-2-1441 Load Rating Analysis  
Main Ave Bridge**

Calculated: MJJ 3/1/2012  
Checked: JMK 3/1/2012  
Revised: CTG 5/14/2012

### As-Built Controlling Rating Factor Summary

Item	Location/ Member	HS20 Inventory	HS20 Operating	2F1 Operating	3F1 Operating	4F1 Operating	5C1 Operating	
Frame Cap	Frame 10 / Pos Moment	1.02	1.70	2.25	1.94	1.99	1.94	
Frame Cap	Frame 19 / Pos Moment	1.23	2.06	3.22	2.23	1.96	2.18	
Deck	Deck	1.31	2.18	3.49	2.55	2.93	2.55	

### As-Inspected Controlling Rating Factor Summary

Item	Location/ Member	HS20 Inventory	HS20 Operating	2F1 Operating	3F1 Operating	4F1 Operating	5C1 Operating	
Frame Cap	Frame 10 / Pos Moment	1.02	1.70	2.25	1.94	1.99	1.94	
Frame Cap	Frame 19 / Pos Moment	1.23	2.06	3.22	2.23	1.96	2.18	
Deck	Deck	1.31	2.18	3.49	2.55	2.93	2.55	

### Overall Summary

Case	Rating Factor	Tonnage	HS equivalent or Ohio Legal Load %
HS20 Inventory	1.02	36.72	HS20.4
HS20 Operating	1.70	61.20	HS34.0
2F1	2.25	33.75	195%
3F1	1.94	44.62	
4F1	1.96	52.92	
5C1	1.94	77.60	





Made by: **MJJ** Date: **2/2/2012** Job No: **P402110046**  
 Checked by: **DBH** Date: **2/28/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **Profile Grade Elevations - Section J'**

**Curve 1 Information**

At Beg. VPI	At PI VPI	At End VPI
<b>11+45.</b>	<b>12+35.</b>	<b>13+25.</b>
PI <sub>Curve</sub> (Station)	VPI <sub>Curve</sub> (Station)	PI <sub>Curve</sub> (Station)
<b>687.53</b>	<b>691.13</b>	<b>691.13</b>
PI <sub>Elev</sub> (ft)	PI <sub>Elev</sub> (ft)	PI <sub>Elev</sub> (ft)
4.0000%	g <sub>1</sub> (%)	
0.0000%	g <sub>2</sub> (%)	
180.00	L <sub>c</sub> (feet)	
-2.222222	r (1/feet)	

**Curve 2 Information (If Applicable)**

At Beg. VPI	At PI VPI	At End VPI
<b>13+25.</b>	<b>14+30.</b>	<b>15+35.</b>
PI <sub>Curve</sub> (Station)	PI <sub>Curve</sub> (Station)	PI <sub>Curve</sub> (Station)
<b>691.13</b>	<b>691.13</b>	<b>688.68</b>
PI <sub>Elev</sub> (ft)	PI <sub>Elev</sub> (ft)	PI <sub>Elev</sub> (ft)
0.0000%	g <sub>1</sub> (%)	
-2.3333%	g <sub>2</sub> (%)	
210.00	L <sub>c</sub> (feet)	
-1.11111	r (1/feet)	

Cross Slope	Station
<b>3.50%</b>	<b>8+22.</b>
<b>-4.00%</b>	<b>12+66.</b>

(Negative is down toward north)  
**-0.017%** % change per foot

**10+38.62** Station at beginning of section

Location	Distance	Station	New Profile Grade Elevation		Elev. from original plans	Cross Slope	Elevations after rehab	
			Rehab	Original			North Gutter Elevation	South Gutter Elevation
Frame 1	<b>3.5313</b>	10+42.15	683.31	108.51	<b>107.234</b>	-0.22%	108.469	108.557
Frame 2	<b>10.15</b>	10+52.3	683.72	108.92	<b>107.640</b>	-0.39%	108.842	108.998
Frame 3	<b>10.15</b>	10+62.45	684.12	109.32	<b>108.346</b>	-0.56%	109.214	109.439
Frame 4	<b>10.15</b>	10+72.6	684.53	109.73	<b>108.432</b>	-0.73%	109.587	109.880
Frame 5	<b>10.15</b>	10+82.75	684.94	110.14	<b>108.838</b>	-0.90%	109.959	110.321
Frame 6	<b>6.33</b>	10+89.08	685.19	110.39	<b>109.110</b>	-1.01%	110.192	110.596
Frame 7	<b>10.15</b>	10+99.23	685.60	110.80	<b>109.317</b>	-1.18%	110.564	111.038
Frame 8	<b>10.15</b>	11+09.38	686.00	111.20	<b>109.823</b>	-1.35%	110.937	111.479
Frame 9	<b>10.15</b>	11+19.53	686.41	111.61	<b>110.329</b>	-1.53%	111.310	111.920
Frame 10	<b>10.15</b>	11+29.68	686.81	112.01	<b>110.735</b>	-1.70%	111.682	112.361
Frame 11	<b>6.33</b>	11+36.01	687.07	112.27	<b>110.986</b>	-1.80%	111.914	112.636
Frame 12	<b>10.15</b>	11+46.16	687.47	112.67	<b>111.334</b>	-1.98%	112.287	113.077
Frame 13	<b>10.15</b>	11+56.31	687.86	113.06	<b>111.983</b>	-2.15%	112.645	113.504
Frame 14	<b>10.15</b>	11+66.46	688.23	113.43	<b>112.139</b>	-2.32%	112.981	113.908
Frame 15	<b>10.15</b>	11+76.61	688.58	113.78	<b>112.587</b>	-2.49%	113.294	114.290
Frame 16	<b>6.33</b>	11+82.94	688.78	113.98	<b>112.714</b>	-2.60%	113.477	114.516
Frame 17	<b>10.15</b>	11+93.09	689.09	114.29	<b>113.013</b>	-2.77%	113.753	114.860
Frame 18	<b>10.15</b>	12+03.24	689.38	114.58	<b>113.334</b>	-2.94%	114.005	115.181
Frame 19	<b>10.15</b>	12+13.39	689.64	114.84	<b>113.666</b>	-3.11%	114.235	115.480
Frame 20	<b>10.15</b>	12+23.54	689.88	115.08	<b>113.836</b>	-3.28%	114.442	115.755

Elevation Equation from rehab plans sheet G7/93 is (Rehab El. + 574.8 ft = Original El.)  
 From 118/991 of rehab plans, cross slope through Section J' varies from 4% down to the north to 3.50% down to the south.  
 North and south gutterline elevations after rehab are used to determine the haunch dead load to add on Staad model



Made by:	MJJ	Date:	2/2/2012	Job No:	P402110046
Checked by:	DBH	Date:	2/28/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	Profile Grade Elevations - Section J'				

**Section J', South Ramp, West Approach - Frame Column Heights**

Frame No.	Rehab North Gutter El.	Rehab South Gutter El.	Original Grade El.	Orig. Bot of Foot. (North)	***Orig. Bot of Foot. (South)	**North Col. Height (Col 1)	**South Col. Height (Col 2)
1	108.469	108.557	107.234	77	88	25.98	14.98
2	108.842	108.998	107.640	77	88	26.39	15.39
3	109.214	109.439	108.346	77	88	27.10	16.10
4	109.587	109.880	108.432	77	88	27.18	16.18
5	109.959	110.321	108.838	77	88	27.59	16.59
6	110.192	110.596	109.110	75	88	29.86	16.86
7	110.564	111.038	109.317	75	88	30.07	17.07
8	110.937	111.479	109.823	75	88	30.57	17.57
9	111.310	111.920	110.329	75	88	31.08	18.08
10	111.682	112.361	110.735	75	88	31.49	18.49
11	111.914	112.636	110.986	74	88	32.74	18.74
12	112.287	113.077	111.334	74	88	33.08	19.08
13	112.645	113.504	111.983	74	88	33.73	19.73
14	112.981	113.908	112.139	74	88	33.89	19.89
15	113.294	114.290	112.587	74	88	34.34	20.34
16	113.477	114.516	112.714	72	88	36.21	20.46
17	113.753	114.860	113.013	72	88	36.51	20.76
18	114.005	115.181	113.334	72	86	36.83	23.08
19	114.235	115.480	113.666	72	84	37.17	25.42
20	114.442	115.755	113.836	72	82	37.34	27.59

\*Original grade elevations are from original plans, sheet 33/246.

\*\*Heights are from top of footing to original center of cap. Cap is 4'-6" deep, this is the original cap depth including slab. The bottom of footing elevations are from original plans, sheet 33/246.

\*\*\*South Footing Elevation assumed, sheet 33/246 of original plans is not legible



Slab, Haunch and Diaphragm Dead Loads are directly input into Staad for analysis. Concrete wearing surface and Live loads are input into Consys as continuous loads to determine reactions. The reactions determined by Consys are input into Staad for analysis. Frame self weight is directly calculated by Staad.

**Slab Dead Loads**      *Slab is 10" thick lightweight concrete (113 lbs/ft<sup>3</sup>).*

Slab Dead Load Frame 1:

$$\text{Slab}_{DL} = \boxed{0.807} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (10.15\text{ft}/2 + 3.5\text{ft}) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frames 2-4, 7-9, 12-14 and 17-19:

$$\text{Slab}_{DL} = \boxed{0.956} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times 10.15\text{ft} \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frames 5, 6, 10, 11, 15 and 16:

$$\text{Slab}_{DL} = \boxed{0.776} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (10.15\text{ft}/2 + 6.33\text{ft}/2) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frame 20:

$$\text{Slab}_{DL} = \boxed{0.729} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (10.15\text{ft}/2 + 2.67\text{ft}) \times 113 \text{ lbs/ft}^3$$

**Beam Haunch Dead Loads:**

*Haunch Height varies across frames due to superelevation in deck.  
Haunch Heights are calculated in Section B' Elevations.xls*

Haunch Dead Load Frame 1:

$$\text{Haunch Height at North Column} = \boxed{1.235} \quad \text{Haunch Height at South Column} = \boxed{1.32}$$

$$\begin{aligned} \text{Hanch}_{DL\text{North}} &= \boxed{0.244} \text{ kips/ft} & \text{Hanch}_{DL} &= \text{Haunch Height} \times 21\text{in} \times 113 \text{ lbs/ft}^3 \\ \text{Hanch}_{DL\text{South}} &= \boxed{0.262} \text{ kips/ft} \end{aligned}$$

Haunch Dead Load Frame 2:

$$\text{Haunch Height at North Column} = \boxed{1.202} \quad \text{Haunch Height at South Column} = \boxed{1.36}$$

$$\begin{aligned} \text{Hanch}_{DL\text{North}} &= \boxed{0.238} \text{ kips/ft} & \text{Hanch}_{DL} &= \text{Haunch Height} \times 21\text{in} \times 113 \text{ lbs/ft}^3 \\ \text{Hanch}_{DL\text{South}} &= \boxed{0.269} \text{ kips/ft} \end{aligned}$$

Haunch Dead Load Frame 3:

$$\text{Haunch Height at North Column} = \boxed{0.868} \quad \text{Haunch Height at South Column} = \boxed{1.09}$$

$$\begin{aligned} \text{Hanch}_{DL\text{North}} &= \boxed{0.172} \text{ kips/ft} & \text{Hanch}_{DL} &= \text{Haunch Height} \times 21\text{in} \times 113 \text{ lbs/ft}^3 \\ \text{Hanch}_{DL\text{South}} &= \boxed{0.216} \text{ kips/ft} \end{aligned}$$



Haunch Dead Load Frame 4:

Haunch Height at North Column = 1.155 Haunch Height at South Column = 1.45

Hanch<sub>DLNorth</sub> = 0.228 kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.286 kips/ft

Haunch Dead Load Frame 5:

Haunch Height at North Column = 1.121 Haunch Height at South Column = 1.48

Hanch<sub>DLNorth</sub> = 0.222 kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.293 kips/ft

Haunch Dead Load Frame 6:

Haunch Height at North Column = 1.082 Haunch Height at South Column = 1.49

Hanch<sub>DLNorth</sub> = 0.214 kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.294 kips/ft

Haunch Dead Load Frame 7:

Haunch Height at North Column = 1.247 Haunch Height at South Column = 1.72

Hanch<sub>DLNorth</sub> = 0.247 kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.340 kips/ft

Haunch Dead Load Frame 8:

Haunch Height at North Column = 1.114 Haunch Height at South Column = 1.66

Hanch<sub>DLNorth</sub> = 0.220 kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.327 kips/ft

Haunch Dead Load Frame 9:

Haunch Height at North Column = 0.981 Haunch Height at South Column = 1.59

Hanch<sub>DLNorth</sub> = 0.194 kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.315 kips/ft



Haunch Dead Load Frame 10:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 11:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 12:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 13:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 14:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 15:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft



Haunch Dead Load Frame 16:

Haunch Height at North Column = 0.763 Haunch Height at South Column = 1.80

Hanch<sub>DLNorth</sub> = 0.151 kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.356 kips/ft

Haunch Dead Load Frame 17:

Haunch Height at North Column = 0.740 Haunch Height at South Column = 1.85

Hanch<sub>DLNorth</sub> = 0.146 kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.365 kips/ft

Haunch Dead Load Frame 18:

Haunch Height at North Column = 0.671 Haunch Height at South Column = 1.85

Hanch<sub>DLNorth</sub> = 0.133 kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.365 kips/ft

Haunch Dead Load Frame 19:

Haunch Height at North Column = 0.569 Haunch Height at South Column = 1.81

Hanch<sub>DLNorth</sub> = 0.113 kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.359 kips/ft

Haunch Dead Load Frame 20:

Haunch Height at North Column = 0.606 Haunch Height at South Column = 1.92

Hanch<sub>DLNorth</sub> = 0.120 kips/ft Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.379 kips/ft

**Diaphragm Dead Loads:**

*Concrete diaphragms located between frames 1-5 and frames 6-10 at midframe.  
Diaphragm is assumed to be all 150 lb/ft<sup>3</sup> concrete*

Diaphragm Dead Load Frame 1, 5, 6, 10, 11, 15, 16 and 20:

Diaphragm<sub>DL</sub> = 2.47 kips Diaphragm<sub>DL</sub> = 1.5ft x (10.15ft/2) x 2.167ft x 150 lbs/ft<sup>3</sup>

Diaphragm Dead Load Frame 2-4, 7-9, 12-14 and 17-19:

Diaphragm<sub>DL</sub> = 4.95 kips Diaphragm<sub>DL</sub> = 1.5ft x 10.15ft x 2.167ft x 150 lbs/ft<sup>3</sup>



**NonComposite Dead Load Summary for Staad Input**

Frame No.	Slab DL (kips/ft)	Haunch DL (kips/ft)		Diap. DL (kips)
		North Col.	South Col.	
1	0.807	0.244	0.262	2.47
2	0.956	0.238	0.269	4.95
3	0.956	0.172	0.216	4.95
4	0.956	0.228	0.286	4.95
5	0.776	0.222	0.293	2.47
6	0.776	0.214	0.294	2.47
7	0.956	0.247	0.340	4.95
8	0.956	0.220	0.327	4.95
9	0.956	0.194	0.315	4.95
10	0.776	0.187	0.322	2.47
11	0.776	0.184	0.326	2.47
12	0.956	0.188	0.345	4.95
13	0.956	0.131	0.301	4.95
14	0.956	0.167	0.350	4.95
15	0.776	0.140	0.337	2.47
16	0.776	0.151	0.356	2.47
17	0.956	0.146	0.365	4.95
18	0.956	0.133	0.365	4.95
19	0.956	0.113	0.359	4.95
20	0.729	0.120	0.379	2.47



**Latex Modified Wearing Surface Dead Load**

Wearing Surface Dead Load is applied to the composite section.  
Unit weight is assumed to be 150 lbs/ft<sup>3</sup>

WS<sub>DL</sub> = 0.625 kips/ft      WS<sub>DL</sub> = 1.25in x 40 ft x 150 lbs/ft<sup>3</sup>

**Soil Loads**

Soil load is applied to north column only. Wall between columns is assumed to transfer load to columns. At-rest condition assumed. Soil Unit weight assumed to be 120 lbs/ft<sup>3</sup>.

Frame No.	Height of North Wall	Int. Soil Height Ratio	Ext. Soil Height Ratio	kips	
				Int. Load at Btm. of Wall	Ext. Load at Btm. of Wall
1	25.98	0.80	0.24	9.41	2.94
2	26.39	0.77	0.21	10.89	2.97
3	27.10	0.73	0.2	10.60	2.90
4	27.18	0.72	0.17	10.49	2.48
5	27.59	0.72	0.16	10.65	2.37
6	29.86	0.71	0.18	11.36	2.88
7	30.07	0.69	0.16	11.12	2.58
8	30.57	0.69	0.15	11.31	2.46
9	31.08	0.68	0.13	11.33	2.17
10	31.49	0.67	0.08	11.31	1.35
11	32.74	0.67	0.14	11.75	2.46
12	33.08	0.66	0.12	11.70	2.13
13	33.73	0.65	0.1	11.75	1.81
14	33.89	0.64	0.09	11.62	1.63
15	34.34	0.63	0.09	11.59	1.66
16	36.21	0.64	0.12	12.42	2.33
17	36.51	0.61	0.11	11.94	2.15
18	36.83	0.61	0.09	12.04	1.78
19	37.17	0.60	0.09	11.95	1.79
20	37.34	0.57	0.08	11.41	1.60

Soil Heights are estimated from original bridge plans sheet 33/246.

**Live Loads**

See Consys output for live load reactions per lane on each frame.

live loads are HS20 Truck, HS20 Lane and Ohio Legal Loads shown in Table 1.

OHIO LEGAL LOADS		
Load Designation	Load Configuration	Gross Weight
2F1		15 Tons
3F1		23 Tons
4F1		27 Tons
5C1		40 Tons

Table 1

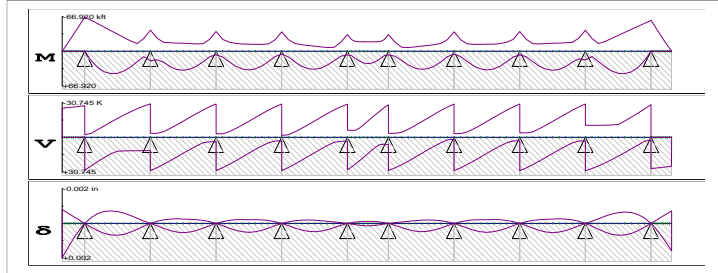


Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: HS20 Lane Load  
 Type: Lane Load

**Factors:**

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) Shear (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) Moment (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	0.00
		-0.000	0.000	0.000	-18.000	-26.000	0.000	-0.000	-0.000	-0.00	
	0.350	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-6.339	0.000	0.000	-18.224	-26.224	0.000	-0.039	-0.000	-0.00	
	0.700	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-12.757	0.000	0.000	-18.448	-26.448	0.000	-0.157	-0.000	-0.00	
	1.050	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-19.253	0.000	0.000	-18.672	-26.672	0.000	-0.353	-0.000	-0.00	
	1.400	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-25.827	0.000	0.000	-18.896	-26.896	0.000	-0.627	-0.000	-0.00	
	1.750	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-32.480	0.000	0.000	-19.120	-27.120	0.000	-0.980	-0.000	-0.00	
	2.100	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-39.211	0.000	0.000	-19.344	-27.344	0.000	-1.411	-0.000	-0.00	
2.450	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00		
	-46.021	0.000	0.000	-19.568	-27.568	0.000	-1.921	-0.000	-0.00		
2.800	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00		
	-52.909	0.000	0.000	-19.792	-27.792	0.000	-2.509	-0.000	-0.00		
3.150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00		
	-59.875	0.000	0.000	-20.016	-28.016	0.000	-3.175	-0.000	-0.00		
3.500	0.000	0.000	0.000	-1.417	29.356	0.000	-3.920	0.000	0.00		
2	0.000	-66.920	17.539	-20.238	-28.581	0.000	-4.011	0.000	-0.00		
	1.015	18.572	17.972	-0.028	25.491	21.953	-1.097	0.000	0.00		
		-60.220	6.601	0.000	-3.672	22.992	-0.059	-0.000	-0.00		
	2.030	31.920	15.075	-2.925	21.716	40.164	0.000	0.000	0.00		
		-53.520	6.601	0.000	-7.043	39.801	0.000	0.000	-0.00		
	3.045	40.221	12.235	-5.765	18.106	51.211	0.000	0.000	0.00		
		-46.820	6.601	0.000	-10.411	50.437	0.000	0.000	-0.00		
	4.060	43.768	9.481	-8.519	14.698	55.753	0.000	0.000	0.00		
		-40.121	6.601	0.000	-13.730	55.090	0.000	0.000	-0.00		
	5.075	42.972	6.843	-11.157	12.512	1.884	-31.423	0.000	0.00		
		-33.421	6.601	0.000	-16.956	54.138	0.000	0.000	-0.00		
	6.090	38.362	4.350	-13.650	12.286	1.670	-20.099	0.000	0.00		
		-26.721	6.601	0.000	-20.043	48.146	0.000	0.000	-0.00		
	7.105	30.584	2.031	-15.969	12.124	1.448	-8.782	0.000	0.00		
	-20.022	6.601	0.000	-22.942	37.880	0.000	0.000	-0.00			
8.120	20.473	0.771	-17.229	12.018	2.666	0.000	0.000	0.00			
	-15.087	0.000	-2.223	-25.605	24.303	-1.628	-0.000	-0.00			
9.135	10.602	0.976	-17.024	11.961	14.346	0.000	0.000	0.00			
	-24.917	0.000	-13.037	-27.983	8.587	-4.280	-0.000	-0.00			
10.150	0.000	18.819	8.447	-2.677	30.442	0.000	-6.075	0.00			
3	0.000	-41.072	17.202	-18.088	-30.580	0.000	-6.087	0.00	0.00		
	1.015	16.552	0.000	-1.627	27.244	9.690	-4.441	0.00	0.00		
		-25.672	11.304	0.000	-3.639	22.822	0.000	-0.000	-0.00		
	2.030	21.471	16.706	-1.294	24.239	25.077	-1.946	0.00	0.00		
		-17.328	3.387	0.000	-5.121	28.435	0.000	0.000	-0.00		
	3.045	30.109	14.270	-3.730	20.988	36.901	-0.288	0.00	0.00		
		-16.748	0.571	0.000	-8.013	38.660	0.000	0.000	-0.00		
	4.060	35.477	11.578	-6.422	17.604	44.268	0.000	0.000	0.00		
		-16.169	0.571	0.000	-11.180	45.139	0.000	0.000	-0.00		
	5.075	37.157	8.821	-9.179	14.202	46.752	0.000	0.000	0.00		
	-15.590	0.571	0.000	-14.515	47.092	0.000	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.090	35.039	6.075	-11.925	10.891	44.385	0.000	0.00		
		-15.011	0.571	0.000	-17.911	44.170	0.000	-0.00		
	7.105	29.319	3.415	-14.585	7.779	37.635	0.000	0.00		
		-14.432	0.571	0.000	-21.258	36.469	0.000	-0.00		
	8.120	20.586	1.703	-16.297	4.970	27.401	0.000	0.00		
		-14.632	0.000	-2.634	-24.441	24.544	-1.489	-0.00		
9.135	11.099	0.904	-17.096	4.083	5.445	0.000	0.00			
	-23.145	0.000	-13.160	-27.343	9.423	-3.965	-0.00			
4	0.000	7.170	3.017	-1.221	30.416	0.000	-5.391	0.00		
		-38.516	16.816	-16.963	-30.421	0.000	-5.387	0.00		
	1.015	11.266	17.132	-0.868	27.209	9.446	-4.053	0.00		
		-23.285	12.995	0.000	-3.278	4.680	0.000	-0.00		
	2.030	20.830	16.267	-1.733	24.251	24.467	-1.661	0.00		
		-17.996	3.162	0.000	-5.005	27.661	0.000	-0.00		
	3.045	29.331	14.313	-3.687	21.017	36.168	-0.107	0.00		
		-15.319	2.582	0.000	-7.872	37.827	0.000	-0.00		
	4.060	34.716	11.620	-6.380	17.628	43.544	0.000	0.00		
		-14.024	0.169	0.000	-11.035	44.390	0.000	-0.00		
	5.075	36.452	8.851	-9.149	14.205	46.089	0.000	0.00		
		-13.852	0.169	0.000	-14.385	46.493	0.000	-0.00		
	6.090	34.392	6.085	-11.915	10.862	43.775	0.000	0.00		
		-13.681	0.169	0.000	-17.807	43.731	0.000	-0.00		
	7.105	28.709	3.401	-14.599	7.714	37.042	0.000	0.00		
		-13.511	0.168	0.000	-21.185	36.167	0.000	-0.00		
	8.120	19.995	1.608	-16.392	4.870	26.781	0.000	0.00		
		-14.500	0.000	-2.667	-24.400	24.345	-1.503	-0.00		
9.135	10.447	0.774	-17.226	3.401	4.322	0.000	0.00			
	-22.662	0.000	-13.018	-27.329	9.306	-3.982	-0.00			
5	0.000	5.692	2.501	-0.864	30.284	0.000	-6.123	0.00		
		-37.950	16.604	-16.840	-30.137	0.000	-6.124	0.00		
	1.015	10.892	17.338	-0.662	27.126	9.509	-4.059	0.00		
		-22.876	12.740	0.000	-2.355	14.826	0.000	-0.00		
	2.030	20.656	16.334	-1.666	24.058	24.435	-1.655	0.00		
		-15.468	2.934	0.000	-4.935	27.476	0.000	-0.00		
	3.045	28.950	14.089	-3.911	20.714	35.829	-0.077	0.00		
		-12.883	1.406	0.000	-7.926	37.587	0.000	-0.00		
	4.060	33.965	11.323	-6.677	17.229	42.712	0.000	0.00		
		-11.457	1.406	0.000	-11.205	43.870	0.000	-0.00		
	5.075	35.241	8.498	-9.502	13.737	44.659	0.000	0.00		
		-10.030	1.406	0.000	-14.646	45.535	0.000	-0.00		
	6.090	32.724	5.705	-12.295	10.369	41.782	0.000	0.00		
		-8.603	1.406	0.000	-18.121	42.312	0.000	-0.00		
	7.105	26.723	3.033	-14.967	7.251	34.716	0.000	0.00		
		-7.176	1.406	0.000	-21.496	34.458	0.000	-0.00		
	8.120	18.295	1.685	-16.315	4.507	24.598	0.000	0.00		
		-8.048	0.000	-6.858	-24.635	22.785	-0.367	-0.00		
9.135	9.705	1.178	-16.822	3.603	5.990	0.000	0.00			
	-17.746	0.000	-12.804	-27.400	8.667	-2.697	-0.00			
6	0.000	7.253	2.673	-2.075	29.738	0.000	-3.813	0.00		
		-32.618	17.762	-16.155	-30.745	0.000	-3.903	0.00		
	0.633	8.443	16.086	-1.914	26.642	5.555	-4.156	0.00		
		-22.846	12.652	0.000	-6.328	3.974	0.000	-0.00		
	1.266	14.551	16.072	-1.928	23.853	15.490	-2.752	0.00		
		-18.949	3.868	0.000	-6.379	1.060	0.000	-0.00		
	1.899	19.772	13.811	-4.189	20.857	23.179	-1.677	0.00		
		-18.521	0.001	0.000	-8.490	25.484	0.000	-0.00		
	2.532	23.049	11.434	-6.566	17.739	28.162	-0.872	0.00		
		-18.520	0.001	0.000	-11.472	29.243	0.000	-0.00		
	3.165	24.166	9.000	-9.000	14.583	30.194	-0.269	0.00		
		-18.520	0.001	-7.203	-14.582	30.195	-0.267	-0.00		
	3.798	23.049	6.566	-11.434	11.473	29.242	0.000	0.00		
		-18.519	0.001	0.000	-17.738	28.165	-0.870	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.431	19.772	4.189	-13.811	8.491	25.483	0.000	0.00		
		-18.519	0.001	0.000	-20.856	23.182	-1.674	-0.00		
	5.064	14.551	1.928	-16.072	6.380	1.060	0.000	0.00		
		-18.946	0.000	-3.865	-23.853	15.493	-2.748	-0.00		
7	5.697	8.443	1.915	-16.085	6.329	3.974	0.000	0.00		
		-22.843	0.000	-12.651	-26.641	5.559	-4.152	-0.00		
	6.330	7.254	2.076	-2.673	30.744	0.000	-3.898	0.00		
		-32.613	16.153	-17.762	-29.738	0.000	-3.806	0.00		
8	1.015	9.706	16.822	-1.178	27.398	8.670	-2.695	0.00		
		-17.744	12.802	0.000	-3.604	5.992	0.000	-0.00		
	2.030	18.296	16.315	-1.685	24.633	22.786	-0.366	0.00		
		-8.047	6.857	0.000	-4.507	24.600	0.000	-0.00		
	3.045	26.722	14.965	-3.035	21.494	34.457	0.000	0.00		
		-7.176	0.000	-1.406	-7.251	34.717	0.000	-0.00		
	4.060	32.721	12.293	-5.707	18.119	42.309	0.000	0.00		
		-8.603	0.000	-1.406	-10.369	41.783	0.000	-0.00		
	5.075	35.237	9.500	-8.500	14.644	45.531	0.000	0.00		
		-10.030	0.000	-1.406	-13.737	44.660	0.000	-0.00		
	6.090	33.958	6.675	-11.325	11.203	43.863	0.000	0.00		
		-11.457	0.000	-1.406	-17.229	42.713	0.000	-0.00		
	7.105	28.942	3.909	-14.091	7.924	37.579	0.000	0.00		
		-12.883	0.000	-1.406	-20.714	35.829	-0.076	-0.00		
	8.120	20.645	1.664	-16.336	4.933	27.466	0.000	0.00		
		-15.468	0.000	-2.934	-24.058	24.435	-1.655	-0.00		
9.135	10.880	0.660	-17.340	2.353	14.814	0.000	0.00			
	-22.877	0.000	-12.740	-27.126	9.508	-4.059	-0.00			
9	10.150	5.679	0.862	-2.495	30.135	0.000	-6.138	0.00		
		-37.950	16.840	-16.605	-30.278	0.000	-6.138	0.00		
	1.015	10.439	17.233	-0.767	27.329	9.306	-3.982	0.00		
		-22.663	13.018	0.000	-3.394	4.315	0.000	-0.00		
	2.030	19.994	16.398	-1.602	24.400	24.345	-1.503	0.00		
		-14.500	2.667	0.000	-4.864	26.780	0.000	-0.00		
	3.045	28.709	14.599	-3.401	21.185	36.167	0.000	0.00		
		-13.505	0.000	-0.162	-7.707	37.048	0.000	-0.00		
	4.060	34.392	11.915	-6.085	17.807	43.731	0.000	0.00		
		-13.670	0.000	-0.162	-10.856	43.787	0.000	-0.00		
	5.075	36.452	9.149	-8.851	14.385	46.493	0.000	0.00		
		-13.834	0.000	-0.162	-14.198	46.107	0.000	-0.00		
	6.090	34.716	6.380	-11.620	11.035	44.390	0.000	0.00		
		-13.999	0.000	-0.162	-17.622	43.569	0.000	-0.00		
	7.105	29.331	3.687	-14.313	7.872	37.827	0.000	0.00		
		-15.019	0.000	-2.521	-21.011	36.199	-0.075	-0.00		
8.120	20.830	1.733	-16.267	5.005	27.661	0.000	0.00			
	-17.634	0.000	-3.101	-24.245	24.505	-1.623	-0.00			
9.135	11.266	0.868	-17.132	3.278	4.680	0.000	0.00			
	-23.241	0.000	-12.989	-27.202	9.491	-4.008	-0.00			
9	10.150	7.170	1.221	-3.017	30.397	0.000	-5.336	0.00		
		-38.465	16.940	-16.809	-30.409	0.000	-5.340	0.00		
	1.015	11.099	17.096	-0.904	27.320	9.450	-3.938	0.00		
		-23.118	13.136	0.000	-4.083	5.445	0.000	-0.00		
	2.030	20.586	16.297	-1.703	24.417	24.547	-1.486	0.00		
		-14.630	2.611	0.000	-4.970	27.401	0.000	-0.00		
	3.045	29.298	14.562	-3.438	21.234	36.448	0.000	0.00		
		-14.432	0.000	-0.571	-7.779	37.635	0.000	-0.00		
	4.060	34.994	11.901	-6.099	17.888	44.124	0.000	0.00		
		-15.011	0.000	-0.571	-10.891	44.385	0.000	-0.00		
	5.075	37.087	9.155	-8.845	14.491	47.022	0.000	0.00		
		-15.590	0.000	-0.571	-14.202	46.752	0.000	-0.00		
	6.090	35.383	6.398	-11.602	11.156	45.045	0.000	0.00		
		-16.169	0.000	-0.571	-17.604	44.268	0.000	-0.00		
	7.105	29.991	3.707	-14.293	7.990	38.542	0.000	0.00		
		-16.749	0.000	-0.571	-20.988	36.901	-0.288	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear(+/-) (K)		SHEAR (max/min) (K)		Corresponding Moment(+/-) (kft)		DEFLECT (max/min) (in)
9	8.120	21.328	1.271	-16.729	5.098	28.293	0.000	0.00		
		-17.328	0.000	-3.387	-24.239	25.077	-1.946	-0.00		
	9.135	14.970	1.401	0.000	3.323	20.611	0.000	0.00		
		-25.672	0.000	-11.304	-27.244	9.690	-4.441	-0.00		
10	10.150	17.007	2.451	-7.603	30.557	0.000	-6.277	0.00		
	0.000	-41.072	18.088	-17.202	-30.354	0.000	-6.266	0.00		
	1.015	10.501	17.113	-0.887	27.983	8.587	-4.280	0.00		
		-24.917	13.037	0.000	-10.781	13.011	0.000	-0.00		
	2.030	20.463	17.319	-0.682	25.605	24.303	-1.628	0.00		
		-15.087	2.223	0.000	-10.837	2.530	0.000	-0.00		
	3.045	30.584	15.969	-2.031	22.942	37.880	0.000	0.00		
		-19.262	0.000	-5.756	-10.943	1.528	-7.720	-0.00		
	4.060	38.362	13.650	-4.350	20.043	48.146	0.000	0.00		
		-25.104	0.000	-5.756	-11.105	1.840	-17.838	-0.00		
	5.075	42.972	11.157	-6.843	16.956	54.138	0.000	0.00		
		-30.946	0.000	-5.756	-11.442	54.860	0.000	-0.00		
	6.090	43.768	8.519	-9.481	13.730	55.090	0.000	0.00		
		-36.789	0.000	-5.756	-14.609	56.103	0.000	-0.00		
	7.105	40.221	5.765	-12.235	10.411	50.437	0.000	0.00		
		-42.631	0.000	-5.756	-18.017	51.652	0.000	-0.00		
8.120	31.920	2.925	-15.075	7.043	39.801	0.000	0.00			
	-48.474	0.000	-5.756	-21.628	40.695	0.000	-0.00			
9.135	18.572	0.028	-17.972	3.672	22.992	-0.059	0.00			
	-54.316	0.000	-5.756	-25.402	22.574	-0.477	-0.00			
11	10.150	0.000	0.000	-9.179	28.368	0.000	-85.469	0.00		
	0.000	-60.159	21.442	-7.515	-29.268	0.000	-3.210	0.00		
	0.317	0.000	0.000	-0.000	27.824	0.000	-76.625	0.00		
		-53.848	19.824	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	0.000	-0.000	27.622	0.000	-67.845	0.00		
		-47.602	19.622	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	0.000	-0.000	27.419	0.000	-59.130	0.00		
		-41.420	19.419	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	0.000	-0.000	27.216	0.000	-50.478	0.00		
		-35.302	19.216	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	0.000	-0.000	27.013	0.000	-41.891	0.00		
		-29.248	19.013	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	0.000	-0.000	26.811	0.000	-33.368	0.00		
		-23.259	18.811	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	0.000	-0.000	26.608	0.000	-24.909	0.00		
		-17.334	18.608	0.000	-0.000	0.000	0.000	-0.00		
2.534	0.000	0.000	-0.000	26.405	0.000	-16.514	0.00			
	-11.473	18.405	0.000	-0.000	0.000	0.000	-0.00			
2.850	0.000	0.000	-0.000	26.203	0.000	-8.184	0.00			
	-5.676	18.203	0.000	-0.000	0.000	0.000	-0.00			
3.167	0.000	0.000	-0.000	0.000	0.000	0.000	0.00			
	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00			

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.389	-42.997
3	15.560	-34.011
4	5.563	-33.614
5	4.490	-33.624
6	7.646	-33.724
7	7.647	-33.721
8	4.482	-33.624
9	5.563	-33.583
10	14.063	-34.011
11	2.389	-41.604
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

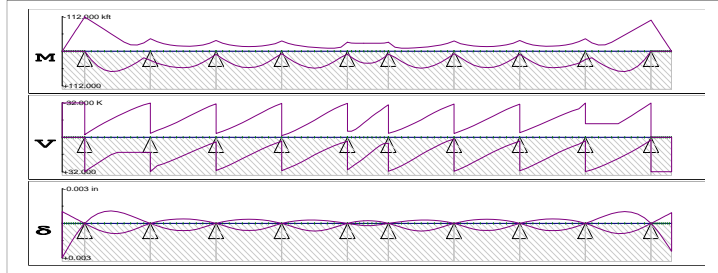
Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: HS20

Type: Truck

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	0.00
		-0.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
	0.350	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-11.200	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
	0.700	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-22.400	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
	1.050	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-33.600	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
	1.400	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-44.800	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
	1.750	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-56.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
	2.100	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-67.200	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
2.450	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00		
	-78.400	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00		
2.800	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00		
	-89.600	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00		
3.150	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00		
	-100.800	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00		
3.500											
2	0.000	0.000	0.000	-2.525	31.959	0.000	-0.000	0.000	-0.112	0.00	
		-112.000	13.991	-32.000	-32.000	0.000	0.000	0.000	0.000	0.00	
	1.015	28.370	27.951	-4.049	27.951	28.370	0.000	0.000	0.000	0.00	
		-98.288	13.509	0.000	-6.454	25.929	0.000	0.000	0.000	-0.00	
	2.030	48.626	23.954	-8.046	23.954	48.626	0.000	0.000	0.000	0.00	
		-84.576	13.509	0.000	-10.130	44.396	0.000	0.000	0.000	-0.00	
	3.045	61.080	20.059	-11.941	20.059	61.080	0.000	0.000	0.000	0.00	
		-70.864	13.509	0.000	-13.580	56.087	0.000	0.000	0.000	-0.00	
	4.060	66.254	16.319	-15.681	16.319	66.254	0.000	0.000	0.000	0.00	
		-57.152	13.509	0.000	-16.808	61.678	0.000	0.000	0.000	-0.00	
	5.075	64.881	12.784	-19.216	13.991	0.000	-40.994	0.000	0.000	0.00	
		-43.439	13.509	0.000	-19.817	61.830	0.000	0.000	0.000	-0.00	
	6.090	57.899	9.507	-22.493	13.991	0.000	-26.792	0.000	0.000	0.00	
		-29.728	13.491	0.000	-22.621	57.117	0.000	0.000	0.000	-0.00	
7.105	48.399	6.812	-25.188	13.991	0.000	-12.591	0.000	0.000	0.00		
	-20.985	4.928	0.000	-25.461	46.458	0.000	0.000	0.000	-0.00		
8.120	36.038	4.438	-27.562	13.991	1.610	0.000	0.000	0.000	0.00		
	-20.558	0.000	-3.359	-28.070	31.915	0.000	0.000	0.000	-0.00		
9.135	21.644	2.369	-29.631	13.991	15.811	0.000	0.000	0.000	0.00		
	-27.579	0.000	-10.130	-30.266	15.837	0.000	0.000	0.000	-0.00		
10.150											
3	0.000	30.013	13.991	-3.750	31.978	0.000	-0.150	0.000	0.00		
		-40.798	11.144	-14.944	-31.985	0.000	-0.174	0.000	0.00		
	1.015	39.434	25.681	-6.319	26.484	38.619	0.000	0.000	0.00		
		-31.493	7.140	0.000	-6.449	25.957	0.000	0.000	0.00		
	2.030	44.908	24.574	-7.426	24.574	44.908	0.000	0.000	0.00		
		-24.945	4.176	0.000	-8.742	36.172	0.000	0.000	0.00		
	3.045	50.048	22.280	-9.720	22.280	50.048	0.000	0.000	0.00		
		-20.706	4.176	0.000	-11.238	44.643	0.000	0.000	0.00		
4.060	52.754	19.737	-12.263	19.737	52.754	0.000	0.000	0.00			
	-18.217	2.110	0.000	-13.973	50.626	0.000	0.000	0.00			
5.075	53.767	14.991	-17.009	17.059	52.339	0.000	0.000	0.00			
	-16.902	0.593	0.000	-17.009	53.767	0.000	0.000	0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR(max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT(max) (min) (in)
3	6.090	52.469	11.899	-20.101	14.321	48.663	0.000	0.00		
		-16.585	0.202	0.000	-20.101	52.469	0.000	-0.00		
	7.105	46.442	8.806	-23.194	11.682	42.350	0.000	0.00		
		-17.875	0.000	-1.727	-23.194	46.442	0.000	-0.00		
	8.120	36.191	6.781	-25.219	9.107	33.491	0.000	0.00		
		-20.618	0.000	-5.078	-26.167	36.042	0.000	-0.00		
	9.135	23.503	4.166	-27.834	6.644	22.613	0.000	0.00		
		-26.452	0.000	-6.904	-28.863	22.357	0.000	-0.00		
	4	10.150	10.668	4.366	-1.940	30.864	8.743	0.000	0.00	
			-35.244	12.198	-10.620	-31.103	6.955	0.000	0.00	
1.015		24.541	27.836	-4.164	28.612	23.671	0.000	0.00		
		-26.185	6.512	0.000	-5.729	21.857	0.000	-0.00		
2.030		36.893	25.244	-6.756	25.906	36.822	0.000	0.00		
		-20.944	4.037	0.000	-8.152	33.607	0.000	-0.00		
3.045		46.670	22.924	-9.076	22.924	46.670	0.000	0.00		
		-17.857	2.488	0.000	-10.791	43.314	0.000	-0.00		
4.060		52.171	19.827	-12.173	19.827	52.171	0.000	0.00		
		-16.137	1.353	0.000	-13.678	50.007	0.000	-0.00		
5.075	53.319	15.238	-16.762	16.931	52.465	0.000	0.00			
	-15.502	0.266	0.000	-16.762	53.319	0.000	-0.00			
6.090	51.998	12.046	-19.954	13.848	49.316	0.000	0.00			
	-15.844	0.000	-0.832	-19.954	51.998	0.000	-0.00			
7.105	45.589	8.805	-23.195	10.918	42.667	0.000	0.00			
	-17.220	0.000	-1.807	-23.195	45.589	0.000	-0.00			
8.120	34.536	6.395	-25.605	8.261	32.876	0.000	0.00			
	-20.606	0.000	-3.551	-26.343	34.395	0.000	-0.00			
9.135	21.035	5.802	-26.198	5.802	21.035	0.000	0.00			
	-24.817	0.000	-6.020	-29.212	19.580	0.000	-0.00			
5	10.150	8.371	3.608	-1.340	31.033	7.102	0.000	0.00		
		-33.638	10.466	-11.338	-31.596	2.909	0.000	0.00		
	1.015	23.150	28.365	-3.635	28.639	22.495	0.000	0.00		
		-25.595	6.061	0.000	-3.635	23.150	0.000	-0.00		
	2.030	36.311	25.630	-6.370	26.131	32.145	0.000	0.00		
		-20.673	3.776	0.000	-6.370	36.311	0.000	-0.00		
	3.045	46.098	22.601	-9.399	23.136	44.374	0.000	0.00		
		-17.249	2.816	0.000	-9.399	46.098	0.000	-0.00		
	4.060	52.598	19.720	-12.280	19.803	52.587	0.000	0.00		
		-14.556	1.992	0.000	-12.627	50.816	0.000	-0.00		
5.075	55.644	16.060	-15.940	16.318	51.889	0.000	0.00			
	-12.587	1.748	0.000	-15.940	55.644	0.000	-0.00			
6.090	53.069	12.337	-19.663	13.301	48.068	0.000	0.00			
	-11.039	1.321	0.000	-19.663	53.069	0.000	-0.00			
7.105	45.170	8.732	-23.268	10.466	40.722	0.000	0.00			
	-9.937	0.534	0.000	-23.268	45.170	0.000	-0.00			
8.120	33.343	6.187	-25.813	7.883	30.939	0.000	0.00			
	-10.396	0.000	-1.740	-26.574	32.975	0.000	-0.00			
9.135	20.096	5.624	-26.376	5.624	20.096	0.000	0.00			
	-13.432	0.000	-14.507	-29.400	18.246	0.000	-0.00			
6	10.150	9.860	3.760	-2.499	30.313	8.629	0.000	0.00		
		-29.696	5.673	-17.623	-31.546	3.307	0.000	0.00		
	0.633	19.954	27.164	-4.836	27.800	19.360	0.000	0.00		
		-26.612	0.236	0.000	-5.673	2.625	0.000	-0.00		
	1.266	28.589	24.498	-7.502	24.938	28.306	0.000	0.00		
		-26.462	0.236	0.000	-7.502	28.589	0.000	-0.00		
	1.899	34.967	21.604	-10.396	22.366	29.994	0.000	0.00		
		-26.324	0.179	0.000	-10.396	34.967	0.000	-0.00		
	2.532	38.548	18.585	-13.415	19.541	35.641	0.000	0.00		
		-26.211	0.179	0.000	-13.415	38.548	0.000	-0.00		
3.165	39.057	16.454	-16.454	16.490	38.507	0.000	0.00			
	-26.098	0.000	-0.179	-16.490	38.507	0.000	-0.00			
3.798	38.548	13.415	-18.585	13.415	38.548	0.000	0.00			
	-26.211	0.000	-0.179	-19.541	35.641	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR (max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.431	34.967	10.396	-21.604	10.396	34.967	0.000	0.00		
		-26.324	0.000	-0.179	-22.366	29.994	0.000	-0.00		
	5.064	28.589	7.502	-24.498	7.502	28.589	0.000	0.00		
		-26.462	0.000	-0.236	-24.938	28.306	0.000	-0.00		
	5.697	19.954	4.836	-27.164	5.673	2.625	0.000	0.00		
		-26.612	0.000	-0.236	-27.800	19.360	0.000	-0.00		
7	0.000	9.860	2.499	-3.760	31.546	3.307	0.000	0.00		
		-29.696	17.623	-5.673	-30.313	8.629	0.000	0.00		
	1.015	20.096	26.376	-5.624	29.400	18.246	0.000	0.00		
		-13.432	14.507	0.000	-5.624	20.096	0.000	-0.00		
	2.030	33.343	25.813	-6.187	26.574	32.975	0.000	0.00		
		-10.396	1.740	0.000	-7.883	30.939	0.000	-0.00		
	3.045	45.170	23.268	-8.732	23.268	45.170	0.000	0.00		
		-9.937	0.000	-0.534	-10.466	40.722	0.000	-0.00		
	4.060	53.069	19.663	-12.337	19.663	53.069	0.000	0.00		
		-11.039	0.000	-1.321	-13.301	48.068	0.000	-0.00		
	5.075	55.644	15.940	-16.060	15.940	55.644	0.000	0.00		
		-12.587	0.000	-1.748	-16.318	51.889	0.000	-0.00		
	6.090	52.598	12.280	-19.720	12.627	50.816	0.000	0.00		
		-14.556	0.000	-1.992	-19.803	52.587	0.000	-0.00		
	7.105	46.098	9.399	-22.601	9.399	46.098	0.000	0.00		
-17.249		0.000	-2.816	-23.136	44.374	0.000	-0.00			
8.120	36.311	6.370	-25.630	6.370	36.311	0.000	0.00			
	-20.673	0.000	-3.776	-26.131	32.145	0.000	-0.00			
9.135	23.150	3.635	-28.365	3.635	23.150	0.000	0.00			
	-25.595	0.000	-6.061	-28.639	22.495	0.000	-0.00			
8	0.000	8.371	1.340	-3.608	31.596	2.909	0.000	0.00		
		-33.638	11.338	-10.466	-31.033	7.102	0.000	0.00		
	1.015	21.035	26.198	-5.802	29.212	19.580	0.000	0.00		
		-24.817	6.020	0.000	-5.802	21.035	0.000	-0.00		
	2.030	34.536	25.605	-6.395	26.343	34.395	0.000	0.00		
		-20.606	3.551	0.000	-8.261	32.876	0.000	-0.00		
	3.045	45.589	23.195	-8.805	23.195	45.589	0.000	0.00		
		-17.220	1.807	0.000	-10.918	42.667	0.000	-0.00		
	4.060	51.998	19.954	-12.046	19.954	51.998	0.000	0.00		
		-15.844	0.832	0.000	-13.848	49.316	0.000	-0.00		
	5.075	53.319	16.762	-15.238	16.762	53.319	0.000	0.00		
		-15.502	0.000	-0.266	-16.931	52.465	0.000	-0.00		
	6.090	52.171	12.173	-19.827	13.678	50.007	0.000	0.00		
		-16.137	0.000	-1.353	-19.827	52.171	0.000	-0.00		
	7.105	46.670	9.076	-22.924	10.791	43.314	0.000	0.00		
-17.857		0.000	-2.488	-22.924	46.670	0.000	-0.00			
8.120	36.893	6.756	-25.244	8.152	33.607	0.000	0.00			
	-20.944	0.000	-4.037	-25.906	36.822	0.000	-0.00			
9.135	24.541	4.164	-27.836	5.729	21.857	0.000	0.00			
	-26.185	0.000	-6.512	-28.612	23.671	0.000	-0.00			
9	0.000	10.668	1.940	-4.366	31.103	6.955	0.000	0.00		
		-35.238	10.871	-11.909	-30.864	8.743	0.000	0.00		
	1.015	23.503	27.834	-4.166	28.863	22.357	0.000	0.00		
		-26.452	6.904	0.000	-6.644	22.613	0.000	-0.00		
	2.030	36.191	25.219	-6.781	26.167	36.042	0.000	0.00		
		-20.551	3.830	0.000	-9.107	33.491	0.000	-0.00		
	3.045	46.442	23.194	-8.806	23.194	46.442	0.000	0.00		
		-17.875	1.727	0.000	-11.682	42.350	0.000	-0.00		
	4.060	52.469	20.101	-11.899	20.101	52.469	0.000	0.00		
		-16.585	0.000	-0.202	-14.321	48.663	0.000	-0.00		
	5.075	53.767	17.009	-14.991	17.009	53.767	0.000	0.00		
		-16.902	0.000	-0.593	-17.059	52.339	0.000	-0.00		
	6.090	52.754	12.263	-19.737	13.973	50.626	0.000	0.00		
		-18.217	0.000	-2.110	-19.737	52.754	0.000	-0.00		
	7.105	50.048	9.720	-22.280	11.238	44.643	0.000	0.00		
-20.706		0.000	-4.176	-22.280	50.048	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
9	8.120	44.908	8.121	-24.574	8.742	36.172	0.000	0.00
		-24.945	0.000	-4.176	-24.574	44.908	0.000	-0.00
	9.135	39.434	6.319	-25.681	6.449	25.957	0.000	0.00
10	10.150	-31.493	0.000	-7.140	-26.484	38.619	0.000	-0.00
		0.000	27.157	3.393	-12.660	31.985	0.000	-0.174
	1.015	-40.798	14.944	-11.144	-31.978	0.000	-0.150	0.00
		21.644	29.631	-2.369	30.266	15.837	0.000	0.00
	2.030	-27.579	10.130	0.000	-12.660	14.307	0.000	-0.00
		36.038	27.562	-4.438	28.070	31.915	0.000	0.00
	3.045	-20.558	3.359	0.000	-12.660	1.457	0.000	-0.00
		48.399	25.188	-6.812	25.461	46.458	0.000	0.00
	4.060	-21.003	0.000	-4.176	-12.660	0.000	-11.393	-0.00
		57.899	22.493	-9.507	22.621	57.117	0.000	0.00
	5.075	-29.640	0.000	-11.774	-12.660	0.000	-24.243	-0.00
		64.881	19.216	-12.784	19.817	61.830	0.000	0.00
	6.090	-41.590	0.000	-11.774	-12.784	64.881	0.000	-0.00
		66.254	15.681	-16.319	16.808	61.678	0.000	0.00
	7.105	-53.541	0.000	-11.774	-16.319	66.254	0.000	-0.00
61.080		11.941	-20.059	13.580	56.087	0.000	0.00	
8.120	-65.492	0.000	-11.774	-20.059	61.080	0.000	-0.00	
	48.626	8.046	-23.954	10.130	44.396	0.000	0.00	
9.135	-77.442	0.000	-11.774	-23.954	48.626	0.000	-0.00	
	28.370	4.049	-27.951	6.454	25.929	0.000	0.00	
11	10.150	-89.393	0.000	-11.774	-27.951	28.370	0.000	-0.00
		0.000	0.000	-16.319	32.000	0.000	-101.344	0.00
	0.317	-101.344	32.000	-12.660	-31.959	0.000	0.000	0.00
		0.000	0.000	-0.000	32.000	0.000	-91.209	0.00
	0.633	-91.209	32.000	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	32.000	0.000	-81.075	0.00
	0.950	-81.075	32.000	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	32.000	0.000	-70.941	0.00
	1.267	-70.941	32.000	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	32.000	0.000	-60.806	0.00
	1.583	-60.806	32.000	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	32.000	0.000	-50.672	0.00
	1.900	-50.672	32.000	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	32.000	0.000	-40.538	0.00
	2.217	-40.538	32.000	0.000	-0.000	0.000	0.000	-0.00
0.000		0.000	-0.000	32.000	0.000	-30.403	0.00	
2.534	-30.403	32.000	0.000	-0.000	0.000	0.000	-0.00	
	0.000	0.000	-0.000	32.000	0.000	-20.269	0.00	
2.850	-20.269	32.000	0.000	-0.000	0.000	0.000	-0.00	
	0.000	0.000	-0.000	32.000	0.000	-10.134	0.00	
3.167	-10.134	32.000	0.000	-0.000	0.000	0.000	-0.00	
	0.000	0.000	0.000	32.000	0.000	0.000	0.00	
		-0.000	0.000	-0.000	0.000	-0.000	-0.00	

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.239	-45.991
3	17.741	-32.126
4	5.299	-27.793
5	3.774	-30.232
6	6.450	-28.489
7	6.450	-28.489
8	3.774	-30.232
9	5.299	-27.793
10	16.053	-32.126
11	2.239	-44.660
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

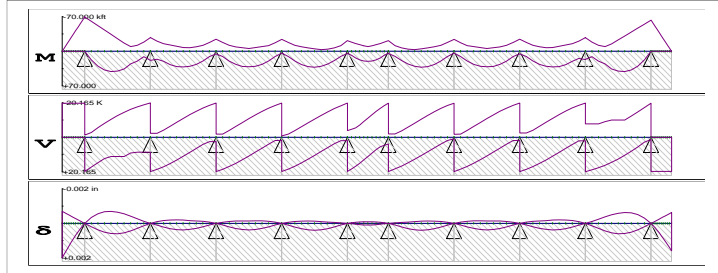


Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 2F1  
Type: Truck

Factors:

Moment: 1.000  
Shear: 1.000  
Deflection: 1.000



Span	Location (ft)	MOMENT (kft)		Corresponding Shear (K)		SHEAR (K)		Corresponding Moment (kft)		DEFLECT (in)	
		(max)	(min)	(+)	(-)	(max)	(min)	(+)	(-)	(max)	(min)
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	0.350	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-7.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	0.700	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-14.000	0.000	0.000	-20.000	-20.000	0.000	0.000	-1.900	-0.00	-0.00
	1.050	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-21.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.400	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-28.000	0.000	0.000	-20.000	-20.000	0.000	0.000	-7.000	-0.00	-0.00
	1.750	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-35.000	0.000	0.000	-20.000	-20.000	0.000	0.000	-2.600	-0.00	-0.00
	2.100	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-42.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
2.450	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-49.000	0.000	0.000	-20.000	-20.000	0.000	0.000	-7.000	-0.00	-0.00	
2.800	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-56.000	0.000	0.000	-20.000	-20.000	0.000	0.000	-3.300	-0.00	-0.00	
3.150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-63.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00	
3.500											
2	0.000	0.000	0.000	-1.364	20.040	0.000	-0.000	0.00	0.00		
		-70.000	11.328	-20.000	-20.000	0.000	-7.000	0.00	0.00		
	1.015	17.731	17.469	-2.531	17.469	17.731	0.000	0.00	0.00		
		-61.124	8.745	0.000	-2.870	17.387	0.000	-0.00	-0.00		
	2.030	30.391	14.971	-5.029	14.971	30.391	0.000	0.00	0.00		
		-52.248	8.745	0.000	-5.634	29.162	0.000	-0.00	-0.00		
	3.045	38.175	12.537	-7.463	12.537	38.175	0.000	0.00	0.00		
		-43.373	8.745	0.000	-8.212	35.896	0.000	-0.00	-0.00		
	4.060	41.409	10.199	-9.801	11.328	0.000	-24.007	0.00	0.00		
		-34.497	8.745	0.000	-10.590	38.206	0.000	-0.00	-0.00		
	5.075	40.550	7.990	-12.010	11.328	0.000	-12.508	0.00	0.00		
		-25.621	8.745	0.000	-12.757	36.758	0.000	-0.00	-0.00		
	6.090	36.187	5.942	-14.058	11.328	0.000	-1.010	0.00	0.00		
		-16.745	8.745	0.000	-14.702	32.267	0.000	-0.00	-0.00		
7.105	25.781	7.703	-12.297	9.276	8.009	0.000	0.00	0.00			
	-9.693	0.000	-1.364	-16.412	25.493	0.000	-0.00	-0.00			
8.120	20.217	4.805	-15.195	8.745	1.006	0.000	0.00	0.00			
	-12.130	0.000	-5.429	-17.876	17.246	0.000	-0.00	-0.00			
9.135	11.119	2.164	-17.836	8.745	9.882	0.000	0.00	0.00			
	-18.584	0.000	-6.643	-19.082	8.383	0.000	-0.00	-0.00			
10.150											
3	0.000	18.758	8.745	-2.344	20.074	0.000	-0.272	0.00	0.00		
		-28.046	7.498	-13.059	-20.165	0.000	-0.483	0.00	0.00		
	1.015	16.379	0.000	-2.344	18.836	8.180	0.000	0.00	0.00		
		-20.782	6.542	0.000	-2.344	16.379	0.000	-0.00	-0.00		
	2.030	20.787	15.768	-4.232	17.274	16.628	0.000	0.00	0.00		
		-15.590	2.610	0.000	-4.232	20.787	0.000	-0.00	-0.00		
	3.045	27.592	13.464	-6.536	15.428	23.828	0.000	0.00	0.00		
		-12.941	2.610	0.000	-6.536	27.592	0.000	-0.00	-0.00		
4.060	31.386	11.141	-8.859	13.362	28.923	0.000	0.00	0.00			
	-10.292	2.610	0.000	-8.859	31.386	0.000	-0.00	-0.00			
5.075	32.042	8.856	-11.144	11.139	31.313	0.000	0.00	0.00			
	-7.643	2.610	0.000	-11.144	32.042	0.000	-0.00	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
3	6.090	30.658	8.823	-11.177	8.823	30.658	0.000	0.00
		-7.442	0.000	-1.833	-13.335	29.660	0.000	-0.00
	7.105	26.874	6.478	-13.522	6.478	26.874	0.000	0.00
		-9.302	0.000	-1.833	-15.375	24.570	0.000	-0.00
	8.120	20.134	4.166	-15.834	4.166	20.134	0.000	0.00
		-12.051	0.000	-4.964	-17.207	17.333	0.000	-0.00
9.135	10.873	1.951	-18.049	2.610	2.954	0.000	0.00	
	-18.025	0.000	-6.178	-18.776	8.736	0.000	-0.00	
4	10.150							
	0.000	5.603	2.610	-0.702	20.075	0.000	-0.289	0.00
		-24.639	7.068	-11.475	-20.083	0.000	-0.307	0.00
	1.015	10.892	18.062	-1.938	18.755	8.718	0.000	0.00
		-18.217	6.169	0.000	-1.938	2.174	0.000	-0.00
	2.030	20.185	15.877	-4.123	17.155	17.279	0.000	0.00
		-12.202	4.947	0.000	-4.123	20.185	0.000	-0.00
	3.045	27.008	13.598	-6.402	15.289	24.425	0.000	0.00
		-9.103	1.844	0.000	-6.402	27.008	0.000	-0.00
	4.060	30.934	11.285	-8.715	13.218	29.368	0.000	0.00
		-7.231	1.844	0.000	-8.715	30.934	0.000	-0.00
	5.075	31.773	8.996	-11.004	11.003	31.567	0.000	0.00
		-5.694	0.000	-1.938	-11.004	31.773	0.000	-0.00
	6.090	30.728	8.705	-11.295	8.705	30.728	0.000	0.00
		-7.660	0.000	-1.938	-13.210	29.577	0.000	-0.00
	7.105	26.805	6.385	-13.615	6.385	26.805	0.000	0.00
-9.627		0.000	-1.938	-15.274	24.636	0.000	-0.00	
8.120	20.000	4.104	-15.896	4.104	20.000	0.000	0.00	
	-11.690	0.000	-4.871	-17.136	17.479	0.000	-0.00	
9.135	10.762	1.923	-18.077	1.923	10.762	0.000	0.00	
	-17.447	0.000	-5.901	-18.738	8.876	0.000	-0.00	
5	10.150							
	0.000	4.001	1.844	-0.521	20.058	0.000	-0.252	0.00
		-24.198	6.946	-11.337	-20.078	0.000	-0.299	0.00
	1.015	10.811	18.111	-1.889	18.683	8.831	0.000	0.00
		-17.921	6.044	0.000	-1.889	10.811	0.000	-0.00
	2.030	20.128	16.003	-3.997	17.003	17.342	0.000	0.00
		-12.072	4.828	0.000	-3.997	20.128	0.000	-0.00
	3.045	27.141	13.802	-6.198	15.056	24.268	0.000	0.00
		-9.135	1.969	0.000	-6.198	27.141	0.000	-0.00
	4.060	31.400	11.555	-8.445	12.914	28.839	0.000	0.00
		-7.136	1.969	0.000	-8.445	31.400	0.000	-0.00
	5.075	32.649	9.311	-10.689	10.647	30.571	0.000	0.00
		-5.138	1.969	0.000	-10.689	32.649	0.000	-0.00
	6.090	30.828	7.118	-12.882	8.325	29.267	0.000	0.00
		-3.448	0.000	-0.874	-12.882	30.828	0.000	-0.00
	7.105	26.084	5.025	-14.975	6.019	25.015	0.000	0.00
-4.335		0.000	-0.874	-14.975	26.084	0.000	-0.00	
8.120	18.961	3.116	-16.884	3.798	18.191	0.000	0.00	
	-7.092	0.000	-3.516	-16.884	18.961	0.000	-0.00	
9.135	10.503	1.496	-18.504	1.969	2.856	0.000	0.00	
	-11.457	0.000	-8.445	-18.504	10.503	0.000	-0.00	
6	10.150							
	0.000	4.855	1.969	-0.927	20.035	0.000	-0.311	0.00
		-21.683	5.540	-10.993	-20.085	0.000	-0.356	0.00
	0.633	8.389	16.395	-3.605	18.654	6.217	0.000	0.00
		-18.638	4.781	0.000	-4.781	5.573	0.000	-0.00
	1.266	13.709	14.611	-5.389	17.032	11.953	0.000	0.00
		-15.884	4.010	0.000	-5.540	6.370	0.000	-0.00
	1.899	17.717	12.698	-7.302	15.235	16.486	0.000	0.00
		-13.412	3.214	0.000	-7.302	17.717	0.000	-0.00
	2.532	20.110	10.705	-9.295	13.312	19.476	0.000	0.00
		-11.378	3.214	0.000	-9.295	20.110	0.000	-0.00
	3.165	20.712	8.685	-11.315	11.315	20.712	0.000	0.00
		-9.656	2.699	0.000	-11.315	20.712	0.000	-0.00
	3.798	20.110	9.295	-10.705	9.295	20.110	0.000	0.00
		-11.378	0.000	-3.214	-13.312	19.476	0.000	-0.00

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.431	17.717	7.302	-12.698	7.302	17.717	0.000	0.00		
		-13.412	0.000	-3.214	-15.235	16.486	0.000	-0.00		
	5.064	13.709	5.389	-14.611	5.540	6.370	0.000	0.00		
		-15.884	0.000	-4.010	-17.032	11.953	0.000	-0.00		
5.697	8.389	3.605	-16.395	4.781	5.573	0.000	0.00			
	-18.638	0.000	-4.781	-18.654	6.217	0.000	-0.00			
7	6.330									
	0.000	4.855	0.927	-1.969	20.085	0.000	-0.356	0.00		
		-21.683	10.993	-5.540	-20.035	0.000	-0.311	0.00		
	1.015	10.503	18.504	-1.496	18.504	10.503	0.000	0.00		
		-11.457	8.445	0.000	-1.969	2.856	0.000	-0.00		
	2.030	18.961	16.884	-3.116	16.884	18.961	0.000	0.00		
		-7.092	3.516	0.000	-3.798	18.191	0.000	-0.00		
	3.045	26.084	14.975	-5.025	14.975	26.084	0.000	0.00		
		-4.335	0.874	0.000	-6.019	25.015	0.000	-0.00		
	4.060	30.828	12.882	-7.118	12.882	30.828	0.000	0.00		
		-3.448	0.874	0.000	-8.325	29.267	0.000	-0.00		
	5.075	32.649	10.689	-9.311	10.689	32.649	0.000	0.00		
		-5.138	0.000	-1.969	-10.647	30.571	0.000	-0.00		
	6.090	31.400	8.445	-11.555	8.445	31.400	0.000	0.00		
		-7.136	0.000	-1.969	-12.914	28.839	0.000	-0.00		
	7.105	27.141	6.198	-13.802	6.198	27.141	0.000	0.00		
-9.135		0.000	-1.969	-15.056	24.268	0.000	-0.00			
8.120	20.128	3.997	-16.003	3.997	20.128	0.000	0.00			
	-12.072	0.000	-4.828	-17.003	17.342	0.000	-0.00			
9.135	10.811	1.889	-18.111	1.889	10.811	0.000	0.00			
	-17.921	0.000	-6.044	-18.683	8.831	0.000	-0.00			
8	10.150									
	0.000	4.001	0.521	-1.844	20.078	0.000	-0.299	0.00		
		-24.198	11.337	-6.946	-20.058	0.000	-0.252	0.00		
	1.015	10.762	18.077	-1.923	18.738	8.876	0.000	0.00		
		-17.447	5.901	0.000	-1.923	10.762	0.000	-0.00		
	2.030	20.000	15.896	-4.104	17.136	17.479	0.000	0.00		
		-11.690	4.871	0.000	-4.104	20.000	0.000	-0.00		
	3.045	26.805	13.615	-6.385	15.274	24.636	0.000	0.00		
		-9.627	1.938	0.000	-6.385	26.805	0.000	-0.00		
	4.060	30.728	11.295	-8.705	13.210	29.577	0.000	0.00		
		-7.660	1.938	0.000	-8.705	30.728	0.000	-0.00		
	5.075	31.773	11.004	-8.996	11.004	31.773	0.000	0.00		
		-5.694	1.938	0.000	-11.003	31.567	0.000	-0.00		
	6.090	30.934	8.715	-11.285	8.715	30.934	0.000	0.00		
		-7.231	0.000	-1.844	-13.218	29.368	0.000	-0.00		
	7.105	27.008	6.402	-13.598	6.402	27.008	0.000	0.00		
-9.103		0.000	-1.844	-15.289	24.425	0.000	-0.00			
8.120	20.185	4.123	-15.877	4.123	20.185	0.000	0.00			
	-12.202	0.000	-4.947	-17.155	17.279	0.000	-0.00			
9.135	10.892	1.938	-18.062	1.938	2.174	0.000	0.00			
	-18.217	0.000	-6.169	-18.755	8.718	0.000	-0.00			
9	10.150									
	0.000	5.603	0.702	-2.610	20.083	0.000	-0.307	0.00		
		-24.639	11.475	-7.068	-20.075	0.000	-0.289	0.00		
	1.015	10.873	18.049	-1.951	18.776	8.736	0.000	0.00		
		-18.025	6.178	0.000	-2.610	2.954	0.000	-0.00		
	2.030	20.134	15.834	-4.166	17.207	17.333	0.000	0.00		
		-12.051	4.964	0.000	-4.166	20.134	0.000	-0.00		
	3.045	26.874	13.522	-6.478	15.375	24.570	0.000	0.00		
		-9.302	1.833	0.000	-6.478	26.874	0.000	-0.00		
	4.060	30.658	11.177	-8.823	13.335	29.660	0.000	0.00		
		-7.442	1.833	0.000	-8.823	30.658	0.000	-0.00		
	5.075	32.042	11.144	-8.856	11.144	32.042	0.000	0.00		
		-7.643	0.000	-2.610	-11.139	31.313	0.000	-0.00		
	6.090	31.386	8.859	-11.141	8.859	31.386	0.000	0.00		
		-10.292	0.000	-2.610	-13.362	28.923	0.000	-0.00		
	7.105	27.592	6.536	-13.464	6.536	27.592	0.000	0.00		
-12.941		0.000	-2.610	-15.428	23.828	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear(+) Shear(-) ( K )		SHEAR(max/min) ( K )		Corresponding Moment(+) Moment(-) (kft)		DEFLECT(max/min) (in)
9	8.120	20.787	4.232	-15.768	4.232	20.787	0.000	0.00		
		-15.590	0.000	-2.610	-17.274	16.628	0.000	-0.00		
	9.135	14.821	2.121	0.000	2.121	14.821	0.000	0.00		
10	10.150	-20.782	0.000	-6.542	-18.836	8.180	0.000	-0.00		
	0.000	16.973	2.121	-7.913	20.165	0.000	-0.483	0.00		
		-28.046	13.059	-7.498	-20.074	0.000	-0.272	0.00		
	1.015	11.119	17.836	-2.164	19.082	8.383	0.000	0.00		
		-18.584	6.643	0.000	-7.913	8.942	0.000	-0.00		
	2.030	20.217	15.195	-4.805	17.876	17.246	0.000	0.00		
		-12.130	5.429	0.000	-7.913	0.911	0.000	-0.00		
	3.045	25.781	12.297	-7.703	16.412	25.493	0.000	0.00		
		-9.693	1.364	0.000	-9.276	8.009	0.000	-0.00		
	4.060	36.187	14.058	-5.942	14.702	32.267	0.000	0.00		
		-15.152	0.000	-7.913	-10.194	0.000	-1.257	-0.00		
	5.075	40.550	12.010	-7.990	12.757	36.758	0.000	0.00		
		-23.183	0.000	-7.913	-10.194	0.000	-11.604	-0.00		
	6.090	41.409	9.801	-10.199	10.590	38.206	0.000	0.00		
		-31.215	0.000	-7.913	-10.199	41.409	0.000	-0.00		
	7.105	38.175	7.463	-12.537	8.212	35.896	0.000	0.00		
		-39.246	0.000	-7.913	-12.537	38.175	0.000	-0.00		
8.120	30.391	5.029	-14.971	5.634	29.162	0.000	0.00			
	-47.277	0.000	-7.913	-14.971	30.391	0.000	-0.00			
9.135	17.731	2.531	-17.469	2.870	17.387	0.000	0.00			
	-55.309	0.000	-7.913	-17.469	17.731	0.000	-0.00			
11	10.150	0.000	0.000	-10.199	20.000	0.000	-63.340	0.00		
	0.000	-63.340	20.000	-7.913	-20.040	0.000	0.000	0.00		
	0.317	0.000	0.000	-0.000	20.000	0.000	-57.006	0.00		
		-57.006	20.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	0.000	-0.000	20.000	0.000	-50.672	0.00		
		-50.672	20.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	0.000	-0.000	20.000	0.000	-44.338	0.00		
		-44.338	20.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	0.000	-0.000	20.000	0.000	-38.004	0.00		
		-38.004	20.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	0.000	-0.000	20.000	0.000	-31.670	0.00		
		-31.670	20.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	0.000	-0.000	20.000	0.000	-25.336	0.00		
		-25.336	20.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	0.000	-0.000	20.000	0.000	-19.002	0.00		
		-19.002	20.000	0.000	-0.000	0.000	0.000	-0.00		
	2.534	0.000	0.000	-0.000	20.000	0.000	-12.668	0.00		
	-12.668	20.000	0.000	-0.000	0.000	0.000	-0.00			
2.850	0.000	0.000	-0.000	20.000	0.000	-6.334	0.00			
	-6.334	20.000	0.000	-0.000	0.000	0.000	-0.00			
3.167	0.000	0.000	0.000	20.000	0.000	0.000	0.00			
	-0.000	0.000	-0.000	-0.000	0.000	0.000	-0.00			

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.364	-31.328
3	11.088	-21.665
4	3.312	-20.766
5	2.365	-20.603
6	3.939	-20.189
7	3.939	-20.189
8	2.365	-20.603
9	3.312	-20.766
10	10.033	-21.665
11	1.364	-30.194
12	0.000	-0.000

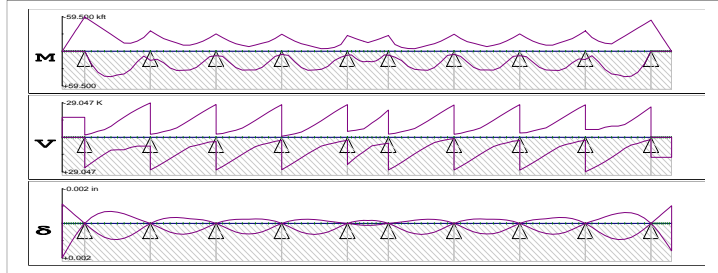
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 3F1  
 Type: Truck

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	-0.000	0.000	0.00
		-0.000	0.000	0.000	0.000	-17.000	0.000	-0.000	-0.000	-0.00	-0.00
	0.350	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-5.950	0.000	0.000	-17.000	-17.000	0.000	0.000	-5.950	-0.00	-0.00
	0.700	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-11.900	0.000	0.000	-17.000	-17.000	0.000	0.000	-3.145	-0.00	-0.00
	1.050	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-17.850	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00	-0.00
	1.400	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-23.800	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00	-0.00
	1.750	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-29.750	0.000	0.000	-17.000	-17.000	0.000	0.000	-3.740	-0.00	-0.00
	2.100	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-35.700	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00	-0.00
	2.450	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
	-41.650	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	-0.00	
2.800	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-47.600	0.000	0.000	-17.000	-17.000	0.000	0.000	-5.950	-0.00	-0.00	
3.150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-53.550	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	-0.00	
3.500											
2	0.000	0.000	0.000	-1.965	25.743	0.000	-0.000	0.000	-0.000	0.00	0.00
		-59.500	10.533	-17.000	-17.000	0.000	-5.950	0.000	-0.000	0.00	0.00
	1.015	22.074	21.748	0.000	21.748	22.074	0.000	0.000	0.000	0.00	0.00
		-51.956	7.433	0.000	-3.373	8.757	0.000	0.000	-0.000	-0.00	-0.00
	2.030	36.286	17.875	0.000	17.875	36.286	0.000	0.000	0.000	0.00	0.00
		-44.411	7.433	0.000	-5.153	13.898	0.000	0.000	-0.000	-0.00	-0.00
	3.045	43.294	14.218	-2.782	14.218	43.294	0.000	0.000	0.000	0.00	0.00
		-36.867	7.433	0.000	-6.614	16.401	0.000	0.000	-0.000	-0.00	-0.00
	4.060	43.984	10.833	-6.167	10.833	43.984	0.000	0.000	0.000	0.00	0.00
		-29.322	7.433	0.000	-9.405	31.856	0.000	0.000	-0.000	-0.00	-0.00
	5.075	41.184	4.514	-12.486	10.533	0.000	-6.043	0.000	0.000	0.00	0.00
		-21.778	7.433	0.000	-13.383	36.634	0.000	0.000	-0.000	-0.00	-0.00
	6.090	39.500	0.652	-16.348	10.533	4.649	0.000	0.000	0.000	0.00	0.00
		-14.233	7.433	0.000	-17.120	34.796	0.000	0.000	-0.000	-0.00	-0.00
	7.105	31.541	0.000	-19.990	8.600	11.889	0.000	0.000	0.000	0.00	0.00
	-13.961	0.000	-1.965	-20.588	27.290	0.000	0.000	-0.000	-0.00	-0.00	
8.120	18.422	0.000	-23.357	7.433	0.855	0.000	0.000	0.000	0.00	0.00	
	-17.620	0.000	-5.480	-23.756	15.181	0.000	0.000	-0.000	-0.00	-0.00	
9.135	8.400	7.433	0.000	7.433	8.400	0.000	0.000	0.000	0.00	0.00	
	-23.878	0.000	-6.614	-26.593	0.000	-0.340	0.000	-0.000	-0.00	-0.00	
10.150											
3	0.000	15.944	7.433	-1.992	27.515	0.000	-14.195	0.000	0.00	0.00	
		-35.443	7.099	-20.391	-29.047	0.000	-18.073	0.000	0.00	0.00	
	1.015	14.004	0.000	-2.004	24.639	1.859	0.000	0.000	0.00	0.00	
		-28.294	6.856	0.000	-3.407	9.036	0.000	0.000	-0.00	-0.00	
	2.030	19.977	19.560	0.000	21.437	14.986	0.000	0.000	0.00	0.00	
		-21.889	3.664	0.000	-4.906	12.472	0.000	0.000	-0.00	-0.00	
	3.045	29.154	16.088	-0.912	18.056	24.243	0.000	0.000	0.00	0.00	
		-18.170	3.664	0.000	-6.172	14.270	0.000	0.000	-0.00	-0.00	
4.060	33.468	12.666	-4.334	14.614	29.056	0.000	0.000	0.00	0.00		
	-14.450	3.664	0.000	-7.968	26.201	0.000	0.000	-0.00	-0.00		
5.075	32.996	9.406	-7.594	11.228	29.328	0.000	0.000	0.00	0.00		
	-10.731	3.664	0.000	-11.225	30.327	0.000	0.000	-0.00	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.090	32.613	4.241	-12.759	8.018	25.445	0.000	0.00		
		-10.722	0.000	-2.641	-14.645	30.070	0.000	-0.00		
	7.105	28.067	0.853	-16.147	6.856	13.457	0.000	0.00		
		-13.402	0.000	-2.641	-18.117	25.077	0.000	-0.00		
	8.120	18.840	0.000	-19.589	5.524	12.434	0.000	0.00		
		-17.531	0.000	-5.186	-21.532	15.443	0.000	-0.00		
	9.135	9.637	3.921	-8.079	3.921	9.637	0.000	0.00		
		-23.320	0.000	-6.172	-24.779	1.710	0.000	-0.00		
	4	10.150	7.867	3.664	-0.986	27.588	0.000	-14.901	0.00	
			-30.114	6.428	-17.912	-27.722	0.000	-15.239	0.00	
1.015		8.943	8.691	-3.309	24.609	1.902	0.000	0.00		
		-23.705	6.194	0.000	-3.309	8.943	0.000	-0.00		
2.030		18.916	19.769	0.000	21.330	15.426	0.000	0.00		
		-17.866	5.215	0.000	-4.763	12.356	0.000	-0.00		
3.045		28.296	16.292	-0.708	17.896	24.811	0.000	0.00		
		-13.091	2.652	0.000	-6.000	14.244	0.000	-0.00		
4.060		32.865	12.844	-4.156	14.427	29.569	0.000	0.00		
		-10.399	2.652	0.000	-7.833	25.856	0.000	-0.00		
5	5.075	32.613	9.540	-7.460	11.038	29.690	0.000	0.00		
		-8.221	0.000	-2.798	-11.037	29.974	0.000	-0.00		
	6.090	32.622	4.130	-12.870	7.847	25.642	0.000	0.00		
		-11.061	0.000	-2.798	-14.435	29.856	0.000	-0.00		
	7.105	27.988	0.691	-16.309	6.194	14.014	0.000	0.00		
		-13.901	0.000	-2.798	-17.914	25.047	0.000	-0.00		
	8.120	18.594	0.000	-19.777	4.938	12.345	0.000	0.00		
		-16.753	0.000	-5.035	-21.356	15.556	0.000	-0.00		
	9.135	9.113	3.455	-8.545	3.455	9.113	0.000	0.00		
		-22.295	0.000	-6.000	-24.649	1.860	0.000	-0.00		
6	10.150	5.753	2.652	-0.749	27.309	0.000	-14.340	0.00		
		-29.519	6.281	-17.708	-27.647	0.000	-15.197	0.00		
	1.015	7.408	10.051	-1.949	24.217	2.345	0.000	0.00		
		-23.271	6.053	0.000	-1.949	7.408	0.000	-0.00		
	2.030	18.795	20.174	0.000	20.844	15.513	0.000	0.00		
		-17.601	5.111	0.000	-3.097	12.157	0.000	-0.00		
	3.045	28.484	16.585	-0.415	17.354	24.374	0.000	0.00		
		-13.156	2.836	0.000	-4.549	18.702	0.000	-0.00		
	4.060	33.074	12.989	-4.011	13.882	28.588	0.000	0.00		
		-10.277	2.836	0.000	-7.395	26.650	0.000	-0.00		
7	5.075	32.624	9.563	-7.437	10.561	28.360	0.000	0.00		
		-7.399	2.836	0.000	-10.587	31.227	0.000	-0.00		
	6.090	31.361	2.965	-14.035	7.526	24.440	0.000	0.00		
		-4.521	2.836	0.000	-14.035	31.361	0.000	-0.00		
	7.105	26.384	0.000	-17.629	6.053	13.594	0.000	0.00		
		-4.913	0.000	-0.990	-17.629	26.384	0.000	-0.00		
	8.120	16.302	0.000	-21.220	4.845	12.032	0.000	0.00		
		-6.805	0.000	-2.899	-21.220	16.302	0.000	-0.00		
	9.135	10.491	1.497	-10.503	3.430	9.137	0.000	0.00		
		-11.786	0.000	-11.046	-24.631	1.930	0.000	-0.00		
8	10.150	6.991	2.836	-1.336	23.010	0.000	-5.967	0.00		
		-27.410	4.303	-19.019	-27.654	0.000	-15.296	0.00		
	0.633	6.598	6.456	-5.544	20.099	3.286	0.000	0.00		
		-24.686	4.303	0.000	-5.544	6.598	0.000	-0.00		
	1.266	12.341	15.942	-1.058	17.100	9.936	0.000	0.00		
		-22.031	3.833	0.000	-6.070	7.742	0.000	-0.00		
	1.899	16.800	12.952	-4.048	14.563	8.630	0.000	0.00		
		-19.605	3.833	0.000	-6.638	8.817	0.000	-0.00		
	2.532	18.459	10.050	-6.950	12.245	14.041	0.000	0.00		
		-17.206	3.779	0.000	-7.253	9.658	0.000	-0.00		
3.165	17.444	9.695	-7.305	9.695	17.444	0.000	0.00			
	-15.028	0.000	-3.398	-9.695	17.444	0.000	-0.00			
3.798	18.459	6.950	-10.050	7.253	9.658	0.000	0.00			
	-17.206	0.000	-3.779	-12.245	14.041	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
6	4.431	16.800	4.048	-12.952	6.638	8.817	0.000	0.00
		-19.605	0.000	-3.833	-14.563	8.630	0.000	-0.00
	5.064	12.341	1.058	-15.942	6.070	7.742	0.000	0.00
		-22.031	0.000	-3.833	-17.100	9.936	0.000	-0.00
	5.697	6.598	5.544	-6.456	5.544	6.598	0.000	0.00
		-24.686	0.000	-4.303	-20.099	3.286	0.000	-0.00
7	6.330							
	0.000	6.991	1.336	-2.836	27.654	0.000	-15.296	0.00
		-27.410	19.019	-4.303	-23.010	0.000	-5.967	0.00
	1.015	10.491	10.503	-1.497	24.631	1.930	0.000	0.00
		-11.786	11.046	0.000	-3.430	9.137	0.000	-0.00
	2.030	16.302	21.220	0.000	21.220	16.302	0.000	0.00
		-6.805	2.899	0.000	-4.845	12.032	0.000	-0.00
	3.045	26.384	17.629	0.000	17.629	26.384	0.000	0.00
		-4.913	0.990	0.000	-6.053	13.594	0.000	-0.00
	4.060	31.361	14.035	-2.965	14.035	31.361	0.000	0.00
		-4.521	0.000	-2.836	-7.526	24.440	0.000	-0.00
	5.075	32.624	7.437	-9.563	10.587	31.227	0.000	0.00
		-7.399	0.000	-2.836	-10.561	28.360	0.000	-0.00
	6.090	33.074	4.011	-12.989	7.395	26.650	0.000	0.00
		-10.277	0.000	-2.836	-13.882	28.588	0.000	-0.00
7.105	28.484	0.415	-16.585	4.549	18.702	0.000	0.00	
	-13.156	0.000	-2.836	-17.354	24.374	0.000	-0.00	
8.120	18.795	0.000	-20.174	3.097	12.157	0.000	0.00	
	-17.601	0.000	-5.111	-20.844	15.513	0.000	-0.00	
9.135	7.408	1.949	-10.051	1.949	7.408	0.000	0.00	
	-23.271	0.000	-6.053	-24.217	2.345	0.000	-0.00	
8	10.150							
	0.000	5.753	0.749	-2.652	27.647	0.000	-15.197	0.00
		-29.519	17.708	-6.281	-27.309	0.000	-14.340	0.00
	1.015	9.113	8.545	-3.455	24.649	1.860	0.000	0.00
		-22.295	6.000	0.000	-3.455	9.113	0.000	-0.00
	2.030	18.594	19.777	0.000	21.356	15.556	0.000	0.00
		-16.753	5.035	0.000	-4.938	12.345	0.000	-0.00
	3.045	27.988	16.309	-0.691	17.914	25.047	0.000	0.00
		-13.901	2.798	0.000	-6.194	14.014	0.000	-0.00
	4.060	32.622	12.870	-4.130	14.435	29.856	0.000	0.00
		-11.061	2.798	0.000	-7.847	25.642	0.000	-0.00
	5.075	32.613	7.460	-9.540	11.037	29.974	0.000	0.00
		-8.221	2.798	0.000	-11.038	29.690	0.000	-0.00
	6.090	32.865	4.156	-12.844	7.833	25.856	0.000	0.00
		-10.399	0.000	-2.652	-14.427	29.569	0.000	-0.00
7.105	28.296	0.708	-16.292	6.000	14.244	0.000	0.00	
	-13.091	0.000	-2.652	-17.896	24.811	0.000	-0.00	
8.120	18.916	0.000	-19.769	4.763	12.356	0.000	0.00	
	-17.866	0.000	-5.215	-21.330	15.426	0.000	-0.00	
9.135	8.943	3.309	-8.691	3.309	8.943	0.000	0.00	
	-23.705	0.000	-6.194	-24.609	1.902	0.000	-0.00	
9	10.150							
	0.000	7.867	0.986	-3.664	27.722	0.000	-15.239	0.00
		-30.114	17.912	-6.428	-27.588	0.000	-14.901	0.00
	1.015	9.637	8.079	-3.921	24.779	1.710	0.000	0.00
		-23.320	6.172	0.000	-3.921	9.637	0.000	-0.00
	2.030	18.840	19.589	0.000	21.532	15.443	0.000	0.00
		-17.531	5.186	0.000	-5.524	12.434	0.000	-0.00
	3.045	28.067	16.147	-0.853	18.117	25.077	0.000	0.00
		-13.402	2.641	0.000	-6.856	13.457	0.000	-0.00
	4.060	32.613	12.759	-4.241	14.645	30.070	0.000	0.00
	-10.722	2.641	0.000	-8.018	25.445	0.000	-0.00	
5.075	32.996	7.594	-9.406	11.225	30.327	0.000	0.00	
	-10.731	0.000	-3.664	-11.228	29.328	0.000	-0.00	
6.090	33.468	4.334	-12.666	7.968	26.201	0.000	0.00	
	-14.450	0.000	-3.664	-14.614	29.056	0.000	-0.00	
7.105	29.154	0.912	-16.088	6.172	14.270	0.000	0.00	
	-18.170	0.000	-3.664	-18.056	24.244	0.000	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR (max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	8.120	19.977	0.000	-19.560	4.906	12.472	0.000	0.00		
		-21.889	0.000	-3.664	-21.437	14.987	0.000	-0.00		
	9.135	13.519	1.933	0.000	3.407	9.036	0.000	0.00		
		-28.294	0.000	-6.856	-24.639	1.859	0.000	-0.00		
10	10.150	14.427	1.803	-6.726	29.047	0.000	-18.073	0.00		
	0.000	-35.443	20.391	-7.099	-27.515	0.000	-14.195	0.00		
	1.015	8.015	9.513	-2.487	26.593	0.000	-0.340	0.00		
		-23.878	6.614	0.000	-6.726	7.601	0.000	-0.00		
	2.030	18.422	23.357	0.000	23.756	15.181	0.000	0.00		
		-17.620	5.480	0.000	-6.726	0.774	0.000	-0.00		
	3.045	31.541	19.990	0.000	20.588	27.290	0.000	0.00		
		-13.961	1.965	0.000	-8.600	11.889	0.000	-0.00		
	4.060	39.500	16.348	-0.652	17.120	34.796	0.000	0.00		
		-12.879	0.000	-6.726	-9.464	3.794	0.000	-0.00		
	5.075	41.184	12.486	-4.514	13.383	36.634	0.000	0.00		
		-19.706	0.000	-6.726	-9.464	0.000	-5.811	-0.00		
	6.090	43.984	6.167	-10.833	9.405	31.856	0.000	0.00		
		-26.533	0.000	-6.726	-10.833	43.984	0.000	-0.00		
	7.105	43.294	2.782	-14.218	6.614	16.401	0.000	0.00		
		-33.359	0.000	-6.726	-14.218	43.294	0.000	-0.00		
8.120	36.286	0.000	-17.875	5.153	13.898	0.000	0.00			
	-40.186	0.000	-6.726	-17.875	36.286	0.000	-0.00			
9.135	22.074	0.000	-21.748	3.373	8.757	0.000	0.00			
	-47.012	0.000	-6.726	-21.748	22.074	0.000	-0.00			
11	10.150	0.000	0.000	-17.652	17.000	0.000	-53.839	0.00		
	0.000	-53.839	17.000	-6.726	-25.743	0.000	0.000	0.00		
	0.317	0.000	0.000	-0.000	17.000	0.000	-48.455	0.00		
		-48.455	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	0.000	-0.000	17.000	0.000	-43.071	0.00		
		-43.071	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	0.000	-0.000	17.000	0.000	-37.687	0.00		
		-37.687	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	0.000	-0.000	17.000	0.000	-32.303	0.00		
		-32.303	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	0.000	-0.000	17.000	0.000	-26.919	0.00		
		-26.919	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	0.000	-0.000	17.000	0.000	-21.536	0.00		
		-21.536	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	0.000	-0.000	17.000	0.000	-16.152	0.00		
		-16.152	17.000	0.000	-0.000	0.000	0.000	-0.00		
2.534	0.000	0.000	-0.000	17.000	0.000	-10.768	0.00			
	-10.768	17.000	0.000	-0.000	0.000	0.000	-0.00			
2.850	0.000	0.000	-0.000	17.000	0.000	-5.384	0.00			
	-5.384	17.000	0.000	-0.000	0.000	0.000	-0.00			
3.167	0.000	0.000	0.000	17.000	0.000	-0.000	0.00			
	-0.000	17.000	0.000	-0.000	0.000	-0.000	-0.00			

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.965	-40.372
3	9.425	-31.435
4	4.650	-30.356
5	3.401	-30.587
6	5.673	-29.677
7	5.673	-29.677
8	3.401	-30.587
9	4.650	-30.356
10	8.528	-31.435
11	1.965	-38.959
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

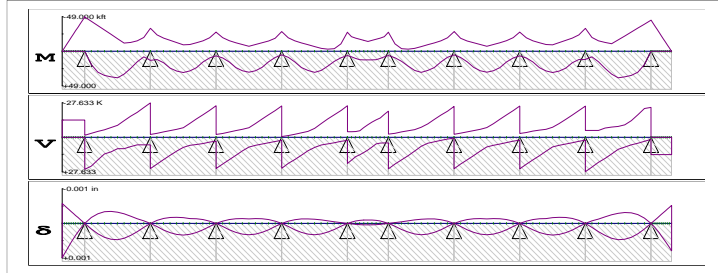


Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 4F1  
 Type: Truck

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	-0.00	-0.00
	0.350	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-4.900	0.000	0.000	-14.000	-14.000	0.000	0.000	0.000	-0.00	-0.00
	0.700	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-9.800	0.000	0.000	-14.000	-14.000	0.000	0.000	-2.590	-0.00	-0.00
	1.050	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-14.700	0.000	0.000	-14.000	-14.000	0.000	0.000	0.000	-0.00	-0.00
	1.400	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-19.600	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
	1.750	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-24.500	0.000	0.000	-14.000	-14.000	0.000	0.000	-3.080	-0.00	-0.00
	2.100	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00
		-29.400	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
	2.450	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00
	-34.300	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00	
2.800	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-39.200	0.000	0.000	-14.000	-14.000	0.000	0.000	-3.570	-0.00	-0.00	
3.150	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-44.100	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00	
3.500											
2	0.000	0.000	0.000	-1.782	25.704	0.000	-49.000	0.00	0.00	0.00	0.00
		-49.000	25.704	-14.000	-14.000	0.000	-4.900	0.00	0.00	0.00	0.00
	1.015	19.054	18.772	0.000	23.131	0.000	-18.312	0.00	0.00	0.00	0.00
		-42.787	6.121	0.000	-3.304	8.826	0.000	-0.00	-0.00	0.00	0.00
	2.030	30.041	14.799	0.000	18.166	9.296	0.000	0.00	0.00	0.00	0.00
		-36.574	6.121	0.000	-4.825	14.566	0.000	-0.00	-0.00	0.00	0.00
	3.045	34.458	11.316	-2.684	13.379	27.370	0.000	0.00	0.00	0.00	0.00
		-30.361	6.121	0.000	-6.125	17.889	0.000	-0.00	-0.00	0.00	0.00
	4.060	36.636	8.817	-5.183	11.704	5.518	0.000	0.00	0.00	0.00	0.00
		-24.148	6.121	0.000	-7.912	25.556	0.000	-0.00	-0.00	0.00	0.00
	5.075	38.027	4.527	-9.473	9.222	0.000	-2.200	0.00	0.00	0.00	0.00
		-17.935	6.121	0.000	-9.683	36.959	0.000	-0.00	-0.00	0.00	0.00
	6.090	32.766	0.576	-13.424	9.222	7.160	0.000	0.00	0.00	0.00	0.00
		-11.722	6.121	0.000	-13.456	32.572	0.000	-0.00	-0.00	0.00	0.00
	7.105	24.567	0.000	-14.897	7.515	12.865	0.000	0.00	0.00	0.00	0.00
	-12.664	0.000	-1.782	-16.978	22.312	0.000	-0.00	-0.00	0.00	0.00	
8.120	15.147	0.000	-19.445	6.121	0.704	0.000	0.00	0.00	0.00	0.00	
	-14.899	0.000	-3.734	-20.107	8.092	0.000	-0.00	-0.00	0.00	0.00	
9.135	8.121	0.889	-11.111	6.121	6.917	0.000	0.00	0.00	0.00	0.00	
	-19.810	0.000	-5.203	-23.915	0.000	-2.796	-0.00	-0.00	0.00	0.00	
10.150											
3	0.000	13.130	6.121	-1.641	25.083	0.000	-16.411	0.00	0.00	0.00	0.00
		-32.784	14.575	-20.278	-27.633	0.000	-22.598	0.00	0.00	0.00	0.00
	1.015	12.043	10.280	-1.720	21.519	0.000	-0.163	0.00	0.00	0.00	0.00
		-23.277	5.018	0.000	-3.313	8.941	0.000	-0.00	-0.00	0.00	0.00
	2.030	16.452	17.016	0.000	17.906	11.461	0.000	0.00	0.00	0.00	0.00
		-18.757	3.140	0.000	-4.466	12.472	0.000	-0.00	-0.00	0.00	0.00
	3.045	24.152	13.390	-0.610	14.420	18.290	0.000	0.00	0.00	0.00	0.00
		-15.570	3.140	0.000	-5.522	14.930	0.000	-0.00	-0.00	0.00	0.00
4.060	28.367	10.909	-3.091	11.138	20.630	0.000	0.00	0.00	0.00	0.00	
	-12.383	3.140	0.000	-6.512	16.402	0.000	-0.00	-0.00	0.00	0.00	
5.075	30.445	6.541	-7.459	8.114	19.075	0.000	0.00	0.00	0.00	0.00	
	-9.195	3.140	0.000	-7.785	19.440	0.000	-0.00	-0.00	0.00	0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)	
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)	
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)	
3	6.090	28.247	2.797	-11.203	6.508	16.073	0.000	0.00	
		-9.672	0.000	-2.382	-11.203	28.247	0.000	-0.00	
	7.105	23.594	0.168	-13.832	5.857	14.354	0.000	0.00	
		-12.090	0.000	-2.382	-14.819	21.165	0.000	-0.00	
	8.120	15.379	0.000	-17.301	5.018	12.375	0.000	0.00	
		-14.833	0.000	-3.633	-18.212	9.795	0.000	-0.00	
	9.135	9.697	3.975	-8.025	3.975	9.697	0.000	0.00	
		-19.283	0.000	-4.627	-21.682	0.000	-0.271	-0.00	
	4	10.150	6.741	3.140	-0.845	25.162	0.000	-17.246	0.00
			-27.370	12.905	-18.878	-25.384	0.000	-17.785	0.00
1.015		9.588	10.627	-1.373	21.473	0.000	-0.042	0.00	
		-19.576	4.638	0.000	-3.184	8.803	0.000	-0.00	
2.030		15.485	17.157	0.000	18.010	10.057	0.000	0.00	
		-15.166	3.680	0.000	-4.327	12.309	0.000	-0.00	
3.045		23.363	13.484	-0.516	14.600	21.113	0.000	0.00	
		-12.210	2.474	0.000	-5.404	14.786	0.000	-0.00	
4.060		27.880	10.981	-3.019	10.981	27.880	0.000	0.00	
		-9.699	2.474	0.000	-6.443	16.225	0.000	-0.00	
5.075	29.989	6.704	-7.296	7.927	19.741	0.000	0.00		
	-7.188	2.474	0.000	-7.834	19.845	0.000	-0.00		
6.090	27.846	2.936	-11.064	6.450	16.117	0.000	0.00		
	-9.634	0.000	-2.437	-11.064	27.846	0.000	-0.00		
7.105	23.205	0.391	-13.609	5.499	14.622	0.000	0.00		
	-12.107	0.000	-2.437	-14.728	20.750	0.000	-0.00		
8.120	15.180	0.000	-17.238	4.483	12.281	0.000	0.00		
	-14.580	0.000	-2.437	-18.183	9.250	0.000	-0.00		
9.135	9.017	3.372	-8.628	3.372	9.017	0.000	0.00		
	-18.495	0.000	-4.624	-21.519	0.000	-0.072	-0.00		
5	10.150	5.366	2.474	-0.698	24.870	0.000	-16.472	0.00	
		-28.168	18.439	-13.789	-25.247	0.000	-17.635	0.00	
	1.015	8.657	10.706	-1.294	20.997	2.101	0.000	0.00	
		-19.224	4.516	0.000	-1.424	6.815	0.000	-0.00	
	2.030	15.423	17.102	0.000	17.859	8.351	0.000	0.00	
		-14.909	3.617	0.000	-2.537	12.093	0.000	-0.00	
	3.045	23.246	13.423	-0.577	14.421	20.014	0.000	0.00	
		-11.962	2.578	0.000	-3.655	16.342	0.000	-0.00	
	4.060	27.517	10.680	-3.320	10.901	21.433	0.000	0.00	
		-9.345	2.578	0.000	-4.811	19.330	0.000	-0.00	
5.075	30.099	6.765	-7.235	8.184	20.583	0.000	0.00		
	-6.728	2.578	0.000	-7.293	23.387	0.000	-0.00		
6.090	27.543	2.877	-11.123	6.286	15.501	0.000	0.00		
	-4.111	2.578	0.000	-11.123	27.543	0.000	-0.00		
7.105	21.412	0.207	-13.793	5.345	14.005	0.000	0.00		
	-3.028	0.467	0.000	-14.785	20.403	0.000	-0.00		
8.120	14.472	2.387	-9.613	4.370	11.825	0.000	0.00		
	-3.690	0.000	-1.647	-18.117	9.592	0.000	-0.00		
9.135	9.373	1.337	-10.663	3.332	8.995	0.000	0.00		
	-10.583	0.000	-15.191	-21.468	0.216	0.000	-0.00		
6	10.150	6.357	2.578	-1.214	21.059	0.000	-15.959	0.00	
		-27.186	12.374	-18.117	-25.310	0.000	-18.204	0.00	
	0.633	8.124	10.237	-1.763	18.423	0.000	-5.901	0.00	
		-20.839	4.529	0.000	-4.529	2.095	0.000	-0.00	
	1.266	10.325	9.425	-2.575	15.643	0.000	-0.202	0.00	
		-18.701	2.697	0.000	-4.664	7.981	0.000	-0.00	
	1.899	12.260	8.705	-5.295	14.101	0.077	0.000	0.00	
		-17.117	2.444	0.000	-5.310	9.884	0.000	-0.00	
	2.532	12.462	7.700	-4.300	12.304	5.564	0.000	0.00	
		-15.570	2.444	0.000	-7.886	12.095	0.000	-0.00	
3.165	12.306	5.152	-6.848	10.228	9.722	0.000	0.00		
	-14.059	0.000	-2.375	-10.228	9.722	0.000	-0.00		
3.798	12.462	4.300	-7.700	7.886	12.095	0.000	0.00		
	-15.570	0.000	-2.444	-12.304	5.564	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.431	12.260	5.295	-8.705	5.310	9.884	0.000	0.00		
		-17.117	0.000	-2.444	-14.101	0.077	0.000	-0.00		
	5.064	10.325	2.575	-9.425	4.664	7.981	0.000	0.00		
		-18.701	0.000	-2.697	-15.643	0.000	-0.202	-0.00		
	5.697	8.124	1.763	-10.237	4.529	2.095	0.000	0.00		
-20.839		0.000	-4.529	-18.423	0.000	-5.901	-0.00			
7	6.330	6.357	1.214	-2.578	25.310	0.000	-18.204	0.00		
		-27.186	18.117	-12.374	-21.059	0.000	-15.959	0.00		
	1.015	9.373	10.663	-1.337	21.468	0.216	0.000	0.00		
		-10.583	15.191	0.000	-3.332	8.995	0.000	-0.00		
	2.030	14.472	9.613	-2.387	18.117	9.592	0.000	0.00		
		-3.690	1.647	0.000	-4.370	11.825	0.000	-0.00		
	3.045	21.412	13.793	-0.207	14.785	20.403	0.000	0.00		
		-3.028	0.000	-0.467	-5.345	14.005	0.000	-0.00		
	4.060	27.543	11.123	-2.877	11.123	27.543	0.000	0.00		
		-4.111	0.000	-2.578	-6.286	15.501	0.000	-0.00		
	5.075	30.099	7.235	-6.765	7.293	23.387	0.000	0.00		
		-6.728	0.000	-2.578	-8.184	20.583	0.000	-0.00		
	6.090	27.517	3.320	-10.680	4.811	19.330	0.000	0.00		
		-9.345	0.000	-2.578	-10.901	21.433	0.000	-0.00		
	7.105	23.246	0.577	-13.423	3.655	16.342	0.000	0.00		
-11.962		0.000	-2.578	-14.421	20.014	0.000	-0.00			
8.120	15.423	0.000	-17.102	2.537	12.093	0.000	0.00			
	-14.909	0.000	-3.617	-17.859	8.351	0.000	-0.00			
9.135	8.657	1.294	-10.706	1.424	6.815	0.000	0.00			
	-19.224	0.000	-4.516	-20.997	2.101	0.000	-0.00			
8	10.150	5.366	0.698	-2.474	25.247	0.000	-17.635	0.00		
		-28.168	13.789	-18.439	-24.870	0.000	-16.472	0.00		
	1.015	9.017	8.628	-3.372	21.519	0.000	-0.072	0.00		
		-18.495	4.624	0.000	-3.372	9.017	0.000	-0.00		
	2.030	15.180	17.238	0.000	18.183	9.250	0.000	0.00		
		-14.580	2.437	0.000	-4.483	12.281	0.000	-0.00		
	3.045	23.205	13.609	-0.391	14.728	20.750	0.000	0.00		
		-12.107	2.437	0.000	-5.499	14.622	0.000	-0.00		
	4.060	27.846	11.064	-2.936	11.064	27.846	0.000	0.00		
		-9.634	2.437	0.000	-6.450	16.117	0.000	-0.00		
	5.075	29.989	7.296	-6.704	7.834	19.845	0.000	0.00		
		-7.188	0.000	-2.474	-7.927	19.741	0.000	-0.00		
	6.090	27.880	3.019	-10.981	6.443	16.225	0.000	0.00		
		-9.699	0.000	-2.474	-10.981	27.880	0.000	-0.00		
	7.105	23.363	0.516	-13.484	5.404	14.786	0.000	0.00		
-12.210		0.000	-2.474	-14.600	21.113	0.000	-0.00			
8.120	15.485	0.000	-17.157	4.327	12.309	0.000	0.00			
	-15.166	0.000	-3.680	-18.010	10.057	0.000	-0.00			
9.135	9.588	1.373	-10.627	3.184	8.803	0.000	0.00			
	-19.576	0.000	-4.638	-21.473	0.000	-0.042	-0.00			
9	10.150	6.741	0.845	-3.140	25.384	0.000	-17.785	0.00		
		-27.370	18.878	-12.905	-25.162	0.000	-17.246	0.00		
	1.015	9.697	8.025	-3.975	21.682	0.000	-0.271	0.00		
		-19.283	4.627	0.000	-3.975	9.697	0.000	-0.00		
	2.030	15.379	17.301	0.000	18.212	9.795	0.000	0.00		
		-14.833	3.633	0.000	-5.018	12.375	0.000	-0.00		
	3.045	23.594	13.832	-0.168	14.819	21.165	0.000	0.00		
		-12.090	2.382	0.000	-5.857	14.354	0.000	-0.00		
	4.060	28.247	11.203	-2.797	11.203	28.247	0.000	0.00		
		-9.672	2.382	0.000	-6.508	16.073	0.000	-0.00		
	5.075	30.445	7.459	-6.541	7.785	19.440	0.000	0.00		
		-9.195	0.000	-3.140	-8.114	19.075	0.000	-0.00		
	6.090	28.367	3.091	-10.909	6.512	16.402	0.000	0.00		
		-12.383	0.000	-3.140	-11.138	20.630	0.000	-0.00		
	7.105	24.152	0.610	-13.390	5.522	14.930	0.000	0.00		
-15.570		0.000	-3.140	-14.420	18.290	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear(+) Shear(-) (K)		SHEAR(max/min) (K)		Corresponding Moment(+) Moment(-) (kft)		DEFLECT(max/min) (in)
9	8.120	16.452	0.000	-17.016	4.466	12.472	0.000	0.00		
		-18.757	0.000	-3.140	-17.906	11.461	0.000	-0.00		
	9.135	12.043	1.720	-10.280	3.313	8.941	0.000	0.00		
		-23.277	0.000	-5.018	-21.519	0.000	-0.163	-0.00		
10	10.150									
	0.000	11.881	1.485	-5.539	27.633	0.000	-22.598	0.00		
		-32.784	20.278	-14.575	-25.083	0.000	-16.411	0.00		
	1.015	8.121	11.111	-0.889	23.915	0.000	-2.796	0.00		
		-19.810	5.203	0.000	-5.539	6.259	0.000	-0.00		
	2.030	15.147	19.445	0.000	20.107	8.092	0.000	0.00		
		-14.899	3.734	0.000	-5.539	0.637	0.000	-0.00		
	3.045	24.567	14.897	0.000	16.978	22.312	0.000	0.00		
		-12.664	1.782	0.000	-7.515	12.865	0.000	-0.00		
	4.060	32.766	13.424	-0.576	13.456	32.572	0.000	0.00		
		-10.855	1.782	0.000	-8.277	6.067	0.000	-0.00		
	5.075	38.027	9.473	-4.527	9.683	36.959	0.000	0.00		
		-16.228	0.000	-5.539	-8.833	18.928	0.000	-0.00		
	6.090	36.636	5.183	-8.817	7.912	25.556	0.000	0.00		
		-21.850	0.000	-5.539	-10.036	8.072	0.000	-0.00		
	7.105	34.458	2.684	-11.316	6.125	17.889	0.000	0.00		
-27.472		0.000	-5.539	-13.379	27.370	0.000	-0.00			
8.120	30.041	0.000	-14.799	4.825	14.566	0.000	0.00			
	-33.094	0.000	-5.539	-18.166	9.296	0.000	-0.00			
9.135	19.054	0.000	-18.772	3.304	8.826	0.000	0.00			
	-38.716	0.000	-5.539	-23.131	0.000	-18.312	-0.00			
11	10.150									
	0.000	0.000	0.000	-18.284	14.000	0.000	-44.338	0.00		
		-44.338	14.000	-5.539	-24.036	0.000	-44.338	0.00		
	0.317	0.000	0.000	-0.000	14.000	0.000	-39.904	0.00		
		-39.904	14.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	0.000	-0.000	14.000	0.000	-35.470	0.00		
		-35.470	14.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	0.000	-0.000	14.000	0.000	-31.037	0.00		
		-31.037	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	0.000	-0.000	14.000	0.000	-26.603	0.00		
		-26.603	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	0.000	-0.000	14.000	0.000	-22.169	0.00		
		-22.169	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	0.000	-0.000	14.000	0.000	-17.735	0.00		
		-17.735	14.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	0.000	-0.000	14.000	0.000	-13.301	0.00		
-13.301		14.000	0.000	-0.000	0.000	0.000	-0.00			
2.534	0.000	0.000	-0.000	14.000	0.000	-8.868	0.00			
	-8.868	14.000	0.000	-0.000	0.000	0.000	-0.00			
2.850	0.000	0.000	-0.000	14.000	0.000	-4.434	0.00			
	-4.434	14.000	0.000	-0.000	0.000	0.000	-0.00			
3.167	0.000	0.000	0.000	14.000	0.000	0.000	0.00			
	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00			

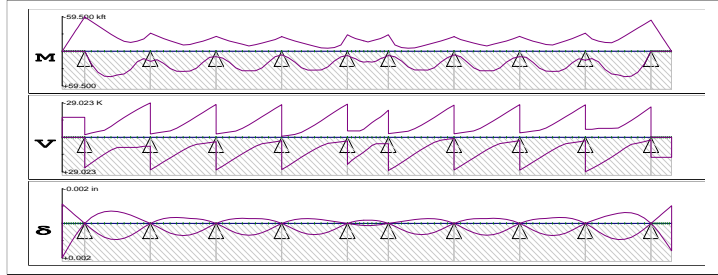
Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.782	-39.704
3	7.762	-35.635
4	3.985	-32.995
5	3.172	-33.634
6	5.149	-31.183
7	5.149	-31.183
8	3.172	-33.634
9	3.985	-32.995
10	7.023	-35.635
11	1.782	-38.037
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 5C1  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) Shear (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) Moment (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
			-0.000	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00
	0.350	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
			-5.950	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00
	0.700	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
			-11.900	0.000	0.000	-17.000	-17.000	0.000	0.000	-3.145	-0.00
	1.050	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
			-17.850	0.000	0.000	-17.000	-17.000	0.000	0.000	-1.190	-0.00
	1.400	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
			-23.800	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00
	1.750	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
			-29.750	0.000	0.000	-17.000	-17.000	0.000	0.000	-3.740	-0.00
	2.100	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
			-35.700	0.000	0.000	-17.000	-17.000	0.000	0.000	-1.785	-0.00
	2.450	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00
		-41.650	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	
2.800	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00	
		-47.600	0.000	0.000	-17.000	-17.000	0.000	0.000	-5.950	-0.00	
3.150	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00	
		-53.550	0.000	0.000	-17.000	-17.000	0.000	0.000	-2.380	-0.00	
3.500											
2	0.000	0.000	0.000	-2.164	25.743	0.000	-0.000	0.000	-0.000	0.00	0.00
			-59.500	23.372	-17.000	-17.000	0.000	-8.330	0.000	-0.00	0.00
	1.015	22.074	21.748	0.000	21.748	22.074	0.000	0.000	0.000	0.00	0.00
			-51.956	7.433	0.000	-3.667	8.458	0.000	0.000	-0.00	-0.00
	2.030	36.286	17.875	0.000	17.875	36.286	0.000	0.000	0.000	0.00	0.00
			-44.411	7.433	0.000	-4.960	14.290	0.000	0.000	-0.00	-0.00
	3.045	43.294	14.218	-2.782	14.218	43.294	0.000	0.000	0.000	0.00	0.00
			-36.867	7.433	0.000	-6.069	18.061	0.000	0.000	-0.00	-0.00
	4.060	43.984	10.833	-6.167	10.833	43.984	0.000	0.000	0.000	0.00	0.00
			-29.322	7.433	0.000	-9.235	32.546	0.000	0.000	-0.00	-0.00
	5.075	41.184	4.514	-12.486	8.579	41.184	-15.960	0.000	0.000	0.00	0.00
			-22.840	5.549	0.000	-13.090	38.119	0.000	0.000	-0.00	-0.00
	6.090	39.500	0.652	-16.348	8.579	39.500	-7.252	0.000	0.000	0.00	0.00
			-17.208	5.549	0.000	-16.753	37.033	0.000	0.000	-0.00	-0.00
	7.105	31.541	0.000	-19.990	8.579	31.541	1.456	0.000	0.000	0.00	0.00
		-15.372	0.000	-2.164	-20.195	30.087	0.000	0.000	-0.00	-0.00	
8.120	18.422	0.000	-23.357	8.579	18.422	10.164	0.000	0.000	0.00	0.00	
		-17.649	0.000	-3.570	-23.384	18.201	0.000	0.000	-0.00	-0.00	
9.135	12.815	6.735	-5.265	7.602	12.815	9.949	0.000	0.000	0.00	0.00	
		-21.411	0.000	-3.992	-26.394	1.478	0.000	0.000	-0.00	-0.00	
10.150											
3	0.000	17.665	7.602	-2.840	27.451	0.000	-13.680	0.000	0.00	0.00	0.00
			-31.449	4.759	-19.998	-29.023	0.000	-17.828	0.000	0.00	0.00
	1.015	14.783	0.000	-2.840	24.187	14.783	5.077	0.000	0.00	0.00	0.00
			-26.628	4.708	0.000	-3.798	9.433	0.000	0.000	-0.00	-0.00
	2.030	21.259	7.852	0.000	20.711	21.259	19.545	0.000	0.000	0.00	0.00
			-22.062	3.815	0.000	-4.645	12.472	0.000	0.000	-0.00	-0.00
	3.045	30.024	16.945	-0.055	17.422	30.024	27.680	0.000	0.000	0.00	0.00
			-18.206	3.795	0.000	-5.442	15.012	0.000	0.000	-0.00	-0.00
4.060	34.681	13.264	-3.736	14.112	34.681	31.350	0.000	0.000	0.00	0.00	
		-14.450	3.664	0.000	-7.739	26.665	0.000	0.000	-0.00	-0.00	
5.075	34.937	6.678	-10.322	10.901	34.937	30.589	0.000	0.000	0.00	0.00	
		-10.889	2.707	0.000	-10.833	31.522	0.000	0.000	-0.00	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR(max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT(max) (min) (in)
3	6.090	34.386	3.418	-13.582	7.909	25.917	0.000	0.00		
		-11.729	0.000	-2.889	-14.154	32.064	0.000	-0.00		
	7.105	29.354	0.000	-17.274	6.067	14.166	0.000	0.00		
		-14.661	0.000	-2.889	-17.592	27.743	0.000	-0.00		
	8.120	19.099	0.000	-20.082	5.375	12.416	0.000	0.00		
		-17.624	0.000	-3.090	-21.037	18.456	0.000	-0.00		
9.135	10.674	1.499	-10.501	4.551	10.349	0.000	0.00			
	-21.406	0.000	-3.798	-24.515	3.586	0.000	-0.00			
4	10.150									
	0.000	9.658	3.476	-2.233	27.553	0.000	-14.618	0.00		
		-25.850	4.060	-17.387	-27.690	0.000	-14.980	0.00		
	1.015	11.912	10.294	-1.706	24.332	3.889	0.000	0.00		
		-21.783	3.863	0.000	-3.659	9.336	0.000	-0.00		
	2.030	18.864	20.255	0.000	20.839	18.569	0.000	0.00		
		-17.978	2.835	0.000	-4.472	12.324	0.000	-0.00		
	3.045	29.027	17.097	0.000	17.396	27.574	0.000	0.00		
		-15.101	2.835	0.000	-5.263	14.914	0.000	-0.00		
	4.060	33.921	13.393	-3.607	13.973	31.663	0.000	0.00		
		-12.224	2.835	0.000	-7.584	26.334	0.000	-0.00		
	5.075	33.852	6.987	-10.013	10.690	31.004	0.000	0.00		
		-9.346	2.835	0.000	-10.633	31.160	0.000	-0.00		
	6.090	33.863	3.578	-13.422	7.665	26.249	0.000	0.00		
-11.574		0.000	-2.685	-13.946	31.792	0.000	-0.00			
7.105	28.973	0.000	-17.123	5.429	14.683	0.000	0.00			
	-14.318	0.000	-2.713	-17.408	27.561	0.000	-0.00			
8.120	18.848	0.000	-20.226	4.668	12.307	0.000	0.00			
	-17.160	0.000	-2.828	-20.904	18.264	0.000	-0.00			
9.135	9.584	3.863	-8.137	3.863	9.584	0.000	0.00			
	-20.377	0.000	-3.651	-24.418	3.475	0.000	-0.00			
5	10.150									
	0.000	6.527	3.009	-0.849	27.252	0.000	-14.025	0.00		
		-25.457	4.014	-17.201	-27.621	0.000	-14.986	0.00		
	1.015	11.088	10.342	-1.658	24.041	4.033	0.000	0.00		
		-21.471	3.843	0.000	-1.725	7.155	0.000	-0.00		
	2.030	19.047	20.219	0.000	20.442	19.021	0.000	0.00		
		-17.710	2.946	0.000	-2.559	14.704	0.000	-0.00		
	3.045	28.497	16.822	-0.178	16.835	27.064	0.000	0.00		
		-14.720	2.946	0.000	-4.307	20.848	0.000	-0.00		
	4.060	32.863	13.204	-3.796	13.406	30.619	0.000	0.00		
		-11.730	2.946	0.000	-7.170	28.606	0.000	-0.00		
	5.075	32.753	6.693	-10.307	10.191	29.618	0.000	0.00		
		-8.740	2.946	0.000	-10.410	32.453	0.000	-0.00		
	6.090	32.639	3.231	-13.769	7.327	25.011	0.000	0.00		
-5.993		1.970	0.000	-13.998	31.738	0.000	-0.00			
7.105	27.323	0.000	-17.394	5.250	14.060	0.000	0.00			
	-5.507	0.000	-0.504	-17.695	25.830	0.000	-0.00			
8.120	16.934	0.000	-21.006	4.551	11.904	0.000	0.00			
	-6.496	0.000	-1.026	-21.400	15.227	0.000	-0.00			
9.135	9.737	3.843	-8.157	3.843	9.737	0.000	0.00			
	-10.887	0.000	-14.034	-24.883	0.170	0.000	-0.00			
6	10.150									
	0.000	7.696	3.121	-1.470	22.927	0.000	-5.629	0.00		
		-28.580	5.460	-19.470	-27.937	0.000	-17.562	0.00		
	0.633	10.718	9.674	-2.326	19.791	4.781	0.000	0.00		
		-25.166	5.138	0.000	-5.460	2.526	0.000	-0.00		
	1.266	13.222	16.330	-0.670	17.069	0.000	-0.126	0.00		
		-22.068	3.084	0.000	-5.460	0.000	-0.930	-0.00		
	1.899	17.338	13.592	-3.408	14.937	7.382	0.000	0.00		
		-20.116	3.084	0.000	-5.460	0.000	-4.387	-0.00		
	2.532	19.079	10.589	-6.411	12.504	13.343	0.000	0.00		
		-18.164	3.084	0.000	-6.932	18.330	0.000	-0.00		
	3.165	18.032	9.242	-7.758	9.838	16.800	0.000	0.00		
-16.214		0.000	-3.069	-9.801	17.225	0.000	-0.00			
3.798	19.079	6.411	-10.589	6.932	18.330	0.000	0.00			
	-18.157	0.000	-3.069	-12.504	13.343	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		6	4.431	17.338	3.408	-13.592	5.460	0.000	-4.386	0.00
		-20.100	0.000	-3.069	-14.937	7.382	0.000	-0.00		
	5.064	13.222	0.670	-16.330	5.460	0.000	-0.930	0.00		
		-22.067	0.000	-3.126	-17.069	0.000	-0.126	-0.00		
	5.697	10.718	2.326	-9.674	5.460	2.526	0.000	0.00		
		-25.166	0.000	-5.138	-19.791	4.781	0.000	-0.00		
	6.330									
7	0.000	7.696	1.470	-3.121	27.937	0.000	-17.562	0.00		
		-28.582	19.487	-5.460	-22.927	0.000	-5.629	0.00		
	1.015	9.737	8.157	-3.843	24.883	0.170	0.000	0.00		
		-10.893	14.879	0.000	-3.843	9.737	0.000	-0.00		
	2.030	16.934	21.006	0.000	21.400	15.227	0.000	0.00		
		-6.496	1.026	0.000	-4.551	11.904	0.000	-0.00		
	3.045	27.323	17.394	0.000	17.695	25.830	0.000	0.00		
		-5.507	0.504	0.000	-5.250	14.060	0.000	-0.00		
	4.060	32.639	13.769	-3.231	13.998	31.738	0.000	0.00		
		-5.993	0.000	-1.970	-7.327	25.011	0.000	-0.00		
	5.075	32.550	10.409	-6.591	10.409	32.550	0.000	0.00		
		-8.740	0.000	-2.946	-10.191	29.618	0.000	-0.00		
	6.090	32.863	3.796	-13.204	7.170	28.606	0.000	0.00		
		-11.730	0.000	-2.946	-13.406	30.619	0.000	-0.00		
	7.105	28.497	0.178	-16.822	4.307	20.848	0.000	0.00		
		-14.720	0.000	-2.946	-16.835	27.064	0.000	-0.00		
	8.120	19.047	0.000	-20.219	2.559	14.704	0.000	0.00		
		-17.710	0.000	-2.946	-20.442	19.021	0.000	-0.00		
	9.135	11.088	1.658	-10.342	1.725	7.155	0.000	0.00		
		-21.471	0.000	-3.843	-24.041	4.033	0.000	-0.00		
	10.150									
8	0.000	6.527	0.849	-3.009	27.621	0.000	-14.986	0.00		
		-25.457	17.201	-4.014	-27.252	0.000	-14.025	0.00		
	1.015	9.584	8.137	-3.863	24.418	3.475	0.000	0.00		
		-20.377	3.651	0.000	-3.863	9.584	0.000	-0.00		
	2.030	18.848	20.226	0.000	20.904	18.264	0.000	0.00		
		-17.158	2.795	0.000	-4.668	12.307	0.000	-0.00		
	3.045	28.973	17.123	0.000	17.408	27.561	0.000	0.00		
		-14.322	2.795	0.000	-5.429	14.683	0.000	-0.00		
	4.060	33.863	13.422	-3.578	13.946	31.792	0.000	0.00		
		-11.575	2.679	0.000	-7.665	26.249	0.000	-0.00		
	5.075	33.852	10.013	-6.987	10.633	31.160	0.000	0.00		
		-9.346	0.000	-2.835	-10.690	31.004	0.000	-0.00		
	6.090	33.921	3.607	-13.393	7.584	26.334	0.000	0.00		
		-12.224	0.000	-2.835	-13.973	31.663	0.000	-0.00		
	7.105	29.027	0.000	-17.097	5.263	14.914	0.000	0.00		
		-15.101	0.000	-2.835	-17.396	27.574	0.000	-0.00		
	8.120	18.864	0.000	-20.255	4.472	12.324	0.000	0.00		
		-17.978	0.000	-2.835	-20.839	18.569	0.000	-0.00		
	9.135	11.912	1.706	-10.294	3.659	9.336	0.000	0.00		
		-21.783	0.000	-3.863	-24.332	3.889	0.000	-0.00		
	10.150									
9	0.000	9.658	2.233	-3.476	27.690	0.000	-14.980	0.00		
		-25.850	17.387	-4.060	-27.553	0.000	-14.618	0.00		
	1.015	10.674	10.501	-1.499	24.515	3.586	0.000	0.00		
		-21.406	3.798	0.000	-4.551	10.349	0.000	-0.00		
	2.030	19.099	20.082	0.000	21.037	18.456	0.000	0.00		
		-17.624	3.090	0.000	-5.375	12.416	0.000	-0.00		
	3.045	29.354	17.274	0.000	17.592	27.743	0.000	0.00		
		-14.661	2.889	0.000	-6.067	14.166	0.000	-0.00		
	4.060	34.386	13.582	-3.418	14.154	32.064	0.000	0.00		
		-11.729	2.889	0.000	-7.909	25.917	0.000	-0.00		
	5.075	34.937	10.322	-6.678	10.833	31.522	0.000	0.00		
		-10.889	0.000	-2.707	-10.901	30.589	0.000	-0.00		
	6.090	34.681	3.736	-13.264	7.739	26.665	0.000	0.00		
		-14.450	0.000	-3.664	-14.112	31.350	0.000	-0.00		
	7.105	30.024	0.055	-16.945	5.442	15.012	0.000	0.00		
		-18.206	0.000	-3.795	-17.422	27.680	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		9	8.120	19.977	0.000	-20.634	4.645	12.472	0.000	0.00
		-22.062	0.000	-3.815	-20.711	19.545	0.000	-0.00		
	9.135	13.274	2.469	0.000	3.798	9.433	0.000	0.00		
		-26.628	0.000	-4.708	-24.187	5.077	0.000	-0.00		
	10.150									
10	0.000	15.781	2.469	-6.859	29.023	0.000	-17.828	0.00		
		-31.449	19.998	-4.759	-27.451	0.000	-13.680	0.00		
	1.015	12.815	5.265	-6.735	26.394	1.478	0.000	0.00		
		-21.411	3.992	0.000	-6.859	8.819	0.000	-0.00		
	2.030	18.422	23.357	0.000	23.384	18.201	0.000	0.00		
		-17.649	3.570	0.000	-7.604	7.903	0.000	-0.00		
	3.045	31.541	19.990	0.000	20.195	30.087	0.000	0.00		
		-15.372	2.164	0.000	-7.604	0.185	0.000	-0.00		
	4.060	39.500	16.348	-0.652	16.753	37.033	0.000	0.00		
		-14.795	0.000	-4.086	-7.604	0.000	-7.533	-0.00		
	5.075	41.184	12.486	-4.514	13.090	38.119	0.000	0.00		
		-19.686	0.000	-6.719	-7.874	39.962	0.000	-0.00		
	6.090	43.984	6.167	-10.833	9.235	32.546	0.000	0.00		
		-26.506	0.000	-6.719	-10.833	43.984	0.000	-0.00		
	7.105	43.294	2.782	-14.218	6.069	18.061	0.000	0.00		
		-33.326	0.000	-6.719	-14.218	43.294	0.000	-0.00		
	8.120	36.286	0.000	-17.875	4.960	14.290	0.000	0.00		
		-40.146	0.000	-6.719	-17.875	36.286	0.000	-0.00		
	9.135	22.074	0.000	-21.748	3.667	8.458	0.000	0.00		
		-46.965	0.000	-6.719	-21.748	22.074	0.000	-0.00		
	10.150									
11	0.000	0.000	0.000	-17.652	17.000	0.000	-53.785	0.00		
		-53.839	17.000	-6.859	-25.743	0.000	0.000	0.00		
	0.317	0.000	0.000	-0.000	17.000	0.000	-48.401	0.00		
		-48.455	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	0.000	-0.000	17.000	0.000	-43.017	0.00		
		-43.071	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	0.000	-0.000	17.000	0.000	-37.633	0.00		
		-37.687	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	0.000	-0.000	17.000	0.000	-32.250	0.00		
		-32.303	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	0.000	-0.000	17.000	0.000	-26.866	0.00		
		-26.919	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	0.000	-0.000	17.000	0.000	-21.482	0.00		
		-21.536	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	0.000	-0.000	17.000	0.000	-16.098	0.00		
		-16.152	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.534	0.000	0.000	-0.000	17.000	0.000	-10.714	0.00		
		-10.768	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.850	0.000	0.000	-0.000	17.000	0.000	-5.330	0.00		
		-5.384	17.000	0.000	-0.000	0.000	0.000	-0.00		
	3.167	0.000	0.000	0.000	17.000	0.000	0.000	0.00		
		-0.000	0.000	-0.000	-0.000	0.000	0.000	-0.00		

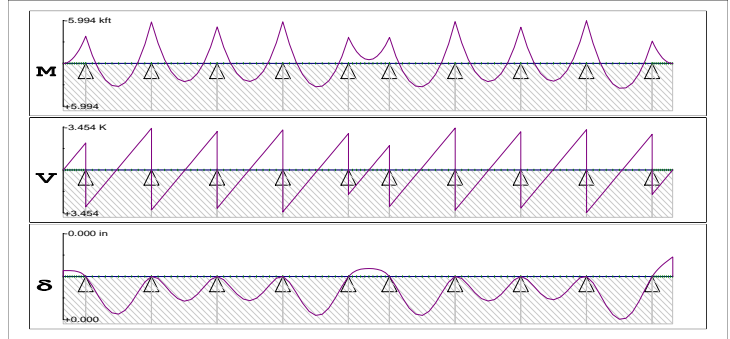
Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.164	-40.372
3	10.442	-32.001
4	5.709	-31.436
5	3.858	-31.211
6	6.208	-31.308
7	6.207	-31.309
8	3.858	-31.212
9	5.709	-31.436
10	9.329	-32.001
11	2.164	-38.946
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



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ID: Wearing Surface  
 Type: Static  
 Factor: 1.000



Span	Location (ft)	Moment (kft)	Shear (K)	Deflect (in)	Reaction (K)	
1	0.000	+0.000/ -0.000	+0.000/ -0.000	-0.00	0.000	
	0.350	-0.038	-0.219	-0.00		
	0.700	-0.153	-0.438	-0.00		
	1.050	-0.345	-0.656	-0.00		
	1.400	-0.613	-0.875	-0.00		
	1.750	-0.957	-1.094	-0.00		
	2.100	-1.378	-1.313	-0.00		
	2.450	-1.876	-1.531	-0.00		
	2.800	-2.450	-1.750	-0.00		
	3.150	-3.101	-1.969	-0.00		
	3.500					
	2	0.000	-3.828	-2.188/ +2.977	+0.00	-5.164
		1.015	-1.129	+2.342	+0.00	
		2.030	+0.927	+1.708	+0.00	
3.045		+2.339	+1.074	+0.00		
4.060		+3.107	+0.439	+0.00		
5.075		+3.230	-0.195	+0.00		
6.090		+2.711	-0.829	+0.00		
7.105		+1.547	-1.464	+0.00		
8.120		-0.261	-2.098	+0.00		
9.135		-2.713	-2.733	+0.00		
10.150						
3		0.000	-5.808	-3.367/ +3.238	+0.00	-6.605
		1.015	-2.843	+2.604	+0.00	
		2.030	-0.522	+1.970	+0.00	
	3.045	+1.155	+1.335	+0.00		
	4.060	+2.188	+0.701	+0.00		
	5.075	+2.578	+0.066	+0.00		
	6.090	+2.323	-0.568	+0.00		
	7.105	+1.425	-1.202	+0.00		
	8.120	-0.118	-1.837	+0.00		
	9.135	-2.304	-2.471	+0.00		
	10.150					
	4	0.000	-5.134	-3.105/ +3.101	+0.00	-6.207
		1.015	-2.308	+2.467	+0.00	
		2.030	-0.126	+1.832	+0.00	
3.045		+1.412	+1.198	+0.00		
4.060		+2.306	+0.564	+0.00		
5.075		+2.556	-0.071	+0.00		
6.090		+2.163	-0.705	+0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Span	Location (ft)	Moment (kft)	Shear ( K )	Deflect (in)	Reaction ( K )	
4	7.105	+1.125		-1.339	+0.00	
	8.120	-0.556		-1.974	+0.00	
	9.135	-2.882		-2.608	+0.00	
	10.150					
5	0.000	-5.851	-3.243/	+3.388	+0.00	-6.631
	1.015	-2.734		+2.754	+0.00	
	2.030	-0.261		+2.119	+0.00	
	3.045	+1.568		+1.485	+0.00	
	4.060	+2.753		+0.851	+0.00	
	5.075	+3.295		+0.216	+0.00	
	6.090	+3.192		-0.418	+0.00	
	7.105	+2.446		-1.053	+0.00	
	8.120	+1.056		-1.687	+0.00	
	9.135	-0.978		-2.321	+0.00	
	10.150					
6	0.000	-3.656	-2.956/	+1.979	+0.00	-4.935
	0.633	-2.529		+1.583	-0.00	
	1.266	-1.652		+1.188	-0.00	
	1.899	-1.025		+0.792	-0.00	
	2.532	-0.649		+0.396	-0.00	
	3.165	-0.523		+0.001	-0.00	
	3.798	-0.648		-0.395	-0.00	
	4.431	-1.023		-0.790	-0.00	
	5.064	-1.649		-1.186	-0.00	
	5.697	-2.525		-1.582	-0.00	
	6.330					
7	0.000	-3.651	-1.977/	+2.954	+0.00	-4.931
	1.015	-0.975		+2.319	+0.00	
	2.030	+1.057		+1.685	+0.00	
	3.045	+2.446		+1.051	+0.00	
	4.060	+3.190		+0.416	+0.00	
	5.075	+3.291		-0.218	+0.00	
	6.090	+2.747		-0.852	+0.00	
	7.105	+1.560		-1.487	+0.00	
	8.120	-0.271		-2.121	+0.00	
	9.135	-2.746		-2.756	+0.00	
	10.150					
8	0.000	-5.865	-3.390/	+3.249	+0.00	-6.639
	1.015	-2.889		+2.614	+0.00	
	2.030	-0.558		+1.980	+0.00	
	3.045	+1.130		+1.346	+0.00	
	4.060	+2.174		+0.711	+0.00	
	5.075	+2.574		+0.077	+0.00	
	6.090	+2.330		-0.557	+0.00	
	7.105	+1.443		-1.192	+0.00	
	8.120	-0.089		-1.826	+0.00	
	9.135	-2.264		-2.461	+0.00	
	10.150					
9	0.000	-5.084	-3.095/	+3.082	+0.00	-6.177
	1.015	-2.277		+2.448	+0.00	
	2.030	-0.115		+1.813	+0.00	
	3.045	+1.404		+1.179	+0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Span	Location (ft)	Moment (kft)	Shear ( K )	Deflect (in)	Reaction ( K )	
9	4.060	+2.279		+0.545	+0.00	
	5.075	+2.510		-0.090	+0.00	
	6.090	+2.097		-0.724	+0.00	
	7.105	+1.040		-1.358	+0.00	
	8.120	-0.661		-1.993	+0.00	
	9.135	-3.006		-2.627	+0.00	
	10.150					
10	0.000	-5.994	-3.262/	+3.454	+0.00	-6.715
	1.015	-2.811		+2.819	+0.00	
	2.030	-0.271		+2.185	+0.00	
	3.045	+1.625		+1.550	+0.00	
	4.060	+2.877		+0.916	+0.00	
	5.075	+3.484		+0.282	+0.00	
	6.090	+3.448		-0.353	+0.00	
	7.105	+2.769		-0.987	+0.00	
	8.120	+1.445		-1.621	+0.00	
	9.135	-0.523		-2.256	+0.00	
10.150						
11	0.000	-3.134	-2.890/	+1.979	+0.00	-4.869
	0.317	-2.539		+1.781	-0.00	
	0.633	-2.006		+1.583	-0.00	
	0.950	-1.536		+1.386	-0.00	
	1.267	-1.128		+1.188	-0.00	
	1.583	-0.784		+0.990	-0.00	
	1.900	-0.501		+0.792	-0.00	
	2.217	-0.282		+0.594	-0.00	
	2.534	-0.125		+0.396	-0.00	
	2.850	-0.031		+0.198	-0.00	
	3.167	+0.000/	+0.000	+0.000/	+0.000	-0.00

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



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Rev

Part Section J', Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 09-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 1.std Date/Time 29-Feb-2012 11:40

## Job Information

	Engineer	Checked	Approved
<b>Name:</b>	M Johnson	D Hoff	
<b>Date:</b>	09-Feb-12	28-Feb-12	

**Structure Type** SPACE FRAME

Number of Nodes	5	Highest Node	5
Number of Elements	4	Highest Beam	4

Number of Basic Load Cases	8
Number of Combination Load Cases	2

*Included in this printout are data for:*

<b>All</b>	The Whole Structure
------------	---------------------

*Included in this printout are results for load cases:*

Type	L/C	Name
Primary	1	DEAD LOAD
Primary	2	SOIL LOAD
Primary	3	LIVE LOAD 1
Primary	4	LIVE LOAD 2
Primary	5	LIVE LOAD 3
Primary	6	LIVE LOAD 4
Primary	7	LIVE LOAD 5
Primary	8	LIVE LOAD 6
Combination	9	DEAD AND SOIL
Combination	10	DL + SOIL POS MOM

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	0.000	0.000
2	0.000	25.980	0.000
3	37.000	25.980	0.000
4	37.000	11.000	0.000
5	0.000	17.250	0.000



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Part Section J', Frame 1

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## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	5	17.250	4	0
2	2	3	37.000	1	0
3	4	3	14.980	2	0
4	5	2	8.730	3	0

## Section Properties

Prop	Section	Area (in <sup>2</sup> )	$I_{yy}$ (in <sup>4</sup> )	$I_{zz}$ (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE
2	Rect 36.00x21.00	756.000	27.8E+3	81.6E+3	70.7E+3	CONCRETE
3	Rect 48.00x21.00	1.01E+3	37E+3	194E+3	107E+3	CONCRETE
4	Taper	1.13E+3	41.7E+3	285E+3	167E+3	CONCRETE

## Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

## Basic Load Cases

Number	Name
1	DEAD LOAD
2	SOIL LOAD
3	LIVE LOAD 1
4	LIVE LOAD 2
5	LIVE LOAD 3
6	LIVE LOAD 4
7	LIVE LOAD 5
8	LIVE LOAD 6

## Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	DEAD AND SOIL	1	DEAD LOAD	1.00
		2	SOIL LOAD	1.15
10	DL + SOIL POS MOM	1	DEAD LOAD	1.00
		2	SOIL LOAD	0.50



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Job No <b>P402110046</b>	Sheet No <b>3</b>	Rev
Part Section J', Frame 1		
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## Beam Force Detail

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	Shear		Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)
1	1:DEAD LOAD	0.000	76.674	-13.311	0.000	0.000	0.000	-1.63E+3
		1.725	74.633	-13.311	0.000	0.000	0.000	-1.36E+3
		3.450	72.592	-13.311	0.000	0.000	0.000	-1.08E+3
		5.175	70.551	-13.311	0.000	0.000	0.000	-805.432
		6.900	68.509	-13.311	0.000	0.000	0.000	-529.904
		8.625	66.468	-13.311	0.000	0.000	0.000	-254.377
		10.350	64.427	-13.311	0.000	0.000	0.000	21.151
		12.075	62.385	-13.311	0.000	0.000	0.000	296.678
		13.800	60.344	-13.311	0.000	0.000	0.000	572.206
		15.525	58.303	-13.311	0.000	0.000	0.000	847.733
		17.250	56.261	-13.311	0.000	0.000	0.000	1.12E+3
	2:SOIL LOAD	0.000	1.694	-80.939	0.000	0.000	0.000	-5.23E+3
		1.725	1.694	-69.681	0.000	0.000	0.000	-3.69E+3
		3.450	1.694	-58.418	0.000	0.000	0.000	-2.37E+3
		5.175	1.694	-47.144	0.000	0.000	0.000	-1.27E+3
		6.900	1.694	-35.892	0.000	0.000	0.000	-410.401
		8.625	1.694	-25.560	0.000	0.000	0.000	235.042
		10.350	1.694	-16.735	0.000	0.000	0.000	660.519
		12.075	1.694	-9.207	0.000	0.000	0.000	922.251
		13.800	1.694	-2.976	0.000	0.000	0.000	1.05E+3
		15.525	1.694	1.959	0.000	0.000	0.000	1.06E+3
		17.250	1.694	5.598	0.000	0.000	0.000	980.542
	3:LIVE LOAD 1	0.000	92.840	-21.603	0.000	0.000	0.000	-2.64E+3
		1.725	92.840	-21.603	0.000	0.000	0.000	-2.2E+3
		3.450	92.840	-21.603	0.000	0.000	0.000	-1.75E+3
		5.175	92.840	-21.603	0.000	0.000	0.000	-1.3E+3
		6.900	92.840	-21.603	0.000	0.000	0.000	-853.600
		8.625	92.840	-21.603	0.000	0.000	0.000	-406.419
		10.350	92.840	-21.603	0.000	0.000	0.000	40.761
		12.075	92.840	-21.603	0.000	0.000	0.000	487.942
		13.800	92.840	-21.603	0.000	0.000	0.000	935.122
		15.525	92.840	-21.603	0.000	0.000	0.000	1.38E+3
		17.250	92.840	-21.603	0.000	0.000	0.000	1.83E+3
	4:LIVE LOAD 2	0.000	64.223	-21.599	0.000	0.000	0.000	-2.64E+3
		1.725	64.223	-21.599	0.000	0.000	0.000	-2.2E+3
		3.450	64.223	-21.599	0.000	0.000	0.000	-1.75E+3
		5.175	64.223	-21.599	0.000	0.000	0.000	-1.3E+3
		6.900	64.223	-21.599	0.000	0.000	0.000	-856.068
		8.625	64.223	-21.599	0.000	0.000	0.000	-408.969
		10.350	64.223	-21.599	0.000	0.000	0.000	38.130
		12.075	64.223	-21.599	0.000	0.000	0.000	485.228
		13.800	64.223	-21.599	0.000	0.000	0.000	932.327



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Rev

Part Section J', Frame 1

Job Title Main Avenue Rating

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By M Johnson Date 09-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 1.std Date/Time 29-Feb-2012 11:40

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		15.525	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	1.38E+3	
		17.250	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	1.83E+3	
	5:LIVE LOAD 3	0.000	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	-2.79E+3	
		1.725	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	-2.32E+3	
		3.450	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	-1.84E+3	
		5.175	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	-1.37E+3	
		6.900	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	-901.151	
		8.625	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	-429.659	
		10.350	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	41.832	
		12.075	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	513.323	
		13.800	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	984.814	
		15.525	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	1.46E+3	
		17.250	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	1.93E+3	
	6:LIVE LOAD 4	0.000	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	-2.76E+3	
		1.725	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	-2.29E+3	
		3.450	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	-1.82E+3	
		5.175	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	-1.36E+3	
		6.900	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	-889.406	
		8.625	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	-422.281	
		10.350	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	44.845	
		12.075	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	511.970	
		13.800	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	979.096	
		15.525	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	1.45E+3	
		17.250	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	1.91E+3	
	7:LIVE LOAD 5	0.000	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	-2.76E+3	
		1.725	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	-2.3E+3	
		3.450	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	-1.83E+3	
		5.175	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	-1.36E+3	
		6.900	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	-895.881	
		8.625	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	-428.969	
		10.350	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	37.942	
		12.075	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	504.853	
		13.800	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	971.765	
		15.525	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	1.44E+3	
		17.250	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	1.91E+3	
	8:LIVE LOAD 6	0.000	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	-2.68E+3	
		1.725	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	-2.23E+3	
		3.450	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	-1.77E+3	
		5.175	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	-1.32E+3	
		6.900	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	-866.371	
		8.625	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	-412.570	
		10.350	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	41.231	
		12.075	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	495.032	
		13.800	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	948.834	



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Part Section J', Frame 1

Job Title Main Avenue Rating

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By M Johnson Date 09-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 1.std Date/Time 29-Feb-2012 11:40

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		15.525	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	1.4E+3	
		17.250	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	1.86E+3	
	9:DEAD AND S	0.000	78.623	-106.391	0.000	0.000	0.000	0.000	0.000	-7.65E+3	
		1.725	76.581	-93.443	0.000	0.000	0.000	0.000	0.000	-5.6E+3	
		3.450	74.540	-80.491	0.000	0.000	0.000	0.000	0.000	-3.8E+3	
		5.175	72.499	-67.527	0.000	0.000	0.000	0.000	0.000	-2.27E+3	
		6.900	70.457	-54.587	0.000	0.000	0.000	0.000	0.000	-1E+3	
		8.625	68.416	-42.704	0.000	0.000	0.000	0.000	0.000	15.922	
		10.350	66.375	-32.556	0.000	0.000	0.000	0.000	0.000	780.747	
		12.075	64.333	-23.899	0.000	0.000	0.000	0.000	0.000	1.36E+3	
		13.800	62.292	-16.733	0.000	0.000	0.000	0.000	0.000	1.77E+3	
		15.525	60.251	-11.057	0.000	0.000	0.000	0.000	0.000	2.06E+3	
		17.250	58.209	-6.873	0.000	0.000	0.000	0.000	0.000	2.25E+3	
	10:DL + SOIL F	0.000	77.521	-53.780	0.000	0.000	0.000	0.000	0.000	-4.25E+3	
		1.725	75.480	-48.151	0.000	0.000	0.000	0.000	0.000	-3.2E+3	
		3.450	73.439	-42.519	0.000	0.000	0.000	0.000	0.000	-2.26E+3	
		5.175	71.398	-36.883	0.000	0.000	0.000	0.000	0.000	-1.44E+3	
		6.900	69.356	-31.257	0.000	0.000	0.000	0.000	0.000	-735.105	
		8.625	67.315	-26.090	0.000	0.000	0.000	0.000	0.000	-136.856	
		10.350	65.274	-21.678	0.000	0.000	0.000	0.000	0.000	351.410	
		12.075	63.232	-17.914	0.000	0.000	0.000	0.000	0.000	757.804	
		13.800	61.191	-14.798	0.000	0.000	0.000	0.000	0.000	1.1E+3	
		15.525	59.150	-12.331	0.000	0.000	0.000	0.000	0.000	1.38E+3	
		17.250	57.108	-10.511	0.000	0.000	0.000	0.000	0.000	1.61E+3	
2	1:DEAD LOAD	0.000	13.311	47.074	0.000	0.000	0.000	0.000	0.000	2.52E+3	
		3.700	13.311	38.284	0.000	0.000	0.000	0.000	0.000	644.386	
		7.400	13.311	29.486	0.000	0.000	0.000	0.000	0.000	-849.278	
		11.100	13.311	20.682	0.000	0.000	0.000	0.000	0.000	-1.96E+3	
		14.800	13.311	11.872	0.000	0.000	0.000	0.000	0.000	-2.7E+3	
		18.500	13.311	3.056	0.000	0.000	0.000	0.000	0.000	-3.05E+3	
		22.200	13.311	-8.239	0.000	0.000	0.000	0.000	0.000	-2.86E+3	
		25.900	13.311	-17.069	0.000	0.000	0.000	0.000	0.000	-2.29E+3	
		29.600	13.311	-25.906	0.000	0.000	0.000	0.000	0.000	-1.33E+3	
		33.300	13.311	-34.750	0.000	0.000	0.000	0.000	0.000	4.178	
		37.000	13.311	-43.600	0.000	0.000	0.000	0.000	0.000	1.72E+3	
	2:SOIL LOAD	0.000	-8.748	1.694	0.000	0.000	0.000	0.000	0.000	111.346	
		3.700	-8.748	1.694	0.000	0.000	0.000	0.000	0.000	36.135	
		7.400	-8.748	1.694	0.000	0.000	0.000	0.000	0.000	-39.076	
		11.100	-8.748	1.694	0.000	0.000	0.000	0.000	0.000	-114.287	
		14.800	-8.748	1.694	0.000	0.000	0.000	0.000	0.000	-189.498	
		18.500	-8.748	1.694	0.000	0.000	0.000	0.000	0.000	-264.709	
		22.200	-8.748	1.694	0.000	0.000	0.000	0.000	0.000	-339.921	
		25.900	-8.748	1.694	0.000	0.000	0.000	0.000	0.000	-415.132	
		29.600	-8.748	1.694	0.000	0.000	0.000	0.000	0.000	-490.343	





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Job No  
**P402110046**

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Part Section J', Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 09-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 1.std Date/Time 29-Feb-2012 11:40

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	-8.748	1.694	0.000	0.000	0.000	0.000	0.000	-565.554	
		37.000	-8.748	1.694	0.000	0.000	0.000	0.000	0.000	-640.765	
	3:LIVE LOAD 1	0.000	21.603	92.840	0.000	0.000	0.000	0.000	0.000	4.09E+3	
		3.700	21.603	62.600	0.000	0.000	0.000	0.000	0.000	1.1E+3	
		7.400	21.603	42.440	0.000	0.000	0.000	0.000	0.000	-1.49E+3	
		11.100	21.603	27.320	0.000	0.000	0.000	0.000	0.000	-3.31E+3	
		14.800	21.603	17.240	0.000	0.000	0.000	0.000	0.000	-4.41E+3	
		18.500	21.603	-7.960	0.000	0.000	0.000	0.000	0.000	-5.03E+3	
		22.200	21.603	-13.000	0.000	0.000	0.000	0.000	0.000	-4.63E+3	
		25.900	21.603	-33.160	0.000	0.000	0.000	0.000	0.000	-3.75E+3	
		29.600	21.603	-48.280	0.000	0.000	0.000	0.000	0.000	-2.12E+3	
		33.300	21.603	-58.360	0.000	0.000	0.000	0.000	0.000	197.255	
		37.000	21.603	-58.360	0.000	0.000	0.000	0.000	0.000	2.79E+3	
	4:LIVE LOAD 2	0.000	21.599	64.223	0.000	0.000	0.000	0.000	0.000	4.09E+3	
		3.700	21.599	64.223	0.000	0.000	0.000	0.000	0.000	1.24E+3	
		7.400	21.599	54.143	0.000	0.000	0.000	0.000	0.000	-1.34E+3	
		11.100	21.599	39.023	0.000	0.000	0.000	0.000	0.000	-3.23E+3	
		14.800	21.599	18.863	0.000	0.000	0.000	0.000	0.000	-4.37E+3	
		18.500	21.599	13.823	0.000	0.000	0.000	0.000	0.000	-5.03E+3	
		22.200	21.599	-11.377	0.000	0.000	0.000	0.000	0.000	-4.67E+3	
		25.900	21.599	-21.457	0.000	0.000	0.000	0.000	0.000	-3.84E+3	
		29.600	21.599	-36.577	0.000	0.000	0.000	0.000	0.000	-2.27E+3	
		33.300	21.599	-56.737	0.000	0.000	0.000	0.000	0.000	57.491	
		37.000	21.599	-86.977	0.000	0.000	0.000	0.000	0.000	2.79E+3	
	5:LIVE LOAD 3	0.000	22.777	78.692	0.000	0.000	0.000	0.000	0.000	4.31E+3	
		3.700	22.777	73.652	0.000	0.000	0.000	0.000	0.000	981.305	
		7.400	22.777	53.492	0.000	0.000	0.000	0.000	0.000	-1.49E+3	
		11.100	22.777	38.372	0.000	0.000	0.000	0.000	0.000	-3.36E+3	
		14.800	22.777	28.292	0.000	0.000	0.000	0.000	0.000	-4.64E+3	
		18.500	22.777	3.092	0.000	0.000	0.000	0.000	0.000	-4.99E+3	
		22.200	22.777	-22.108	0.000	0.000	0.000	0.000	0.000	-4.92E+3	
		25.900	22.777	-32.188	0.000	0.000	0.000	0.000	0.000	-3.9E+3	
		29.600	22.777	-47.308	0.000	0.000	0.000	0.000	0.000	-2.32E+3	
		33.300	22.777	-67.468	0.000	0.000	0.000	0.000	0.000	-116.997	
		37.000	22.777	-72.508	0.000	0.000	0.000	0.000	0.000	2.94E+3	
	6:LIVE LOAD 4	0.000	22.566	84.808	0.000	0.000	0.000	0.000	0.000	4.28E+3	
		3.700	22.566	59.608	0.000	0.000	0.000	0.000	0.000	1.03E+3	
		7.400	22.566	49.528	0.000	0.000	0.000	0.000	0.000	-1.47E+3	
		11.100	22.566	34.408	0.000	0.000	0.000	0.000	0.000	-3.33E+3	
		14.800	22.566	14.248	0.000	0.000	0.000	0.000	0.000	-4.51E+3	
		18.500	22.566	9.208	0.000	0.000	0.000	0.000	0.000	-5.02E+3	
		22.200	22.566	-15.992	0.000	0.000	0.000	0.000	0.000	-4.77E+3	
		25.900	22.566	-26.072	0.000	0.000	0.000	0.000	0.000	-3.85E+3	
		29.600	22.566	-41.192	0.000	0.000	0.000	0.000	0.000	-2.26E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**7**

Rev

Part Section J', Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 09-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 1.std Date/Time 29-Feb-2012 11:40

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	22.566	-61.352	0.000	0.000	0.000	0.000	0.000	33.496	
		37.000	22.566	-66.392	0.000	0.000	0.000	0.000	0.000	2.91E+3	
	7:LIVE LOAD 5	0.000	22.556	72.517	0.000	0.000	0.000	0.000	0.000	4.27E+3	
		3.700	22.556	67.477	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		7.400	22.556	47.317	0.000	0.000	0.000	0.000	0.000	-1.45E+3	
		11.100	22.556	32.197	0.000	0.000	0.000	0.000	0.000	-3.3E+3	
		14.800	22.556	22.117	0.000	0.000	0.000	0.000	0.000	-4.5E+3	
		18.500	22.556	-3.083	0.000	0.000	0.000	0.000	0.000	-5.03E+3	
		22.200	22.556	-8.123	0.000	0.000	0.000	0.000	0.000	-4.79E+3	
		25.900	22.556	-28.283	0.000	0.000	0.000	0.000	0.000	-3.88E+3	
		29.600	22.556	-43.403	0.000	0.000	0.000	0.000	0.000	-2.29E+3	
		33.300	22.556	-53.483	0.000	0.000	0.000	0.000	0.000	-63.755	
		37.000	22.556	-78.683	0.000	0.000	0.000	0.000	0.000	2.92E+3	
	8:LIVE LOAD 6	0.000	21.923	58.980	0.000	0.000	0.000	0.000	0.000	4.15E+3	
		3.700	21.923	58.980	0.000	0.000	0.000	0.000	0.000	1.53E+3	
		7.400	21.923	58.980	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		11.100	21.923	42.180	0.000	0.000	0.000	0.000	0.000	-3.33E+3	
		14.800	21.923	30.980	0.000	0.000	0.000	0.000	0.000	-4.88E+3	
		18.500	21.923	2.980	0.000	0.000	0.000	0.000	0.000	-5.58E+3	
		22.200	21.923	-25.020	0.000	0.000	0.000	0.000	0.000	-5.14E+3	
		25.900	21.923	-36.220	0.000	0.000	0.000	0.000	0.000	-3.86E+3	
		29.600	21.923	-53.020	0.000	0.000	0.000	0.000	0.000	-1.88E+3	
		33.300	21.923	-53.020	0.000	0.000	0.000	0.000	0.000	475.768	
		37.000	21.923	-53.020	0.000	0.000	0.000	0.000	0.000	2.83E+3	
	9:DEAD AND S	0.000	3.250	49.022	0.000	0.000	0.000	0.000	0.000	2.65E+3	
		3.700	3.250	40.232	0.000	0.000	0.000	0.000	0.000	685.942	
		7.400	3.250	31.434	0.000	0.000	0.000	0.000	0.000	-894.215	
		11.100	3.250	22.630	0.000	0.000	0.000	0.000	0.000	-2.09E+3	
		14.800	3.250	13.820	0.000	0.000	0.000	0.000	0.000	-2.91E+3	
		18.500	3.250	5.004	0.000	0.000	0.000	0.000	0.000	-3.35E+3	
		22.200	3.250	-6.291	0.000	0.000	0.000	0.000	0.000	-3.25E+3	
		25.900	3.250	-15.121	0.000	0.000	0.000	0.000	0.000	-2.76E+3	
		29.600	3.250	-23.958	0.000	0.000	0.000	0.000	0.000	-1.9E+3	
		33.300	3.250	-32.802	0.000	0.000	0.000	0.000	0.000	-646.209	
		37.000	3.250	-41.652	0.000	0.000	0.000	0.000	0.000	984.808	
	10:DL + SOIL F	0.000	8.936	47.921	0.000	0.000	0.000	0.000	0.000	2.57E+3	
		3.700	8.936	39.130	0.000	0.000	0.000	0.000	0.000	662.454	
		7.400	8.936	30.333	0.000	0.000	0.000	0.000	0.000	-868.816	
		11.100	8.936	21.529	0.000	0.000	0.000	0.000	0.000	-2.02E+3	
		14.800	8.936	12.719	0.000	0.000	0.000	0.000	0.000	-2.79E+3	
		18.500	8.936	3.902	0.000	0.000	0.000	0.000	0.000	-3.18E+3	
		22.200	8.936	-7.392	0.000	0.000	0.000	0.000	0.000	-3.03E+3	
		25.900	8.936	-16.222	0.000	0.000	0.000	0.000	0.000	-2.49E+3	
		29.600	8.936	-25.059	0.000	0.000	0.000	0.000	0.000	-1.58E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**8**

Rev

Part Section J', Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 09-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 1.std Date/Time 29-Feb-2012 11:40

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	8.936	-33.903	0.000	0.000	0.000	0.000	0.000	-278.599	
		37.000	8.936	-42.753	0.000	0.000	0.000	0.000	0.000	1.4E+3	
3	1:DEAD LOAD	0.000	55.423	13.311	0.000	0.000	0.000	0.000	0.000	671.009	
		1.498	54.241	13.311	0.000	0.000	0.000	0.000	0.000	431.739	
		2.996	53.058	13.311	0.000	0.000	0.000	0.000	0.000	192.470	
		4.494	51.876	13.311	0.000	0.000	0.000	0.000	0.000	-46.800	
		5.992	50.694	13.311	0.000	0.000	0.000	0.000	0.000	-286.070	
		7.490	49.511	13.311	0.000	0.000	0.000	0.000	0.000	-525.339	
		8.988	48.329	13.311	0.000	0.000	0.000	0.000	0.000	-764.609	
		10.486	47.147	13.311	0.000	0.000	0.000	0.000	0.000	-1E+3	
		11.984	45.964	13.311	0.000	0.000	0.000	0.000	0.000	-1.24E+3	
		13.482	44.782	13.311	0.000	0.000	0.000	0.000	0.000	-1.48E+3	
		14.980	43.600	13.311	0.000	0.000	0.000	0.000	0.000	-1.72E+3	
	2:SOIL LOAD	0.000	-1.694	-8.748	0.000	0.000	0.000	0.000	0.000	-931.783	
		1.498	-1.694	-8.748	0.000	0.000	0.000	0.000	0.000	-774.529	
		2.996	-1.694	-8.748	0.000	0.000	0.000	0.000	0.000	-617.274	
		4.494	-1.694	-8.748	0.000	0.000	0.000	0.000	0.000	-460.019	
		5.992	-1.694	-8.748	0.000	0.000	0.000	0.000	0.000	-302.764	
		7.490	-1.694	-8.748	0.000	0.000	0.000	0.000	0.000	-145.509	
		8.988	-1.694	-8.748	0.000	0.000	0.000	0.000	0.000	11.746	
		10.486	-1.694	-8.748	0.000	0.000	0.000	0.000	0.000	169.001	
		11.984	-1.694	-8.748	0.000	0.000	0.000	0.000	0.000	326.256	
		13.482	-1.694	-8.748	0.000	0.000	0.000	0.000	0.000	483.511	
		14.980	-1.694	-8.748	0.000	0.000	0.000	0.000	0.000	640.765	
	3:LIVE LOAD 1	0.000	58.360	21.603	0.000	0.000	0.000	0.000	0.000	1.09E+3	
		1.498	58.360	21.603	0.000	0.000	0.000	0.000	0.000	706.567	
		2.996	58.360	21.603	0.000	0.000	0.000	0.000	0.000	318.233	
		4.494	58.360	21.603	0.000	0.000	0.000	0.000	0.000	-70.101	
		5.992	58.360	21.603	0.000	0.000	0.000	0.000	0.000	-458.436	
		7.490	58.360	21.603	0.000	0.000	0.000	0.000	0.000	-846.770	
		8.988	58.360	21.603	0.000	0.000	0.000	0.000	0.000	-1.24E+3	
		10.486	58.360	21.603	0.000	0.000	0.000	0.000	0.000	-1.62E+3	
		11.984	58.360	21.603	0.000	0.000	0.000	0.000	0.000	-2.01E+3	
		13.482	58.360	21.603	0.000	0.000	0.000	0.000	0.000	-2.4E+3	
		14.980	58.360	21.603	0.000	0.000	0.000	0.000	0.000	-2.79E+3	
	4:LIVE LOAD 2	0.000	86.977	21.599	0.000	0.000	0.000	0.000	0.000	1.09E+3	
		1.498	86.977	21.599	0.000	0.000	0.000	0.000	0.000	704.050	
		2.996	86.977	21.599	0.000	0.000	0.000	0.000	0.000	315.786	
		4.494	86.977	21.599	0.000	0.000	0.000	0.000	0.000	-72.477	
		5.992	86.977	21.599	0.000	0.000	0.000	0.000	0.000	-460.740	
		7.490	86.977	21.599	0.000	0.000	0.000	0.000	0.000	-849.003	
		8.988	86.977	21.599	0.000	0.000	0.000	0.000	0.000	-1.24E+3	
		10.486	86.977	21.599	0.000	0.000	0.000	0.000	0.000	-1.63E+3	
		11.984	86.977	21.599	0.000	0.000	0.000	0.000	0.000	-2.01E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**9**

Rev

Part Section J', Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 09-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 1.std Date/Time 29-Feb-2012 11:40

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		13.482	86.977	21.599	0.000	0.000	0.000	0.000	0.000	-2.4E+3	
		14.980	86.977	21.599	0.000	0.000	0.000	0.000	0.000	-2.79E+3	
	5:LIVE LOAD 3	0.000	72.508	22.777	0.000	0.000	0.000	0.000	0.000	1.15E+3	
		1.498	72.508	22.777	0.000	0.000	0.000	0.000	0.000	743.936	
		2.996	72.508	22.777	0.000	0.000	0.000	0.000	0.000	334.491	
		4.494	72.508	22.777	0.000	0.000	0.000	0.000	0.000	-74.955	
		5.992	72.508	22.777	0.000	0.000	0.000	0.000	0.000	-484.401	
		7.490	72.508	22.777	0.000	0.000	0.000	0.000	0.000	-893.846	
		8.988	72.508	22.777	0.000	0.000	0.000	0.000	0.000	-1.3E+3	
		10.486	72.508	22.777	0.000	0.000	0.000	0.000	0.000	-1.71E+3	
		11.984	72.508	22.777	0.000	0.000	0.000	0.000	0.000	-2.12E+3	
		13.482	72.508	22.777	0.000	0.000	0.000	0.000	0.000	-2.53E+3	
		14.980	72.508	22.777	0.000	0.000	0.000	0.000	0.000	-2.94E+3	
	6:LIVE LOAD 4	0.000	66.392	22.566	0.000	0.000	0.000	0.000	0.000	1.15E+3	
		1.498	66.392	22.566	0.000	0.000	0.000	0.000	0.000	740.143	
		2.996	66.392	22.566	0.000	0.000	0.000	0.000	0.000	334.488	
		4.494	66.392	22.566	0.000	0.000	0.000	0.000	0.000	-71.166	
		5.992	66.392	22.566	0.000	0.000	0.000	0.000	0.000	-476.821	
		7.490	66.392	22.566	0.000	0.000	0.000	0.000	0.000	-882.476	
		8.988	66.392	22.566	0.000	0.000	0.000	0.000	0.000	-1.29E+3	
		10.486	66.392	22.566	0.000	0.000	0.000	0.000	0.000	-1.69E+3	
		11.984	66.392	22.566	0.000	0.000	0.000	0.000	0.000	-2.1E+3	
		13.482	66.392	22.566	0.000	0.000	0.000	0.000	0.000	-2.51E+3	
		14.980	66.392	22.566	0.000	0.000	0.000	0.000	0.000	-2.91E+3	
	7:LIVE LOAD 5	0.000	78.683	22.556	0.000	0.000	0.000	0.000	0.000	1.14E+3	
		1.498	78.683	22.556	0.000	0.000	0.000	0.000	0.000	733.540	
		2.996	78.683	22.556	0.000	0.000	0.000	0.000	0.000	328.072	
		4.494	78.683	22.556	0.000	0.000	0.000	0.000	0.000	-77.397	
		5.992	78.683	22.556	0.000	0.000	0.000	0.000	0.000	-482.865	
		7.490	78.683	22.556	0.000	0.000	0.000	0.000	0.000	-888.334	
		8.988	78.683	22.556	0.000	0.000	0.000	0.000	0.000	-1.29E+3	
		10.486	78.683	22.556	0.000	0.000	0.000	0.000	0.000	-1.7E+3	
		11.984	78.683	22.556	0.000	0.000	0.000	0.000	0.000	-2.1E+3	
		13.482	78.683	22.556	0.000	0.000	0.000	0.000	0.000	-2.51E+3	
		14.980	78.683	22.556	0.000	0.000	0.000	0.000	0.000	-2.92E+3	
	8:LIVE LOAD 6	0.000	53.020	21.923	0.000	0.000	0.000	0.000	0.000	1.11E+3	
		1.498	53.020	21.923	0.000	0.000	0.000	0.000	0.000	716.906	
		2.996	53.020	21.923	0.000	0.000	0.000	0.000	0.000	322.823	
		4.494	53.020	21.923	0.000	0.000	0.000	0.000	0.000	-71.261	
		5.992	53.020	21.923	0.000	0.000	0.000	0.000	0.000	-465.344	
		7.490	53.020	21.923	0.000	0.000	0.000	0.000	0.000	-859.428	
		8.988	53.020	21.923	0.000	0.000	0.000	0.000	0.000	-1.25E+3	
		10.486	53.020	21.923	0.000	0.000	0.000	0.000	0.000	-1.65E+3	
		11.984	53.020	21.923	0.000	0.000	0.000	0.000	0.000	-2.04E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**10**

Rev

Part Section J', Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 09-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 1.std Date/Time 29-Feb-2012 11:40

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		13.482	53.020	21.923	0.000	0.000	0.000	0.000	0.000	-2.44E+3	
		14.980	53.020	21.923	0.000	0.000	0.000	0.000	0.000	-2.83E+3	
	9:DEAD AND S	0.000	53.475	3.250	0.000	0.000	0.000	0.000	0.000	-400.542	
		1.498	52.293	3.250	0.000	0.000	0.000	0.000	0.000	-458.969	
		2.996	51.110	3.250	0.000	0.000	0.000	0.000	0.000	-517.395	
		4.494	49.928	3.250	0.000	0.000	0.000	0.000	0.000	-575.822	
		5.992	48.746	3.250	0.000	0.000	0.000	0.000	0.000	-634.248	
		7.490	47.563	3.250	0.000	0.000	0.000	0.000	0.000	-692.675	
		8.988	46.381	3.250	0.000	0.000	0.000	0.000	0.000	-751.101	
		10.486	45.199	3.250	0.000	0.000	0.000	0.000	0.000	-809.528	
		11.984	44.016	3.250	0.000	0.000	0.000	0.000	0.000	-867.955	
		13.482	42.834	3.250	0.000	0.000	0.000	0.000	0.000	-926.381	
		14.980	41.652	3.250	0.000	0.000	0.000	0.000	0.000	-984.808	
	10:DL + SOIL F	0.000	54.576	8.936	0.000	0.000	0.000	0.000	0.000	205.117	
		1.498	53.394	8.936	0.000	0.000	0.000	0.000	0.000	44.475	
		2.996	52.211	8.936	0.000	0.000	0.000	0.000	0.000	-116.167	
		4.494	51.029	8.936	0.000	0.000	0.000	0.000	0.000	-276.810	
		5.992	49.847	8.936	0.000	0.000	0.000	0.000	0.000	-437.452	
		7.490	48.664	8.936	0.000	0.000	0.000	0.000	0.000	-598.094	
		8.988	47.482	8.936	0.000	0.000	0.000	0.000	0.000	-758.736	
		10.486	46.300	8.936	0.000	0.000	0.000	0.000	0.000	-919.378	
		11.984	45.117	8.936	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		13.482	43.935	8.936	0.000	0.000	0.000	0.000	0.000	-1.24E+3	
		14.980	42.753	8.936	0.000	0.000	0.000	0.000	0.000	-1.4E+3	
4	1:DEAD LOAD	0.000	56.261	-13.311	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		0.873	55.343	-13.311	0.000	0.000	0.000	0.000	0.000	1.26E+3	
		1.746	54.424	-13.311	0.000	0.000	0.000	0.000	0.000	1.4E+3	
		2.619	53.505	-13.311	0.000	0.000	0.000	0.000	0.000	1.54E+3	
		3.492	52.587	-13.311	0.000	0.000	0.000	0.000	0.000	1.68E+3	
		4.365	51.668	-13.311	0.000	0.000	0.000	0.000	0.000	1.82E+3	
		5.238	50.749	-13.311	0.000	0.000	0.000	0.000	0.000	1.96E+3	
		6.111	49.830	-13.311	0.000	0.000	0.000	0.000	0.000	2.1E+3	
		6.984	48.912	-13.311	0.000	0.000	0.000	0.000	0.000	2.24E+3	
		7.857	47.993	-13.311	0.000	0.000	0.000	0.000	0.000	2.38E+3	
		8.730	47.074	-13.311	0.000	0.000	0.000	0.000	0.000	2.52E+3	
	2:SOIL LOAD	0.000	1.694	5.598	0.000	0.000	0.000	0.000	0.000	980.542	
		0.873	1.694	6.867	0.000	0.000	0.000	0.000	0.000	914.182	
		1.746	1.694	7.837	0.000	0.000	0.000	0.000	0.000	836.618	
		2.619	1.694	8.385	0.000	0.000	0.000	0.000	0.000	751.143	
		3.492	1.694	8.755	0.000	0.000	0.000	0.000	0.000	661.086	
		4.365	1.694	8.748	0.000	0.000	0.000	0.000	0.000	569.569	
		5.238	1.694	8.748	0.000	0.000	0.000	0.000	0.000	477.925	
		6.111	1.694	8.748	0.000	0.000	0.000	0.000	0.000	386.280	
		6.984	1.694	8.748	0.000	0.000	0.000	0.000	0.000	294.635	



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Job No  
**P402110046**

Sheet No  
**11**

Rev

Part Section J', Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 09-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 1.std Date/Time 29-Feb-2012 11:40

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		7.857	1.694	8.748	0.000	0.000	0.000	0.000	0.000	202.991	
		8.730	1.694	8.748	0.000	0.000	0.000	0.000	0.000	111.346	
	3:LIVE LOAD 1	0.000	92.840	-21.603	0.000	0.000	0.000	0.000	0.000	1.83E+3	
		0.873	92.840	-21.603	0.000	0.000	0.000	0.000	0.000	2.06E+3	
		1.746	92.840	-21.603	0.000	0.000	0.000	0.000	0.000	2.28E+3	
		2.619	92.840	-21.603	0.000	0.000	0.000	0.000	0.000	2.51E+3	
		3.492	92.840	-21.603	0.000	0.000	0.000	0.000	0.000	2.73E+3	
		4.365	92.840	-21.603	0.000	0.000	0.000	0.000	0.000	2.96E+3	
		5.238	92.840	-21.603	0.000	0.000	0.000	0.000	0.000	3.19E+3	
		6.111	92.840	-21.603	0.000	0.000	0.000	0.000	0.000	3.41E+3	
		6.984	92.840	-21.603	0.000	0.000	0.000	0.000	0.000	3.64E+3	
		7.857	92.840	-21.603	0.000	0.000	0.000	0.000	0.000	3.87E+3	
		8.730	92.840	-21.603	0.000	0.000	0.000	0.000	0.000	4.09E+3	
	4:LIVE LOAD 2	0.000	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	1.83E+3	
		0.873	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	2.05E+3	
		1.746	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	2.28E+3	
		2.619	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	2.51E+3	
		3.492	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	2.73E+3	
		4.365	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	2.96E+3	
		5.238	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	3.18E+3	
		6.111	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	3.41E+3	
		6.984	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	3.64E+3	
		7.857	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	3.86E+3	
		8.730	64.223	-21.599	0.000	0.000	0.000	0.000	0.000	4.09E+3	
	5:LIVE LOAD 3	0.000	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	1.93E+3	
		0.873	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	2.17E+3	
		1.746	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	2.41E+3	
		2.619	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	2.64E+3	
		3.492	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	2.88E+3	
		4.365	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	3.12E+3	
		5.238	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	3.36E+3	
		6.111	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	3.6E+3	
		6.984	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	3.84E+3	
		7.857	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	4.08E+3	
		8.730	78.692	-22.777	0.000	0.000	0.000	0.000	0.000	4.31E+3	
	6:LIVE LOAD 4	0.000	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	1.91E+3	
		0.873	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	2.15E+3	
		1.746	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	2.39E+3	
		2.619	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	2.62E+3	
		3.492	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	2.86E+3	
		4.365	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	3.1E+3	
		5.238	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	3.33E+3	
		6.111	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	3.57E+3	
		6.984	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	3.8E+3	



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Job No  
**P402110046**

Sheet No  
**12**

Rev

Part Section J', Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 09-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 1.std Date/Time 29-Feb-2012 11:40

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		7.857	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	4.04E+3	
		8.730	84.808	-22.566	0.000	0.000	0.000	0.000	0.000	4.28E+3	
	7:LIVE LOAD 5	0.000	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	1.91E+3	
		0.873	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	2.14E+3	
		1.746	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	2.38E+3	
		2.619	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	2.61E+3	
		3.492	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	2.85E+3	
		4.365	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	3.09E+3	
		5.238	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	3.32E+3	
		6.111	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	3.56E+3	
		6.984	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	3.8E+3	
		7.857	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	4.03E+3	
		8.730	72.517	-22.556	0.000	0.000	0.000	0.000	0.000	4.27E+3	
	8:LIVE LOAD 6	0.000	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	1.86E+3	
		0.873	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	2.09E+3	
		1.746	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	2.32E+3	
		2.619	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	2.55E+3	
		3.492	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	2.78E+3	
		4.365	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	3E+3	
		5.238	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	3.23E+3	
		6.111	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	3.46E+3	
		6.984	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	3.69E+3	
		7.857	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	3.92E+3	
		8.730	58.980	-21.923	0.000	0.000	0.000	0.000	0.000	4.15E+3	
	9:DEAD AND S	0.000	58.209	-6.873	0.000	0.000	0.000	0.000	0.000	2.25E+3	
		0.873	57.291	-5.414	0.000	0.000	0.000	0.000	0.000	2.31E+3	
		1.746	56.372	-4.298	0.000	0.000	0.000	0.000	0.000	2.36E+3	
		2.619	55.453	-3.668	0.000	0.000	0.000	0.000	0.000	2.41E+3	
		3.492	54.535	-3.242	0.000	0.000	0.000	0.000	0.000	2.44E+3	
		4.365	53.616	-3.250	0.000	0.000	0.000	0.000	0.000	2.48E+3	
		5.238	52.697	-3.250	0.000	0.000	0.000	0.000	0.000	2.51E+3	
		6.111	51.778	-3.250	0.000	0.000	0.000	0.000	0.000	2.54E+3	
		6.984	50.860	-3.250	0.000	0.000	0.000	0.000	0.000	2.58E+3	
		7.857	49.941	-3.250	0.000	0.000	0.000	0.000	0.000	2.61E+3	
		8.730	49.022	-3.250	0.000	0.000	0.000	0.000	0.000	2.65E+3	
	10:DL + SOIL F	0.000	57.108	-10.511	0.000	0.000	0.000	0.000	0.000	1.61E+3	
		0.873	56.190	-9.877	0.000	0.000	0.000	0.000	0.000	1.72E+3	
		1.746	55.271	-9.392	0.000	0.000	0.000	0.000	0.000	1.82E+3	
		2.619	54.352	-9.118	0.000	0.000	0.000	0.000	0.000	1.92E+3	
		3.492	53.434	-8.933	0.000	0.000	0.000	0.000	0.000	2.01E+3	
		4.365	52.515	-8.936	0.000	0.000	0.000	0.000	0.000	2.11E+3	
		5.238	51.596	-8.936	0.000	0.000	0.000	0.000	0.000	2.2E+3	
		6.111	50.677	-8.936	0.000	0.000	0.000	0.000	0.000	2.29E+3	
		6.984	49.759	-8.936	0.000	0.000	0.000	0.000	0.000	2.39E+3	



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Job No  
**P402110046**

Sheet No  
**13**

Rev

Part Section J', Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 09-Feb-12 Chd D Hoff

Client ODOT

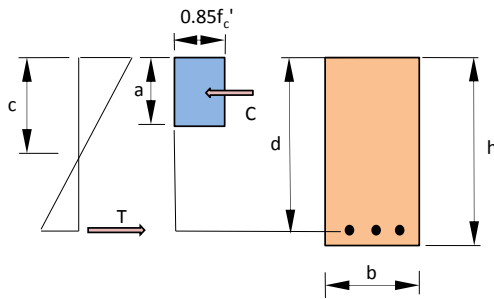
File Section J' Frame 1.std Date/Time 29-Feb-2012 11:40

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear		Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip·in)	My (kip·in)	Mz (kip·in)
		7.857	48.840	-8.936	0.000	0.000	0.000	2.48E+3
		8.730	47.921	-8.936	0.000	0.000	0.000	2.57E+3



### Floor Beam Postive Moment Section



b =	103	in
d =	48	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	14.15	in <sup>2</sup>
% Steel Loss =	0%	

(5-1 1/4" □ and  
5-1 1/8" □ from  
49/246 of  
original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	14.150	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	249.28	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	1.185	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1660.3	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

(Soil Load Moment includes 1.15 factor)

Total Service Positive Moment = 279.5 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	43	46	31.3	40.4	39.7	40.4	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	55.9	59.8	40.7	52.5	51.6	52.5	kips
Reaction per Wheel (LL+I) =	28.0	29.9	20.3	26.3	25.8	26.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

	From STAAD						
Max. Positive LL+I Moment =	465.08	497.5	338.5	437.0	429.4	437.0	ft*kips

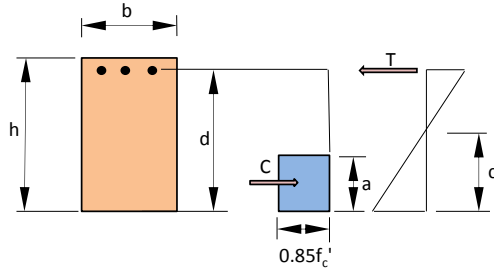
Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.20	43.2 Tons	HS24.0
Operating	HS20	36 Tons	RF=2.01	72.2 Tons	HS40.1
	2F1	15 Tons	RF=2.95	44.2 Tons	
	3F1	23 Tons	RF=2.28	52.5 Tons	
	4F1	27 Tons	RF=2.32	62.7 Tons	
	5C1	40 Tons	RF=2.28	91.3 Tons	
	Ohio Legal %	230%			

### Floor Beam Negative Moment Section

(South end of frame controls)



b =	21	in
d =	66	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	9.35	in <sup>2</sup>
% Steel Loss =	0%	

(5-1 1/8" □,  
3 -1" □) from  
49/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	9.350	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	49.50	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.85		
a =	5.762	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1460.7	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

Moment at face of column

(Soil Load Moment includes 1.15 factor)

Total Service Negative Moment = **22.3** ft\*kips From Staad

#### Live Load Moment

Moment at face of column

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Negative LL+I Moment =		<b>136.25</b>	145.8	99.2	128.0	125.8	128.0

ft\*kips

Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=4.53	163.0 Tons	HS90.5
Operating	HS20	36 Tons	RF=7.56	272.0 Tons	HS151.1
	2F1	15 Tons	RF=11.10	166.6 Tons	
	3F1	23 Tons	RF=8.60	197.9 Tons	
	4F1	27 Tons	RF=8.76	236.4 Tons	
	5C1	40 Tons	RF=8.60	344.1 Tons	
	Ohio Legal %	860%			



Made by: **MJJ** Date: **2/10/2012** Job No: **P402110046**  
 Checked by: **DBH** Date: **2/28/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Built Concrete Frame Rating Section J' (Frame 1)**

## Floor Beam Shear Section

### Section Capacity

Taken at face of column (South end of cap controls)

$A_{sh} = 0.62 \text{ in}^2$  Total Bar area per space (assumed double leg #5's)  
 $s = 12 \text{ in}$  Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed conservatively)  
 $d = 66 \text{ in}$   $d$  used for shear  
 $\alpha = 30 \text{ degrees}$  angle of shear reinforcement (30 degrees assumed)  
 $V_c = 151.8 \text{ kips}$  Shear strength provided by concrete (AASHTO 8-49)  
 $V_s = 153.7 \text{ kips}$  (AASHTO Eq. 8-54)  
 $\phi V_n = 259.7 \text{ kips}$  Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

(Soil Shear includes 1.15 factor)

Total Service Shear = **38** kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<b>78.7</b>	84.2	57.3	73.9	72.7	73.9	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.15	41.4 Tons	HS23.0
Operating	HS20	36 Tons	RF=1.92	69.2 Tons	HS38.4
	2F1	15 Tons	RF=2.82	42.4 Tons	
	3F1	23 Tons	RF=2.19	50.3 Tons	
	4F1	27 Tons	RF=2.23	60.1 Tons	
	5C1	40 Tons	RF=2.19	87.5 Tons	
	Ohio Legal %	220%			



**Column Section** (North Column at top of column controls)

h =	48	in	Column Depth
b =	21	in	Column Width
A <sub>s</sub> =	12.7	in <sup>2</sup>	Area of Tension Steel (10-1 1/8" bars)
A' <sub>s</sub> =	3	in <sup>2</sup>	Area of Compression Steel (3-1" bars)
d =	45	in	Distance from compression face to centroid of tension steel
d' =	3	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	3	ksi	Concrete Strength
f <sub>y</sub> =	33	ksi	Steel Yield Stress
E <sub>s</sub> =	29000	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	0.003	in/in	Ultimate concrete strain
β <sub>1</sub> =	0.85		
d" =	21	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads plus Soil Load** (moment taken at the top of column below chamfer)

Total Service Moment =	205.0	ft-kips	From Staad (Moment for Soil includes 1.15 load factor)
Total Service Axial Force =	50	kips	From Staad (Axial for Soil includes 1.15 load factor)

**Live Loads** (Moment taken at the top of column below chamfer)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	251.3	268.8	182.9	236.1	232.0	236.1	ft-kips	
Max. LL+I Axial Force =	78.7	84.2	53.6	101.6	77.3	80.1	kips	

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	27.73	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	32.63	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	33	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	1164.9	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	2160.8	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	3048.5	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	2133.9	kips		



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**Pure Bending Capacity** (Ignoring compression steel)

$a =$	7.826	in	$a = A_s * f_y / 0.85 * f'_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	1435.0	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	1291.5	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **21.27** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d - c) / c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c - d') / c, f_y)$	Stress in compression steel
$a =$	18.08068983	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	968.2	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	453.7	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	1479.6	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	39.14	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	235.8	247.7	181.2	285.4	232.8	238.8	kips
$M_u =$	811.7	849.8	663.4	778.7	769.9	778.7	ft-kips
$e =$	41.31	41.17	43.93	32.74	39.68	39.13	in
$\phi P_n =$	425.5	427.3	395.3	556.6	446.3	453.7	kips
$\phi M_n =$	1464.8	1465.8	1447.0	1518.6	1475.9	1479.6	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

Column Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.98	71.4 Tons	HS39.7
Operating	HS20	36 Tons	RF=3.31	119.2 Tons	HS66.2
	2F1	15 Tons	RF=4.74	71.2 Tons	
	3F1	23 Tons	RF=3.72	85.6 Tons	
	4F1	27 Tons	RF=3.79	102.4 Tons	
	5C1	40 Tons	RF=3.73	149.3 Tons	
Ohio Legal %	370%				

Floor Beam Load Rating Summary:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.15	41.4 Tons	HS23.0
Operating	HS20	36 Tons	RF=1.92	69.2 Tons	HS40.1
	2F1	15 Tons	RF=2.82	42.4 Tons	
	3F1	23 Tons	RF=2.19	50.3 Tons	
	4F1	27 Tons	RF=2.23	60.1 Tons	
	5C1	40 Tons	RF=2.19	87.5 Tons	
Ohio Legal %	220%				

Shear in Beam  
Shear in Beam  
Shear in Beam  
Shear in Beam  
Shear in Beam  
Shear in Beam



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Part Section J', Frame 10		
Ref		
By M Johnson	Date 10-Feb-12	Chd D Hoff
Client ODOT	File Section J' Frame 10.std	Date/Time 29-Feb-2012 11:41

## Job Information

	Engineer	Checked	Approved
<b>Name:</b>	M Johnson	D Hoff	
<b>Date:</b>	10-Feb-12	28-Feb-12	

**Structure Type** | SPACE FRAME

Number of Nodes	5	Highest Node	5
Number of Elements	4	Highest Beam	4

Number of Basic Load Cases	8
Number of Combination Load Cases	2

Included in this printout are data for:

<b>All</b>	The Whole Structure
------------	---------------------

Included in this printout are results for load cases:

Type	L/C	Name
Primary	1	DEAD LOAD
Primary	2	SOIL LOAD
Primary	3	LIVE LOAD 1
Primary	4	LIVE LOAD 2
Primary	5	LIVE LOAD 3
Primary	6	LIVE LOAD 4
Primary	7	LIVE LOAD 5
Primary	8	LIVE LOAD 6
Combination	9	DEAD AND SOIL
Combination	10	DL + SOIL POS MOM

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	0.000	0.000
2	0.000	31.490	0.000
3	37.000	31.490	0.000
4	37.000	13.000	0.000
5	0.000	17.250	0.000



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## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	5	17.250	4	0
2	2	3	37.000	1	0
3	4	3	18.490	2	0
4	5	2	14.240	3	0

## Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE
2	Rect 36.00x21.00	756.000	27.8E+3	81.6E+3	70.7E+3	CONCRETE
3	Rect 48.00x21.00	1.01E+3	37E+3	194E+3	107E+3	CONCRETE
4	Taper	1.13E+3	41.7E+3	285E+3	167E+3	CONCRETE

## Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip'ft/deg)	rY (kip'ft/deg)	rZ (kip'ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

## Basic Load Cases

Number	Name
1	DEAD LOAD
2	SOIL LOAD
3	LIVE LOAD 1
4	LIVE LOAD 2
5	LIVE LOAD 3
6	LIVE LOAD 4
7	LIVE LOAD 5
8	LIVE LOAD 6

## Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	DEAD AND SOIL	1	DEAD LOAD	1.00
		2	SOIL LOAD	1.15
10	DL + SOIL POS MOM	1	DEAD LOAD	1.00
		2	SOIL LOAD	0.50



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## Beam Force Detail

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	Shear		Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)
1	1:DEAD LOAD	0.000	84.059	-10.075	0.000	0.000	0.000	-1.5E+3
		1.725	82.018	-10.075	0.000	0.000	0.000	-1.29E+3
		3.450	79.976	-10.075	0.000	0.000	0.000	-1.08E+3
		5.175	77.935	-10.075	0.000	0.000	0.000	-876.214
		6.900	75.894	-10.075	0.000	0.000	0.000	-667.671
		8.625	73.853	-10.075	0.000	0.000	0.000	-459.129
		10.350	71.811	-10.075	0.000	0.000	0.000	-250.587
		12.075	69.770	-10.075	0.000	0.000	0.000	-42.045
		13.800	67.729	-10.075	0.000	0.000	0.000	166.498
		15.525	65.687	-10.075	0.000	0.000	0.000	375.040
	17.250	63.646	-10.075	0.000	0.000	0.000	583.582	
	2:SOIL LOAD	0.000	1.610	-109.503	0.000	0.000	0.000	-7.08E+3
		1.725	1.610	-92.315	0.000	0.000	0.000	-5.02E+3
		3.450	1.610	-75.510	0.000	0.000	0.000	-3.29E+3
		5.175	1.610	-60.007	0.000	0.000	0.000	-1.89E+3
		6.900	1.610	-46.061	0.000	0.000	0.000	-787.265
		8.625	1.610	-33.674	0.000	0.000	0.000	49.677
		10.350	1.610	-23.067	0.000	0.000	0.000	622.184
		12.075	1.610	-14.018	0.000	0.000	0.000	997.868
		13.800	1.610	-6.527	0.000	0.000	0.000	1.21E+3
		15.525	1.610	-0.594	0.000	0.000	0.000	1.28E+3
	17.250	1.610	3.780	0.000	0.000	0.000	1.25E+3	
	3:LIVE LOAD 1	0.000	89.323	-16.013	0.000	0.000	0.000	-2.38E+3
		1.725	89.323	-16.013	0.000	0.000	0.000	-2.05E+3
		3.450	89.323	-16.013	0.000	0.000	0.000	-1.72E+3
		5.175	89.323	-16.013	0.000	0.000	0.000	-1.38E+3
		6.900	89.323	-16.013	0.000	0.000	0.000	-1.05E+3
		8.625	89.323	-16.013	0.000	0.000	0.000	-721.646
		10.350	89.323	-16.013	0.000	0.000	0.000	-390.167
		12.075	89.323	-16.013	0.000	0.000	0.000	-58.689
		13.800	89.323	-16.013	0.000	0.000	0.000	272.790
		15.525	89.323	-16.013	0.000	0.000	0.000	604.269
	17.250	89.323	-16.013	0.000	0.000	0.000	935.748	
	4:LIVE LOAD 2	0.000	61.745	-16.015	0.000	0.000	0.000	-2.38E+3
		1.725	61.745	-16.015	0.000	0.000	0.000	-2.05E+3
		3.450	61.745	-16.015	0.000	0.000	0.000	-1.72E+3
		5.175	61.745	-16.015	0.000	0.000	0.000	-1.38E+3
		6.900	61.745	-16.015	0.000	0.000	0.000	-1.05E+3
		8.625	61.745	-16.015	0.000	0.000	0.000	-720.594
		10.350	61.745	-16.015	0.000	0.000	0.000	-389.081
		12.075	61.745	-16.015	0.000	0.000	0.000	-57.568
	13.800	61.745	-16.015	0.000	0.000	0.000	273.945	





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### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		15.525	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	605.459	
		17.250	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	936.972	
	5:LIVE LOAD 3	0.000	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	-2.51E+3	
		1.725	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	-2.16E+3	
		3.450	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	-1.81E+3	
		5.175	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	-1.46E+3	
		6.900	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	-1.11E+3	
		8.625	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	-760.170	
		10.350	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	-410.620	
		12.075	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	-61.069	
		13.800	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	288.482	
		15.525	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	638.033	
		17.250	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	987.584	
	6:LIVE LOAD 4	0.000	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	-2.48E+3	
		1.725	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	-2.14E+3	
		3.450	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	-1.79E+3	
		5.175	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	-1.44E+3	
		6.900	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	-1.1E+3	
		8.625	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	-751.099	
		10.350	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	-404.802	
		12.075	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	-58.506	
		13.800	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	287.791	
		15.525	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	634.088	
		17.250	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	980.385	
	7:LIVE LOAD 5	0.000	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	-2.49E+3	
		1.725	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	-2.14E+3	
		3.450	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	-1.79E+3	
		5.175	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	-1.45E+3	
		6.900	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	-1.1E+3	
		8.625	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	-754.896	
		10.350	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	-408.724	
		12.075	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	-62.551	
		13.800	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	283.621	
		15.525	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	629.794	
		17.250	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	975.966	
	8:LIVE LOAD 6	0.000	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	-2.41E+3	
		1.725	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	-2.08E+3	
		3.450	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	-1.74E+3	
		5.175	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	-1.4E+3	
		6.900	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		8.625	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	-730.743	
		10.350	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	-394.302	
		12.075	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	-57.860	
		13.800	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	278.582	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**5**

Rev

Part Section J', Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 10-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 10.std Date/Time 29-Feb-2012 11:41

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		15.525	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	615.023	
		17.250	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	951.465	
	9:DEAD AND S	0.000	85.911	-136.003	0.000	0.000	0.000	0.000	0.000	-9.65E+3	
		1.725	83.870	-116.236	0.000	0.000	0.000	0.000	0.000	-7.06E+3	
		3.450	81.829	-96.911	0.000	0.000	0.000	0.000	0.000	-4.87E+3	
		5.175	79.787	-79.082	0.000	0.000	0.000	0.000	0.000	-3.05E+3	
		6.900	77.746	-63.045	0.000	0.000	0.000	0.000	0.000	-1.57E+3	
		8.625	75.705	-48.799	0.000	0.000	0.000	0.000	0.000	-402.001	
		10.350	73.663	-36.601	0.000	0.000	0.000	0.000	0.000	464.925	
		12.075	71.622	-26.195	0.000	0.000	0.000	0.000	0.000	1.11E+3	
		13.800	69.581	-17.581	0.000	0.000	0.000	0.000	0.000	1.56E+3	
		15.525	67.539	-10.758	0.000	0.000	0.000	0.000	0.000	1.85E+3	
		17.250	65.498	-5.727	0.000	0.000	0.000	0.000	0.000	2.02E+3	
	10:DL + SOIL F	0.000	84.864	-64.826	0.000	0.000	0.000	0.000	0.000	-5.04E+3	
		1.725	82.823	-56.232	0.000	0.000	0.000	0.000	0.000	-3.8E+3	
		3.450	80.782	-47.830	0.000	0.000	0.000	0.000	0.000	-2.73E+3	
		5.175	78.740	-40.078	0.000	0.000	0.000	0.000	0.000	-1.82E+3	
		6.900	76.699	-33.105	0.000	0.000	0.000	0.000	0.000	-1.06E+3	
		8.625	74.658	-26.911	0.000	0.000	0.000	0.000	0.000	-434.291	
		10.350	72.616	-21.608	0.000	0.000	0.000	0.000	0.000	60.505	
		12.075	70.575	-17.084	0.000	0.000	0.000	0.000	0.000	456.889	
		13.800	68.534	-13.338	0.000	0.000	0.000	0.000	0.000	770.218	
		15.525	66.493	-10.372	0.000	0.000	0.000	0.000	0.000	1.02E+3	
		17.250	64.451	-8.184	0.000	0.000	0.000	0.000	0.000	1.21E+3	
2	1:DEAD LOAD	0.000	10.075	48.660	0.000	0.000	0.000	0.000	0.000	2.31E+3	
		3.700	10.075	37.401	0.000	0.000	0.000	0.000	0.000	477.410	
		7.400	10.075	28.893	0.000	0.000	0.000	0.000	0.000	-984.006	
		11.100	10.075	20.336	0.000	0.000	0.000	0.000	0.000	-2.08E+3	
		14.800	10.075	11.730	0.000	0.000	0.000	0.000	0.000	-2.8E+3	
		18.500	10.075	3.077	0.000	0.000	0.000	0.000	0.000	-3.15E+3	
		22.200	10.075	-8.103	0.000	0.000	0.000	0.000	0.000	-2.96E+3	
		25.900	10.075	-16.861	0.000	0.000	0.000	0.000	0.000	-2.4E+3	
		29.600	10.075	-25.667	0.000	0.000	0.000	0.000	0.000	-1.45E+3	
		33.300	10.075	-34.523	0.000	0.000	0.000	0.000	0.000	-128.437	
		37.000	10.075	-46.226	0.000	0.000	0.000	0.000	0.000	1.58E+3	
	2:SOIL LOAD	0.000	-7.568	1.610	0.000	0.000	0.000	0.000	0.000	14.738	
		3.700	-7.568	1.610	0.000	0.000	0.000	0.000	0.000	-56.768	
		7.400	-7.568	1.610	0.000	0.000	0.000	0.000	0.000	-128.274	
		11.100	-7.568	1.610	0.000	0.000	0.000	0.000	0.000	-199.780	
		14.800	-7.568	1.610	0.000	0.000	0.000	0.000	0.000	-271.286	
		18.500	-7.568	1.610	0.000	0.000	0.000	0.000	0.000	-342.791	
		22.200	-7.568	1.610	0.000	0.000	0.000	0.000	0.000	-414.297	
		25.900	-7.568	1.610	0.000	0.000	0.000	0.000	0.000	-485.803	
		29.600	-7.568	1.610	0.000	0.000	0.000	0.000	0.000	-557.309	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**6**

Rev

Part Section J', Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 10-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 10.std Date/Time 29-Feb-2012 11:41

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	-7.568	1.610	0.000	0.000	0.000	0.000	0.000	-628.814	
		37.000	-7.568	1.610	0.000	0.000	0.000	0.000	0.000	-700.320	
	3:LIVE LOAD 1	0.000	16.013	89.323	0.000	0.000	0.000	0.000	0.000	3.67E+3	
		3.700	16.013	60.163	0.000	0.000	0.000	0.000	0.000	794.807	
		7.400	16.013	40.723	0.000	0.000	0.000	0.000	0.000	-1.69E+3	
		11.100	16.013	26.143	0.000	0.000	0.000	0.000	0.000	-3.44E+3	
		14.800	16.013	16.423	0.000	0.000	0.000	0.000	0.000	-4.49E+3	
		18.500	16.013	-7.877	0.000	0.000	0.000	0.000	0.000	-5.08E+3	
		22.200	16.013	-12.737	0.000	0.000	0.000	0.000	0.000	-4.69E+3	
		25.900	16.013	-32.177	0.000	0.000	0.000	0.000	0.000	-3.82E+3	
		29.600	16.013	-46.757	0.000	0.000	0.000	0.000	0.000	-2.25E+3	
		33.300	16.013	-56.477	0.000	0.000	0.000	0.000	0.000	-3.829	
		37.000	16.013	-56.477	0.000	0.000	0.000	0.000	0.000	2.5E+3	
	4:LIVE LOAD 2	0.000	16.015	61.745	0.000	0.000	0.000	0.000	0.000	3.67E+3	
		3.700	16.015	61.745	0.000	0.000	0.000	0.000	0.000	932.169	
		7.400	16.015	52.025	0.000	0.000	0.000	0.000	0.000	-1.55E+3	
		11.100	16.015	37.445	0.000	0.000	0.000	0.000	0.000	-3.36E+3	
		14.800	16.015	18.005	0.000	0.000	0.000	0.000	0.000	-4.45E+3	
		18.500	16.015	13.145	0.000	0.000	0.000	0.000	0.000	-5.08E+3	
		22.200	16.015	-11.155	0.000	0.000	0.000	0.000	0.000	-4.73E+3	
		25.900	16.015	-20.875	0.000	0.000	0.000	0.000	0.000	-3.91E+3	
		29.600	16.015	-35.455	0.000	0.000	0.000	0.000	0.000	-2.4E+3	
		33.300	16.015	-54.895	0.000	0.000	0.000	0.000	0.000	-140.461	
		37.000	16.015	-84.055	0.000	0.000	0.000	0.000	0.000	2.5E+3	
	5:LIVE LOAD 3	0.000	16.887	75.679	0.000	0.000	0.000	0.000	0.000	3.87E+3	
		3.700	16.887	70.819	0.000	0.000	0.000	0.000	0.000	668.545	
		7.400	16.887	51.379	0.000	0.000	0.000	0.000	0.000	-1.71E+3	
		11.100	16.887	36.799	0.000	0.000	0.000	0.000	0.000	-3.5E+3	
		14.800	16.887	27.079	0.000	0.000	0.000	0.000	0.000	-4.73E+3	
		18.500	16.887	2.779	0.000	0.000	0.000	0.000	0.000	-5.05E+3	
		22.200	16.887	-21.521	0.000	0.000	0.000	0.000	0.000	-4.97E+3	
		25.900	16.887	-31.241	0.000	0.000	0.000	0.000	0.000	-3.99E+3	
		29.600	16.887	-45.821	0.000	0.000	0.000	0.000	0.000	-2.45E+3	
		33.300	16.887	-65.261	0.000	0.000	0.000	0.000	0.000	-318.396	
		37.000	16.887	-70.121	0.000	0.000	0.000	0.000	0.000	2.64E+3	
	6:LIVE LOAD 4	0.000	16.729	81.572	0.000	0.000	0.000	0.000	0.000	3.84E+3	
		3.700	16.729	57.272	0.000	0.000	0.000	0.000	0.000	713.009	
		7.400	16.729	47.552	0.000	0.000	0.000	0.000	0.000	-1.68E+3	
		11.100	16.729	32.972	0.000	0.000	0.000	0.000	0.000	-3.47E+3	
		14.800	16.729	13.532	0.000	0.000	0.000	0.000	0.000	-4.6E+3	
		18.500	16.729	8.672	0.000	0.000	0.000	0.000	0.000	-5.08E+3	
		22.200	16.729	-15.628	0.000	0.000	0.000	0.000	0.000	-4.83E+3	
		25.900	16.729	-25.348	0.000	0.000	0.000	0.000	0.000	-3.93E+3	
		29.600	16.729	-39.928	0.000	0.000	0.000	0.000	0.000	-2.39E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**7**

Rev

Part Section J', Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 10-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 10.std Date/Time 29-Feb-2012 11:41

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	16.729	-59.368	0.000	0.000	0.000	0.000	0.000	-170.604	
		37.000	16.729	-64.228	0.000	0.000	0.000	0.000	0.000	2.61E+3	
	7:LIVE LOAD 5	0.000	16.723	69.732	0.000	0.000	0.000	0.000	0.000	3.83E+3	
		3.700	16.723	64.872	0.000	0.000	0.000	0.000	0.000	805.588	
		7.400	16.723	45.432	0.000	0.000	0.000	0.000	0.000	-1.66E+3	
		11.100	16.723	30.852	0.000	0.000	0.000	0.000	0.000	-3.44E+3	
		14.800	16.723	21.132	0.000	0.000	0.000	0.000	0.000	-4.58E+3	
		18.500	16.723	-3.168	0.000	0.000	0.000	0.000	0.000	-5.09E+3	
		22.200	16.723	-8.028	0.000	0.000	0.000	0.000	0.000	-4.85E+3	
		25.900	16.723	-27.468	0.000	0.000	0.000	0.000	0.000	-3.96E+3	
		29.600	16.723	-42.048	0.000	0.000	0.000	0.000	0.000	-2.42E+3	
		33.300	16.723	-51.768	0.000	0.000	0.000	0.000	0.000	-265.824	
		37.000	16.723	-76.068	0.000	0.000	0.000	0.000	0.000	2.62E+3	
	8:LIVE LOAD 6	0.000	16.253	56.678	0.000	0.000	0.000	0.000	0.000	3.73E+3	
		3.700	16.253	56.678	0.000	0.000	0.000	0.000	0.000	1.21E+3	
		7.400	16.253	56.678	0.000	0.000	0.000	0.000	0.000	-1.3E+3	
		11.100	16.253	40.478	0.000	0.000	0.000	0.000	0.000	-3.46E+3	
		14.800	16.253	29.678	0.000	0.000	0.000	0.000	0.000	-4.94E+3	
		18.500	16.253	2.678	0.000	0.000	0.000	0.000	0.000	-5.61E+3	
		22.200	16.253	-24.322	0.000	0.000	0.000	0.000	0.000	-5.18E+3	
		25.900	16.253	-35.122	0.000	0.000	0.000	0.000	0.000	-3.94E+3	
		29.600	16.253	-51.322	0.000	0.000	0.000	0.000	0.000	-2.02E+3	
		33.300	16.253	-51.322	0.000	0.000	0.000	0.000	0.000	260.961	
		37.000	16.253	-51.322	0.000	0.000	0.000	0.000	0.000	2.54E+3	
	9:DEAD AND S	0.000	1.372	50.513	0.000	0.000	0.000	0.000	0.000	2.32E+3	
		3.700	1.372	39.253	0.000	0.000	0.000	0.000	0.000	412.126	
		7.400	1.372	30.745	0.000	0.000	0.000	0.000	0.000	-1.13E+3	
		11.100	1.372	22.188	0.000	0.000	0.000	0.000	0.000	-2.31E+3	
		14.800	1.372	13.582	0.000	0.000	0.000	0.000	0.000	-3.11E+3	
		18.500	1.372	4.929	0.000	0.000	0.000	0.000	0.000	-3.54E+3	
		22.200	1.372	-6.251	0.000	0.000	0.000	0.000	0.000	-3.44E+3	
		25.900	1.372	-15.009	0.000	0.000	0.000	0.000	0.000	-2.96E+3	
		29.600	1.372	-23.815	0.000	0.000	0.000	0.000	0.000	-2.09E+3	
		33.300	1.372	-32.670	0.000	0.000	0.000	0.000	0.000	-851.573	
		37.000	1.372	-44.374	0.000	0.000	0.000	0.000	0.000	774.524	
	10:DL + SOIL F	0.000	6.291	49.466	0.000	0.000	0.000	0.000	0.000	2.31E+3	
		3.700	6.291	38.206	0.000	0.000	0.000	0.000	0.000	449.026	
		7.400	6.291	29.698	0.000	0.000	0.000	0.000	0.000	-1.05E+3	
		11.100	6.291	21.141	0.000	0.000	0.000	0.000	0.000	-2.18E+3	
		14.800	6.291	12.536	0.000	0.000	0.000	0.000	0.000	-2.94E+3	
		18.500	6.291	3.882	0.000	0.000	0.000	0.000	0.000	-3.32E+3	
		22.200	6.291	-7.298	0.000	0.000	0.000	0.000	0.000	-3.17E+3	
		25.900	6.291	-16.056	0.000	0.000	0.000	0.000	0.000	-2.64E+3	
		29.600	6.291	-24.862	0.000	0.000	0.000	0.000	0.000	-1.73E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**8**

Rev

Part Section J', Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 10-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 10.std Date/Time 29-Feb-2012 11:41

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	6.291	-33.717	0.000	0.000	0.000	0.000	0.000	-442.844	
		37.000	6.291	-45.421	0.000	0.000	0.000	0.000	0.000	1.23E+3	
3	1:DEAD LOAD	0.000	60.820	10.075	0.000	0.000	0.000	0.000	0.000	655.439	
		1.849	59.360	10.075	0.000	0.000	0.000	0.000	0.000	431.906	
		3.698	57.901	10.075	0.000	0.000	0.000	0.000	0.000	208.373	
		5.547	56.442	10.075	0.000	0.000	0.000	0.000	0.000	-15.160	
		7.396	54.982	10.075	0.000	0.000	0.000	0.000	0.000	-238.694	
		9.245	53.523	10.075	0.000	0.000	0.000	0.000	0.000	-462.227	
		11.094	52.064	10.075	0.000	0.000	0.000	0.000	0.000	-685.760	
		12.943	50.604	10.075	0.000	0.000	0.000	0.000	0.000	-909.293	
		14.792	49.145	10.075	0.000	0.000	0.000	0.000	0.000	-1.13E+3	
		16.641	47.686	10.075	0.000	0.000	0.000	0.000	0.000	-1.36E+3	
		18.490	46.226	10.075	0.000	0.000	0.000	0.000	0.000	-1.58E+3	
	2:SOIL LOAD	0.000	-1.610	-7.568	0.000	0.000	0.000	0.000	0.000	-978.830	
		1.849	-1.610	-7.568	0.000	0.000	0.000	0.000	0.000	-810.915	
		3.698	-1.610	-7.568	0.000	0.000	0.000	0.000	0.000	-643.000	
		5.547	-1.610	-7.568	0.000	0.000	0.000	0.000	0.000	-475.085	
		7.396	-1.610	-7.568	0.000	0.000	0.000	0.000	0.000	-307.170	
		9.245	-1.610	-7.568	0.000	0.000	0.000	0.000	0.000	-139.255	
		11.094	-1.610	-7.568	0.000	0.000	0.000	0.000	0.000	28.660	
		12.943	-1.610	-7.568	0.000	0.000	0.000	0.000	0.000	196.575	
		14.792	-1.610	-7.568	0.000	0.000	0.000	0.000	0.000	364.490	
		16.641	-1.610	-7.568	0.000	0.000	0.000	0.000	0.000	532.405	
		18.490	-1.610	-7.568	0.000	0.000	0.000	0.000	0.000	700.320	
	3:LIVE LOAD 1	0.000	56.477	16.013	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		1.849	56.477	16.013	0.000	0.000	0.000	0.000	0.000	694.027	
		3.698	56.477	16.013	0.000	0.000	0.000	0.000	0.000	338.721	
		5.547	56.477	16.013	0.000	0.000	0.000	0.000	0.000	-16.586	
		7.396	56.477	16.013	0.000	0.000	0.000	0.000	0.000	-371.893	
		9.245	56.477	16.013	0.000	0.000	0.000	0.000	0.000	-727.200	
		11.094	56.477	16.013	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		12.943	56.477	16.013	0.000	0.000	0.000	0.000	0.000	-1.44E+3	
		14.792	56.477	16.013	0.000	0.000	0.000	0.000	0.000	-1.79E+3	
		16.641	56.477	16.013	0.000	0.000	0.000	0.000	0.000	-2.15E+3	
		18.490	56.477	16.013	0.000	0.000	0.000	0.000	0.000	-2.5E+3	
	4:LIVE LOAD 2	0.000	84.055	16.015	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		1.849	84.055	16.015	0.000	0.000	0.000	0.000	0.000	695.139	
		3.698	84.055	16.015	0.000	0.000	0.000	0.000	0.000	339.796	
		5.547	84.055	16.015	0.000	0.000	0.000	0.000	0.000	-15.548	
		7.396	84.055	16.015	0.000	0.000	0.000	0.000	0.000	-370.892	
		9.245	84.055	16.015	0.000	0.000	0.000	0.000	0.000	-726.236	
		11.094	84.055	16.015	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		12.943	84.055	16.015	0.000	0.000	0.000	0.000	0.000	-1.44E+3	
		14.792	84.055	16.015	0.000	0.000	0.000	0.000	0.000	-1.79E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**9**

Rev

Part Section J', Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 10-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 10.std Date/Time 29-Feb-2012 11:41

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		16.641	84.055	16.015	0.000	0.000	0.000	0.000	0.000	-2.15E+3	
		18.490	84.055	16.015	0.000	0.000	0.000	0.000	0.000	-2.5E+3	
	5:LIVE LOAD 3	0.000	70.121	16.887	0.000	0.000	0.000	0.000	0.000	1.11E+3	
		1.849	70.121	16.887	0.000	0.000	0.000	0.000	0.000	732.622	
		3.698	70.121	16.887	0.000	0.000	0.000	0.000	0.000	357.944	
		5.547	70.121	16.887	0.000	0.000	0.000	0.000	0.000	-16.734	
		7.396	70.121	16.887	0.000	0.000	0.000	0.000	0.000	-391.412	
		9.245	70.121	16.887	0.000	0.000	0.000	0.000	0.000	-766.090	
		11.094	70.121	16.887	0.000	0.000	0.000	0.000	0.000	-1.14E+3	
		12.943	70.121	16.887	0.000	0.000	0.000	0.000	0.000	-1.52E+3	
		14.792	70.121	16.887	0.000	0.000	0.000	0.000	0.000	-1.89E+3	
		16.641	70.121	16.887	0.000	0.000	0.000	0.000	0.000	-2.26E+3	
		18.490	70.121	16.887	0.000	0.000	0.000	0.000	0.000	-2.64E+3	
	6:LIVE LOAD 4	0.000	64.228	16.729	0.000	0.000	0.000	0.000	0.000	1.1E+3	
		1.849	64.228	16.729	0.000	0.000	0.000	0.000	0.000	727.642	
		3.698	64.228	16.729	0.000	0.000	0.000	0.000	0.000	356.452	
		5.547	64.228	16.729	0.000	0.000	0.000	0.000	0.000	-14.738	
		7.396	64.228	16.729	0.000	0.000	0.000	0.000	0.000	-385.928	
		9.245	64.228	16.729	0.000	0.000	0.000	0.000	0.000	-757.119	
		11.094	64.228	16.729	0.000	0.000	0.000	0.000	0.000	-1.13E+3	
		12.943	64.228	16.729	0.000	0.000	0.000	0.000	0.000	-1.5E+3	
		14.792	64.228	16.729	0.000	0.000	0.000	0.000	0.000	-1.87E+3	
		16.641	64.228	16.729	0.000	0.000	0.000	0.000	0.000	-2.24E+3	
		18.490	64.228	16.729	0.000	0.000	0.000	0.000	0.000	-2.61E+3	
	7:LIVE LOAD 5	0.000	76.068	16.723	0.000	0.000	0.000	0.000	0.000	1.09E+3	
		1.849	76.068	16.723	0.000	0.000	0.000	0.000	0.000	723.628	
		3.698	76.068	16.723	0.000	0.000	0.000	0.000	0.000	352.572	
		5.547	76.068	16.723	0.000	0.000	0.000	0.000	0.000	-18.485	
		7.396	76.068	16.723	0.000	0.000	0.000	0.000	0.000	-389.542	
		9.245	76.068	16.723	0.000	0.000	0.000	0.000	0.000	-760.599	
		11.094	76.068	16.723	0.000	0.000	0.000	0.000	0.000	-1.13E+3	
		12.943	76.068	16.723	0.000	0.000	0.000	0.000	0.000	-1.5E+3	
		14.792	76.068	16.723	0.000	0.000	0.000	0.000	0.000	-1.87E+3	
		16.641	76.068	16.723	0.000	0.000	0.000	0.000	0.000	-2.24E+3	
		18.490	76.068	16.723	0.000	0.000	0.000	0.000	0.000	-2.62E+3	
	8:LIVE LOAD 6	0.000	51.322	16.253	0.000	0.000	0.000	0.000	0.000	1.07E+3	
		1.849	51.322	16.253	0.000	0.000	0.000	0.000	0.000	705.993	
		3.698	51.322	16.253	0.000	0.000	0.000	0.000	0.000	345.367	
		5.547	51.322	16.253	0.000	0.000	0.000	0.000	0.000	-15.260	
		7.396	51.322	16.253	0.000	0.000	0.000	0.000	0.000	-375.886	
		9.245	51.322	16.253	0.000	0.000	0.000	0.000	0.000	-736.512	
		11.094	51.322	16.253	0.000	0.000	0.000	0.000	0.000	-1.1E+3	
		12.943	51.322	16.253	0.000	0.000	0.000	0.000	0.000	-1.46E+3	
		14.792	51.322	16.253	0.000	0.000	0.000	0.000	0.000	-1.82E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**10**

Rev

Part Section J', Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 10-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 10.std Date/Time 29-Feb-2012 11:41

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		16.641	51.322	16.253	0.000	0.000	0.000	0.000	0.000	-2.18E+3	
		18.490	51.322	16.253	0.000	0.000	0.000	0.000	0.000	-2.54E+3	
	9:DEAD AND S	0.000	58.968	1.372	0.000	0.000	0.000	0.000	0.000	-470.215	
		1.849	57.508	1.372	0.000	0.000	0.000	0.000	0.000	-500.646	
		3.698	56.049	1.372	0.000	0.000	0.000	0.000	0.000	-531.077	
		5.547	54.590	1.372	0.000	0.000	0.000	0.000	0.000	-561.508	
		7.396	53.130	1.372	0.000	0.000	0.000	0.000	0.000	-591.939	
		9.245	51.671	1.372	0.000	0.000	0.000	0.000	0.000	-622.370	
		11.094	50.212	1.372	0.000	0.000	0.000	0.000	0.000	-652.801	
		12.943	48.752	1.372	0.000	0.000	0.000	0.000	0.000	-683.232	
		14.792	47.293	1.372	0.000	0.000	0.000	0.000	0.000	-713.662	
		16.641	45.833	1.372	0.000	0.000	0.000	0.000	0.000	-744.093	
		18.490	44.374	1.372	0.000	0.000	0.000	0.000	0.000	-774.524	
	10:DL + SOIL F	0.000	60.014	6.291	0.000	0.000	0.000	0.000	0.000	166.024	
		1.849	58.555	6.291	0.000	0.000	0.000	0.000	0.000	26.448	
		3.698	57.096	6.291	0.000	0.000	0.000	0.000	0.000	-113.127	
		5.547	55.636	6.291	0.000	0.000	0.000	0.000	0.000	-252.703	
		7.396	54.177	6.291	0.000	0.000	0.000	0.000	0.000	-392.278	
		9.245	52.718	6.291	0.000	0.000	0.000	0.000	0.000	-531.854	
		11.094	51.258	6.291	0.000	0.000	0.000	0.000	0.000	-671.430	
		12.943	49.799	6.291	0.000	0.000	0.000	0.000	0.000	-811.005	
		14.792	48.340	6.291	0.000	0.000	0.000	0.000	0.000	-950.581	
		16.641	46.880	6.291	0.000	0.000	0.000	0.000	0.000	-1.09E+3	
		18.490	45.421	6.291	0.000	0.000	0.000	0.000	0.000	-1.23E+3	
4	1:DEAD LOAD	0.000	63.646	-10.075	0.000	0.000	0.000	0.000	0.000	583.582	
		1.424	62.147	-10.075	0.000	0.000	0.000	0.000	0.000	755.735	
		2.848	60.649	-10.075	0.000	0.000	0.000	0.000	0.000	927.889	
		4.272	59.150	-10.075	0.000	0.000	0.000	0.000	0.000	1.1E+3	
		5.696	57.652	-10.075	0.000	0.000	0.000	0.000	0.000	1.27E+3	
		7.120	56.153	-10.075	0.000	0.000	0.000	0.000	0.000	1.44E+3	
		8.544	54.655	-10.075	0.000	0.000	0.000	0.000	0.000	1.62E+3	
		9.968	53.156	-10.075	0.000	0.000	0.000	0.000	0.000	1.79E+3	
		11.392	51.658	-10.075	0.000	0.000	0.000	0.000	0.000	1.96E+3	
		12.816	50.159	-10.075	0.000	0.000	0.000	0.000	0.000	2.13E+3	
		14.240	48.660	-10.075	0.000	0.000	0.000	0.000	0.000	2.31E+3	
	2:SOIL LOAD	0.000	1.610	3.780	0.000	0.000	0.000	0.000	0.000	1.25E+3	
		1.424	1.610	6.024	0.000	0.000	0.000	0.000	0.000	1.16E+3	
		2.848	1.610	7.254	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		4.272	1.610	7.538	0.000	0.000	0.000	0.000	0.000	919.963	
		5.696	1.610	7.568	0.000	0.000	0.000	0.000	0.000	790.652	
		7.120	1.610	7.568	0.000	0.000	0.000	0.000	0.000	661.333	
		8.544	1.610	7.568	0.000	0.000	0.000	0.000	0.000	532.014	
		9.968	1.610	7.568	0.000	0.000	0.000	0.000	0.000	402.695	
		11.392	1.610	7.568	0.000	0.000	0.000	0.000	0.000	273.376	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**11**

Rev

Part Section J', Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 10-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 10.std Date/Time 29-Feb-2012 11:41

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		12.816	1.610	7.568	0.000	0.000	0.000	0.000	0.000	144.056	
		14.240	1.610	7.568	0.000	0.000	0.000	0.000	0.000	14.738	
	3:LIVE LOAD 1	0.000	89.323	-16.013	0.000	0.000	0.000	0.000	0.000	935.748	
		1.424	89.323	-16.013	0.000	0.000	0.000	0.000	0.000	1.21E+3	
		2.848	89.323	-16.013	0.000	0.000	0.000	0.000	0.000	1.48E+3	
		4.272	89.323	-16.013	0.000	0.000	0.000	0.000	0.000	1.76E+3	
		5.696	89.323	-16.013	0.000	0.000	0.000	0.000	0.000	2.03E+3	
		7.120	89.323	-16.013	0.000	0.000	0.000	0.000	0.000	2.3E+3	
		8.544	89.323	-16.013	0.000	0.000	0.000	0.000	0.000	2.58E+3	
		9.968	89.323	-16.013	0.000	0.000	0.000	0.000	0.000	2.85E+3	
		11.392	89.323	-16.013	0.000	0.000	0.000	0.000	0.000	3.12E+3	
		12.816	89.323	-16.013	0.000	0.000	0.000	0.000	0.000	3.4E+3	
		14.240	89.323	-16.013	0.000	0.000	0.000	0.000	0.000	3.67E+3	
	4:LIVE LOAD 2	0.000	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	936.972	
		1.424	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	1.21E+3	
		2.848	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	1.48E+3	
		4.272	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	1.76E+3	
		5.696	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	2.03E+3	
		7.120	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	2.31E+3	
		8.544	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	2.58E+3	
		9.968	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	2.85E+3	
		11.392	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	3.13E+3	
		12.816	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	3.4E+3	
		14.240	61.745	-16.015	0.000	0.000	0.000	0.000	0.000	3.67E+3	
	5:LIVE LOAD 3	0.000	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	987.584	
		1.424	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	1.28E+3	
		2.848	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	1.56E+3	
		4.272	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	1.85E+3	
		5.696	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	2.14E+3	
		7.120	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	2.43E+3	
		8.544	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	2.72E+3	
		9.968	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	3.01E+3	
		11.392	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	3.3E+3	
		12.816	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	3.58E+3	
		14.240	75.679	-16.887	0.000	0.000	0.000	0.000	0.000	3.87E+3	
	6:LIVE LOAD 4	0.000	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	980.385	
		1.424	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	1.27E+3	
		2.848	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	1.55E+3	
		4.272	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	1.84E+3	
		5.696	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	2.12E+3	
		7.120	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	2.41E+3	
		8.544	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	2.7E+3	
		9.968	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	2.98E+3	
		11.392	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	3.27E+3	





Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**12**

Rev

Part Section J', Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 10-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 10.std Date/Time 29-Feb-2012 11:41

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		12.816	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	3.55E+3	
		14.240	81.572	-16.729	0.000	0.000	0.000	0.000	0.000	3.84E+3	
	7:LIVE LOAD 5	0.000	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	975.966	
		1.424	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	1.26E+3	
		2.848	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	1.55E+3	
		4.272	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	1.83E+3	
		5.696	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	2.12E+3	
		7.120	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	2.4E+3	
		8.544	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	2.69E+3	
		9.968	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	2.98E+3	
		11.392	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	3.26E+3	
		12.816	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	3.55E+3	
		14.240	69.732	-16.723	0.000	0.000	0.000	0.000	0.000	3.83E+3	
	8:LIVE LOAD 6	0.000	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	951.465	
		1.424	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	1.23E+3	
		2.848	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	1.51E+3	
		4.272	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	1.78E+3	
		5.696	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	2.06E+3	
		7.120	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	2.34E+3	
		8.544	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	2.62E+3	
		9.968	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	2.9E+3	
		11.392	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	3.17E+3	
		12.816	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	3.45E+3	
		14.240	56.678	-16.253	0.000	0.000	0.000	0.000	0.000	3.73E+3	
	9:DEAD AND S	0.000	65.498	-5.727	0.000	0.000	0.000	0.000	0.000	2.02E+3	
		1.424	63.999	-3.147	0.000	0.000	0.000	0.000	0.000	2.09E+3	
		2.848	62.501	-1.732	0.000	0.000	0.000	0.000	0.000	2.13E+3	
		4.272	61.002	-1.406	0.000	0.000	0.000	0.000	0.000	2.16E+3	
		5.696	59.504	-1.372	0.000	0.000	0.000	0.000	0.000	2.18E+3	
		7.120	58.005	-1.372	0.000	0.000	0.000	0.000	0.000	2.2E+3	
		8.544	56.507	-1.372	0.000	0.000	0.000	0.000	0.000	2.23E+3	
		9.968	55.008	-1.372	0.000	0.000	0.000	0.000	0.000	2.25E+3	
		11.392	53.510	-1.372	0.000	0.000	0.000	0.000	0.000	2.28E+3	
		12.816	52.011	-1.372	0.000	0.000	0.000	0.000	0.000	2.3E+3	
		14.240	50.513	-1.372	0.000	0.000	0.000	0.000	0.000	2.32E+3	
	10:DL + SOIL F	0.000	64.451	-8.184	0.000	0.000	0.000	0.000	0.000	1.21E+3	
		1.424	62.953	-7.062	0.000	0.000	0.000	0.000	0.000	1.34E+3	
		2.848	61.454	-6.447	0.000	0.000	0.000	0.000	0.000	1.45E+3	
		4.272	59.956	-6.306	0.000	0.000	0.000	0.000	0.000	1.56E+3	
		5.696	58.457	-6.291	0.000	0.000	0.000	0.000	0.000	1.67E+3	
		7.120	56.958	-6.291	0.000	0.000	0.000	0.000	0.000	1.78E+3	
		8.544	55.460	-6.291	0.000	0.000	0.000	0.000	0.000	1.88E+3	
		9.968	53.961	-6.291	0.000	0.000	0.000	0.000	0.000	1.99E+3	
		11.392	52.463	-6.291	0.000	0.000	0.000	0.000	0.000	2.1E+3	



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Job No  
**P402110046**

Sheet No  
**13**

Rev

Part Section J', Frame 10

Job Title Main Avenue Rating

Ref

By M Johnson Date 10-Feb-12 Chd D Hoff

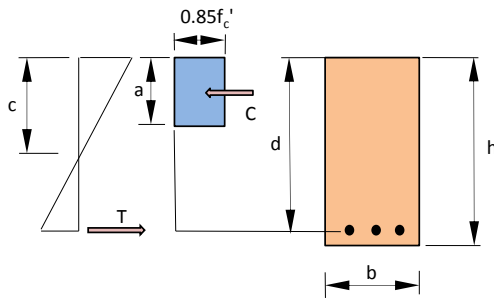
Client ODOT

File Section J' Frame 10.std Date/Time 29-Feb-2012 11:41

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear		Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip·in)	My (kip·in)	Mz (kip·in)
		12.816	50.964	-6.291	0.000	0.000	0.000	2.2E+3
		14.240	49.466	-6.291	0.000	0.000	0.000	2.31E+3

### Floor Beam Postive Moment Section



b =	98	in	
d =	48	in	
f'c =	4.5	ksi	
fy =	33	ksi	
φ =	0.9		
Area of Steel =	12.7	in <sup>2</sup>	(10 - 1 1/8" □)
% Steel Loss =	0%		from 49/246 of original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	12.700	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	237.18	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	1.118	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1491.2	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

(Soil Load Moment includes 1.15 factor)

Total Service Positive Moment = 295.3 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	41.6	44.6	30.1	39	38	39	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	54.1	58.0	39.1	50.7	49.4	50.7	kips
Reaction per Wheel (LL+I) =	27.0	29.0	19.6	25.4	24.7	25.4	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

		From STAAD					
Max. Positive LL+I Moment =	467.83	501.6	338.5	438.6	427.3	438.6	ft*kips

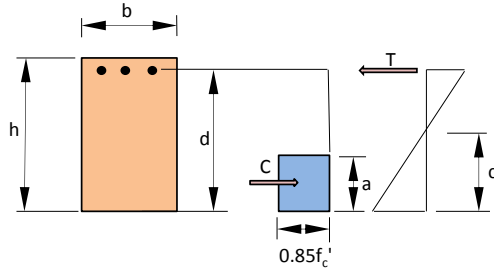
Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.02	36.6 Tons	HS20.3
Operating	HS20	36 Tons	RF=1.70	61.1 Tons	HS34.0
	2F1	15 Tons	RF=2.52	37.7 Tons	
	3F1	23 Tons	RF=1.94	44.7 Tons	
	4F1	27 Tons	RF=1.99	53.8 Tons	
	5C1	40 Tons	RF=1.94	77.7 Tons	
	Ohio Legal %	195%			

### Floor Beam Negative Moment Section

(South end of frame controls)



b =	21	in
d =	66	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	8	in <sup>2</sup>
% Steel Loss =	0%	

(8 - 1" □) from  
49/246 of  
original plans

### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	8.000	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	49.50	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.85		
a =	4.930	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1258.0	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

### Dead Load plus Soil Load Moment

Moment at face of column

(Soil Load Moment includes 1.15 factor)

Total Service Negative Moment = **4.9** ft\*kips From Staad

### Live Load Moment

Moment at face of column

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Negative LL+I Moment =		<b>123.92</b>	132.9	89.7	116.2	113.2	116.2

ft\*kips  
Maximum Negative Moment results from 3 lanes loaded.

### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=4.34	156.3 Tons	HS86.8
Operating	HS20	36 Tons	RF=7.25	260.9 Tons	HS144.9
	2F1	15 Tons	RF=10.74	161.1 Tons	
	3F1	23 Tons	RF=8.29	190.6 Tons	
	4F1	27 Tons	RF=8.51	229.7 Tons	
	5C1	40 Tons	RF=8.29	331.5 Tons	
	Ohio Legal %	830%			



Made by: MJJ Date: 2/10/2012 Job No: P402110046  
 Checked by: DBH Date: 2/28/2012 Page:  
 Project: CUY-2-14.41 (Main Avenue Bridge)  
 Subject: As-Built Concrete Frame Rating Section J' (Frame 10)

## Floor Beam Shear Section

### Section Capacity

Taken at face of column (South end of cap controls)

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed conservatively)
$d =$	<input type="text" value="66"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="151.8"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="259.7"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

(Soil Shear includes 1.15 factor)

Total Service Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="76"/>	76	81.5	55.0	71.3	69.4	71.3

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.19	42.8 Tons	HS23.8
Operating	HS20	36 Tons	RF=1.99	71.5 Tons	HS39.7
	2F1	15 Tons	RF=2.94	44.2 Tons	
	3F1	23 Tons	RF=2.27	52.3 Tons	
	4F1	27 Tons	RF=2.33	63.0 Tons	
	5C1	40 Tons	RF=2.27	90.9 Tons	
	Ohio Legal %	225%			



**Column Section** (North Column at bottom of column controls)

h =	60	in	Column Depth
b =	21	in	Column Width
A <sub>s</sub> =	10.35	in <sup>2</sup>	Area of Tension Steel (5 -1 1/8" bars, 4 -1" bars)
A' <sub>s</sub> =	6.35	in <sup>2</sup>	Area of Compression Steel (5- 1 1/8" bars)
d =	57	in	Distance from compression face to centroid of tension steel
d' =	3	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	3	ksi	Concrete Strength
f <sub>y</sub> =	33	ksi	Steel Yield Stress
E <sub>s</sub> =	29000	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	0.003	in/in	Ultimate concrete strain
β <sub>1</sub> =	0.85		
d" =	27	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads plus Soil Load** (moment taken at the top of footing)

Total Service Moment =	804.1	ft-kips	From Staad (Moment for Soil includes 1.15 load factor)
Total Service Axial Force =	85.9	kips	From Staad (Axial for Soil includes 1.15 load factor)

**Live Loads** (Moment taken at the top of footing)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	209.0	224.1	151.2	195.9	190.9	195.9	ft-kips	
Max. LL+I Axial Force =	75.7	81.2	51.1	98.1	73.8	77.7	kips	

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	35.13	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	41.33	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	33	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	1749.0	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	3189.5	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	3721.5	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	2605.1	kips		



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Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	As-Built Concrete Frame Rating Section J' (Frame 10)				

**Pure Bending Capacity** (Ignoring compression steel)

$a =$	6.378	in	$a = A_s * f_y / 0.85 * f_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	1531.6	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	1378.4	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **13.21** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a =$	11.22637808	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	601.2	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	328.4	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	1723.2	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	62.96	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	275.9	287.8	222.5	324.5	271.7	280.3	kips
$M_u =$	1498.8	1531.5	1373.5	1470.5	1459.6	1470.5	ft-kips
$e =$	65.18	63.86	74.06	54.38	64.46	62.96	in
$\phi P_n =$	312.6	321.9	261.4	405.4	317.6	328.4	kips
$\phi M_n =$	1698.2	1712.9	1613.3	1837.0	1706.2	1723.2	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

Column Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.19	43.0 Tons	HS23.9
Operating	HS20	36 Tons	RF=1.99	71.7 Tons	HS39.8
	2F1	15 Tons	RF=2.25	33.8 Tons	
	3F1	23 Tons	RF=2.30	53.0 Tons	
	4F1	27 Tons	RF=2.15	58.0 Tons	
	5C1	40 Tons	RF=2.15	85.8 Tons	
Ohio Legal %	215%				

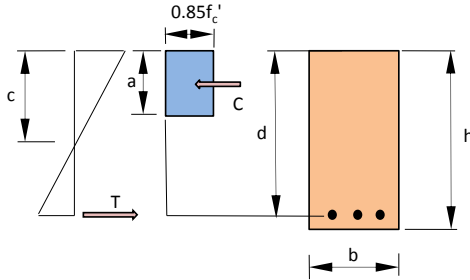
Floor Beam Load Rating Summary:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.02	36.6 Tons	HS20.3
Operating	HS20	36 Tons	RF=1.70	61.1 Tons	HS34.0
	2F1	15 Tons	RF=2.25	33.8 Tons	
	3F1	23 Tons	RF=1.94	44.7 Tons	
	4F1	27 Tons	RF=1.99	53.8 Tons	
	5C1	40 Tons	RF=1.94	77.7 Tons	
Ohio Legal %	195%				

Positive Moment  
Positive Moment  
Column  
Positive Moment  
Positive Moment  
Positive Moment



Made by: **MJJ** Date: **2/10/2012** Job No: **P402110046**  
 Checked by: \_\_\_\_\_ Date: \_\_\_\_\_ Page: \_\_\_\_\_  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Inspected Concrete Frame Rating Section J' (Frame 10)**

### Floor Beam Postive Moment Section



b =	98.9	in
d =	48	in
f' <sub>c</sub> =	4.5	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	12.7	in <sup>2</sup>
% Steel Loss =	0%	

(10 - 1 1/8" □)  
from 49/246 of original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	12.700	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	239.36	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	1.108	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1491.3	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

(Soil Load Moment includes 1.15 factor)

Total Service Positive Moment = 295.3 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	41.6	44.6	30.1	39	38	39	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	54.1	58.0	39.1	50.7	49.4	50.7	kips
Reaction per Wheel (LL+I) =	27.0	29.0	19.6	25.4	24.7	25.4	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

		From STAAD					
Max. Positive LL+I Moment =	467.83	501.6	338.5	438.6	427.3	438.6	ft*kips

Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

#### Postive Moment Rating

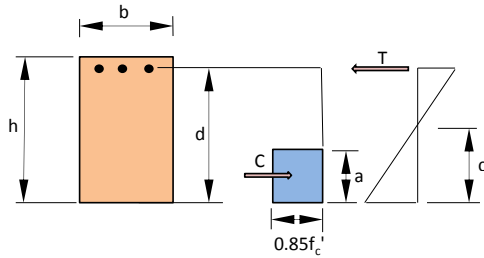
Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.02	36.6 Tons	HS20.3
	Operating	HS20	36 Tons	RF=1.70	61.1 Tons
	2F1	15 Tons	RF=2.52	37.7 Tons	
	3F1	23 Tons	RF=1.94	44.7 Tons	
	4F1	27 Tons	RF=1.99	53.8 Tons	
	5C1	40 Tons	RF=1.94	77.7 Tons	
	Ohio Legal %		195%		



### Floor Beam Negative Moment Section

(South end of frame controls)

Decucted 2" from beam (b) to account for spalling noted in notes. Does not control.



$b =$	19	in
$d =$	66	in
$f_c' =$	3	ksi
$f_y =$	33	ksi
$\phi =$	0.9	
Area of Steel =	8	in <sup>2</sup>
% Steel Loss =	0%	

(8 - 1" □) from 49/246 of original plans

### Section Capacity

$b =$  Frame width for negative moment

$A_s =$   in<sup>2</sup>

Area of reinforcing steel minus any loss noted

$\rho_b =$

Balanced reinforcement ratio, AASHTO Eq. 8-18

$0.75 \cdot A_{sb} =$   in<sup>2</sup>

75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2

$\beta_1 =$

$a =$   in

Depth of equivalent compressive stress block, AASHTO Eq. 8-17

$\phi M_n =$   ft\*kips

Design Moment Strength, AASHTO Eq. 8-16

### Dead Load plus Soil Load Moment

Moment at end of floorbeam

(Soil Load Moment includes 1.15 factor)

Total Service Negative Moment =  ft\*kips

From Staad

### Live Load Moment

From STAAD					
HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
123.92	132.9	89.7	116.2	113.2	116.2

Max. Negative LL+I Moment =  ft\*kips

Maximum Negative Moment results from 3 lanes loaded.

### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=4.32	155.7 Tons	HS86.5
	HS20	36 Tons	RF=7.22	259.8 Tons	HS144.3
Operating	2F1	15 Tons	RF=10.69	160.4 Tons	
	3F1	23 Tons	RF=8.25	189.8 Tons	
	4F1	27 Tons	RF=8.47	228.7 Tons	
	5C1	40 Tons	RF=8.25	330.1 Tons	
	Ohio Legal %	825%			

## Floor Beam Shear Section

### Section Capacity

Taken at face of column (South end of cap controls)

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed conservatively)
$d =$	<input type="text" value="66"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="137.4"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="247.4"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

(Soil Shear includes 1.15 factor)

Total Service Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="76"/>	76	81.5	55.0	71.3	69.4	71.3

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.12	40.3 Tons	HS22.4
Operating	HS20	36 Tons	RF=1.87	67.3 Tons	HS37.4
	2F1	15 Tons	RF=2.77	41.6 Tons	
	3F1	23 Tons	RF=2.14	49.2 Tons	
	4F1	27 Tons	RF=2.20	59.3 Tons	
	5C1	40 Tons	RF=2.14	85.6 Tons	
	Ohio Legal %			215%	

**Column Section** (North Column at bottom of column controls)

h =	<input type="text" value="60"/>	in	Column Depth
b =	<input type="text" value="21"/>	in	Column Width
A <sub>s</sub> =	<input type="text" value="10.35"/>	in <sup>2</sup>	Area of Tension Steel (5 - 1 1/8" bars, 4 - 1" bars)
A' <sub>s</sub> =	<input type="text" value="6.35"/>	in <sup>2</sup>	Area of Compression Steel (5 - 1 1/8" bars)
d =	<input type="text" value="57"/>	in	Distance from compression face to centroid of tension steel
d' =	<input type="text" value="3"/>	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	<input type="text" value="3"/>	ksi	Concrete Strength
f <sub>y</sub> =	<input type="text" value="33"/>	ksi	Steel Yield Stress
E <sub>s</sub> =	<input type="text" value="29000"/>	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	<input type="text" value="0.003"/>	in/in	Ultimate concrete strain
β <sub>1</sub> =	<input type="text" value="0.85"/>		
d" =	<input type="text" value="27"/>	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads plus Soil Load** (moment taken at the top of footing)

Total Service Moment =	<input type="text" value="804.1"/>	ft-kips	From Staad (Moment for Soil includes 1.15 load factor)
Total Service Axial Force =	<input type="text" value="85.9"/>	kips	From Staad (Axial for Soil includes 1.15 load factor)

**Live Loads** (Moment taken at the top of footing)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	<input type="text" value="209.0"/>		224.1	151.2	195.9	190.9	195.9	ft-kips
Max. LL+I Axial Force =	<input type="text" value="75.7"/>		81.2	51.1	98.1	73.8	77.7	kips

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	<input type="text" value="35.13"/>	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	<input type="text" value="41.33"/>	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f' <sub>s</sub> =	<input type="text" value="33"/>	ksi	f' <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	<input type="text" value="1749.0"/>	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f' <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	<input type="text" value="3189.5"/>	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"/2)+A' <sub>s</sub> *f' <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	<input type="text" value="3721.5"/>	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	<input type="text" value="2605.1"/>	kips		

**Pure Bending Capacity** (Ignoring compression steel)

a =	<input type="text" value="6.378"/>	in	a = A <sub>s</sub> *f <sub>y</sub> /0.85*f <sub>c</sub> *b	Depth of equivalent stress block (AASHTO Eq. 8-17)
M <sub>n</sub> =	<input type="text" value="1531.6"/>	ft-kips	M <sub>n</sub> = A <sub>s</sub> *f <sub>y</sub> *(d-a/2)	Nominal Moment Strength (AASHTO Eq. 8-15)
φM <sub>n</sub> =	<input type="text" value="1378.4"/>	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$    $\text{in}$

**Tension Failure**

$f_s = $	<input type="text" value="33.00"/>	ksi	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s = $	<input type="text" value="33.00"/>	ksi	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a = $	<input type="text" value="11.22637808"/>	in	$a = \beta_1 * c$	Depth of concrete stress block
$C = $	<input type="text" value="601.2"/>	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n = $	<input type="text" value="328.4"/>	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n = $	<input type="text" value="1723.2"/>	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e = $	<input type="text" value="62.96"/>	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	275.9	287.8	222.5	324.5	271.7	280.3	kips
$M_u =$	1498.8	1531.5	1373.5	1470.5	1459.6	1470.5	ft-kips
$e =$	65.18	63.86	74.06	54.38	64.46	62.96	in
$\phi P_n =$	312.65	321.86	261.40	405.39	317.63	328.42	kips
$\phi M_n =$	1698.2	1712.9	1613.3	1837.0	1706.2	1723.2	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.19	43.0 Tons	HS23.9
Operating	HS20	36 Tons	RF=1.99	71.7 Tons	HS39.8
	2F1	15 Tons	RF=2.25	33.8 Tons	
	3F1	23 Tons	RF=2.30	53.0 Tons	
	4F1	27 Tons	RF=2.15	58.0 Tons	
	5C1	40 Tons	RF=2.15	85.8 Tons	
Ohio Legal %	215%				

	Load	GVW	Rating Factor	Safe Load	HS Rating	
Inventory	HS20	36 Tons	RF=1.02	36.6 Tons	HS20.3	Positive Moment
Operating	HS20	36 Tons	RF=1.70	61.1 Tons	HS34.0	Positive Moment
	2F1	15 Tons	RF=2.25	33.8 Tons		Column
	3F1	23 Tons	RF=1.94	44.7 Tons		Positive Moment
	4F1	27 Tons	RF=1.99	53.8 Tons		Positive Moment
	5C1	40 Tons	RF=1.94	77.7 Tons		Positive Moment
Ohio Legal %	195%					



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Part Section J', Frame 19

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 19.std Date/Time 29-Feb-2012 11:42

## Job Information

	Engineer	Checked	Approved
<b>Name:</b>	M Johnson	D Hoff	
<b>Date:</b>	13-Feb-12	29-Feb-12	

**Structure Type** SPACE FRAME

Number of Nodes	5	Highest Node	5
Number of Elements	4	Highest Beam	4

Number of Basic Load Cases	8
Number of Combination Load Cases	2

*Included in this printout are data for:*

<b>All</b>	The Whole Structure
------------	---------------------

*Included in this printout are results for load cases:*

Type	L/C	Name
Primary	1	DEAD LOAD
Primary	2	SOIL LOAD
Primary	3	LIVE LOAD 1
Primary	4	LIVE LOAD 2
Primary	5	LIVE LOAD 3
Primary	6	LIVE LOAD 4
Primary	7	LIVE LOAD 5
Primary	8	LIVE LOAD 6
Combination	9	DEAD AND SOIL
Combination	10	DL + SOIL POS MOM

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	0.000	0.000
2	0.000	37.170	0.000
3	37.000	37.170	0.000
4	37.000	11.750	0.000
5	0.000	20.250	0.000



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## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	5	20.250	4	0
2	2	3	37.000	1	0
3	4	3	25.420	2	0
4	5	2	16.920	3	0

## Section Properties

Prop	Section	Area (in <sup>2</sup> )	$I_{yy}$ (in <sup>4</sup> )	$I_{zz}$ (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE
2	Rect 36.00x21.00	756.000	27.8E+3	81.6E+3	70.7E+3	CONCRETE
3	Rect 48.00x21.00	1.01E+3	37E+3	194E+3	107E+3	CONCRETE
4	Taper	1.26E+3	46.3E+3	423E+3	185E+3	CONCRETE

## Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip'ft/deg)	rY (kip'ft/deg)	rZ (kip'ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

## Basic Load Cases

Number	Name
1	DEAD LOAD
2	SOIL LOAD
3	LIVE LOAD 1
4	LIVE LOAD 2
5	LIVE LOAD 3
6	LIVE LOAD 4
7	LIVE LOAD 5
8	LIVE LOAD 6

## Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	DEAD AND SOIL	1	DEAD LOAD	1.00
		2	SOIL LOAD	1.15
10	DL + SOIL POS MOM	1	DEAD LOAD	1.00
		2	SOIL LOAD	0.50



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## Beam Force Detail

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			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
1	1:DEAD LOAD	0.000	97.548	-8.608	0.000	0.000	0.000	0.000	0.000	-1.53E+3	
		2.025	94.885	-8.608	0.000	0.000	0.000	0.000	0.000	-1.32E+3	
		4.050	92.222	-8.608	0.000	0.000	0.000	0.000	0.000	-1.11E+3	
		6.075	89.560	-8.608	0.000	0.000	0.000	0.000	0.000	-901.402	
		8.100	86.897	-8.608	0.000	0.000	0.000	0.000	0.000	-692.236	
		10.125	84.234	-8.608	0.000	0.000	0.000	0.000	0.000	-483.070	
		12.150	81.571	-8.608	0.000	0.000	0.000	0.000	0.000	-273.904	
		14.175	78.909	-8.608	0.000	0.000	0.000	0.000	0.000	-64.738	
		16.200	76.246	-8.608	0.000	0.000	0.000	0.000	0.000	144.428	
		18.225	73.583	-8.608	0.000	0.000	0.000	0.000	0.000	353.594	
		20.250	70.921	-8.608	0.000	0.000	0.000	0.000	562.760		
	2:SOIL LOAD	0.000	1.599	-123.961	0.000	0.000	0.000	0.000	0.000	-9.42E+3	
		2.025	1.599	-103.416	0.000	0.000	0.000	0.000	0.000	-6.68E+3	
		4.050	1.599	-83.193	0.000	0.000	0.000	0.000	0.000	-4.43E+3	
		6.075	1.599	-64.563	0.000	0.000	0.000	0.000	0.000	-2.64E+3	
		8.100	1.599	-48.099	0.000	0.000	0.000	0.000	0.000	-1.26E+3	
		10.125	1.599	-33.800	0.000	0.000	0.000	0.000	0.000	-254.715	
		12.150	1.599	-21.976	0.000	0.000	0.000	0.000	0.000	402.823	
		14.175	1.599	-12.318	0.000	0.000	0.000	0.000	0.000	808.174	
		16.200	1.599	-4.825	0.000	0.000	0.000	0.000	0.000	1.01E+3	
		18.225	1.599	0.501	0.000	0.000	0.000	0.000	0.000	1.06E+3	
		20.250	1.599	3.663	0.000	0.000	0.000	0.000	1.01E+3		
	3:LIVE LOAD 1	0.000	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	-1.73E+3	
		2.025	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	-1.49E+3	
		4.050	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	-1.26E+3	
		6.075	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	-1.02E+3	
		8.100	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	-781.194	
		10.125	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	-543.289	
		12.150	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	-305.385	
		14.175	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	-67.480	
		16.200	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	170.424	
		18.225	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	408.329	
		20.250	71.462	-9.790	0.000	0.000	0.000	0.000	646.233		
	4:LIVE LOAD 2	0.000	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	-1.73E+3	
		2.025	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	-1.49E+3	
		4.050	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	-1.25E+3	
		6.075	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	-1.01E+3	
		8.100	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	-776.555	
		10.125	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	-538.656	
		12.150	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	-300.757	
		14.175	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	-62.857	
		16.200	49.229	-9.790	0.000	0.000	0.000	0.000	175.042		



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### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		18.225	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	412.941	
		20.250	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	650.840	
	5:LIVE LOAD 3	0.000	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	-1.82E+3	
		2.025	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	-1.57E+3	
		4.050	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	-1.32E+3	
		6.075	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		8.100	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	-821.301	
		10.125	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	-570.447	
		12.150	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	-319.593	
		14.175	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	-68.739	
		16.200	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	182.115	
		18.225	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	432.970	
		20.250	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	683.824	
	6:LIVE LOAD 4	0.000	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	-1.81E+3	
		2.025	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	-1.56E+3	
		4.050	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	-1.31E+3	
		6.075	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	-1.06E+3	
		8.100	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	-812.470	
		10.125	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	-563.996	
		12.150	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	-315.522	
		14.175	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	-67.048	
		16.200	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	181.426	
		18.225	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	429.900	
		20.250	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	678.374	
	7:LIVE LOAD 5	0.000	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	-1.81E+3	
		2.025	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	-1.56E+3	
		4.050	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	-1.31E+3	
		6.075	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	-1.06E+3	
		8.100	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	-814.547	
		10.125	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	-566.071	
		12.150	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	-317.594	
		14.175	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	-69.118	
		16.200	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	179.358	
		18.225	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	427.835	
		20.250	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	676.311	
	8:LIVE LOAD 6	0.000	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	-1.76E+3	
		2.025	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	-1.52E+3	
		4.050	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	-1.27E+3	
		6.075	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	-1.03E+3	
		8.100	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	-791.330	
		10.125	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	-549.658	
		12.150	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	-307.985	
		14.175	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	-66.312	
		16.200	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	175.360	





Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**5**

Rev

Part Section J', Frame 19

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 19.std Date/Time 29-Feb-2012 11:42

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		18.225	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	417.033	
		20.250	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	658.706	
	9:DEAD AND S	0.000	99.387	-151.162	0.000	0.000	0.000	0.000	0.000	-12.4E+3	
		2.025	96.724	-127.536	0.000	0.000	0.000	0.000	0.000	-9E+3	
		4.050	94.061	-104.280	0.000	0.000	0.000	0.000	0.000	-6.21E+3	
		6.075	91.398	-82.855	0.000	0.000	0.000	0.000	0.000	-3.94E+3	
		8.100	88.736	-63.921	0.000	0.000	0.000	0.000	0.000	-2.15E+3	
		10.125	86.073	-47.477	0.000	0.000	0.000	0.000	0.000	-775.992	
		12.150	83.410	-33.880	0.000	0.000	0.000	0.000	0.000	189.343	
		14.175	80.748	-22.773	0.000	0.000	0.000	0.000	0.000	864.662	
		16.200	78.085	-14.157	0.000	0.000	0.000	0.000	0.000	1.31E+3	
		18.225	75.422	-8.031	0.000	0.000	0.000	0.000	0.000	1.58E+3	
		20.250	72.760	-4.396	0.000	0.000	0.000	0.000	0.000	1.73E+3	
	10:DL + SOIL F	0.000	98.347	-70.588	0.000	0.000	0.000	0.000	0.000	-6.24E+3	
		2.025	95.684	-60.316	0.000	0.000	0.000	0.000	0.000	-4.66E+3	
		4.050	93.022	-50.204	0.000	0.000	0.000	0.000	0.000	-3.33E+3	
		6.075	90.359	-40.889	0.000	0.000	0.000	0.000	0.000	-2.22E+3	
		8.100	87.696	-32.657	0.000	0.000	0.000	0.000	0.000	-1.32E+3	
		10.125	85.034	-25.508	0.000	0.000	0.000	0.000	0.000	-610.427	
		12.150	82.371	-19.596	0.000	0.000	0.000	0.000	0.000	-72.492	
		14.175	79.708	-14.767	0.000	0.000	0.000	0.000	0.000	339.349	
		16.200	77.046	-11.020	0.000	0.000	0.000	0.000	0.000	650.156	
		18.225	74.383	-8.357	0.000	0.000	0.000	0.000	0.000	884.986	
		20.250	71.720	-6.776	0.000	0.000	0.000	0.000	0.000	1.07E+3	
2	1:DEAD LOAD	0.000	8.608	53.115	0.000	0.000	0.000	0.000	0.000	2.31E+3	
		3.700	8.608	41.266	0.000	0.000	0.000	0.000	0.000	299.365	
		7.400	8.608	32.129	0.000	0.000	0.000	0.000	0.000	-1.32E+3	
		11.100	8.608	22.904	0.000	0.000	0.000	0.000	0.000	-2.54E+3	
		14.800	8.608	13.590	0.000	0.000	0.000	0.000	0.000	-3.36E+3	
		18.500	8.608	4.187	0.000	0.000	0.000	0.000	0.000	-3.78E+3	
		22.200	8.608	-10.267	0.000	0.000	0.000	0.000	0.000	-3.51E+3	
		25.900	8.608	-19.859	0.000	0.000	0.000	0.000	0.000	-2.83E+3	
		29.600	8.608	-29.540	0.000	0.000	0.000	0.000	0.000	-1.74E+3	
		33.300	8.608	-39.309	0.000	0.000	0.000	0.000	0.000	-220.808	
		37.000	8.608	-51.966	0.000	0.000	0.000	0.000	0.000	1.72E+3	
	2:SOIL LOAD	0.000	-4.494	1.599	0.000	0.000	0.000	0.000	0.000	105.651	
		3.700	-4.494	1.599	0.000	0.000	0.000	0.000	0.000	34.654	
		7.400	-4.494	1.599	0.000	0.000	0.000	0.000	0.000	-36.343	
		11.100	-4.494	1.599	0.000	0.000	0.000	0.000	0.000	-107.341	
		14.800	-4.494	1.599	0.000	0.000	0.000	0.000	0.000	-178.338	
		18.500	-4.494	1.599	0.000	0.000	0.000	0.000	0.000	-249.335	
		22.200	-4.494	1.599	0.000	0.000	0.000	0.000	0.000	-320.332	
		25.900	-4.494	1.599	0.000	0.000	0.000	0.000	0.000	-391.330	
		29.600	-4.494	1.599	0.000	0.000	0.000	0.000	0.000	-462.327	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**6**

Rev

Part Section J', Frame 19

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 19.std Date/Time 29-Feb-2012 11:42

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	-4.494	1.599	0.000	0.000	0.000	0.000	0.000	-533.324	
		37.000	-4.494	1.599	0.000	0.000	0.000	0.000	0.000	-604.321	
	3:LIVE LOAD 1	0.000	9.790	71.462	0.000	0.000	0.000	0.000	0.000	2.63E+3	
		3.700	9.790	47.942	0.000	0.000	0.000	0.000	0.000	339.233	
		7.400	9.790	32.262	0.000	0.000	0.000	0.000	0.000	-1.64E+3	
		11.100	9.790	20.502	0.000	0.000	0.000	0.000	0.000	-3.03E+3	
		14.800	9.790	12.662	0.000	0.000	0.000	0.000	0.000	-3.85E+3	
		18.500	9.790	-6.938	0.000	0.000	0.000	0.000	0.000	-4.29E+3	
		22.200	9.790	-10.858	0.000	0.000	0.000	0.000	0.000	-3.95E+3	
		25.900	9.790	-26.538	0.000	0.000	0.000	0.000	0.000	-3.23E+3	
		29.600	9.790	-38.298	0.000	0.000	0.000	0.000	0.000	-1.93E+3	
		33.300	9.790	-46.138	0.000	0.000	0.000	0.000	0.000	-97.103	
		37.000	9.790	-46.138	0.000	0.000	0.000	0.000	0.000	1.95E+3	
	4:LIVE LOAD 2	0.000	9.790	49.229	0.000	0.000	0.000	0.000	0.000	2.64E+3	
		3.700	9.790	49.229	0.000	0.000	0.000	0.000	0.000	452.841	
		7.400	9.790	41.389	0.000	0.000	0.000	0.000	0.000	-1.52E+3	
		11.100	9.790	29.629	0.000	0.000	0.000	0.000	0.000	-2.95E+3	
		14.800	9.790	13.949	0.000	0.000	0.000	0.000	0.000	-3.82E+3	
		18.500	9.790	10.029	0.000	0.000	0.000	0.000	0.000	-4.29E+3	
		22.200	9.790	-9.571	0.000	0.000	0.000	0.000	0.000	-3.98E+3	
		25.900	9.790	-17.411	0.000	0.000	0.000	0.000	0.000	-3.3E+3	
		29.600	9.790	-29.171	0.000	0.000	0.000	0.000	0.000	-2.05E+3	
		33.300	9.790	-44.851	0.000	0.000	0.000	0.000	0.000	-208.753	
		37.000	9.790	-68.371	0.000	0.000	0.000	0.000	0.000	1.95E+3	
	5:LIVE LOAD 3	0.000	10.323	60.430	0.000	0.000	0.000	0.000	0.000	2.78E+3	
		3.700	10.323	56.510	0.000	0.000	0.000	0.000	0.000	222.217	
		7.400	10.323	40.830	0.000	0.000	0.000	0.000	0.000	-1.67E+3	
		11.100	10.323	29.070	0.000	0.000	0.000	0.000	0.000	-3.08E+3	
		14.800	10.323	21.230	0.000	0.000	0.000	0.000	0.000	-4.05E+3	
		18.500	10.323	1.630	0.000	0.000	0.000	0.000	0.000	-4.29E+3	
		22.200	10.323	-17.970	0.000	0.000	0.000	0.000	0.000	-4.19E+3	
		25.900	10.323	-25.810	0.000	0.000	0.000	0.000	0.000	-3.37E+3	
		29.600	10.323	-37.570	0.000	0.000	0.000	0.000	0.000	-2.1E+3	
		33.300	10.323	-53.250	0.000	0.000	0.000	0.000	0.000	-356.607	
		37.000	10.323	-57.170	0.000	0.000	0.000	0.000	0.000	2.06E+3	
	6:LIVE LOAD 4	0.000	10.225	65.185	0.000	0.000	0.000	0.000	0.000	2.75E+3	
		3.700	10.225	45.585	0.000	0.000	0.000	0.000	0.000	260.125	
		7.400	10.225	37.745	0.000	0.000	0.000	0.000	0.000	-1.65E+3	
		11.100	10.225	25.985	0.000	0.000	0.000	0.000	0.000	-3.06E+3	
		14.800	10.225	10.305	0.000	0.000	0.000	0.000	0.000	-3.95E+3	
		18.500	10.225	6.385	0.000	0.000	0.000	0.000	0.000	-4.31E+3	
		22.200	10.225	-13.215	0.000	0.000	0.000	0.000	0.000	-4.07E+3	
		25.900	10.225	-21.055	0.000	0.000	0.000	0.000	0.000	-3.32E+3	
		29.600	10.225	-32.815	0.000	0.000	0.000	0.000	0.000	-2.05E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**7**

Rev

Part Section J', Frame 19

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 19.std Date/Time 29-Feb-2012 11:42

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	10.225	-48.495	0.000	0.000	0.000	0.000	0.000	-236.100	
		37.000	10.225	-52.415	0.000	0.000	0.000	0.000	0.000	2.04E+3	
	7:LIVE LOAD 5	0.000	10.225	55.643	0.000	0.000	0.000	0.000	0.000	2.75E+3	
		3.700	10.225	51.723	0.000	0.000	0.000	0.000	0.000	336.802	
		7.400	10.225	36.043	0.000	0.000	0.000	0.000	0.000	-1.62E+3	
		11.100	10.225	24.283	0.000	0.000	0.000	0.000	0.000	-3.04E+3	
		14.800	10.225	16.443	0.000	0.000	0.000	0.000	0.000	-3.93E+3	
		18.500	10.225	-3.157	0.000	0.000	0.000	0.000	0.000	-4.31E+3	
		22.200	10.225	-7.077	0.000	0.000	0.000	0.000	0.000	-4.09E+3	
		25.900	10.225	-22.757	0.000	0.000	0.000	0.000	0.000	-3.35E+3	
		29.600	10.225	-34.517	0.000	0.000	0.000	0.000	0.000	-2.08E+3	
		33.300	10.225	-42.357	0.000	0.000	0.000	0.000	0.000	-313.653	
		37.000	10.225	-61.957	0.000	0.000	0.000	0.000	0.000	2.04E+3	
	8:LIVE LOAD 6	0.000	9.945	45.170	0.000	0.000	0.000	0.000	0.000	2.68E+3	
		3.700	9.945	45.170	0.000	0.000	0.000	0.000	0.000	672.484	
		7.400	9.945	45.170	0.000	0.000	0.000	0.000	0.000	-1.33E+3	
		11.100	9.945	32.090	0.000	0.000	0.000	0.000	0.000	-3.05E+3	
		14.800	9.945	23.370	0.000	0.000	0.000	0.000	0.000	-4.22E+3	
		18.500	9.945	1.570	0.000	0.000	0.000	0.000	0.000	-4.73E+3	
		22.200	9.945	-20.230	0.000	0.000	0.000	0.000	0.000	-4.36E+3	
		25.900	9.945	-28.950	0.000	0.000	0.000	0.000	0.000	-3.33E+3	
		29.600	9.945	-42.030	0.000	0.000	0.000	0.000	0.000	-1.75E+3	
		33.300	9.945	-42.030	0.000	0.000	0.000	0.000	0.000	114.956	
		37.000	9.945	-42.030	0.000	0.000	0.000	0.000	0.000	1.98E+3	
	9:DEAD AND S	0.000	3.440	54.954	0.000	0.000	0.000	0.000	0.000	2.43E+3	
		3.700	3.440	43.105	0.000	0.000	0.000	0.000	0.000	339.217	
		7.400	3.440	33.968	0.000	0.000	0.000	0.000	0.000	-1.36E+3	
		11.100	3.440	24.743	0.000	0.000	0.000	0.000	0.000	-2.66E+3	
		14.800	3.440	15.428	0.000	0.000	0.000	0.000	0.000	-3.57E+3	
		18.500	3.440	6.026	0.000	0.000	0.000	0.000	0.000	-4.07E+3	
		22.200	3.440	-8.428	0.000	0.000	0.000	0.000	0.000	-3.88E+3	
		25.900	3.440	-18.020	0.000	0.000	0.000	0.000	0.000	-3.28E+3	
		29.600	3.440	-27.701	0.000	0.000	0.000	0.000	0.000	-2.27E+3	
		33.300	3.440	-37.470	0.000	0.000	0.000	0.000	0.000	-834.131	
		37.000	3.440	-50.127	0.000	0.000	0.000	0.000	0.000	1.02E+3	
	10:DL + SOIL F	0.000	6.361	53.914	0.000	0.000	0.000	0.000	0.000	2.36E+3	
		3.700	6.361	42.066	0.000	0.000	0.000	0.000	0.000	316.692	
		7.400	6.361	32.929	0.000	0.000	0.000	0.000	0.000	-1.34E+3	
		11.100	6.361	23.703	0.000	0.000	0.000	0.000	0.000	-2.59E+3	
		14.800	6.361	14.389	0.000	0.000	0.000	0.000	0.000	-3.45E+3	
		18.500	6.361	4.987	0.000	0.000	0.000	0.000	0.000	-3.91E+3	
		22.200	6.361	-9.467	0.000	0.000	0.000	0.000	0.000	-3.67E+3	
		25.900	6.361	-19.059	0.000	0.000	0.000	0.000	0.000	-3.03E+3	
		29.600	6.361	-28.740	0.000	0.000	0.000	0.000	0.000	-1.97E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**8**

Rev

Part Section J', Frame 19

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 19.std Date/Time 29-Feb-2012 11:42

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	6.361	-38.509	0.000	0.000	0.000	0.000	0.000	-487.470	
		37.000	6.361	-51.167	0.000	0.000	0.000	0.000	0.000	1.42E+3	
3	1:DEAD LOAD	0.000	72.029	8.608	0.000	0.000	0.000	0.000	0.000	906.970	
		2.542	70.023	8.608	0.000	0.000	0.000	0.000	0.000	644.403	
		5.084	68.017	8.608	0.000	0.000	0.000	0.000	0.000	381.835	
		7.626	66.010	8.608	0.000	0.000	0.000	0.000	0.000	119.267	
		10.168	64.004	8.608	0.000	0.000	0.000	0.000	0.000	-143.301	
		12.710	61.998	8.608	0.000	0.000	0.000	0.000	0.000	-405.869	
		15.252	59.992	8.608	0.000	0.000	0.000	0.000	0.000	-668.437	
		17.794	57.985	8.608	0.000	0.000	0.000	0.000	0.000	-931.005	
		20.336	55.979	8.608	0.000	0.000	0.000	0.000	0.000	-1.19E+3	
		22.878	53.973	8.608	0.000	0.000	0.000	0.000	0.000	-1.46E+3	
		25.420	51.966	8.608	0.000	0.000	0.000	0.000	0.000	-1.72E+3	
	2:SOIL LOAD	0.000	-1.599	-4.494	0.000	0.000	0.000	0.000	0.000	-766.506	
		2.542	-1.599	-4.494	0.000	0.000	0.000	0.000	0.000	-629.424	
		5.084	-1.599	-4.494	0.000	0.000	0.000	0.000	0.000	-492.341	
		7.626	-1.599	-4.494	0.000	0.000	0.000	0.000	0.000	-355.258	
		10.168	-1.599	-4.494	0.000	0.000	0.000	0.000	0.000	-218.175	
		12.710	-1.599	-4.494	0.000	0.000	0.000	0.000	0.000	-81.092	
		15.252	-1.599	-4.494	0.000	0.000	0.000	0.000	0.000	55.990	
		17.794	-1.599	-4.494	0.000	0.000	0.000	0.000	0.000	193.073	
		20.336	-1.599	-4.494	0.000	0.000	0.000	0.000	0.000	330.156	
		22.878	-1.599	-4.494	0.000	0.000	0.000	0.000	0.000	467.239	
		25.420	-1.599	-4.494	0.000	0.000	0.000	0.000	0.000	604.321	
	3:LIVE LOAD 1	0.000	46.138	9.790	0.000	0.000	0.000	0.000	0.000	1.03E+3	
		2.542	46.138	9.790	0.000	0.000	0.000	0.000	0.000	736.354	
		5.084	46.138	9.790	0.000	0.000	0.000	0.000	0.000	437.711	
		7.626	46.138	9.790	0.000	0.000	0.000	0.000	0.000	139.068	
		10.168	46.138	9.790	0.000	0.000	0.000	0.000	0.000	-159.576	
		12.710	46.138	9.790	0.000	0.000	0.000	0.000	0.000	-458.219	
		15.252	46.138	9.790	0.000	0.000	0.000	0.000	0.000	-756.863	
		17.794	46.138	9.790	0.000	0.000	0.000	0.000	0.000	-1.06E+3	
		20.336	46.138	9.790	0.000	0.000	0.000	0.000	0.000	-1.35E+3	
		22.878	46.138	9.790	0.000	0.000	0.000	0.000	0.000	-1.65E+3	
		25.420	46.138	9.790	0.000	0.000	0.000	0.000	0.000	-1.95E+3	
	4:LIVE LOAD 2	0.000	68.371	9.790	0.000	0.000	0.000	0.000	0.000	1.04E+3	
		2.542	68.371	9.790	0.000	0.000	0.000	0.000	0.000	738.903	
		5.084	68.371	9.790	0.000	0.000	0.000	0.000	0.000	440.266	
		7.626	68.371	9.790	0.000	0.000	0.000	0.000	0.000	141.629	
		10.168	68.371	9.790	0.000	0.000	0.000	0.000	0.000	-157.008	
		12.710	68.371	9.790	0.000	0.000	0.000	0.000	0.000	-455.645	
		15.252	68.371	9.790	0.000	0.000	0.000	0.000	0.000	-754.282	
		17.794	68.371	9.790	0.000	0.000	0.000	0.000	0.000	-1.05E+3	
		20.336	68.371	9.790	0.000	0.000	0.000	0.000	0.000	-1.35E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**9**

Rev

Part Section J', Frame 19

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 19.std Date/Time 29-Feb-2012 11:42

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		22.878	68.371	9.790	0.000	0.000	0.000	0.000	0.000	-1.65E+3	
		25.420	68.371	9.790	0.000	0.000	0.000	0.000	0.000	-1.95E+3	
	5:LIVE LOAD 3	0.000	57.170	10.323	0.000	0.000	0.000	0.000	0.000	1.09E+3	
		2.542	57.170	10.323	0.000	0.000	0.000	0.000	0.000	777.776	
		5.084	57.170	10.323	0.000	0.000	0.000	0.000	0.000	462.877	
		7.626	57.170	10.323	0.000	0.000	0.000	0.000	0.000	147.977	
		10.168	57.170	10.323	0.000	0.000	0.000	0.000	0.000	-166.922	
		12.710	57.170	10.323	0.000	0.000	0.000	0.000	0.000	-481.822	
		15.252	57.170	10.323	0.000	0.000	0.000	0.000	0.000	-796.721	
		17.794	57.170	10.323	0.000	0.000	0.000	0.000	0.000	-1.11E+3	
		20.336	57.170	10.323	0.000	0.000	0.000	0.000	0.000	-1.43E+3	
		22.878	57.170	10.323	0.000	0.000	0.000	0.000	0.000	-1.74E+3	
		25.420	57.170	10.323	0.000	0.000	0.000	0.000	0.000	-2.06E+3	
	6:LIVE LOAD 4	0.000	52.415	10.225	0.000	0.000	0.000	0.000	0.000	1.08E+3	
		2.542	52.415	10.225	0.000	0.000	0.000	0.000	0.000	770.973	
		5.084	52.415	10.225	0.000	0.000	0.000	0.000	0.000	459.061	
		7.626	52.415	10.225	0.000	0.000	0.000	0.000	0.000	147.149	
		10.168	52.415	10.225	0.000	0.000	0.000	0.000	0.000	-164.762	
		12.710	52.415	10.225	0.000	0.000	0.000	0.000	0.000	-476.674	
		15.252	52.415	10.225	0.000	0.000	0.000	0.000	0.000	-788.585	
		17.794	52.415	10.225	0.000	0.000	0.000	0.000	0.000	-1.1E+3	
		20.336	52.415	10.225	0.000	0.000	0.000	0.000	0.000	-1.41E+3	
		22.878	52.415	10.225	0.000	0.000	0.000	0.000	0.000	-1.72E+3	
		25.420	52.415	10.225	0.000	0.000	0.000	0.000	0.000	-2.04E+3	
	7:LIVE LOAD 5	0.000	61.957	10.225	0.000	0.000	0.000	0.000	0.000	1.08E+3	
		2.542	61.957	10.225	0.000	0.000	0.000	0.000	0.000	769.832	
		5.084	61.957	10.225	0.000	0.000	0.000	0.000	0.000	457.917	
		7.626	61.957	10.225	0.000	0.000	0.000	0.000	0.000	146.003	
		10.168	61.957	10.225	0.000	0.000	0.000	0.000	0.000	-165.912	
		12.710	61.957	10.225	0.000	0.000	0.000	0.000	0.000	-477.827	
		15.252	61.957	10.225	0.000	0.000	0.000	0.000	0.000	-789.741	
		17.794	61.957	10.225	0.000	0.000	0.000	0.000	0.000	-1.1E+3	
		20.336	61.957	10.225	0.000	0.000	0.000	0.000	0.000	-1.41E+3	
		22.878	61.957	10.225	0.000	0.000	0.000	0.000	0.000	-1.73E+3	
		25.420	61.957	10.225	0.000	0.000	0.000	0.000	0.000	-2.04E+3	
	8:LIVE LOAD 6	0.000	42.030	9.945	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		2.542	42.030	9.945	0.000	0.000	0.000	0.000	0.000	749.259	
		5.084	42.030	9.945	0.000	0.000	0.000	0.000	0.000	445.885	
		7.626	42.030	9.945	0.000	0.000	0.000	0.000	0.000	142.511	
		10.168	42.030	9.945	0.000	0.000	0.000	0.000	0.000	-160.862	
		12.710	42.030	9.945	0.000	0.000	0.000	0.000	0.000	-464.236	
		15.252	42.030	9.945	0.000	0.000	0.000	0.000	0.000	-767.610	
		17.794	42.030	9.945	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		20.336	42.030	9.945	0.000	0.000	0.000	0.000	0.000	-1.37E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**10**

Rev

Part Section J', Frame 19

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 19.std Date/Time 29-Feb-2012 11:42

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	
		22.878	42.030	9.945	0.000	0.000	0.000	0.000	-1.68E+3
		25.420	42.030	9.945	0.000	0.000	0.000	0.000	-1.98E+3
	9:DEAD AND S	0.000	70.191	3.440	0.000	0.000	0.000	0.000	25.488
		2.542	68.184	3.440	0.000	0.000	0.000	0.000	-79.435
		5.084	66.178	3.440	0.000	0.000	0.000	0.000	-184.357
		7.626	64.172	3.440	0.000	0.000	0.000	0.000	-289.280
		10.168	62.165	3.440	0.000	0.000	0.000	0.000	-394.202
		12.710	60.159	3.440	0.000	0.000	0.000	0.000	-499.125
		15.252	58.153	3.440	0.000	0.000	0.000	0.000	-604.048
		17.794	56.146	3.440	0.000	0.000	0.000	0.000	-708.970
		20.336	54.140	3.440	0.000	0.000	0.000	0.000	-813.893
		22.878	52.134	3.440	0.000	0.000	0.000	0.000	-918.816
		25.420	50.127	3.440	0.000	0.000	0.000	0.000	-1.02E+3
	10:DL + SOIL F	0.000	71.230	6.361	0.000	0.000	0.000	0.000	523.717
		2.542	69.224	6.361	0.000	0.000	0.000	0.000	329.691
		5.084	67.217	6.361	0.000	0.000	0.000	0.000	135.664
		7.626	65.211	6.361	0.000	0.000	0.000	0.000	-58.362
		10.168	63.205	6.361	0.000	0.000	0.000	0.000	-252.389
		12.710	61.198	6.361	0.000	0.000	0.000	0.000	-446.415
		15.252	59.192	6.361	0.000	0.000	0.000	0.000	-640.442
		17.794	57.186	6.361	0.000	0.000	0.000	0.000	-834.468
		20.336	55.179	6.361	0.000	0.000	0.000	0.000	-1.03E+3
		22.878	53.173	6.361	0.000	0.000	0.000	0.000	-1.22E+3
		25.420	51.167	6.361	0.000	0.000	0.000	0.000	-1.42E+3
4	1:DEAD LOAD	0.000	70.921	-8.608	0.000	0.000	0.000	0.000	562.760
		1.692	69.140	-8.608	0.000	0.000	0.000	0.000	737.530
		3.384	67.359	-8.608	0.000	0.000	0.000	0.000	912.300
		5.076	65.579	-8.608	0.000	0.000	0.000	0.000	1.09E+3
		6.768	63.798	-8.608	0.000	0.000	0.000	0.000	1.26E+3
		8.460	62.018	-8.608	0.000	0.000	0.000	0.000	1.44E+3
		10.152	60.237	-8.608	0.000	0.000	0.000	0.000	1.61E+3
		11.844	58.457	-8.608	0.000	0.000	0.000	0.000	1.79E+3
		13.536	56.676	-8.608	0.000	0.000	0.000	0.000	1.96E+3
		15.228	54.895	-8.608	0.000	0.000	0.000	0.000	2.14E+3
		16.920	53.115	-8.608	0.000	0.000	0.000	0.000	2.31E+3
	2:SOIL LOAD	0.000	1.599	3.663	0.000	0.000	0.000	0.000	1.01E+3
		1.692	1.599	4.484	0.000	0.000	0.000	0.000	926.817
		3.384	1.599	4.494	0.000	0.000	0.000	0.000	835.609
		5.076	1.599	4.494	0.000	0.000	0.000	0.000	744.364
		6.768	1.599	4.494	0.000	0.000	0.000	0.000	653.120
		8.460	1.599	4.494	0.000	0.000	0.000	0.000	561.875
		10.152	1.599	4.494	0.000	0.000	0.000	0.000	470.630
		11.844	1.599	4.494	0.000	0.000	0.000	0.000	379.385
		13.536	1.599	4.494	0.000	0.000	0.000	0.000	288.141



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**11**

Rev

Part Section J', Frame 19

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 19.std Date/Time 29-Feb-2012 11:42

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		15.228	1.599	4.494	0.000	0.000	0.000	0.000	0.000	196.896	
		16.920	1.599	4.494	0.000	0.000	0.000	0.000	0.000	105.651	
	3:LIVE LOAD 1	0.000	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	646.233	
		1.692	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	845.015	
		3.384	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	1.04E+3	
		5.076	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	1.24E+3	
		6.768	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	1.44E+3	
		8.460	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	1.64E+3	
		10.152	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	1.84E+3	
		11.844	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	2.04E+3	
		13.536	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	2.24E+3	
		15.228	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	2.44E+3	
		16.920	71.462	-9.790	0.000	0.000	0.000	0.000	0.000	2.63E+3	
	4:LIVE LOAD 2	0.000	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	650.840	
		1.692	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	849.618	
		3.384	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		5.076	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	1.25E+3	
		6.768	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	1.45E+3	
		8.460	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	1.64E+3	
		10.152	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	1.84E+3	
		11.844	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	2.04E+3	
		13.536	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	2.24E+3	
		15.228	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	2.44E+3	
		16.920	49.229	-9.790	0.000	0.000	0.000	0.000	0.000	2.64E+3	
	5:LIVE LOAD 3	0.000	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	683.824	
		1.692	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	893.427	
		3.384	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	1.1E+3	
		5.076	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	1.31E+3	
		6.768	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	1.52E+3	
		8.460	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	1.73E+3	
		10.152	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	1.94E+3	
		11.844	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	2.15E+3	
		13.536	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	2.36E+3	
		15.228	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	2.57E+3	
		16.920	60.430	-10.323	0.000	0.000	0.000	0.000	0.000	2.78E+3	
	6:LIVE LOAD 4	0.000	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	678.374	
		1.692	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	885.988	
		3.384	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	1.09E+3	
		5.076	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	1.3E+3	
		6.768	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	1.51E+3	
		8.460	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	1.72E+3	
		10.152	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	1.92E+3	
		11.844	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	2.13E+3	
		13.536	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	2.34E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**12**

Rev

Part Section J', Frame 19

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 19.std Date/Time 29-Feb-2012 11:42

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		15.228	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	2.55E+3	
		16.920	65.185	-10.225	0.000	0.000	0.000	0.000	0.000	2.75E+3	
	7:LIVE LOAD 5	0.000	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	676.311	
		1.692	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	883.927	
		3.384	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	1.09E+3	
		5.076	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	1.3E+3	
		6.768	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	1.51E+3	
		8.460	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	1.71E+3	
		10.152	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	1.92E+3	
		11.844	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	2.13E+3	
		13.536	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	2.34E+3	
		15.228	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	2.54E+3	
		16.920	55.643	-10.225	0.000	0.000	0.000	0.000	0.000	2.75E+3	
	8:LIVE LOAD 6	0.000	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	658.706	
		1.692	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	860.637	
		3.384	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	1.06E+3	
		5.076	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	1.26E+3	
		6.768	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	1.47E+3	
		8.460	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	1.67E+3	
		10.152	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	1.87E+3	
		11.844	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	2.07E+3	
		13.536	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	2.27E+3	
		15.228	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	2.48E+3	
		16.920	45.170	-9.945	0.000	0.000	0.000	0.000	0.000	2.68E+3	
	9:DEAD AND S	0.000	72.760	-4.396	0.000	0.000	0.000	0.000	0.000	1.73E+3	
		1.692	70.979	-3.451	0.000	0.000	0.000	0.000	0.000	1.8E+3	
		3.384	69.198	-3.440	0.000	0.000	0.000	0.000	0.000	1.87E+3	
		5.076	67.418	-3.440	0.000	0.000	0.000	0.000	0.000	1.94E+3	
		6.768	65.637	-3.440	0.000	0.000	0.000	0.000	0.000	2.01E+3	
		8.460	63.857	-3.440	0.000	0.000	0.000	0.000	0.000	2.08E+3	
		10.152	62.076	-3.440	0.000	0.000	0.000	0.000	0.000	2.15E+3	
		11.844	60.295	-3.440	0.000	0.000	0.000	0.000	0.000	2.22E+3	
		13.536	58.515	-3.440	0.000	0.000	0.000	0.000	0.000	2.29E+3	
		15.228	56.734	-3.440	0.000	0.000	0.000	0.000	0.000	2.36E+3	
		16.920	54.954	-3.440	0.000	0.000	0.000	0.000	0.000	2.43E+3	
	10:DL + SOIL F	0.000	71.720	-6.776	0.000	0.000	0.000	0.000	0.000	1.07E+3	
		1.692	69.940	-6.366	0.000	0.000	0.000	0.000	0.000	1.2E+3	
		3.384	68.159	-6.361	0.000	0.000	0.000	0.000	0.000	1.33E+3	
		5.076	66.378	-6.361	0.000	0.000	0.000	0.000	0.000	1.46E+3	
		6.768	64.598	-6.361	0.000	0.000	0.000	0.000	0.000	1.59E+3	
		8.460	62.817	-6.361	0.000	0.000	0.000	0.000	0.000	1.72E+3	
		10.152	61.037	-6.361	0.000	0.000	0.000	0.000	0.000	1.85E+3	
		11.844	59.256	-6.361	0.000	0.000	0.000	0.000	0.000	1.98E+3	
		13.536	57.476	-6.361	0.000	0.000	0.000	0.000	0.000	2.1E+3	





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Job No  
**P402110046**

Sheet No  
**13**

Rev

Part Section J', Frame 19

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

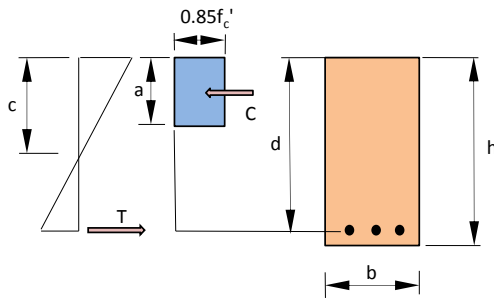
Client ODOT

File Section J' Frame 19.std Date/Time 29-Feb-2012 11:42

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear		Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip·in)	My (kip·in)	Mz (kip·in)
		15.228	55.695	-6.361	0.000	0.000	0.000	2.23E+3
		16.920	53.914	-6.361	0.000	0.000	0.000	2.36E+3

### Floor Beam Postive Moment Section



b =	121.8	in	
d =	48	in	
f'c =	4.5	ksi	
fy =	33	ksi	
φ =	0.9		
Area of Steel =	12.7	in <sup>2</sup>	(10 - 1 1/8" □)
% Steel Loss =	0%		from 49/246 of original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	12.700	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	294.78	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	0.900	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1494.6	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

(Soil Load Moment includes 1.15 factor)

Total Service Positive Moment = 339.0 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	34	32.1	21.7	31.4	35.6	32	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	44.2	41.7	28.2	40.8	46.3	41.6	kips
Reaction per Wheel (LL+I) =	22.1	20.9	14.1	20.4	23.1	20.8	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

From STAAD							
Max. Positive LL+I Moment =	394.5	372.5	251.8	364.3	413.1	371.3	ft*kips

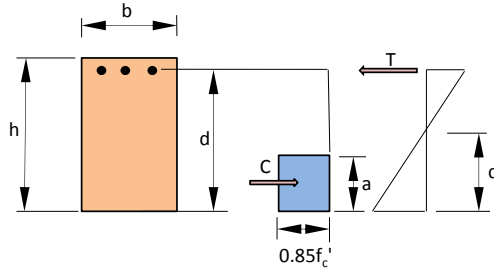
Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.23	44.3 Tons	HS24.6
Operating	HS20	36 Tons	RF=2.06	74.0 Tons	HS41.1
	2F1	15 Tons	RF=3.22	48.3 Tons	
	3F1	23 Tons	RF=2.23	51.2 Tons	
	4F1	27 Tons	RF=1.96	53.0 Tons	
	5C1	40 Tons	RF=2.18	87.3 Tons	
	Ohio Legal %	195%			

### Floor Beam Negative Moment Section

(South end of frame controls)



b =	21	in
d =	66	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	8	in <sup>2</sup>
% Steel Loss =	0%	

(8 - 1" □) from  
49/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

$$A_s = 8.000 \text{ in}^2$$

Area of reinforcing steel minus any loss noted

$$\rho_b = 0.048$$

$$0.75 \cdot A_{sb} = 49.50 \text{ in}^2$$

Balanced reinforcement ratio, AASHTO Eq. 8-18

75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2

$$\beta_1 = 0.85$$

$$a = 4.930 \text{ in}$$

Depth of equivalent compressive stress block, AASHTO Eq. 8-17

$$\phi M_n = 1258.0 \text{ ft} \cdot \text{kips}$$

Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

Moment at end face of column

(Soil Load Moment includes 1.15 factor)

$$\text{Total Service Negative Moment} = 17.3 \text{ ft} \cdot \text{kips}$$

From Staad

#### Live Load Moment

Moment at end face of column

From STAAD					
HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
85.58	80.8	54.6	79.0	89.6	80.5

Max. Negative LL+I Moment = 85.58 ft\*kips

Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=6.65	239.5 Tons	HS133.1
Operating	HS20	36 Tons	RF=11.11	399.8 Tons	HS222.1
	2F1	15 Tons	RF=17.40	261.0 Tons	
	3F1	23 Tons	RF=12.02	276.6 Tons	
	4F1	27 Tons	RF=10.61	286.4 Tons	
	5C1	40 Tons	RF=11.80	472.0 Tons	
	Ohio Legal %	1060%			



## Floor Beam Shear Section

### Section Capacity

Taken at face of column (South end of cap controls)

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed conservatively)
$d =$	<input type="text" value="66"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="151.8"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="259.7"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

(Soil Shear includes 1.15 factor)

Total Service Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="62"/>		58.5	39.6	57.3	64.9	58.4

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.51	54.4 Tons	HS30.2
Operating	HS20	36 Tons	RF=2.52	90.9 Tons	HS50.5
	2F1	15 Tons	RF=3.95	59.3 Tons	
	3F1	23 Tons	RF=2.73	62.9 Tons	
	4F1	27 Tons	RF=2.41	65.1 Tons	
	5C1	40 Tons	RF=2.68	107.3 Tons	
	Ohio Legal %	240%			



**Column Section** (North Column at bottom of column controls)

h =	72	in	Column Depth
b =	21	in	Column Width
A <sub>s</sub> =	10.35	in <sup>2</sup>	Area of Tension Steel (5 -1 1/8" bars, 4 -1" bars)
A' <sub>s</sub> =	6.35	in <sup>2</sup>	Area of Compression Steel (5- 1 1/8" bars)
d =	69	in	Distance from compression face to centroid of tension steel
d' =	3	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	3	ksi	Concrete Strength
f <sub>y</sub> =	33	ksi	Steel Yield Stress
E <sub>s</sub> =	29000	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	0.003	in/in	Ultimate concrete strain
β <sub>1</sub> =	0.85		
d" =	33	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads plus Soil Load** (moment taken at the top of footing)

Total Service Moment =	1029.8	ft-kips	From Staad (Moment for Soil includes 1.15 load factor)
Total Service Axial Force =	99.4	kips	From Staad (Axial for Soil includes 1.15 load factor)

**Live Loads** (Moment taken at the top of footing)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	152.1	143.6	97.1	140.5	159.2	143.1		ft-kips
Max. LL+I Axial Force =	57.2	54.0	38.7	82.8	64.9	51.4		kips

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	42.52	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	50.03	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	33	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	2145.0	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	4312.3	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	4364.1	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	3054.9	kips		



Made by:	MJJ	Date:	2/13/2012	Job No:	P402110046
Checked by:	DBH	Date:	2/29/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	As-Built Concrete Frame Rating Section J' (Frame 19)				

**Pure Bending Capacity** (Ignoring compression steel)

$a =$	6.378	in	$a = A_s * f_y / 0.85 * f'_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	1873.1	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	1685.8	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **12.39** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d - c) / c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c - d') / c, f_y)$	Stress in compression steel
$a =$	10.53569135	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	564.2	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	302.5	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	2072.3	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	82.20	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	253.3	246.4	213.1	308.8	269.9	240.8	kips
$M_u =$	1668.8	1650.4	1549.4	1643.6	1684.3	1649.4	ft-kips
$e =$	79.05	80.37	87.24	63.86	74.87	82.20	in
$\phi P_n =$	320.3	312.6	277.7	440.4	346.8	302.5	kips
$\phi M_n =$	2109.6	2093.5	2019.0	2343.7	2164.1	2072.3	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

Column Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.54	55.4 Tons	HS30.8
Operating	HS20	36 Tons	RF=2.57	92.5 Tons	HS51.4
	2F1	15 Tons	RF=2.95	44.3 Tons	
	3F1	23 Tons	RF=2.89	66.5 Tons	
	4F1	27 Tons	RF=2.58	69.7 Tons	
	5C1	40 Tons	RF=2.59	103.7 Tons	
Ohio Legal %	260%				

Floor Beam Load Rating Summary:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.23	44.3 Tons	HS24.6
Operating	HS20	36 Tons	RF=2.06	74.0 Tons	HS41.1
	2F1	15 Tons	RF=2.95	44.3 Tons	
	3F1	23 Tons	RF=2.23	51.2 Tons	
	4F1	27 Tons	RF=1.96	53.0 Tons	
	5C1	40 Tons	RF=2.18	87.3 Tons	
Ohio Legal %	195%				

Positive Moment  
Positive Moment  
Column  
Positive Moment  
Positive Moment  
Positive Moment



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**P402110046**Sheet No  
**1**

Rev

Part Section J', Frame 20

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 20.std Date/Time 29-Feb-2012 11:43

## Job Information

	Engineer	Checked	Approved
<b>Name:</b>	M Johnson	D Hoff	
<b>Date:</b>	13-Feb-12	29-Feb-12	

<b>Structure Type</b>	SPACE FRAME
-----------------------	-------------

Number of Nodes	5	Highest Node	5
Number of Elements	4	Highest Beam	4

Number of Basic Load Cases	8
Number of Combination Load Cases	2

Included in this printout are data for:

<b>All</b>	The Whole Structure
------------	---------------------

Included in this printout are results for load cases:

Type	L/C	Name
Primary	1	DEAD LOAD
Primary	2	SOIL LOAD
Primary	3	LIVE LOAD 1
Primary	4	LIVE LOAD 2
Primary	5	LIVE LOAD 3
Primary	6	LIVE LOAD 4
Primary	7	LIVE LOAD 5
Primary	8	LIVE LOAD 6
Combination	9	DEAD AND SOIL
Combination	10	DL + SOIL POS M

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	0.000	0.000
2	0.000	37.340	0.000
3	37.000	37.340	0.000
4	37.000	9.750	0.000
5	0.000	20.250	0.000



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**2**

Rev

Part Section J', Frame 20

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By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 20.std Date/Time 29-Feb-2012 11:43

## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	5	20.250	4	0
2	2	3	37.000	1	0
3	4	3	27.590	2	0
4	5	2	17.090	3	0

## Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE
2	Rect 36.00x21.00	756.000	27.8E+3	81.6E+3	70.7E+3	CONCRETE
3	Rect 48.00x21.00	1.01E+3	37E+3	194E+3	107E+3	CONCRETE
4	Taper	1.26E+3	46.3E+3	423E+3	185E+3	CONCRETE

## Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip'ft/deg)	rY (kip'ft/deg)	rZ (kip'ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

## Basic Load Cases

Number	Name
1	DEAD LOAD
2	SOIL LOAD
3	LIVE LOAD 1
4	LIVE LOAD 2
5	LIVE LOAD 3
6	LIVE LOAD 4
7	LIVE LOAD 5
8	LIVE LOAD 6

## Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	DEAD AND SOIL	1	DEAD LOAD	1.00
		2	SOIL LOAD	1.15
10	DL + SOIL POS M	1	DEAD LOAD	1.00
		2	SOIL LOAD	0.50





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**3**

Rev

Part Section J', Frame 20

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 20.std Date/Time 29-Feb-2012 11:43

## Beam Force Detail

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			Shear			Torsion		Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)				
1	1:DEAD LOAD	0.000	91.459	-6.965	0.000	0.000	0.000	0.000	0.000	0.000	-1.18E+3	
		2.025	88.796	-6.965	0.000	0.000	0.000	0.000	0.000	0.000	-1.01E+3	
		4.050	86.134	-6.965	0.000	0.000	0.000	0.000	0.000	0.000	-838.280	
		6.075	83.471	-6.965	0.000	0.000	0.000	0.000	0.000	0.000	-669.030	
		8.100	80.808	-6.965	0.000	0.000	0.000	0.000	0.000	0.000	-499.780	
		10.125	78.146	-6.965	0.000	0.000	0.000	0.000	0.000	0.000	-330.530	
		12.150	75.483	-6.965	0.000	0.000	0.000	0.000	0.000	0.000	-161.280	
		14.175	72.820	-6.965	0.000	0.000	0.000	0.000	0.000	0.000	7.970	
		16.200	70.157	-6.965	0.000	0.000	0.000	0.000	0.000	0.000	177.220	
		18.225	67.495	-6.965	0.000	0.000	0.000	0.000	0.000	0.000	346.470	
		20.250	64.832	-6.965	0.000	0.000	0.000	0.000	0.000	0.000	515.720	
	2:SOIL LOAD	0.000	1.245	-110.162	0.000	0.000	0.000	0.000	0.000	0.000	-7.88E+3	
		2.025	1.245	-90.328	0.000	0.000	0.000	0.000	0.000	0.000	-5.47E+3	
		4.050	1.245	-71.149	0.000	0.000	0.000	0.000	0.000	0.000	-3.53E+3	
		6.075	1.245	-53.820	0.000	0.000	0.000	0.000	0.000	0.000	-2.01E+3	
		8.100	1.245	-38.738	0.000	0.000	0.000	0.000	0.000	0.000	-883.144	
		10.125	1.245	-25.901	0.000	0.000	0.000	0.000	0.000	0.000	-84.783	
		12.150	1.245	-15.632	0.000	0.000	0.000	0.000	0.000	0.000	401.656	
		14.175	1.245	-7.610	0.000	0.000	0.000	0.000	0.000	0.000	673.650	
		16.200	1.245	-1.833	0.000	0.000	0.000	0.000	0.000	0.000	783.186	
		18.225	1.245	1.696	0.000	0.000	0.000	0.000	0.000	0.000	782.249	
		20.250	1.245	2.980	0.000	0.000	0.000	0.000	0.000	0.000	722.832	
	3:LIVE LOAD 1	0.000	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	0.000	-1.97E+3	
		2.025	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	0.000	-1.68E+3	
		4.050	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	0.000	-1.4E+3	
		6.075	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	0.000	-1.11E+3	
		8.100	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	0.000	-830.143	
		10.125	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	0.000	-546.207	
		12.150	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	0.000	-262.271	
		14.175	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	0.000	21.665	
		16.200	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	0.000	305.601	
		18.225	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	0.000	589.537	
		20.250	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	0.000	873.473	
	4:LIVE LOAD 2	0.000	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	0.000	-1.96E+3	
		2.025	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	0.000	-1.67E+3	
		4.050	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	0.000	-1.39E+3	
		6.075	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	0.000	-1.11E+3	
		8.100	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	0.000	-822.669	
		10.125	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	0.000	-538.791	
		12.150	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	0.000	-254.912	
		14.175	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	0.000	28.966	
16.200	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	0.000	312.844			



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**4**

Rev

Part Section J', Frame 20

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 20.std Date/Time 29-Feb-2012 11:43

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		18.225	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	596.722	
		20.250	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	880.600	
	5:LIVE LOAD 3	0.000	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	-2.07E+3	
		2.025	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	-1.77E+3	
		4.050	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	-1.47E+3	
		6.075	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	-1.17E+3	
		8.100	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	-871.578	
		10.125	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	-572.212	
		12.150	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	-272.847	
		14.175	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	26.519	
		16.200	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	325.884	
		18.225	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	625.249	
		20.250	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	924.615	
	6:LIVE LOAD 4	0.000	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	-2.05E+3	
		2.025	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	-1.75E+3	
		4.050	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	-1.46E+3	
		6.075	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	-1.16E+3	
		8.100	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	-862.120	
		10.125	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	-565.603	
		12.150	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	-269.085	
		14.175	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	27.432	
		16.200	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	323.949	
		18.225	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	620.466	
		20.250	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	916.983	
	7:LIVE LOAD 5	0.000	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	-2.05E+3	
		2.025	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	-1.75E+3	
		4.050	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	-1.46E+3	
		6.075	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	-1.16E+3	
		8.100	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	-864.442	
		10.125	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	-567.907	
		12.150	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	-271.372	
		14.175	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	25.163	
		16.200	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	321.698	
		18.225	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	618.233	
		20.250	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	914.769	
	8:LIVE LOAD 6	0.000	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	-1.99E+3	
		2.025	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	-1.7E+3	
		4.050	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	-1.42E+3	
		6.075	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	-1.13E+3	
		8.100	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	-839.551	
		10.125	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	-551.431	
		12.150	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	-263.311	
		14.175	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	24.808	
		16.200	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	312.928	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**5**

Rev

Part Section J', Frame 20

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 20.std Date/Time 29-Feb-2012 11:43

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		18.225	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	601.048	
		20.250	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	889.168	
	9:DEAD AND S	0.000	92.890	-133.651	0.000	0.000	0.000	0.000	0.000	-10.2E+3	
		2.025	90.228	-110.843	0.000	0.000	0.000	0.000	0.000	-7.3E+3	
		4.050	87.565	-88.787	0.000	0.000	0.000	0.000	0.000	-4.89E+3	
		6.075	84.902	-68.858	0.000	0.000	0.000	0.000	0.000	-2.98E+3	
		8.100	82.240	-51.513	0.000	0.000	0.000	0.000	0.000	-1.52E+3	
		10.125	79.577	-36.752	0.000	0.000	0.000	0.000	0.000	-428.030	
		12.150	76.914	-24.942	0.000	0.000	0.000	0.000	0.000	300.625	
		14.175	74.252	-15.716	0.000	0.000	0.000	0.000	0.000	782.668	
		16.200	71.589	-9.074	0.000	0.000	0.000	0.000	0.000	1.08E+3	
		18.225	68.926	-5.014	0.000	0.000	0.000	0.000	0.000	1.25E+3	
		20.250	66.263	-3.538	0.000	0.000	0.000	0.000	0.000	1.35E+3	
	10:DL + SOIL F	0.000	92.081	-62.046	0.000	0.000	0.000	0.000	0.000	-5.12E+3	
		2.025	89.419	-52.129	0.000	0.000	0.000	0.000	0.000	-3.74E+3	
		4.050	86.756	-42.540	0.000	0.000	0.000	0.000	0.000	-2.6E+3	
		6.075	84.093	-33.875	0.000	0.000	0.000	0.000	0.000	-1.68E+3	
		8.100	81.431	-26.334	0.000	0.000	0.000	0.000	0.000	-941.352	
		10.125	78.768	-19.916	0.000	0.000	0.000	0.000	0.000	-372.921	
		12.150	76.105	-14.781	0.000	0.000	0.000	0.000	0.000	39.548	
		14.175	73.442	-10.770	0.000	0.000	0.000	0.000	0.000	344.795	
		16.200	70.780	-7.882	0.000	0.000	0.000	0.000	0.000	568.813	
		18.225	68.117	-6.117	0.000	0.000	0.000	0.000	0.000	737.595	
		20.250	65.454	-5.475	0.000	0.000	0.000	0.000	0.000	877.136	
2	1:DEAD LOAD	0.000	6.965	46.847	0.000	0.000	0.000	0.000	0.000	1.94E+3	
		3.700	6.965	35.958	0.000	0.000	0.000	0.000	0.000	187.613	
		7.400	6.965	27.776	0.000	0.000	0.000	0.000	0.000	-1.22E+3	
		11.100	6.965	19.500	0.000	0.000	0.000	0.000	0.000	-2.27E+3	
		14.800	6.965	11.131	0.000	0.000	0.000	0.000	0.000	-2.96E+3	
		18.500	6.965	2.669	0.000	0.000	0.000	0.000	0.000	-3.29E+3	
		22.200	6.965	-8.369	0.000	0.000	0.000	0.000	0.000	-3.08E+3	
		25.900	6.965	-17.031	0.000	0.000	0.000	0.000	0.000	-2.51E+3	
		29.600	6.965	-25.785	0.000	0.000	0.000	0.000	0.000	-1.56E+3	
		33.300	6.965	-34.633	0.000	0.000	0.000	0.000	0.000	-229.287	
		37.000	6.965	-46.374	0.000	0.000	0.000	0.000	0.000	1.48E+3	
	2:SOIL LOAD	0.000	-2.980	1.245	0.000	0.000	0.000	0.000	0.000	111.659	
		3.700	-2.980	1.245	0.000	0.000	0.000	0.000	0.000	56.393	
		7.400	-2.980	1.245	0.000	0.000	0.000	0.000	0.000	1.127	
		11.100	-2.980	1.245	0.000	0.000	0.000	0.000	0.000	-54.138	
		14.800	-2.980	1.245	0.000	0.000	0.000	0.000	0.000	-109.404	
		18.500	-2.980	1.245	0.000	0.000	0.000	0.000	0.000	-164.669	
		22.200	-2.980	1.245	0.000	0.000	0.000	0.000	0.000	-219.935	
		25.900	-2.980	1.245	0.000	0.000	0.000	0.000	0.000	-275.201	
		29.600	-2.980	1.245	0.000	0.000	0.000	0.000	0.000	-330.466	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**6**

Rev

Part Section J', Frame 20

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 20.std Date/Time 29-Feb-2012 11:43

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	-2.980	1.245	0.000	0.000	0.000	0.000	0.000	-385.732	
		37.000	-2.980	1.245	0.000	0.000	0.000	0.000	0.000	-440.998	
	3:LIVE LOAD 1	0.000	11.685	91.667	0.000	0.000	0.000	0.000	0.000	3.27E+3	
		3.700	11.685	61.427	0.000	0.000	0.000	0.000	0.000	328.708	
		7.400	11.685	41.267	0.000	0.000	0.000	0.000	0.000	-2.21E+3	
		11.100	11.685	26.147	0.000	0.000	0.000	0.000	0.000	-3.98E+3	
		14.800	11.685	16.067	0.000	0.000	0.000	0.000	0.000	-5.03E+3	
		18.500	11.685	-9.133	0.000	0.000	0.000	0.000	0.000	-5.59E+3	
		22.200	11.685	-14.173	0.000	0.000	0.000	0.000	0.000	-5.14E+3	
		25.900	11.685	-34.333	0.000	0.000	0.000	0.000	0.000	-4.2E+3	
		29.600	11.685	-49.453	0.000	0.000	0.000	0.000	0.000	-2.53E+3	
		33.300	11.685	-59.533	0.000	0.000	0.000	0.000	0.000	-156.747	
		37.000	11.685	-59.533	0.000	0.000	0.000	0.000	0.000	2.49E+3	
	4:LIVE LOAD 2	0.000	11.682	63.085	0.000	0.000	0.000	0.000	0.000	3.28E+3	
		3.700	11.682	63.085	0.000	0.000	0.000	0.000	0.000	475.405	
		7.400	11.682	53.005	0.000	0.000	0.000	0.000	0.000	-2.05E+3	
		11.100	11.682	37.885	0.000	0.000	0.000	0.000	0.000	-3.89E+3	
		14.800	11.682	17.725	0.000	0.000	0.000	0.000	0.000	-4.98E+3	
		18.500	11.682	12.685	0.000	0.000	0.000	0.000	0.000	-5.59E+3	
		22.200	11.682	-12.515	0.000	0.000	0.000	0.000	0.000	-5.18E+3	
		25.900	11.682	-22.595	0.000	0.000	0.000	0.000	0.000	-4.29E+3	
		29.600	11.682	-37.715	0.000	0.000	0.000	0.000	0.000	-2.68E+3	
		33.300	11.682	-57.875	0.000	0.000	0.000	0.000	0.000	-300.793	
		37.000	11.682	-88.115	0.000	0.000	0.000	0.000	0.000	2.48E+3	
	5:LIVE LOAD 3	0.000	12.320	77.472	0.000	0.000	0.000	0.000	0.000	3.45E+3	
		3.700	12.320	72.432	0.000	0.000	0.000	0.000	0.000	172.630	
		7.400	12.320	52.272	0.000	0.000	0.000	0.000	0.000	-2.25E+3	
		11.100	12.320	37.152	0.000	0.000	0.000	0.000	0.000	-4.06E+3	
		14.800	12.320	27.072	0.000	0.000	0.000	0.000	0.000	-5.29E+3	
		18.500	12.320	1.872	0.000	0.000	0.000	0.000	0.000	-5.58E+3	
		22.200	12.320	-23.328	0.000	0.000	0.000	0.000	0.000	-5.45E+3	
		25.900	12.320	-33.408	0.000	0.000	0.000	0.000	0.000	-4.39E+3	
		29.600	12.320	-48.528	0.000	0.000	0.000	0.000	0.000	-2.75E+3	
		33.300	12.320	-68.688	0.000	0.000	0.000	0.000	0.000	-492.337	
		37.000	12.320	-73.728	0.000	0.000	0.000	0.000	0.000	2.62E+3	
	6:LIVE LOAD 4	0.000	12.202	83.588	0.000	0.000	0.000	0.000	0.000	3.42E+3	
		3.700	12.202	58.388	0.000	0.000	0.000	0.000	0.000	222.219	
		7.400	12.202	48.308	0.000	0.000	0.000	0.000	0.000	-2.22E+3	
		11.100	12.202	33.188	0.000	0.000	0.000	0.000	0.000	-4.03E+3	
		14.800	12.202	13.028	0.000	0.000	0.000	0.000	0.000	-5.16E+3	
		18.500	12.202	7.988	0.000	0.000	0.000	0.000	0.000	-5.61E+3	
		22.200	12.202	-17.212	0.000	0.000	0.000	0.000	0.000	-5.3E+3	
		25.900	12.202	-27.292	0.000	0.000	0.000	0.000	0.000	-4.32E+3	
		29.600	12.202	-42.412	0.000	0.000	0.000	0.000	0.000	-2.68E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**7**

Rev

Part Section J', Frame 20

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 20.std Date/Time 29-Feb-2012 11:43

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	12.202	-62.572	0.000	0.000	0.000	0.000	0.000	-336.998	
		37.000	12.202	-67.612	0.000	0.000	0.000	0.000	0.000	2.59E+3	
	7:LIVE LOAD 5	0.000	12.203	71.321	0.000	0.000	0.000	0.000	0.000	3.42E+3	
		3.700	12.203	66.281	0.000	0.000	0.000	0.000	0.000	321.286	
		7.400	12.203	46.121	0.000	0.000	0.000	0.000	0.000	-2.19E+3	
		11.100	12.203	31.001	0.000	0.000	0.000	0.000	0.000	-4E+3	
		14.800	12.203	20.921	0.000	0.000	0.000	0.000	0.000	-5.14E+3	
		18.500	12.203	-4.279	0.000	0.000	0.000	0.000	0.000	-5.61E+3	
		22.200	12.203	-9.319	0.000	0.000	0.000	0.000	0.000	-5.32E+3	
		25.900	12.203	-29.479	0.000	0.000	0.000	0.000	0.000	-4.35E+3	
		29.600	12.203	-44.599	0.000	0.000	0.000	0.000	0.000	-2.71E+3	
		33.300	12.203	-54.679	0.000	0.000	0.000	0.000	0.000	-436.892	
		37.000	12.203	-79.879	0.000	0.000	0.000	0.000	0.000	2.6E+3	
	8:LIVE LOAD 6	0.000	11.857	57.799	0.000	0.000	0.000	0.000	0.000	3.32E+3	
		3.700	11.857	57.799	0.000	0.000	0.000	0.000	0.000	754.465	
		7.400	11.857	57.799	0.000	0.000	0.000	0.000	0.000	-1.81E+3	
		11.100	11.857	40.999	0.000	0.000	0.000	0.000	0.000	-4.01E+3	
		14.800	11.857	29.799	0.000	0.000	0.000	0.000	0.000	-5.5E+3	
		18.500	11.857	1.799	0.000	0.000	0.000	0.000	0.000	-6.15E+3	
		22.200	11.857	-26.201	0.000	0.000	0.000	0.000	0.000	-5.66E+3	
		25.900	11.857	-37.401	0.000	0.000	0.000	0.000	0.000	-4.33E+3	
		29.600	11.857	-54.201	0.000	0.000	0.000	0.000	0.000	-2.29E+3	
		33.300	11.857	-54.201	0.000	0.000	0.000	0.000	0.000	115.319	
		37.000	11.857	-54.201	0.000	0.000	0.000	0.000	0.000	2.52E+3	
	9:DEAD AND S	0.000	3.538	48.279	0.000	0.000	0.000	0.000	0.000	2.07E+3	
		3.700	3.538	37.389	0.000	0.000	0.000	0.000	0.000	252.465	
		7.400	3.538	29.207	0.000	0.000	0.000	0.000	0.000	-1.22E+3	
		11.100	3.538	20.931	0.000	0.000	0.000	0.000	0.000	-2.33E+3	
		14.800	3.538	12.563	0.000	0.000	0.000	0.000	0.000	-3.08E+3	
		18.500	3.538	4.101	0.000	0.000	0.000	0.000	0.000	-3.48E+3	
		22.200	3.538	-6.938	0.000	0.000	0.000	0.000	0.000	-3.34E+3	
		25.900	3.538	-15.599	0.000	0.000	0.000	0.000	0.000	-2.83E+3	
		29.600	3.538	-24.354	0.000	0.000	0.000	0.000	0.000	-1.94E+3	
		33.300	3.538	-33.202	0.000	0.000	0.000	0.000	0.000	-672.879	
		37.000	3.538	-44.943	0.000	0.000	0.000	0.000	0.000	977.392	
	10:DL + SOIL F	0.000	5.475	47.470	0.000	0.000	0.000	0.000	0.000	2E+3	
		3.700	5.475	36.580	0.000	0.000	0.000	0.000	0.000	215.809	
		7.400	5.475	28.398	0.000	0.000	0.000	0.000	0.000	-1.22E+3	
		11.100	5.475	20.122	0.000	0.000	0.000	0.000	0.000	-2.29E+3	
		14.800	5.475	11.754	0.000	0.000	0.000	0.000	0.000	-3.01E+3	
		18.500	5.475	3.292	0.000	0.000	0.000	0.000	0.000	-3.37E+3	
		22.200	5.475	-7.747	0.000	0.000	0.000	0.000	0.000	-3.19E+3	
		25.900	5.475	-16.408	0.000	0.000	0.000	0.000	0.000	-2.65E+3	
		29.600	5.475	-25.163	0.000	0.000	0.000	0.000	0.000	-1.72E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**8**

Rev

Part Section J', Frame 20

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 20.std Date/Time 29-Feb-2012 11:43

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	5.475	-34.011	0.000	0.000	0.000	0.000	0.000	-422.153	
		37.000	5.475	-45.752	0.000	0.000	0.000	0.000	0.000	1.26E+3	
3	1:DEAD LOAD	0.000	68.150	6.965	0.000	0.000	0.000	0.000	0.000	821.440	
		2.759	65.973	6.965	0.000	0.000	0.000	0.000	0.000	590.842	
		5.518	63.795	6.965	0.000	0.000	0.000	0.000	0.000	360.244	
		8.277	61.617	6.965	0.000	0.000	0.000	0.000	0.000	129.646	
		11.036	59.440	6.965	0.000	0.000	0.000	0.000	0.000	-100.952	
		13.795	57.262	6.965	0.000	0.000	0.000	0.000	0.000	-331.550	
		16.554	55.085	6.965	0.000	0.000	0.000	0.000	0.000	-562.148	
		19.313	52.907	6.965	0.000	0.000	0.000	0.000	0.000	-792.746	
		22.072	50.730	6.965	0.000	0.000	0.000	0.000	0.000	-1.02E+3	
		24.831	48.552	6.965	0.000	0.000	0.000	0.000	0.000	-1.25E+3	
		27.590	46.374	6.965	0.000	0.000	0.000	0.000	0.000	-1.48E+3	
	2:SOIL LOAD	0.000	-1.245	-2.980	0.000	0.000	0.000	0.000	0.000	-545.677	
		2.759	-1.245	-2.980	0.000	0.000	0.000	0.000	0.000	-447.010	
		5.518	-1.245	-2.980	0.000	0.000	0.000	0.000	0.000	-348.342	
		8.277	-1.245	-2.980	0.000	0.000	0.000	0.000	0.000	-249.675	
		11.036	-1.245	-2.980	0.000	0.000	0.000	0.000	0.000	-151.007	
		13.795	-1.245	-2.980	0.000	0.000	0.000	0.000	0.000	-52.340	
		16.554	-1.245	-2.980	0.000	0.000	0.000	0.000	0.000	46.328	
		19.313	-1.245	-2.980	0.000	0.000	0.000	0.000	0.000	144.995	
		22.072	-1.245	-2.980	0.000	0.000	0.000	0.000	0.000	243.663	
		24.831	-1.245	-2.980	0.000	0.000	0.000	0.000	0.000	342.330	
		27.590	-1.245	-2.980	0.000	0.000	0.000	0.000	0.000	440.998	
	3:LIVE LOAD 1	0.000	59.533	11.685	0.000	0.000	0.000	0.000	0.000	1.38E+3	
		2.759	59.533	11.685	0.000	0.000	0.000	0.000	0.000	995.155	
		5.518	59.533	11.685	0.000	0.000	0.000	0.000	0.000	608.301	
		8.277	59.533	11.685	0.000	0.000	0.000	0.000	0.000	221.447	
		11.036	59.533	11.685	0.000	0.000	0.000	0.000	0.000	-165.407	
		13.795	59.533	11.685	0.000	0.000	0.000	0.000	0.000	-552.261	
		16.554	59.533	11.685	0.000	0.000	0.000	0.000	0.000	-939.115	
		19.313	59.533	11.685	0.000	0.000	0.000	0.000	0.000	-1.33E+3	
		22.072	59.533	11.685	0.000	0.000	0.000	0.000	0.000	-1.71E+3	
		24.831	59.533	11.685	0.000	0.000	0.000	0.000	0.000	-2.1E+3	
		27.590	59.533	11.685	0.000	0.000	0.000	0.000	0.000	-2.49E+3	
	4:LIVE LOAD 2	0.000	88.115	11.682	0.000	0.000	0.000	0.000	0.000	1.39E+3	
		2.759	88.115	11.682	0.000	0.000	0.000	0.000	0.000	998.432	
		5.518	88.115	11.682	0.000	0.000	0.000	0.000	0.000	611.657	
		8.277	88.115	11.682	0.000	0.000	0.000	0.000	0.000	224.882	
		11.036	88.115	11.682	0.000	0.000	0.000	0.000	0.000	-161.893	
		13.795	88.115	11.682	0.000	0.000	0.000	0.000	0.000	-548.668	
		16.554	88.115	11.682	0.000	0.000	0.000	0.000	0.000	-935.443	
		19.313	88.115	11.682	0.000	0.000	0.000	0.000	0.000	-1.32E+3	
		22.072	88.115	11.682	0.000	0.000	0.000	0.000	0.000	-1.71E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**9**

Rev

Part Section J', Frame 20

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 20.std Date/Time 29-Feb-2012 11:43

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		24.831	88.115	11.682	0.000	0.000	0.000	0.000	0.000	-2.1E+3	
		27.590	88.115	11.682	0.000	0.000	0.000	0.000	0.000	-2.48E+3	
	5:LIVE LOAD 3	0.000	73.728	12.320	0.000	0.000	0.000	0.000	0.000	1.46E+3	
		2.759	73.728	12.320	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		5.518	73.728	12.320	0.000	0.000	0.000	0.000	0.000	643.108	
		8.277	73.728	12.320	0.000	0.000	0.000	0.000	0.000	235.232	
		11.036	73.728	12.320	0.000	0.000	0.000	0.000	0.000	-172.644	
		13.795	73.728	12.320	0.000	0.000	0.000	0.000	0.000	-580.521	
		16.554	73.728	12.320	0.000	0.000	0.000	0.000	0.000	-988.397	
		19.313	73.728	12.320	0.000	0.000	0.000	0.000	0.000	-1.4E+3	
		22.072	73.728	12.320	0.000	0.000	0.000	0.000	0.000	-1.8E+3	
		24.831	73.728	12.320	0.000	0.000	0.000	0.000	0.000	-2.21E+3	
		27.590	73.728	12.320	0.000	0.000	0.000	0.000	0.000	-2.62E+3	
	6:LIVE LOAD 4	0.000	67.612	12.202	0.000	0.000	0.000	0.000	0.000	1.45E+3	
		2.759	67.612	12.202	0.000	0.000	0.000	0.000	0.000	1.04E+3	
		5.518	67.612	12.202	0.000	0.000	0.000	0.000	0.000	637.544	
		8.277	67.612	12.202	0.000	0.000	0.000	0.000	0.000	233.549	
		11.036	67.612	12.202	0.000	0.000	0.000	0.000	0.000	-170.446	
		13.795	67.612	12.202	0.000	0.000	0.000	0.000	0.000	-574.442	
		16.554	67.612	12.202	0.000	0.000	0.000	0.000	0.000	-978.437	
		19.313	67.612	12.202	0.000	0.000	0.000	0.000	0.000	-1.38E+3	
		22.072	67.612	12.202	0.000	0.000	0.000	0.000	0.000	-1.79E+3	
		24.831	67.612	12.202	0.000	0.000	0.000	0.000	0.000	-2.19E+3	
		27.590	67.612	12.202	0.000	0.000	0.000	0.000	0.000	-2.59E+3	
	7:LIVE LOAD 5	0.000	79.879	12.203	0.000	0.000	0.000	0.000	0.000	1.44E+3	
		2.759	79.879	12.203	0.000	0.000	0.000	0.000	0.000	1.04E+3	
		5.518	79.879	12.203	0.000	0.000	0.000	0.000	0.000	636.502	
		8.277	79.879	12.203	0.000	0.000	0.000	0.000	0.000	232.482	
		11.036	79.879	12.203	0.000	0.000	0.000	0.000	0.000	-171.538	
		13.795	79.879	12.203	0.000	0.000	0.000	0.000	0.000	-575.558	
		16.554	79.879	12.203	0.000	0.000	0.000	0.000	0.000	-979.578	
		19.313	79.879	12.203	0.000	0.000	0.000	0.000	0.000	-1.38E+3	
		22.072	79.879	12.203	0.000	0.000	0.000	0.000	0.000	-1.79E+3	
		24.831	79.879	12.203	0.000	0.000	0.000	0.000	0.000	-2.19E+3	
		27.590	79.879	12.203	0.000	0.000	0.000	0.000	0.000	-2.6E+3	
	8:LIVE LOAD 6	0.000	54.201	11.857	0.000	0.000	0.000	0.000	0.000	1.4E+3	
		2.759	54.201	11.857	0.000	0.000	0.000	0.000	0.000	1.01E+3	
		5.518	54.201	11.857	0.000	0.000	0.000	0.000	0.000	618.610	
		8.277	54.201	11.857	0.000	0.000	0.000	0.000	0.000	226.055	
		11.036	54.201	11.857	0.000	0.000	0.000	0.000	0.000	-166.499	
		13.795	54.201	11.857	0.000	0.000	0.000	0.000	0.000	-559.054	
		16.554	54.201	11.857	0.000	0.000	0.000	0.000	0.000	-951.608	
		19.313	54.201	11.857	0.000	0.000	0.000	0.000	0.000	-1.34E+3	
		22.072	54.201	11.857	0.000	0.000	0.000	0.000	0.000	-1.74E+3	



Software licensed to TranSystems

Job No <b>P402110046</b>	Sheet No <b>10</b>	Rev
Part Section J', Frame 20		
Ref		
By M Johnson	Date 13-Feb-12	Chd D Hoff
Client ODOT	File Section J' Frame 20.std	Date/Time 29-Feb-2012 11:43

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		24.831	54.201	11.857	0.000	0.000	0.000	0.000	0.000	-2.13E+3	
		27.590	54.201	11.857	0.000	0.000	0.000	0.000	0.000	-2.52E+3	
	9:DEAD AND S	0.000	66.719	3.538	0.000	0.000	0.000	0.000	0.000	193.911	
		2.759	64.541	3.538	0.000	0.000	0.000	0.000	0.000	76.781	
		5.518	62.364	3.538	0.000	0.000	0.000	0.000	0.000	-40.349	
		8.277	60.186	3.538	0.000	0.000	0.000	0.000	0.000	-157.480	
		11.036	58.008	3.538	0.000	0.000	0.000	0.000	0.000	-274.610	
		13.795	55.831	3.538	0.000	0.000	0.000	0.000	0.000	-391.740	
		16.554	53.653	3.538	0.000	0.000	0.000	0.000	0.000	-508.871	
		19.313	51.476	3.538	0.000	0.000	0.000	0.000	0.000	-626.001	
		22.072	49.298	3.538	0.000	0.000	0.000	0.000	0.000	-743.132	
		24.831	47.120	3.538	0.000	0.000	0.000	0.000	0.000	-860.262	
		27.590	44.943	3.538	0.000	0.000	0.000	0.000	0.000	-977.392	
	10:DL + SOIL F	0.000	67.528	5.475	0.000	0.000	0.000	0.000	0.000	548.601	
		2.759	65.350	5.475	0.000	0.000	0.000	0.000	0.000	367.337	
		5.518	63.173	5.475	0.000	0.000	0.000	0.000	0.000	186.073	
		8.277	60.995	5.475	0.000	0.000	0.000	0.000	0.000	4.809	
		11.036	58.817	5.475	0.000	0.000	0.000	0.000	0.000	-176.455	
		13.795	56.640	5.475	0.000	0.000	0.000	0.000	0.000	-357.720	
		16.554	54.462	5.475	0.000	0.000	0.000	0.000	0.000	-538.984	
		19.313	52.285	5.475	0.000	0.000	0.000	0.000	0.000	-720.248	
		22.072	50.107	5.475	0.000	0.000	0.000	0.000	0.000	-901.512	
		24.831	47.930	5.475	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		27.590	45.752	5.475	0.000	0.000	0.000	0.000	0.000	-1.26E+3	
4	1:DEAD LOAD	0.000	64.832	-6.965	0.000	0.000	0.000	0.000	0.000	515.720	
		1.709	63.034	-6.965	0.000	0.000	0.000	0.000	0.000	658.559	
		3.418	61.235	-6.965	0.000	0.000	0.000	0.000	0.000	801.398	
		5.127	59.437	-6.965	0.000	0.000	0.000	0.000	0.000	944.236	
		6.836	57.638	-6.965	0.000	0.000	0.000	0.000	0.000	1.09E+3	
		8.545	55.840	-6.965	0.000	0.000	0.000	0.000	0.000	1.23E+3	
		10.254	54.041	-6.965	0.000	0.000	0.000	0.000	0.000	1.37E+3	
		11.963	52.243	-6.965	0.000	0.000	0.000	0.000	0.000	1.52E+3	
		13.672	50.444	-6.965	0.000	0.000	0.000	0.000	0.000	1.66E+3	
		15.381	48.646	-6.965	0.000	0.000	0.000	0.000	0.000	1.8E+3	
		17.090	46.847	-6.965	0.000	0.000	0.000	0.000	0.000	1.94E+3	
	2:SOIL LOAD	0.000	1.245	2.980	0.000	0.000	0.000	0.000	0.000	722.832	
		1.709	1.245	2.980	0.000	0.000	0.000	0.000	0.000	661.715	
		3.418	1.245	2.980	0.000	0.000	0.000	0.000	0.000	600.597	
		5.127	1.245	2.980	0.000	0.000	0.000	0.000	0.000	539.480	
		6.836	1.245	2.980	0.000	0.000	0.000	0.000	0.000	478.363	
		8.545	1.245	2.980	0.000	0.000	0.000	0.000	0.000	417.245	
		10.254	1.245	2.980	0.000	0.000	0.000	0.000	0.000	356.128	
		11.963	1.245	2.980	0.000	0.000	0.000	0.000	0.000	295.011	
		13.672	1.245	2.980	0.000	0.000	0.000	0.000	0.000	233.893	





Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**11**

Rev

Part Section J', Frame 20

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 20.std Date/Time 29-Feb-2012 11:43

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		15.381	1.245	2.980	0.000	0.000	0.000	0.000	0.000	172.776	
		17.090	1.245	2.980	0.000	0.000	0.000	0.000	0.000	111.659	
	3:LIVE LOAD 1	0.000	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	873.473	
		1.709	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	1.11E+3	
		3.418	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	1.35E+3	
		5.127	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	1.59E+3	
		6.836	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	1.83E+3	
		8.545	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	2.07E+3	
		10.254	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	2.31E+3	
		11.963	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	2.55E+3	
		13.672	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	2.79E+3	
		15.381	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	3.03E+3	
		17.090	91.667	-11.685	0.000	0.000	0.000	0.000	0.000	3.27E+3	
	4:LIVE LOAD 2	0.000	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	880.600	
		1.709	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		3.418	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	1.36E+3	
		5.127	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	1.6E+3	
		6.836	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	1.84E+3	
		8.545	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	2.08E+3	
		10.254	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	2.32E+3	
		11.963	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	2.56E+3	
		13.672	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	2.8E+3	
		15.381	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	3.04E+3	
		17.090	63.085	-11.682	0.000	0.000	0.000	0.000	0.000	3.28E+3	
	5:LIVE LOAD 3	0.000	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	924.615	
		1.709	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	1.18E+3	
		3.418	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	1.43E+3	
		5.127	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	1.68E+3	
		6.836	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	1.94E+3	
		8.545	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	2.19E+3	
		10.254	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	2.44E+3	
		11.963	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	2.69E+3	
		13.672	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	2.95E+3	
		15.381	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	3.2E+3	
		17.090	77.472	-12.320	0.000	0.000	0.000	0.000	0.000	3.45E+3	
	6:LIVE LOAD 4	0.000	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	916.983	
		1.709	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	1.17E+3	
		3.418	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	1.42E+3	
		5.127	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	1.67E+3	
		6.836	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	1.92E+3	
		8.545	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	2.17E+3	
		10.254	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	2.42E+3	
		11.963	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	2.67E+3	
		13.672	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	2.92E+3	



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Job No  
**P402110046**

Sheet No  
**12**

Rev

Part Section J', Frame 20

Job Title Main Avenue Rating

Ref

By M Johnson Date 13-Feb-12 Chd D Hoff

Client ODOT

File Section J' Frame 20.std Date/Time 29-Feb-2012 11:43

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		15.381	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	3.17E+3	
		17.090	83.588	-12.202	0.000	0.000	0.000	0.000	0.000	3.42E+3	
	7:LIVE LOAD 5	0.000	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	914.769	
		1.709	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	1.17E+3	
		3.418	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	1.42E+3	
		5.127	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	1.67E+3	
		6.836	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	1.92E+3	
		8.545	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	2.17E+3	
		10.254	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	2.42E+3	
		11.963	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	2.67E+3	
		13.672	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	2.92E+3	
		15.381	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	3.17E+3	
		17.090	71.321	-12.203	0.000	0.000	0.000	0.000	0.000	3.42E+3	
	8:LIVE LOAD 6	0.000	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	889.168	
		1.709	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	1.13E+3	
		3.418	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	1.38E+3	
		5.127	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	1.62E+3	
		6.836	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	1.86E+3	
		8.545	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	2.1E+3	
		10.254	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	2.35E+3	
		11.963	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	2.59E+3	
		13.672	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	2.83E+3	
		15.381	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	3.08E+3	
		17.090	57.799	-11.857	0.000	0.000	0.000	0.000	0.000	3.32E+3	
	9:DEAD AND S	0.000	66.263	-3.538	0.000	0.000	0.000	0.000	0.000	1.35E+3	
		1.709	64.465	-3.538	0.000	0.000	0.000	0.000	0.000	1.42E+3	
		3.418	62.666	-3.538	0.000	0.000	0.000	0.000	0.000	1.49E+3	
		5.127	60.868	-3.538	0.000	0.000	0.000	0.000	0.000	1.56E+3	
		6.836	59.070	-3.538	0.000	0.000	0.000	0.000	0.000	1.64E+3	
		8.545	57.271	-3.538	0.000	0.000	0.000	0.000	0.000	1.71E+3	
		10.254	55.473	-3.538	0.000	0.000	0.000	0.000	0.000	1.78E+3	
		11.963	53.674	-3.538	0.000	0.000	0.000	0.000	0.000	1.85E+3	
		13.672	51.876	-3.538	0.000	0.000	0.000	0.000	0.000	1.93E+3	
		15.381	50.077	-3.538	0.000	0.000	0.000	0.000	0.000	2E+3	
		17.090	48.279	-3.538	0.000	0.000	0.000	0.000	0.000	2.07E+3	
	10:DL + SOIL F	0.000	65.454	-5.475	0.000	0.000	0.000	0.000	0.000	877.136	
		1.709	63.656	-5.475	0.000	0.000	0.000	0.000	0.000	989.416	
		3.418	61.857	-5.475	0.000	0.000	0.000	0.000	0.000	1.1E+3	
		5.127	60.059	-5.475	0.000	0.000	0.000	0.000	0.000	1.21E+3	
		6.836	58.260	-5.475	0.000	0.000	0.000	0.000	0.000	1.33E+3	
		8.545	56.462	-5.475	0.000	0.000	0.000	0.000	0.000	1.44E+3	
		10.254	54.664	-5.475	0.000	0.000	0.000	0.000	0.000	1.55E+3	
		11.963	52.865	-5.475	0.000	0.000	0.000	0.000	0.000	1.66E+3	
		13.672	51.067	-5.475	0.000	0.000	0.000	0.000	0.000	1.78E+3	



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Rev

Part Section J', Frame 20

Job Title Main Avenue Rating

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By M Johnson Date 13-Feb-12 Chd D Hoff

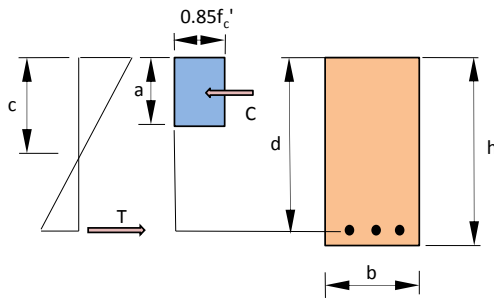
Client ODOT

File Section J' Frame 20.std Date/Time 29-Feb-2012 11:43

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear		Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip·in)	My (kip·in)	Mz (kip·in)
		15.381	49.268	-5.475	0.000	0.000	0.000	1.89E+3
		17.090	47.470	-5.475	0.000	0.000	0.000	2E+3

### Floor Beam Postive Moment Section



b =	92.9	in	
d =	48	in	
f'c =	4.5	ksi	
fy =	33	ksi	
φ =	0.9		
Area of Steel =	14.15	in <sup>2</sup>	
% Steel Loss =	0%		

(5-1 1/4" □, 5-1 1/8" □)  
from 49/246 of original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

As =	14.150	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρb =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*Asb =	224.93	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β1 =	0.8		
a =	1.314	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φMn =	1658.0	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

(Soil Load Moment includes 1.15 factor)

Total Service Positive Moment = 289.6 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	43	46	31.3	40.4	39.7	40.4	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	55.9	59.8	40.7	52.5	51.6	52.5	kips
Reaction per Wheel (LL+I) =	28.0	29.9	20.3	26.3	25.8	26.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

		From STAAD						
Max. Positive LL+I Moment =		512.6	548.3	373.1	481.6	473.2	481.6	ft*kips

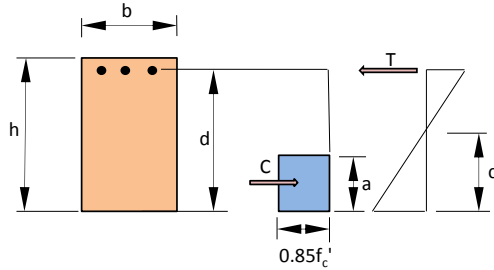
Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.08	38.8 Tons	HS21.5
Operating	HS20	36 Tons	RF=1.80	64.7 Tons	HS36.0
	2F1	15 Tons	RF=2.64	39.6 Tons	
	3F1	23 Tons	RF=2.05	47.1 Tons	
	4F1	27 Tons	RF=2.08	56.2 Tons	
	5C1	40 Tons	RF=2.05	81.9 Tons	
	Ohio Legal %	205%			

### Floor Beam Negative Moment Section

(South end of frame controls)



b =	21	in
d =	66	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	8	in <sup>2</sup>
% Steel Loss =	0%	

(8 - 1" □) from  
49/246 of  
original plans

### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	8.000	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	49.50	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.85		
a =	4.930	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1258.0	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

### Dead Load plus Soil Load Moment

Moment at face of column

(Soil Load Moment includes 1.15 factor)

Total Service Negative Moment = **20.9** ft\*kips From Staad

### Live Load Moment

Moment at face of column

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. Negative LL+I Moment =	<b>117.83</b>	126.1	85.8	110.7	108.8	110.7	ft*kips	

Maximum Negative Moment results from 3 lanes loaded.

### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=4.50	162.0 Tons	HS90.0
Operating	HS20	36 Tons	RF=7.51	270.4 Tons	HS150.2
	2F1	15 Tons	RF=11.04	165.6 Tons	
	3F1	23 Tons	RF=8.55	196.7 Tons	
	4F1	27 Tons	RF=8.70	235.0 Tons	
	5C1	40 Tons	RF=8.55	342.1 Tons	
	Ohio Legal %	855%			



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 Checked by: DBH Date: 2/29/2012 Page:  
 Project: CUY-2-14.41 (Main Avenue Bridge)  
 Subject: As-Built Concrete Frame Rating Section J' (Frame 20)

## Floor Beam Shear Section

### Section Capacity

Taken at face of column (South end of cap controls)

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed conservatively)
$d =$	<input type="text" value="66"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="151.8"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="259.7"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

(Soil Shear includes 1.15 factor)

Total Service Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="79.9"/>		85.5	58.2	75.1	73.8	75.1

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.13	40.7 Tons	HS22.6
Operating	HS20	36 Tons	RF=1.89	67.9 Tons	HS37.7
	2F1	15 Tons	RF=2.77	41.6 Tons	
	3F1	23 Tons	RF=2.15	49.4 Tons	
	4F1	27 Tons	RF=2.19	59.0 Tons	
	5C1	40 Tons	RF=2.15	85.9 Tons	
	Ohio Legal %	215%			



**Column Section** (North Column at bottom of column controls)

h =	72	in	Column Depth
b =	21	in	Column Width
A <sub>s</sub> =	10.35	in <sup>2</sup>	Area of Tension Steel (5 -1 1/8" bars, 4 -1" bars)
A' <sub>s</sub> =	6.35	in <sup>2</sup>	Area of Compression Steel (5- 1 1/8" bars)
d =	69	in	Distance from compression face to centroid of tension steel
d' =	3	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	3	ksi	Concrete Strength
f <sub>y</sub> =	33	ksi	Steel Yield Stress
E <sub>s</sub> =	29000	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	0.003	in/in	Ultimate concrete strain
β <sub>1</sub> =	0.85		
d" =	33	in	Distance from centroid of gross section to centroid of tension steel

**Dead Loads plus Soil Load** (moment taken at the top of footing)

Total Service Moment =	853.4	ft-kips	From Staad (Moment for Soil includes 1.15 load factor)
Total Service Axial Force =	92.9	kips	From Staad (Axial for Soil includes 1.15 load factor)

**Live Loads** (Moment taken at the top of footing)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	172.4	184.4	125.5	162.0	159.2	162.0		ft-kips
Max. LL+I Axial Force =	77	82.4	52.4	99.4	75.7	78.4		kips

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	42.52	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	50.03	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	33	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	2145.0	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	4312.3	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	4364.1	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	3054.9	kips		



Made by:	MJJ	Date:	2/13/2012	Job No:	P402110046
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Subject:	As-Built Concrete Frame Rating Section J' (Frame 20)				

**Pure Bending Capacity** (Ignoring compression steel)

$a =$	6.378	in	$a = A_s * f_y / 0.85 * f'_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	1873.1	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	1685.8	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **17.99** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d - c) / c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c - d') / c, f_y)$	Stress in compression steel
$a =$	15.28975926	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	818.8	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	480.7	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	2415.1	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	60.29	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	287.9	299.5	234.5	336.4	285.0	290.8	kips
$M_u =$	1483.6	1509.7	1381.8	1461.0	1454.9	1461.0	ft-kips
$e =$	61.85	60.48	70.72	52.11	61.27	60.29	in
$\phi P_n =$	462.4	478.3	377.6	599.9	469.1	480.7	kips
$\phi M_n =$	2383.1	2411.0	2225.3	2605.0	2394.9	2415.1	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

Column Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.00	72.0 Tons	HS40.0
Operating	HS20	36 Tons	RF=3.34	120.2 Tons	HS66.8
	2F1	15 Tons	RF=3.77	56.6 Tons	
	3F1	23 Tons	RF=3.71	85.3 Tons	
	4F1	27 Tons	RF=3.54	95.6 Tons	
	5C1	40 Tons	RF=3.53	141.4 Tons	
Ohio Legal %	355%				

Floor Beam Load Rating Summary:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.08	38.8 Tons	HS21.5
Operating	HS20	36 Tons	RF=1.80	64.7 Tons	HS36.0
	2F1	15 Tons	RF=2.64	39.6 Tons	
	3F1	23 Tons	RF=2.05	47.1 Tons	
	4F1	27 Tons	RF=2.08	56.2 Tons	
	5C1	40 Tons	RF=2.05	81.9 Tons	
Ohio Legal %	205%				

Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment



**BRIDGE LOAD RATING SUMMARY REPORT**

**CUY-2-1441**

**SECTION M**

SFN	BRIDGE NUMBER	DISTRICT
1800035	CUY-2-1441	12
ORIGINAL CONSTRUCTION YEAR	REHABILITATION YEAR	OVERALL STRUCTURE LENGTH (FT)
1938 - 1940	1991 - 1992	6580
<b>FEATURE INTERSECTED:</b>	NUMEROUS LOCAL STREETS, RTA RAILROAD TRACKS AND THE CUYAHOGA RIVER	
<b>SPECIAL ASSUMPTIONS &amp; COMMENTS</b>		
<b>RATING &amp; ANALYSIS OPTION:</b>		
<b>LOAD RATING PURPOSE:</b>	LOAD RATING FOR FUTURE REHABILITATION RECOMMENDATIONS	
<b>RATING SOFTWARE:</b>	STAAD, CONSYS	
<b>BASIS OF ANALYSIS:</b>	EXISTING PLANS AND FIELD MEASUREMENTS	
<b>METHOD OF ANALYSIS:</b>	LOAD FACTOR	
<b>DESIGN LOADING (ORIGINAL):</b>	H20-33	
<b>STRUCTURE RATING SUMMARY</b>		
LOADING & RATING TYPE	RATING FACTOR - RF (ROUNDED TO 2 DECIMAL POINTS)	RATING LOAD
INVENTORY CURRENT DESIGN	1.00	HS20.0
OPERATING CURRENT DESIGN	1.66	
OHIO LEGAL - 2F1	2.45	<b>OHIO LEGAL LOADS OVERALL MINIMUM RATING FACTOR</b>
OHIO LEGAL - 3F1	1.90	1.9
OHIO LEGAL - 4F1	1.95	<b>OHIO LEGAL LOADS OVERALL CONTROLLING TRUCK</b>
OHIO LEGAL - 5C1	1.92	3F1
RATED BY, PE#	REVIEWED BY, PE#	REPORT DATE
Matt Johnson, PE	Jason Kemnitz, PE	3/2/2012
AGENCY/FIRM	PHONE NUMBER	EMAIL
Transystems	216-861-1780	mjohnson@transystems.com

**SFN: 1800035 BRIDGE NO.: CUY-2-1441**

# SUMMARY SHEET

## West Approach - Section M

**CUY-2-1441 Load Rating Analysis**  
**Main Ave Bridge**

Calculated: MJJ 3/1/2012  
 Checked: JMK 3/1/2012  
 Revised: CTG 5/14/2012

### As-Built Controlling Rating Factor Summary

Item	Location/ Member	HS20 Inventory	HS20 Operating	2F1 Operating	3F1 Operating	4F1 Operating	5C1 Operating
Frame Cap	Frame 13 / Pos Moment	1.00	1.66	2.45	1.90	1.95	1.92
Deck	Deck	1.30	2.17	3.47	2.54	2.93	2.54

### As-Inspected Controlling Rating Factor Summary

Item	Location/ Member	HS20 Inventory	HS20 Operating	2F1 Operating	3F1 Operating	4F1 Operating	5C1 Operating
Frame Cap	Frame 13 / Pos Moment	1.00	1.66	2.45	1.90	1.95	1.92
Deck	Deck	1.30	2.17	3.47	2.54	2.93	2.54

### Overall Summary

Case	Rating Factor	Tonnage	HS equivalent or Ohio Legal Load %
HS20 Inventory	1.00	36.00	HS20.0
HS20 Operating	1.66	59.76	HS33.2
2F1	2.45	36.75	190%
3F1	1.90	43.70	
4F1	1.95	52.65	
5C1	1.92	76.80	



Made by: **MJJ** Date: **2/13/2012** Job No: **P402110046**  
 Checked by: **JMK** Date: **2/20/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **Profile Grade Elevations - Section M**

**Curve 1 Information**

At Beg. VPI		At PI VPI		At End VPI
<b>15+80.</b>	PI <sub>Curve</sub> (Station)	<b>17+30.</b>	PI <sub>Curve</sub> (Station)	<b>18+80.</b>
<b>687.63</b>	PI <sub>Elev</sub> (ft)	<b>684.13</b>	PI <sub>Elev</sub> (ft)	<b>684.13</b>
<b>-2.333%</b>	g <sub>1</sub> (%)			
<b>0.000%</b>	g <sub>2</sub> (%)			
<b>300.00</b>	L <sub>c</sub> (feet)			
<b>0.77778</b>	r (1/feet)			

**Curve 2 Information (If Applicable)**

At Beg. VPI		At PI VPI		At End VPI
<b>18+80.</b>	PI <sub>Curve</sub> (Station)	<b>19+80.</b>	PI <sub>Curve</sub> (Station)	<b>20+80.</b>
<b>684.13</b>	PI <sub>Elev</sub> (ft)	<b>684.13</b>	PI <sub>Elev</sub> (ft)	<b>684.13</b>
<b>0.000%</b>	g <sub>1</sub> (%)			
<b>0.000%</b>	g <sub>2</sub> (%)			
<b>200.00</b>	L <sub>c</sub> (feet)			
<b>0.0000</b>	r (1/feet)			

Cross Slope	Station
<b>-4.00%</b>	<b>18+29.</b>
<b>-2.47%</b>	<b>18+90.</b>

(Negative is down toward north)  
**0.025%** % change per foot

**15+85.54** Station at beginning of section

Location	Distance	Station	New Profile Grade Elevation		Elev. from original plans	Cross Slope	Elevations after rehab	
			Rehab	Original			North Gutter Elevation	South Gutter Elevation
Frame 1	<b>2.5625</b>	15+88.1	687.34	112.54	<b>111.300</b>	-4.00%	111.759	113.359
Frame 2	<b>10.1146</b>	15+98.22	687.11	112.31	<b>111.084</b>	-4.00%	111.534	113.134
Frame 3	<b>10.1510</b>	16+08.37	686.90	112.10	<b>110.867</b>	-4.00%	111.315	112.915
Frame 4	<b>10.1510</b>	16+18.52	686.68	111.88	<b>110.549</b>	-4.00%	111.105	112.705
Frame 5	<b>10.1510</b>	16+28.67	686.48	111.68	<b>110.431</b>	-4.00%	110.902	112.502
Frame 6	<b>10.1510</b>	16+38.82	686.29	111.49	<b>110.214</b>	-4.00%	110.708	112.308
Frame 7	<b>10.1510</b>	16+48.97	686.10	111.30	<b>109.996</b>	-4.00%	110.521	112.121
Frame 8	<b>10.1510</b>	16+59.12	685.92	111.12	<b>109.775</b>	-4.00%	110.343	111.943
Frame 9	<b>6.3333</b>	16+65.46	685.82	111.02	<b>109.643</b>	-4.00%	110.236	111.836
Frame 10	<b>10.1510</b>	16+75.61	685.65	110.85	<b>109.425</b>	-4.00%	110.070	111.670
Frame 11	<b>10.1510</b>	16+85.76	685.49	110.69	<b>109.208</b>	-4.00%	109.913	111.513
Frame 12	<b>10.1510</b>	16+95.91	685.34	110.54	<b>108.950</b>	-4.00%	109.764	111.364
Frame 13	<b>10.1510</b>	17+06.06	685.20	110.40	<b>108.777</b>	-4.00%	109.622	111.222
Frame 14	<b>6.3333</b>	17+12.39	685.12	110.32	<b>108.646</b>	-4.00%	109.538	111.138
Frame 15	<b>10.1510</b>	17+22.55	684.99	110.19	<b>108.443</b>	-4.00%	109.410	111.010
Frame 16	<b>10.1510</b>	17+32.7	684.87	110.07	<b>108.246</b>	-4.00%	109.290	110.890
Frame 17	<b>10.1510</b>	17+42.85	684.76	109.96	<b>108.055</b>	-4.00%	109.177	110.777
Frame 18	<b>10.1510</b>	17+53.	684.65	109.85	<b>107.872</b>	-4.00%	109.073	110.673
Frame 19	<b>6.3333</b>	17+59.33	684.59	109.79	<b>107.760</b>	-4.00%	109.012	110.612
Frame 20	<b>10.1510</b>	17+69.48	684.50	109.70	<b>107.586</b>	-4.00%	108.921	110.521
Frame 21	<b>10.1510</b>	17+79.63	684.42	109.62	<b>107.419</b>	-4.00%	108.838	110.438
Frame 22	<b>10.1510</b>	17+89.78	684.34	109.54	<b>107.258</b>	-4.00%	108.762	110.362
Frame 23	<b>10.1510</b>	17+99.94	684.28	109.48	<b>107.104</b>	-4.00%	108.695	110.295
Frame 24	<b>6.3333</b>	18+06.27	684.24	109.44	<b>107.011</b>	-4.00%	108.657	110.257
Frame 25	<b>10.1510</b>	18+16.42	684.18	109.38	<b>106.867</b>	-4.00%	108.603	110.203
Frame 26	<b>10.1510</b>	18+26.57	684.14	109.34	<b>106.783</b>	-4.00%	108.557	110.157
Frame 27	<b>10.1510</b>	18+36.72	684.10	109.30	<b>106.538</b>	-3.81%	108.556	110.079
Frame 28	<b>10.1510</b>	18+46.87	684.07	109.27	<b>106.474</b>	-3.55%	108.576	109.997
Frame 29	<b>6.3333</b>	18+53.21	684.05	109.25	<b>106.333</b>	-3.39%	108.592	109.949
Frame 30	<b>10.1510</b>	18+63.36	684.04	109.24	<b>106.285</b>	-3.14%	108.625	109.880
Frame 31	<b>10.1510</b>	18+73.51	684.03	109.23	<b>106.177</b>	-2.88%	108.665	109.819
Frame 32	<b>10.1510</b>	18+83.66	684.03	109.23	<b>106.076</b>	-2.63%	108.713	109.765
Frame 33	<b>10.1719</b>	18+93.83	684.03	109.23	<b>105.981</b>	-2.37%	108.763	109.712

Elevation Equation from rehab plans sheet G7/93 is (Rehab El. + 574.8 ft = Original El.)

From 119/991 of rehab plans, cross slope through Section M varies from 4% to 2.47%

North and south gutterline elevations after rehab are used to determine the haunch dead load to add on Staad model



Made by: MJJ Date: 2/13/2012 Job No: P402110046  
 Checked by: JMK Date: 2/20/2012 Page:  
 Project: CUY-2-14.41 (Main Avenue Bridge)  
 Subject: Profile Grade Elevations - Section M

**Section M, South Ramp, West Approach - Frame Column Heights**

Frame No.	Rehab North Gutter El.	Rehab South Gutter El.	Original Grade El.	Orig. Bot of Foot. (North)	Orig. Bot of Foot. (South)	**North Col. Height (Col 1)	**South Col. Height (Col 2)
1	111.759	113.359	111.300	88.0	79.0	19.05	28.05
2	111.534	113.134	111.084	88.0	82.0	18.83	24.83
3	111.315	112.915	110.867	88.0	84.0	18.62	22.62
4	111.105	112.705	110.549	88.0	86.0	18.30	20.30
5	110.902	112.502	110.431	88.0	86.0	18.18	20.18
6	110.708	112.308	110.214	88.0	86.0	17.96	19.96
7	110.521	112.121	109.996	88.0	86.0	17.75	19.75
8	110.343	111.943	109.775	88.0	86.0	17.53	19.53
9	110.236	111.836	109.643	87.0	86.0	18.39	19.39
10	110.070	111.670	109.425	87.0	86.0	18.18	19.18
11	109.913	111.513	109.208	87.0	86.0	17.96	18.96
12	109.764	111.364	108.950	87.0	86.0	17.70	18.70
13	<b>109.622</b>	<b>111.222</b>	<b>108.777</b>	87.0	86.0	<b>17.53</b>	<b>18.53</b>
14	109.538	111.138	108.646	85.0	86.0	19.40	18.40
15	109.410	111.010	108.443	85.0	86.0	19.19	18.19
16	109.290	110.890	108.246	85.0	86.0	19.00	18.00
17	109.177	110.777	108.055	85.0	86.0	18.81	17.81
18	109.073	110.673	107.872	85.0	86.0	18.62	17.62
19	109.012	110.612	107.760	82.0	84.0	21.51	19.51
20	108.921	110.521	107.586	82.0	84.0	21.34	19.34
21	108.838	110.438	107.419	82.0	84.0	21.17	19.17
22	108.762	110.362	107.258	82.0	84.0	21.01	19.01
23	<b>108.695</b>	<b>110.295</b>	<b>107.104</b>	82.0	84.0	<b>20.85</b>	<b>18.85</b>
24	<b>108.657</b>	<b>110.257</b>	<b>107.011</b>	81.0	81.5	<b>21.76</b>	<b>21.26</b>
25	108.603	110.203	106.867	81.0	81.5	21.62	21.12
26	<b>108.557</b>	<b>110.157</b>	<b>106.783</b>	81.0	81.5	<b>21.53</b>	<b>21.03</b>
27	108.556	110.079	106.538	81.0	81.5	21.29	20.79
28	108.576	109.997	106.474	81.0	81.5	21.22	20.72
29	108.592	109.949	106.333	79.0	78.5	23.08	23.58
30	108.625	109.880	106.285	79.0	78.5	23.04	23.54
31	108.665	109.819	106.177	79.0	78.5	22.93	23.43
32	108.713	109.765	106.076	79.0	78.5	22.83	23.33
33	<b>108.763</b>	<b>109.712</b>	<b>105.981</b>	79.0	78.5	<b>22.73</b>	<b>23.23</b>

\*Original grade elevations are from original plans, sheet 46/246.

\*\*Heights are from top of footing to original center of cap. Cap is 4'-6" deep, this is the original cap depth including slab. The bottom of footing elevations are from original plans, sheet 46/246.



Made by:	MJJ	Date:	2/13/2012	Job No:	P402110046
Checked by:	JMK	Date:	2/21/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	Dead Load Calculations for Frames (Section M)				

Slab, Haunch and Diaphragm Dead Loads are directly input into Staad for analysis. Concrete wearing surface and Live loads are input into Consys as continuous loads to determine reactions. The reactions determined by Consys are input into Staad for analysis. Frame self weight is directly calculated by Staad.

**Slab Dead Loads**      *Slab is 10" thick lightweight concrete (113 lbs/ft<sup>3</sup>).*

Slab Dead Load Frame 1:

$$\text{Slab}_{DL} = \boxed{0.589} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (7.5\text{ft}/2 + 2.5\text{ft}) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frame 2:

$$\text{Slab}_{DL} = \boxed{0.822} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (7.5\text{ft}/2 + 9.95\text{ft}/2) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frames 3-7, 10-12, 15-17, 20-22, 25-27 and 30-31:

$$\text{Slab}_{DL} = \boxed{0.937} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times 9.95\text{ft} \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frames 8-9, 13-14, 18-19, 23-24 and 28-29:

$$\text{Slab}_{DL} = \boxed{0.759} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (9.95\text{ft}/2 + 3.083\text{ft}) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frame 32

$$\text{Slab}_{DL} = \boxed{0.896} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (9.95\text{ft}/2 + 9.083\text{ft}/2) \times 113 \text{ lbs/ft}^3$$

Slab Dead Load Frame 33:

$$\text{Slab}_{DL} = \boxed{0.655} \text{ kips/ft} \quad \text{Slab}_{DL} = 10\text{in} \times (9.083\text{ft}/2 + 2.4167\text{ft}) \times 113 \text{ lbs/ft}^3$$

**Beam Haunch Dead Loads:**

*Haunch Height varies across frames due to superelevation in deck.  
Haunch Heights are calculated in Section B' Elevations.xls*

Haunch Dead Load Frame 1:

$$\text{Haunch Height at North Column} = \boxed{0.459} \quad \text{Haunch Height at South Column} = \boxed{2.06}$$

$$\begin{aligned} \text{Hanch}_{DL\text{North}} &= \boxed{0.091} \text{ kips/ft} & \text{Hanch}_{DL} &= \text{Haunch Height} \times 21\text{in} \times 113 \text{ lbs/ft}^3 \\ \text{Hanch}_{DL\text{South}} &= \boxed{0.407} \text{ kips/ft} \end{aligned}$$

Haunch Dead Load Frame 2:

$$\text{Haunch Height at North Column} = \boxed{0.450} \quad \text{Haunch Height at South Column} = \boxed{2.05}$$

$$\begin{aligned} \text{Hanch}_{DL\text{North}} &= \boxed{0.089} \text{ kips/ft} & \text{Hanch}_{DL} &= \text{Haunch Height} \times 21\text{in} \times 113 \text{ lbs/ft}^3 \\ \text{Hanch}_{DL\text{South}} &= \boxed{0.405} \text{ kips/ft} \end{aligned}$$



Haunch Dead Load Frame 3:

Haunch Height at North Column = 0.448      Haunch Height at South Column = 2.05

Hanch<sub>DLNorth</sub> = 0.089 kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.405 kips/ft

Haunch Dead Load Frame 4:

Haunch Height at North Column = 0.556      Haunch Height at South Column = 2.16

Hanch<sub>DLNorth</sub> = 0.110 kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.426 kips/ft

Haunch Dead Load Frame 5:

Haunch Height at North Column = 0.471      Haunch Height at South Column = 2.07

Hanch<sub>DLNorth</sub> = 0.093 kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.410 kips/ft

Haunch Dead Load Frame 6:

Haunch Height at North Column = 0.494      Haunch Height at South Column = 2.09

Hanch<sub>DLNorth</sub> = 0.098 kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.414 kips/ft

Haunch Dead Load Frame 7:

Haunch Height at North Column = 0.525      Haunch Height at South Column = 2.13

Hanch<sub>DLNorth</sub> = 0.104 kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.420 kips/ft

Haunch Dead Load Frame 8:

Haunch Height at North Column = 0.568      Haunch Height at South Column = 2.17

Hanch<sub>DLNorth</sub> = 0.112 kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> = 0.429 kips/ft



Haunch Dead Load Frame 9:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 10:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 11:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 12:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 13:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 14:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft



Haunch Dead Load Frame 15:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 16:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 17:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 18:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 19:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 20:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft





Haunch Dead Load Frame 21:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Hanch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 22:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Hanch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 23:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Hanch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 24:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Hanch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 25:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Hanch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 26:

Haunch Height at North Column =  Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Hanch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft



Haunch Dead Load Frame 27:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 28:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 29:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 30:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 31:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft

Haunch Dead Load Frame 32:

Haunch Height at North Column =       Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft      Haunch<sub>DL</sub> = Haunch Height x 21in x 113 lbs/ft<sup>3</sup>  
Hanch<sub>DLSouth</sub> =  kips/ft



Made by:	MJJ	Date:	2/13/2012	Job No:	P402110046
Checked by:	JMK	Date:	2/21/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	Dead Load Calculations for Frames (Section M)				

Haunch Dead Load Frame 33:

Haunch Height at North Column =

Haunch Height at South Column =

Hanch<sub>DLNorth</sub> =  kips/ft  
Hanch<sub>DLSouth</sub> =  kips/ft

$\text{Hanch}_{DL} = \text{Haunch Height} \times 21\text{in} \times 113 \text{ lbs/ft}^3$

**Diaphragm Dead Loads:**

*Concrete diaphragms located between frames 1-5 and frames 6-10 at midframe.  
Diaphragm is assumed to be all 150 lb/ft<sup>3</sup> concrete*

Diaphragm Dead Load Frame 1:

Diaphragm<sub>DL</sub> =  kips

$\text{Diaphragm}_{DL} = 1.5\text{ft} \times (7.5\text{ft}/2) \times 2.167\text{ft} \times 150 \text{ lbs/ft}^3$

Diaphragm Dead Load Frame 2:

Diaphragm<sub>DL</sub> =  kips

$\text{Diaphragm}_{DL} = 1.5\text{ft} \times (7.5\text{ft}/2 + 9.95\text{ft}/2) \times 2.167\text{ft} \times 150 \text{ lbs/ft}^3$

Slab Dead Load Frames 3-7, 10-12, 15-17, 20-22, 25-27 and 30-31:

Diaphragm<sub>DL</sub> =  kips

$\text{Diaphragm}_{DL} = 1.5\text{ft} \times (9.95\text{ft}) \times 2.167\text{ft} \times 150 \text{ lbs/ft}^3$

Slab Dead Load Frames 8-9, 13-14, 18-19, 23-24 and 28-29:

Diaphragm<sub>DL</sub> =  kips

$\text{Diaphragm}_{DL} = 1.5\text{ft} \times (9.95\text{ft}/2) \times 2.167\text{ft} \times 150 \text{ lbs/ft}^3$

Slab Dead Load Frame 32

Diaphragm<sub>DL</sub> =  kips

$\text{Diaphragm}_{DL} = 1.5\text{ft} \times (9.95\text{ft}/2 + 9.083\text{ft}/2) \times 2.167\text{ft} \times 150 \text{ lbs/ft}^3$

Slab Dead Load Frame 33

Diaphragm<sub>DL</sub> =  kips

$\text{Diaphragm}_{DL} = 1.5\text{ft} \times (9.083\text{ft}/2) \times 2.167\text{ft} \times 150 \text{ lbs/ft}^3$



**NonComposite Dead Load Summary for Staad Input**

Frame No.	Slab DL (kips/ft)	Haunch DL (kips/ft)		Diap. DL (kips)
		North Col.	South Col.	
1	0.589	0.091	0.407	1.83
2	0.822	0.089	0.405	4.25
3	0.937	0.089	0.405	4.85
4	0.937	0.110	0.426	4.85
5	0.937	0.093	0.410	4.85
6	0.937	0.098	0.414	4.85
7	0.937	0.104	0.420	4.85
8	0.759	0.112	0.429	2.43
9	0.759	0.117	0.434	2.43
10	0.937	0.128	0.444	4.85
11	0.937	0.139	0.456	4.85
12	0.937	0.161	0.477	4.85
13	0.759	0.167	0.484	2.43
14	0.759	0.176	0.493	2.43
15	0.937	0.191	0.508	4.85
16	0.937	0.206	0.523	4.85
17	0.937	0.222	0.538	4.85
18	0.759	0.238	0.554	2.43
19	0.759	0.248	0.564	2.43
20	0.937	0.264	0.580	4.85
21	0.937	0.281	0.597	4.85
22	0.937	0.297	0.614	4.85
23	0.759	0.315	0.631	2.43
24	0.759	0.326	0.642	2.43
25	0.937	0.343	0.660	4.85
26	0.937	0.351	0.667	4.85
27	0.937	0.399	0.700	4.85
28	0.759	0.416	0.697	2.43
29	0.759	0.447	0.715	2.43
30	0.937	0.463	0.711	4.85
31	0.937	0.492	0.720	4.85
32	0.896	0.522	0.729	4.64
33	0.655	0.550	0.738	2.21



**Soil Loads** Soil load is applied to north column only. Wall between columns is assumed to transfer load to columns. At-rest condition assumed. Soil Unit weight assumed to be 120 lbs/ft<sup>3</sup>.

Frame No.	Height of North Wall	Int. Soil Height Ratio	Ext. Soil Height Ratio	kips	
				Int. Load at Btm. of Wall	Ext. Load at Btm. of Wall
1	19.05	0.11	0.35	0.77	2.44
2	18.83	0.11	0.43	0.95	3.73
3	18.62	0.12	0.5	1.17	4.89
4	18.30	0.12	0.52	1.15	5.00
5	18.18	0.14	0.54	1.34	5.16
6	17.96	0.13	0.57	1.23	5.38
7	17.75	0.15	0.59	1.40	5.50
8	17.53	0.15	0.64	1.13	4.82
9	18.39	0.23	0.69	1.82	5.46
10	18.18	0.22	0.7	2.10	6.68
11	17.96	0.21	0.74	1.98	6.98
12	17.70	0.21	0.76	1.95	7.07
13	17.53	0.18	0.78	1.36	5.88
14	19.40	0.24	0.81	2.00	6.75
15	19.19	0.24	0.84	2.42	8.47
16	19.00	0.23	0.86	2.30	8.58
17	18.81	0.21	0.88	2.07	8.69
18	18.62	0.17	0.9	1.36	7.20
19	21.51	0.23	0.87	2.13	8.04
20	21.34	0.20	0.93	2.24	10.42
21	21.17	0.17	0.96	1.89	10.68
22	21.01	0.15	0.980	1.66	10.82
23	20.85	0.15	1.000	1.34	8.97
24	21.76	0.18	1.000	1.68	9.36
25	21.62	0.17	1.000	1.93	11.36
26	21.53	0.17	1.000	1.92	11.31
27	21.29	0.16	1.000	1.79	11.18
28	21.22	0.16	1.000	1.46	9.12
29	23.08	0.22	1.000	2.18	9.92
30	23.04	0.20	1.000	2.42	12.10
31	22.93	0.20	1.000	2.41	12.04
32	22.83	0.19	1.000	2.17	11.42
33	22.73	0.19	1.000	1.75	9.20

Soil Heights are estimated from original bridge plans sheet 46/246.



**Latex Modified Wearing Surface Dead Load**

*Wearing Surface Dead Load is applied to the composite section.  
Unit weight is assumed to be 150 lbs/ft<sup>3</sup>*

$WS_{DL} = 0.625$  kips/ft       $WS_{DL} = 1.25\text{in} \times 40\text{ft} \times 150\text{lbs/ft}^3$

**Live Loads**

*See Consys output for live load reactions per lane on each frame.*

live loads are HS20 Truck, HS20 Lane and Ohio Legal Loads shown in Table 1.  
live load positions are shown in table 2.

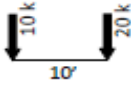
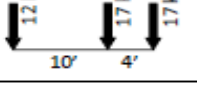
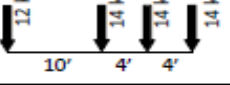
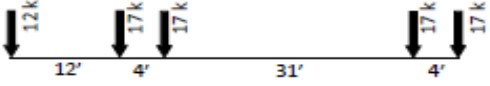
OHIO LEGAL LOADS		
Load Designation	Load Configuration	Gross Weight
2F1		15 Tons
3F1		23 Tons
4F1		27 Tons
5C1		40 Tons

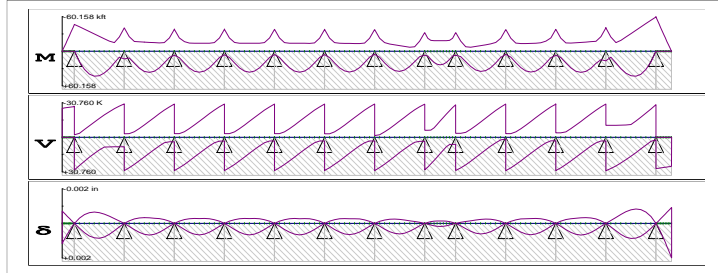
Table 1

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: HS20 Lane Load  
 Type: Lane Load

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.000	0.00
		-0.000	0.000	0.000	0.000	-26.000	0.000	-0.000	-0.000	-0.00	-0.00
	0.250	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
		-4.520	0.000	0.000	-18.160	-26.160	0.000	-0.020	-0.020	-0.00	-0.00
	0.500	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
		-9.080	0.000	0.000	-18.320	-26.320	0.000	-0.080	-0.080	-0.00	-0.00
	0.750	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
		-13.680	0.000	0.000	-18.480	-26.480	0.000	-0.180	-0.180	-0.00	-0.00
	1.000	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
		-18.320	0.000	0.000	-18.640	-26.640	0.000	-0.320	-0.320	-0.00	-0.00
	1.250	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
		-23.000	0.000	0.000	-18.800	-26.800	0.000	-0.500	-0.500	-0.00	-0.00
	1.500	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
		-27.720	0.000	0.000	-18.960	-26.960	0.000	-0.720	-0.720	-0.00	-0.00
	1.750	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00
	-32.480	0.000	0.000	-19.120	-27.120	0.000	-0.980	-0.980	-0.00	-0.00	
2.000	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-37.280	0.000	0.000	-19.280	-27.280	0.000	-1.280	-1.280	-0.00	-0.00	
2.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-42.120	0.000	0.000	-19.440	-27.440	0.000	-1.620	-1.620	-0.00	-0.00	
2.500	0.000	0.000	0.000	-1.427	29.116	0.000	-2.000	-2.000	0.00	0.00	
2	0.000	-47.000	15.066	-19.598	-27.946	0.000	-2.065	-2.065	0.00	0.00	
	1.013	18.527	17.974	-0.026	25.254	23.570	0.000	0.000	0.00	0.00	
		-42.838	4.111	0.000	-3.675	22.932	-0.063	-0.063	-0.00	-0.00	
	2.025	31.847	15.079	-2.921	21.482	41.501	0.000	0.000	0.00	0.00	
		-38.676	4.111	0.000	-7.044	39.698	0.000	0.000	-0.00	-0.00	
	3.038	40.135	12.241	-5.759	17.873	52.289	0.000	0.000	0.00	0.00	
		-34.514	4.111	0.000	-10.410	50.307	0.000	0.000	-0.00	-0.00	
	4.050	43.683	9.490	-8.510	14.467	56.591	0.000	0.000	0.00	0.00	
		-30.352	4.111	0.000	-13.728	54.951	0.000	0.000	-0.00	-0.00	
	5.063	42.900	6.854	-11.146	11.301	55.213	0.000	0.000	0.00	0.00	
		-26.190	4.111	0.000	-16.953	54.003	0.000	0.000	-0.00	-0.00	
	6.075	38.314	4.363	-13.637	8.820	2.152	-13.418	-13.418	0.00	0.00	
		-22.027	4.111	0.000	-20.038	48.029	0.000	0.000	-0.00	-0.00	
	7.088	30.567	2.045	-15.955	8.658	1.695	-5.636	-5.636	0.00	0.00	
		-17.865	4.111	0.000	-22.936	37.790	0.000	0.000	-0.00	-0.00	
8.100	20.461	0.545	-17.455	8.553	2.276	0.000	0.000	0.00	0.00		
	-15.201	0.000	-2.039	-25.599	24.244	-1.655	-1.655	-0.00	-0.00		
9.113	10.368	0.745	-17.255	8.496	10.419	0.000	0.000	0.00	0.00		
	-24.939	0.000	-13.041	-27.977	8.560	-4.298	-4.298	-0.00	-0.00		
10.125	13.507	5.976	-2.028	30.218	0.000	-6.543	-6.543	0.00	0.00		
3	0.000	-41.051	17.202	-18.088	-30.534	0.000	-6.555	-6.555	0.00	0.00	
	1.017	11.895	0.000	-0.976	27.256	9.704	-4.430	-4.430	0.00	0.00	
		-25.620	11.301	0.000	-3.296	3.907	0.000	0.000	-0.00	-0.00	
	2.033	21.100	16.395	-1.605	24.252	25.117	-1.924	-1.924	0.00	0.00	
		-17.246	3.390	0.000	-5.075	28.071	0.000	0.000	-0.00	-0.00	
	3.050	29.830	14.350	-3.650	21.001	36.968	-0.258	-0.258	0.00	0.00	
		-16.707	0.520	0.000	-7.965	38.357	0.000	0.000	-0.00	-0.00	
	4.067	35.288	11.658	-6.342	17.618	44.360	0.000	0.000	0.00	0.00	
		-16.179	0.520	0.000	-11.131	44.897	0.000	0.000	-0.00	-0.00	
	5.083	37.053	8.900	-9.100	14.215	46.863	0.000	0.000	0.00	0.00	
	-15.650	0.520	0.000	-14.467	46.907	0.000	0.000	-0.00	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)	
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)	
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)	
3	6.100	35.012	6.152	-11.848	10.903	44.504	0.000	0.00	
		-15.121	0.520	0.000	-17.864	44.033	0.000	-0.00	
	7.117	29.360	3.490	-14.510	7.789	37.752	0.000	0.00	
		-14.593	0.520	0.000	-21.212	36.370	-0.026	-0.00	
	8.134	20.677	1.706	-16.294	4.978	27.506	0.000	0.00	
		-15.242	0.000	-2.668	-24.397	24.470	-1.622	-0.00	
	9.150	11.170	0.906	-17.094	4.064	5.469	0.000	0.00	
		-23.303	0.000	-13.122	-27.303	9.360	-4.062	-0.00	
	4	10.167	7.190	3.004	-1.239	30.491	0.000	-5.405	0.00
			-38.661	16.904	-16.929	-30.408	0.000	-5.404	0.00
1.017		11.297	17.117	-0.883	27.288	9.473	-4.038	0.00	
		-23.320	13.083	0.000	-3.430	4.852	0.000	-0.00	
2.033		20.860	16.262	-1.738	24.338	24.598	-1.571	0.00	
		-16.953	3.050	0.000	-5.011	27.700	0.000	-0.00	
3.050		29.474	14.421	-3.579	21.112	36.412	0.000	0.00	
		-14.482	2.363	0.000	-7.868	37.886	0.000	-0.00	
4.067		34.988	11.733	-6.267	17.730	43.910	0.000	0.00	
		-14.217	0.026	0.000	-11.023	44.482	0.000	-0.00	
5.083	36.854	8.967	-9.033	14.311	46.576	0.000	0.00		
	-14.191	0.026	0.000	-14.367	46.624	0.000	-0.00		
6.100	34.916	6.202	-11.798	10.970	44.372	0.000	0.00		
	-14.164	0.026	0.000	-17.785	43.893	0.000	-0.00		
7.117	29.337	3.516	-14.484	7.818	37.722	0.000	0.00		
	-14.138	0.026	0.000	-21.165	36.338	0.000	-0.00		
8.134	20.675	1.696	-16.304	4.967	27.501	0.000	0.00		
	-15.244	0.000	-2.786	-24.386	24.482	-1.618	-0.00		
9.150	11.105	0.849	-17.151	3.448	4.769	0.000	0.00		
	-23.269	0.000	-13.101	-27.329	9.342	-4.118	-0.00		
5	10.167	6.219	2.552	-1.118	30.418	0.000	-5.705	0.00	
		-38.636	16.896	-16.921	-30.443	0.000	-5.697	0.00	
	1.017	11.106	17.144	-0.856	27.305	9.323	-4.143	0.00	
		-23.294	13.074	0.000	-3.410	4.719	0.000	-0.00	
	2.033	20.672	16.296	-1.704	24.359	24.441	-1.665	0.00	
		-15.474	2.798	0.000	-4.978	27.502	0.000	-0.00	
	3.050	29.301	14.449	-3.551	21.134	36.268	-0.027	0.00	
		-14.165	0.011	0.000	-7.833	37.710	0.000	-0.00	
	4.067	34.842	11.762	-6.239	17.753	43.787	0.000	0.00	
		-14.153	0.011	0.000	-10.987	44.339	0.000	-0.00	
5.083	36.739	8.995	-9.005	14.332	46.479	0.000	0.00		
	-14.142	0.011	0.000	-14.331	46.519	0.000	-0.00		
6.100	34.831	6.228	-11.772	10.989	44.301	0.000	0.00		
	-14.131	0.011	0.000	-17.751	43.828	0.000	-0.00		
7.117	29.280	3.540	-14.460	7.835	37.673	0.000	0.00		
	-14.120	0.011	0.000	-21.133	36.309	0.000	-0.00		
8.134	20.642	1.709	-16.291	4.980	27.468	0.000	0.00		
	-15.200	0.000	-2.756	-24.357	24.485	-1.615	-0.00		
9.150	11.082	0.860	-17.140	3.418	4.702	0.000	0.00		
	-23.231	0.000	-13.070	-27.302	9.372	-4.090	-0.00		
6	10.167	6.146	2.534	-1.093	30.418	0.000	-5.664	0.00	
		-38.569	16.886	-16.891	-30.401	0.000	-5.659	0.00	
	1.017	11.106	17.162	-0.838	27.297	9.369	-4.095	0.00	
		-23.236	13.064	0.000	-3.384	4.713	0.000	-0.00	
	2.033	20.688	16.314	-1.686	24.350	24.477	-1.624	0.00	
		-15.264	2.763	0.000	-4.961	27.518	0.000	-0.00	
	3.050	29.313	14.443	-3.557	21.126	36.294	0.000	0.00	
		-14.096	0.031	0.000	-7.816	37.742	0.000	-0.00	
	4.067	34.848	11.755	-6.245	17.743	43.804	0.000	0.00	
		-14.065	0.031	0.000	-10.971	44.387	0.000	-0.00	
5.083	36.737	8.988	-9.012	14.322	46.485	0.000	0.00		
	-14.034	0.031	0.000	-14.315	46.581	0.000	-0.00		
6.100	34.823	6.221	-11.779	10.979	44.296	0.000	0.00		
	-14.003	0.030	0.000	-17.736	43.905	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	7.117	29.265	3.533	-14.467	7.825	37.660	0.000	0.00		
		-13.972	0.030	0.000	-21.118	36.402	0.000	-0.00		
	8.134	20.624	1.699	-16.301	4.970	27.448	0.000	0.00		
		-14.659	0.000	-2.672	-24.342	24.596	-1.490	-0.00		
	9.150	11.061	0.851	-17.149	3.408	4.690	0.000	0.00		
		-23.059	0.000	-13.048	-27.286	9.505	-3.947	-0.00		
7	10.167									
	0.000	6.125	2.525	-1.089	30.334	0.000	-5.527	0.00		
		-38.376	16.794	-16.870	-30.379	0.000	-5.524	0.00		
	1.017	11.096	17.161	-0.839	27.213	9.457	-4.015	0.00		
		-23.134	12.969	0.000	-3.258	4.558	0.000	-0.00		
	2.033	20.678	16.301	-1.699	24.258	24.481	-1.622	0.00		
		-15.250	2.697	0.000	-4.972	27.506	0.000	-0.00		
	3.050	29.216	14.348	-3.652	21.025	36.197	-0.069	0.00		
		-14.012	0.129	0.000	-7.836	37.711	0.000	-0.00		
	4.067	34.643	11.655	-6.345	17.636	43.591	0.000	0.00		
		-13.882	0.129	0.000	-11.000	44.319	0.000	-0.00		
	5.083	36.419	8.884	-9.116	14.210	46.149	0.000	0.00		
		-13.751	0.129	0.000	-14.351	46.465	0.000	-0.00		
	6.100	34.390	6.115	-11.885	10.865	43.839	0.000	0.00		
		-13.620	0.128	0.000	-17.775	43.738	0.000	-0.00		
7.117	28.729	3.428	-14.572	7.713	37.099	0.000	0.00			
	-13.490	0.128	0.000	-21.156	36.198	0.000	-0.00			
8.134	20.023	1.598	-16.402	4.866	26.819	0.000	0.00			
	-14.513	0.000	-2.645	-24.374	24.386	-1.502	-0.00			
9.150	10.451	0.765	-17.235	3.349	4.267	0.000	0.00			
		-22.662	0.000	-12.990	-27.307	9.346	-3.965	-0.00		
8	10.167									
	0.000	5.615	2.462	-0.851	30.273	0.000	-6.114	0.00		
		-37.951	16.597	-16.815	-30.113	0.000	-6.117	0.00		
	1.017	10.891	17.343	-0.657	27.121	9.564	-4.025	0.00		
		-22.859	12.729	0.000	-2.352	14.829	0.000	-0.00		
	2.033	20.675	16.339	-1.661	24.051	24.508	-1.621	0.00		
		-15.269	2.897	0.000	-4.933	27.504	0.000	-0.00		
	3.050	28.984	14.088	-3.912	20.704	35.910	-0.045	0.00		
		-12.850	1.414	0.000	-7.926	37.632	0.000	-0.00		
	4.067	34.003	11.320	-6.680	17.217	42.790	0.000	0.00		
		-11.413	1.414	0.000	-11.208	43.921	0.000	-0.00		
	5.083	35.275	8.493	-9.507	13.723	44.722	0.000	0.00		
		-9.976	1.414	0.000	-14.651	45.584	0.000	-0.00		
	6.100	32.746	5.698	-12.302	10.354	41.823	0.000	0.00		
		-8.538	1.414	0.000	-18.128	42.347	0.000	-0.00		
7.117	26.729	3.026	-14.974	7.236	34.731	0.000	0.00			
	-7.101	1.413	0.000	-21.503	34.476	0.000	-0.00			
8.134	18.287	1.670	-16.330	4.494	24.591	0.000	0.00			
	-8.003	0.000	-6.846	-24.642	22.784	-0.359	-0.00			
9.150	9.691	1.168	-16.832	3.597	6.008	0.000	0.00			
		-17.729	0.000	-12.798	-27.406	8.656	-2.693	-0.00		
9	10.167									
	0.000	7.262	2.667	-2.094	29.731	0.000	-3.822	0.00		
		-32.626	17.797	-16.152	-30.756	0.000	-3.916	0.00		
	0.629	8.404	16.070	-1.930	26.640	5.503	-4.169	0.00		
		-22.901	12.696	0.000	-6.391	3.949	0.000	-0.00		
	1.258	14.480	16.065	-1.935	23.853	15.388	-2.771	0.00		
		-19.029	3.901	0.000	-6.442	1.045	0.000	-0.00		
	1.887	19.670	13.806	-4.194	20.859	23.039	-1.699	0.00		
		-18.630	0.000	-0.001	-8.502	25.346	0.000	-0.00		
	2.516	22.928	11.433	-6.567	17.744	27.998	-0.893	0.00		
		-18.630	0.000	-0.001	-11.482	29.075	0.000	-0.00		
	3.145	24.039	9.003	-8.997	14.592	30.025	-0.286	0.00		
		-18.630	0.000	-0.001	-14.589	30.015	-0.295	-0.00		
	3.774	22.932	6.574	-11.426	11.485	29.086	0.000	0.00		
		-18.631	0.000	-0.001	-17.741	27.991	-0.901	-0.00		
4.403	19.678	4.201	-13.799	8.505	25.358	0.000	0.00			
	-18.631	0.000	-0.001	-20.856	23.033	-1.705	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	5.032	14.493	1.942	-16.058	6.444	1.059	0.000	0.00		
		-19.048	0.000	-3.906	-23.850	15.384	-2.775	-0.00		
	5.661	8.419	1.933	-16.067	6.393	3.965	0.000	0.00		
		-22.902	0.000	-12.692	-26.637	5.501	-4.172	-0.00		
10	6.290	7.284	2.097	-2.676	30.760	0.000	-3.896	0.00		
		-32.626	16.153	-17.794	-29.735	0.000	-3.806	0.00		
	1.017	9.700	16.825	-1.175	27.406	8.659	-2.691	0.00		
		-17.728	12.799	0.000	-3.607	6.022	0.000	-0.00		
	2.033	18.290	16.323	-1.677	24.643	22.788	-0.355	0.00		
		-8.001	6.848	0.000	-4.500	24.593	0.000	-0.00		
	3.050	26.730	14.977	-3.024	21.504	34.480	0.000	0.00		
		-7.104	0.000	-1.424	-7.242	34.726	0.000	-0.00		
	4.067	32.748	12.304	-5.696	18.129	42.353	0.000	0.00		
		-8.551	0.000	-1.424	-10.360	41.813	0.000	-0.00		
	5.083	35.279	9.509	-8.491	14.653	45.591	0.000	0.00		
		-9.998	0.000	-1.424	-13.729	44.706	0.000	-0.00		
	6.100	34.009	6.682	-11.318	11.209	43.931	0.000	0.00		
		-11.446	0.000	-1.424	-17.223	42.768	0.000	-0.00		
	7.117	28.991	3.914	-14.086	7.928	37.642	0.000	0.00		
		-12.893	0.000	-1.424	-20.710	35.882	-0.078	-0.00		
	8.134	20.684	1.663	-16.337	4.934	27.515	0.000	0.00		
		-15.498	0.000	-2.938	-24.057	24.474	-1.660	-0.00		
	9.150	10.899	0.657	-17.343	2.352	14.839	0.000	0.00		
		-22.915	0.000	-12.737	-27.128	9.521	-4.071	-0.00		
11	10.167	5.684	0.860	-2.495	30.138	0.000	-6.162	0.00		
		-38.015	16.845	-16.606	-30.282	0.000	-6.163	0.00		
	1.017	10.451	17.235	-0.765	27.334	9.316	-3.992	0.00		
		-22.697	13.020	0.000	-3.394	4.318	0.000	-0.00		
	2.033	20.022	16.402	-1.598	24.404	24.383	-1.505	0.00		
		-14.515	2.666	0.000	-4.863	26.816	0.000	-0.00		
	3.050	28.756	14.603	-3.397	21.189	36.227	0.000	0.00		
		-13.521	0.000	-0.164	-7.707	37.103	0.000	-0.00		
	4.067	34.452	11.918	-6.082	17.810	43.806	0.000	0.00		
		-13.688	0.000	-0.164	-10.855	43.855	0.000	-0.00		
	5.083	36.518	9.151	-8.849	14.388	46.573	0.000	0.00		
		-13.855	0.000	-0.164	-14.199	46.181	0.000	-0.00		
	6.100	34.780	6.380	-11.620	11.037	44.467	0.000	0.00		
		-14.022	0.000	-0.164	-17.623	43.640	0.000	-0.00		
	7.117	29.387	3.687	-14.313	7.873	37.893	0.000	0.00		
		-15.043	0.000	-2.520	-21.012	36.259	-0.076	-0.00		
	8.134	20.869	1.731	-16.269	5.006	27.710	0.000	0.00		
		-17.662	0.000	-3.101	-24.247	24.544	-1.628	-0.00		
	9.150	11.288	0.867	-17.133	3.276	4.688	0.000	0.00		
		-23.284	0.000	-12.991	-27.206	9.502	-4.020	-0.00		
12	10.167	7.185	1.222	-3.018	30.403	0.000	-5.352	0.00		
		-38.538	16.945	-16.814	-30.415	0.000	-5.356	0.00		
	1.017	11.119	17.097	-0.903	27.324	9.461	-3.950	0.00		
		-23.161	13.139	0.000	-4.084	5.456	0.000	-0.00		
	2.033	20.624	16.299	-1.701	24.421	24.587	-1.490	0.00		
		-14.651	2.610	0.000	-4.972	27.448	0.000	-0.00		
	3.050	29.353	14.564	-3.436	21.237	36.509	0.000	0.00		
		-14.459	0.000	-0.571	-7.781	37.699	0.000	-0.00		
	4.067	35.060	11.902	-6.098	17.890	44.200	0.000	0.00		
		-15.039	0.000	-0.571	-10.893	44.460	0.000	-0.00		
	5.083	37.157	9.155	-8.845	14.493	47.102	0.000	0.00		
		-15.620	0.000	-0.571	-14.204	46.832	0.000	-0.00		
	6.100	35.449	6.397	-11.603	11.157	45.122	0.000	0.00		
		-16.201	0.000	-0.571	-17.607	44.343	0.000	-0.00		
	7.117	30.046	3.704	-14.296	7.990	38.607	0.000	0.00		
		-16.782	0.000	-0.572	-20.991	36.962	-0.289	-0.00		
	8.134	21.366	1.267	-16.733	5.098	28.340	0.000	0.00		
		-17.363	0.000	-3.387	-24.244	25.116	-1.953	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
12	9.150	14.972	1.396	0.000	3.318	20.613	0.000	0.00
		-25.723	0.000	-11.308	-27.250	9.699	-4.456	-0.00
13	10.167							
	0.000	17.010	2.448	-7.590	30.564	0.000	-6.301	0.00
		-41.154	18.095	-17.209	-30.360	0.000	-6.289	0.00
	1.017	10.520	17.114	-0.886	27.989	8.595	-4.294	0.00
		-24.966	13.042	0.000	-10.763	13.014	0.000	-0.00
	2.033	20.501	17.322	-0.678	25.610	24.341	-1.633	0.00
		-15.116	2.224	0.000	-10.820	2.534	0.000	-0.00
	3.050	30.643	15.972	-2.028	22.946	37.943	0.000	0.00
		-19.286	0.000	-5.743	-10.925	1.534	-7.713	-0.00
	4.067	38.436	13.651	-4.349	20.046	48.229	0.000	0.00
		-25.125	0.000	-5.743	-11.088	1.848	-17.830	-0.00
	5.083	43.054	11.157	-6.843	16.959	54.231	0.000	0.00
		-30.964	0.000	-5.743	-11.443	54.959	0.000	-0.00
	6.100	43.852	8.518	-9.482	13.732	55.185	0.000	0.00
		-36.803	0.000	-5.743	-14.610	56.206	0.000	-0.00
	7.117	40.298	5.764	-12.236	10.412	50.523	0.000	0.00
	-42.642	0.000	-5.743	-18.018	51.748	0.000	-0.00	
8.134	31.981	2.923	-15.077	7.044	39.868	0.000	0.00	
	-48.481	0.000	-5.743	-21.630	40.773	0.000	-0.00	
9.150	18.607	0.024	-17.976	3.673	23.031	-0.059	0.00	
	-54.319	0.000	-5.743	-25.405	22.620	-0.469	-0.00	
14	10.167							
	0.000	0.000	1.417	-0.000	28.369	0.000	-3.292	0.00
		-60.158	20.025	-16.682	-29.272	0.000	-3.210	0.00
	0.317	0.000	0.000	-0.000	27.824	0.000	-2.600	0.00
		-53.848	19.824	0.000	-0.000	0.000	0.000	-0.00
	0.633	0.000	18.000	-0.000	27.621	0.000	-2.054	0.00
		-47.602	19.622	0.000	-0.000	0.000	0.000	-0.00
	0.950	0.000	18.000	-0.000	27.419	0.000	-1.573	0.00
		-41.420	19.419	0.000	-0.000	0.000	0.000	-0.00
	1.267	0.000	18.000	-0.000	27.216	0.000	-1.155	0.00
		-35.302	19.216	0.000	-0.000	0.000	0.000	-0.00
	1.583	0.000	18.000	-0.000	27.013	0.000	-0.802	0.00
		-29.248	19.013	0.000	-0.000	0.000	0.000	-0.00
	1.900	0.000	18.000	-0.000	26.811	0.000	-0.514	0.00
		-23.259	18.811	0.000	-0.000	0.000	0.000	-0.00
	2.217	0.000	18.000	-0.000	26.608	0.000	-0.289	0.00
	-17.334	18.608	0.000	-0.000	0.000	0.000	-0.00	
2.534	0.000	18.000	-0.000	26.405	0.000	-0.128	0.00	
	-11.473	18.405	0.000	-0.000	0.000	0.000	-0.00	
2.850	0.000	18.000	-0.000	26.203	0.000	-0.032	0.00	
	-5.676	18.203	0.000	-0.000	0.000	0.000	-0.00	
3.167	0.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00	

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.407	-38.886
3	11.175	-34.002
4	5.558	-33.649
5	4.778	-33.718
6	4.720	-33.685
7	4.707	-33.591
8	4.422	-33.603
9	7.702	-33.755
10	7.711	-33.753
11	4.480	-33.635
12	5.565	-33.594
13	14.041	-34.024
14	2.389	-41.590

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Support	Reaction	
	Positive	Negative
15	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

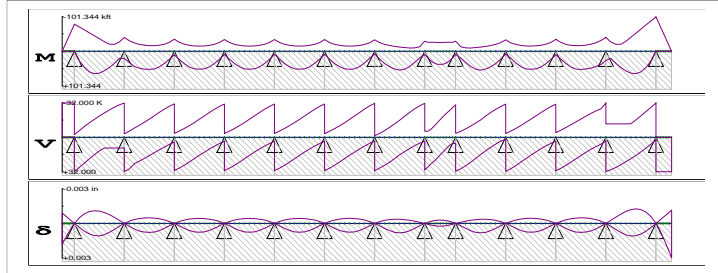
Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: HS20

Type: Truck

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	0.00
		-0.000	0.000	0.000	-32.000	-32.000	0.000	-0.000	-0.000	-0.00	
	0.250	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-8.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
	0.500	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-16.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
	0.750	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-24.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
	1.000	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-32.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
	1.250	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-40.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
	1.500	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-48.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
	1.750	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	
		-56.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	
2.000	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00		
	-64.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00		
2.250	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00		
	-72.000	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00		
2.500	0.000	0.000	0.000	-2.542	31.959	0.000	-0.000	0.000	0.00		
2	0.000	-80.000	10.014	-32.000	-32.000	0.000	-0.080	0.000	0.00		
	1.013	28.302	27.953	-4.047	27.953	28.302	0.000	0.000	0.00		
		-71.455	8.439	0.000	-6.465	25.854	0.000	-0.000	-0.00		
	2.025	48.513	23.957	-8.043	23.957	48.513	0.000	0.000	0.00		
		-62.910	8.439	0.000	-10.137	44.273	0.000	-0.000	-0.00		
	3.038	60.943	20.064	-11.936	20.064	60.943	0.000	0.000	0.00		
		-54.365	8.439	0.000	-13.584	55.939	0.000	-0.000	-0.00		
	4.050	66.114	16.325	-15.675	16.325	66.114	0.000	0.000	0.00		
		-45.820	8.439	0.000	-16.810	61.520	0.000	-0.000	-0.00		
	5.063	64.753	12.791	-19.209	12.791	64.753	0.000	0.000	0.00		
		-37.275	8.439	0.000	-19.817	61.676	0.000	-0.000	-0.00		
	6.075	57.796	9.514	-22.486	10.014	0.000	-19.163	0.000	0.00		
		-28.731	8.439	0.000	-22.620	56.982	0.000	-0.000	-0.00		
	7.088	48.316	6.817	-25.183	10.014	0.000	-9.024	0.000	0.00		
		-21.150	4.917	0.000	-25.455	46.386	0.000	-0.000	-0.00		
	8.100	36.001	4.445	-27.555	10.014	1.116	0.000	0.000	0.00		
	-20.632	0.000	-3.305	-28.065	31.876	0.000	-0.000	-0.00			
9.113	21.654	2.376	-29.624	10.014	11.255	0.000	0.000	0.00			
	-27.572	0.000	-10.137	-30.263	15.825	0.000	-0.000	-0.00			
10.125	0.000	21.395	10.014	-2.668	31.978	0.000	-0.151	0.00			
3	0.000	-40.732	11.068	-15.008	-31.985	0.000	-0.173	0.00			
	1.017	32.528	25.077	0.000	29.525	17.396	0.000	0.00			
		-31.398	7.131	0.000	-5.707	20.693	0.000	-0.00			
	2.033	45.047	23.864	-8.136	24.566	45.045	0.000	0.00			
		-24.837	4.816	0.000	-8.767	36.231	0.000	-0.00			
	3.050	50.190	22.272	-9.728	22.272	50.190	0.000	0.00			
		-20.617	4.150	0.000	-11.264	44.685	0.000	-0.00			
	4.067	52.900	19.727	-12.273	19.727	52.900	0.000	0.00			
		-18.134	2.075	0.000	-14.007	50.605	0.000	-0.00			
	5.083	53.701	14.952	-17.048	17.047	52.480	0.000	0.00			
	-16.848	0.580	0.000	-17.048	53.701	0.000	-0.00				

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.100	52.361	11.859	-20.141	14.308	48.789	0.000	0.00		
		-16.569	0.159	0.000	-20.141	52.361	0.000	-0.00		
	7.117	46.312	8.770	-23.230	11.666	42.450	0.000	0.00		
		-17.911	0.000	-1.780	-23.230	46.312	0.000	-0.00		
	8.134	36.345	6.793	-25.207	9.092	33.575	0.000	0.00		
		-20.659	0.000	-3.895	-26.194	35.918	0.000	-0.00		
	9.150	23.740	4.190	-27.810	6.628	22.678	0.000	0.00		
		-26.636	0.000	-7.253	-28.877	22.279	0.000	-0.00		
	4	10.167	10.700	4.349	-1.966	30.876	8.691	0.000	0.00	
			-35.516	12.122	-10.822	-31.103	6.969	0.000	0.00	
1.017		24.562	27.811	-4.189	28.634	23.638	0.000	0.00		
		-26.390	6.464	0.000	-5.905	22.078	0.000	-0.00		
2.033		36.899	25.225	-6.775	25.939	36.823	0.000	0.00		
		-20.989	4.208	0.000	-8.338	33.668	0.000	-0.00		
3.050		46.720	22.970	-9.030	22.970	46.720	0.000	0.00		
		-17.743	2.229	0.000	-10.967	43.208	0.000	-0.00		
4.067		52.282	19.883	-12.117	19.883	52.282	0.000	0.00		
		-15.911	1.388	0.000	-13.811	49.832	0.000	-0.00		
5.083	53.192	16.804	-15.196	16.804	53.192	0.000	0.00			
	-15.194	0.019	0.000	-16.854	53.134	0.000	-0.00			
6.100	52.029	12.033	-19.967	13.910	49.552	0.000	0.00			
	-15.695	0.000	-1.427	-19.967	52.029	0.000	-0.00			
7.117	46.187	8.910	-23.090	10.998	43.052	0.000	0.00			
	-17.507	0.000	-2.228	-23.090	46.187	0.000	-0.00			
8.134	36.333	6.688	-25.312	8.365	33.492	0.000	0.00			
	-20.694	0.000	-4.198	-26.096	35.930	0.000	-0.00			
9.150	23.589	4.058	-27.942	5.922	21.879	0.000	0.00			
	-26.040	0.000	-6.444	-28.822	22.342	0.000	-0.00			
5	10.167	9.368	3.729	-1.800	31.087	6.997	0.000	0.00		
		-34.840	11.536	-10.967	-31.087	7.003	0.000	0.00		
	1.017	23.649	27.942	-4.058	28.824	22.307	0.000	0.00		
		-26.027	6.412	0.000	-5.869	21.835	0.000	-0.00		
	2.033	36.373	25.313	-6.687	26.097	35.877	0.000	0.00		
		-20.711	4.161	0.000	-8.309	33.498	0.000	-0.00		
	3.050	46.124	23.090	-8.910	23.090	46.124	0.000	0.00		
		-17.557	2.191	0.000	-10.946	43.108	0.000	-0.00		
	4.067	51.960	19.964	-12.036	19.964	51.960	0.000	0.00		
		-15.784	1.355	0.000	-13.795	49.779	0.000	-0.00		
5.083	53.099	15.162	-16.838	16.849	53.060	0.000	0.00			
	-15.126	0.000	-0.005	-16.838	53.099	0.000	-0.00			
6.100	52.015	12.048	-19.952	13.803	49.756	0.000	0.00			
	-15.765	0.000	-1.356	-19.952	52.015	0.000	-0.00			
7.117	46.189	8.922	-23.078	10.948	43.095	0.000	0.00			
	-17.536	0.000	-2.191	-23.078	46.189	0.000	-0.00			
8.134	36.323	6.679	-25.321	8.311	33.483	0.000	0.00			
	-20.685	0.000	-4.160	-26.087	35.942	0.000	-0.00			
9.150	23.563	4.046	-27.954	5.871	21.817	0.000	0.00			
	-25.996	0.000	-6.410	-28.817	22.355	0.000	-0.00			
6	10.167	9.267	3.684	-1.785	31.086	7.005	0.000	0.00		
		-34.790	11.528	-10.946	-31.085	7.008	0.000	0.00		
	1.017	23.581	27.954	-4.046	28.818	22.344	0.000	0.00		
		-25.992	6.400	0.000	-5.855	21.804	0.000	-0.00		
	2.033	36.335	25.322	-6.678	26.088	35.926	0.000	0.00		
		-20.690	4.149	0.000	-8.295	33.485	0.000	-0.00		
	3.050	46.170	23.078	-8.922	23.078	46.170	0.000	0.00		
		-17.551	2.180	0.000	-10.933	43.111	0.000	-0.00		
	4.067	51.994	19.951	-12.049	19.951	51.994	0.000	0.00		
		-15.790	1.345	0.000	-13.772	49.818	0.000	-0.00		
5.083	53.178	15.191	-16.809	16.837	53.077	0.000	0.00			
	-15.140	0.000	-0.014	-16.809	53.178	0.000	-0.00			
6.100	52.135	12.079	-19.921	13.793	49.757	0.000	0.00			
	-15.741	0.000	-1.346	-19.921	52.135	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	7.117	46.334	8.952	-23.048	10.940	43.075	0.000	0.00		
		-17.497	0.000	-2.180	-23.048	46.334	0.000	-0.00		
	8.134	36.204	6.658	-25.342	8.301	33.444	0.000	0.00		
		-20.622	0.000	-4.147	-26.063	36.081	0.000	-0.00		
9.150	23.356	4.016	-27.984	5.859	21.758	0.000	0.00			
	-25.911	0.000	-6.396	-28.804	22.444	0.000	-0.00			
7	10.167									
	0.000	9.192	3.672	-1.753	31.082	7.014	0.000	0.00		
		-34.698	11.486	-10.933	-31.086	7.000	0.000	0.00		
	1.017	23.542	27.984	-4.016	28.805	22.361	0.000	0.00		
		-25.883	6.453	0.000	-5.694	21.621	0.000	-0.00		
	2.033	36.329	25.346	-6.654	26.065	35.932	0.000	0.00		
		-20.675	4.034	0.000	-8.129	33.465	0.000	-0.00		
	3.050	46.145	23.046	-8.954	23.046	46.145	0.000	0.00		
		-17.649	2.070	0.000	-10.779	43.250	0.000	-0.00		
	4.067	51.922	19.912	-12.088	19.912	51.922	0.000	0.00		
		-15.966	1.333	0.000	-13.676	50.001	0.000	-0.00		
	5.083	53.324	15.240	-16.760	16.792	52.951	0.000	0.00		
		-15.382	0.255	0.000	-16.760	53.324	0.000	-0.00		
	6.100	52.014	12.049	-19.951	13.748	49.583	0.000	0.00		
		-15.776	0.000	-0.832	-19.951	52.014	0.000	-0.00		
	7.117	45.614	8.807	-23.193	10.876	42.759	0.000	0.00		
-17.199		0.000	-1.854	-23.193	45.614	0.000	-0.00			
8.134	34.553	6.383	-25.617	8.212	32.912	0.000	0.00			
	-20.637	0.000	-3.567	-26.342	34.413	0.000	-0.00			
9.150	21.001	5.751	-26.249	5.751	21.001	0.000	0.00			
	-24.900	0.000	-6.075	-29.214	19.576	0.000	-0.00			
8	10.167									
	0.000	8.267	3.556	-1.322	31.032	7.121	0.000	0.00		
		-33.769	10.468	-11.403	-31.601	2.874	0.000	0.00		
	1.017	23.094	28.380	-3.620	28.633	22.555	0.000	0.00		
		-25.662	6.110	0.000	-3.620	23.094	0.000	-0.00		
	2.033	36.295	25.642	-6.358	26.143	32.192	0.000	0.00		
		-20.688	4.148	0.000	-6.358	36.295	0.000	-0.00		
	3.050	46.106	22.610	-9.390	23.141	44.445	0.000	0.00		
		-17.229	2.820	0.000	-9.394	45.749	0.000	-0.00		
	4.067	52.675	19.718	-12.282	19.804	52.650	0.000	0.00		
		-14.508	2.001	0.000	-12.634	50.875	0.000	-0.00		
	5.083	55.706	16.052	-15.948	16.324	51.905	0.000	0.00		
		-12.523	1.777	0.000	-15.948	55.706	0.000	-0.00		
	6.100	53.105	12.325	-19.675	13.305	48.081	0.000	0.00		
		-10.954	1.344	0.000	-19.675	53.105	0.000	-0.00		
	7.117	45.171	8.718	-23.282	10.468	40.731	0.000	0.00		
-9.841		0.560	0.000	-23.282	45.171	0.000	-0.00			
8.134	33.317	6.176	-25.824	7.883	30.945	0.000	0.00			
	-10.298	0.000	-1.721	-26.588	32.943	0.000	-0.00			
9.150	20.105	5.623	-26.377	5.623	20.105	0.000	0.00			
	-13.534	0.000	-14.366	-29.411	18.196	0.000	-0.00			
9	10.167									
	0.000	9.882	3.758	-2.513	30.297	8.664	0.000	0.00		
		-29.805	5.726	-17.486	-31.552	3.266	0.000	0.00		
	0.629	19.920	27.149	-4.851	27.783	19.335	0.000	0.00		
		-26.762	0.234	0.000	-5.721	2.606	0.000	-0.00		
	1.258	28.499	24.484	-7.516	24.921	28.221	0.000	0.00		
		-26.615	0.234	0.000	-7.516	28.499	0.000	-0.00		
	1.887	34.831	21.593	-10.407	22.369	29.854	0.000	0.00		
		-26.489	0.187	0.000	-10.407	34.831	0.000	-0.00		
	2.516	38.383	18.577	-13.423	19.545	35.474	0.000	0.00		
		-26.371	0.187	0.000	-13.423	38.383	0.000	-0.00		
	3.145	38.883	16.460	-15.540	16.497	38.329	0.000	0.00		
		-26.255	0.000	-0.187	-16.498	38.333	0.000	-0.00		
	3.774	38.385	13.424	-18.576	13.424	38.385	0.000	0.00		
		-26.373	0.000	-0.187	-19.547	35.477	0.000	-0.00		
	4.403	34.835	10.408	-21.592	10.408	34.835	0.000	0.00		
-26.490		0.000	-0.187	-22.370	29.855	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	5.032	28.504	7.517	-24.483	7.517	28.504	0.000	0.00		
		-26.617	0.000	-0.234	-24.922	28.217	0.000	-0.00		
	5.661	19.927	4.852	-27.148	5.726	2.608	0.000	0.00		
		-26.764	0.000	-0.234	-27.783	19.332	0.000	-0.00		
10	6.290	9.891	2.515	-3.762	31.552	3.264	0.000	0.00		
		-29.782	17.476	-5.721	-30.297	8.663	0.000	0.00		
	0.000	20.111	26.373	-5.627	29.411	18.195	0.000	0.00		
		-13.517	14.354	0.000	-5.627	20.111	0.000	-0.00		
	2.033	33.317	25.823	-6.177	26.588	32.943	0.000	0.00		
		-10.299	1.721	0.000	-7.888	30.947	0.000	-0.00		
	3.050	45.172	23.283	-8.717	23.283	45.172	0.000	0.00		
		-9.842	0.000	-0.561	-10.472	40.728	0.000	-0.00		
	4.067	53.107	19.676	-12.324	19.676	53.107	0.000	0.00		
		-10.958	0.000	-1.346	-13.309	48.076	0.000	-0.00		
	5.083	55.710	15.949	-16.051	15.949	55.710	0.000	0.00		
		-12.529	0.000	-1.779	-16.325	51.901	0.000	-0.00		
	6.100	52.680	12.283	-19.717	12.623	50.832	0.000	0.00		
		-14.518	0.000	-2.614	-19.803	52.655	0.000	-0.00		
	7.117	46.124	9.394	-22.606	9.394	46.124	0.000	0.00		
		-17.245	0.000	-2.824	-23.140	44.451	0.000	-0.00		
	8.134	36.337	6.365	-25.635	6.365	36.337	0.000	0.00		
		-20.710	0.000	-4.152	-26.142	32.197	0.000	-0.00		
	9.150	23.168	3.631	-28.369	3.631	23.168	0.000	0.00		
		-25.691	0.000	-6.115	-28.639	22.513	0.000	-0.00		
11	10.167	8.375	1.336	-3.606	31.602	2.872	0.000	0.00		
		-33.801	11.418	-10.472	-31.034	7.109	0.000	0.00		
	0.000	21.067	26.192	-5.808	29.218	19.572	0.000	0.00		
		-24.907	6.081	0.000	-5.808	21.067	0.000	-0.00		
	2.033	34.554	25.608	-6.392	26.350	34.412	0.000	0.00		
		-20.637	3.563	0.000	-8.271	32.920	0.000	-0.00		
	3.050	45.624	23.204	-8.796	23.204	45.624	0.000	0.00		
		-17.211	1.841	0.000	-10.931	42.711	0.000	-0.00		
	4.067	52.040	19.965	-12.035	19.965	52.040	0.000	0.00		
		-15.816	0.812	0.000	-13.861	49.369	0.000	-0.00		
	5.083	53.369	16.775	-15.225	16.775	53.369	0.000	0.00		
		-15.467	0.000	-0.284	-16.944	52.511	0.000	-0.00		
	6.100	52.201	12.160	-19.840	13.692	50.064	0.000	0.00		
		-16.111	0.000	-1.370	-19.840	52.201	0.000	-0.00		
	7.117	46.696	9.066	-22.934	10.801	43.362	0.000	0.00		
		-17.857	0.000	-2.504	-22.934	46.696	0.000	-0.00		
	8.134	36.914	6.752	-25.248	8.161	33.654	0.000	0.00		
		-20.984	0.000	-4.086	-25.912	36.843	0.000	-0.00		
	9.150	24.557	4.161	-27.839	5.733	21.893	0.000	0.00		
		-26.288	0.000	-6.511	-28.615	23.685	0.000	-0.00		
12	10.167	10.676	1.938	-4.362	31.104	6.962	0.000	0.00		
		-35.407	10.824	-12.052	-30.885	8.914	0.000	0.00		
	0.000	23.524	27.835	-4.165	28.865	22.375	0.000	0.00		
		-26.548	6.958	0.000	-6.647	22.651	0.000	-0.00		
	2.033	36.218	25.222	-6.778	26.173	36.069	0.000	0.00		
		-20.591	3.883	0.000	-9.117	33.539	0.000	-0.00		
	3.050	46.474	23.203	-8.797	23.203	46.474	0.000	0.00		
		-17.869	1.766	0.000	-11.697	42.394	0.000	-0.00		
	4.067	52.504	20.113	-11.887	20.113	52.504	0.000	0.00		
		-16.563	0.000	-0.176	-14.342	48.703	0.000	-0.00		
	5.083	53.810	17.025	-14.975	17.025	53.810	0.000	0.00		
		-16.867	0.000	-0.614	-17.083	52.356	0.000	-0.00		
	6.100	52.743	12.238	-19.762	13.989	50.678	0.000	0.00		
		-18.192	0.000	-2.096	-19.762	52.743	0.000	-0.00		
	7.117	50.007	9.695	-22.305	11.247	44.671	0.000	0.00		
		-20.741	0.000	-4.176	-22.305	50.007	0.000	-0.00		
	8.134	44.833	8.099	-24.599	8.748	36.195	0.000	0.00		
		-24.986	0.000	-4.176	-24.599	44.833	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		12	9.150	39.326	6.296	-25.704	6.449	25.964	0.000	0.00
	10.167	-31.602	0.000	-7.202	-26.509	38.508	0.000	-0.00		
13	0.000	27.157	3.388	-12.639	31.985	0.000	-0.174	0.00		
		-41.002	15.105	-11.098	-32.000	0.000	-0.000	0.00		
	1.017	21.663	29.633	-2.367	30.266	15.864	0.000	0.00		
		-27.709	10.139	0.000	-12.639	14.307	0.000	-0.00		
	2.033	36.064	27.566	-4.434	28.070	31.968	0.000	0.00		
		-20.603	3.453	0.000	-12.639	1.457	0.000	-0.00		
	3.050	48.432	25.195	-6.805	25.461	46.535	0.000	0.00		
		-20.956	0.000	-4.175	-12.639	0.000	-11.393	-0.00		
	4.067	57.996	22.493	-9.507	22.631	57.153	0.000	0.00		
		-29.523	0.000	-11.774	-12.639	0.000	-24.243	-0.00		
	5.083	64.989	19.216	-12.784	19.828	61.874	0.000	0.00		
		-41.493	0.000	-11.774	-12.784	64.989	0.000	-0.00		
	6.100	66.365	15.681	-16.319	16.820	61.733	0.000	0.00		
		-53.463	0.000	-11.774	-16.319	66.365	0.000	-0.00		
	7.117	61.182	11.941	-20.059	13.591	56.149	0.000	0.00		
		-65.433	0.000	-11.774	-20.059	61.182	0.000	-0.00		
	8.134	48.707	8.046	-23.954	10.139	44.451	0.000	0.00		
		-77.403	0.000	-11.774	-23.954	48.707	0.000	-0.00		
	9.150	28.418	4.049	-27.951	6.459	25.967	0.000	0.00		
		-89.373	0.000	-11.774	-27.951	28.418	0.000	-0.00		
14	10.167	0.000	0.000	-29.475	32.000	0.000	-0.101	0.00		
	0.000	-101.344	32.000	-12.423	-32.000	0.000	-0.000	0.00		
	0.317	0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
		-91.209	32.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
		-81.075	32.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
		-70.941	32.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
		-60.806	32.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
		-50.672	32.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
		-40.537	32.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
		-30.403	32.000	0.000	-0.000	0.000	0.000	-0.00		
	2.534	0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
		-20.269	32.000	0.000	-0.000	0.000	0.000	-0.00		
	2.850	0.000	32.000	-0.000	32.000	0.000	0.000	0.00		
		-10.134	32.000	0.000	-0.000	0.000	0.000	-0.00		
	3.167	0.000	0.000	0.000	32.000	0.000	0.000	0.00		
		-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00		

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.245	-42.014
3	12.682	-32.111
4	5.261	-27.791
5	3.873	-27.775
6	3.900	-27.770
7	4.351	-27.773
8	3.925	-30.258
9	6.495	-28.509
10	6.500	-28.510
11	3.766	-30.257
12	5.299	-27.795
13	16.027	-32.126
14	2.237	-44.639

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

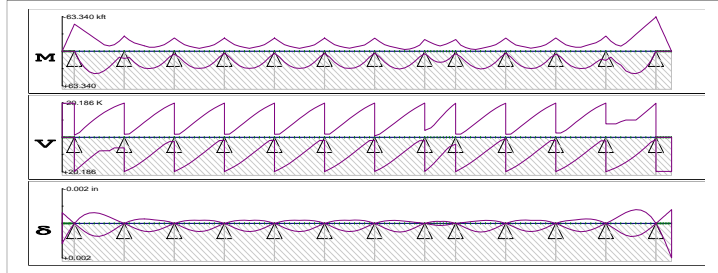
Support	Reaction	
	Positive	Negative
15	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 2F1  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-20.000	0.000	-0.000	-0.000	-0.00	-0.00
	0.250	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-5.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	0.500	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-10.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	0.750	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-15.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.000	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-20.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.250	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-25.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.500	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-30.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.750	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
	-35.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00	
2.000	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-40.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00	
2.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-45.000	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00	
2.500	0.000	0.000	0.000	-1.373	20.028	0.000	-0.000	0.00	0.00	0.00	
2	0.000	-50.000	7.957	-20.000	-20.000	0.000	-0.050	0.00	0.00	0.00	
	1.013	17.689	17.470	-2.530	17.470	17.689	0.000	0.00	0.00	0.00	
		-43.663	6.259	0.000	-2.878	17.336	0.000	-0.00	-0.00		
	2.025	30.320	14.973	-5.027	14.973	30.320	0.000	0.00	0.00		
		-37.326	6.259	0.000	-5.640	29.080	0.000	-0.00	-0.00		
	3.038	38.090	12.540	-7.460	12.540	38.090	0.000	0.00	0.00		
		-30.988	6.259	0.000	-8.215	35.798	0.000	-0.00	-0.00		
	4.050	41.321	10.203	-9.797	10.203	41.321	0.000	0.00	0.00		
		-24.651	6.259	0.000	-10.591	38.105	0.000	-0.00	-0.00		
	5.063	40.471	7.994	-12.006	7.994	40.471	0.000	0.00	0.00		
		-18.314	6.259	0.000	-12.758	36.664	0.000	-0.00	-0.00		
	6.075	36.123	5.946	-14.054	7.957	0.000	-1.658	0.00	0.00		
		-11.977	6.259	0.000	-14.702	32.186	0.000	-0.00	-0.00		
	7.088	28.992	4.091	-15.909	7.957	6.399	0.000	0.00	0.00		
		-9.728	0.000	-1.373	-16.412	25.428	0.000	-0.00	-0.00		
8.100	20.188	4.838	-15.162	6.259	0.697	0.000	0.00	0.00			
	-12.175	0.000	-5.423	-17.877	17.198	0.000	-0.00	-0.00			
9.113	11.139	2.196	-17.804	6.259	7.035	0.000	0.00	0.00			
	-18.615	0.000	-6.643	-19.084	8.350	0.000	-0.00	-0.00			
10.125	13.372	6.259	-1.668	20.085	0.000	-0.295	0.00	0.00			
3	0.000	-27.982	7.485	-13.052	-20.134	0.000	-0.415	0.00	0.00		
	1.017	11.676	0.000	-1.668	18.829	8.240	0.000	0.00	0.00		
		-20.719	6.528	0.000	-1.994	11.329	0.000	-0.00	-0.00		
	2.033	20.803	15.775	-4.225	17.269	16.688	0.000	0.00	0.00		
		-15.522	2.593	0.000	-4.225	20.803	0.000	-0.00	-0.00		
	3.050	27.620	13.468	-6.532	15.425	23.891	0.000	0.00	0.00		
		-12.885	2.593	0.000	-6.532	27.620	0.000	-0.00	-0.00		
	4.067	31.420	11.143	-8.857	13.360	28.990	0.000	0.00	0.00		
		-10.249	2.593	0.000	-8.857	31.420	0.000	-0.00	-0.00		
	5.083	32.074	8.856	-11.144	11.137	31.383	0.000	0.00	0.00		
	-7.612	2.593	0.000	-11.144	32.074	0.000	-0.00	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.100	30.726	8.821	-11.179	8.821	30.726	0.000	0.00		
		-7.429	0.000	-1.828	-13.336	29.684	0.000	-0.00		
	7.117	26.933	6.474	-13.526	6.474	26.933	0.000	0.00		
		-9.288	0.000	-1.828	-15.378	24.582	0.000	-0.00		
	8.134	20.177	4.160	-15.840	4.160	20.177	0.000	0.00		
		-12.091	0.000	-4.986	-17.211	17.328	0.000	-0.00		
	9.150	10.888	1.943	-18.057	2.593	2.935	0.000	0.00		
		-18.100	0.000	-6.202	-18.780	8.717	0.000	-0.00		
	4	10.167	5.572	2.593	-0.695	20.087	0.000	-0.315	0.00	
			-24.714	7.077	-11.512	-20.095	0.000	-0.332	0.00	
1.017		10.905	18.067	-1.933	18.763	8.702	0.000	0.00		
		-18.254	6.195	0.000	-1.933	10.905	0.000	-0.00		
2.033		20.218	15.873	-4.127	17.169	17.285	0.000	0.00		
		-12.211	4.972	0.000	-4.127	20.218	0.000	-0.00		
3.050		27.040	13.585	-6.415	15.309	24.465	0.000	0.00		
		-9.131	1.838	0.000	-6.415	27.040	0.000	-0.00		
4.067		30.944	11.264	-8.736	13.243	29.451	0.000	0.00		
		-7.263	1.838	0.000	-8.736	30.944	0.000	-0.00		
5.083	31.745	8.969	-11.031	11.031	31.695	0.000	0.00			
	-5.476	0.000	-1.861	-11.031	31.745	0.000	-0.00			
6.100	30.894	8.734	-11.266	8.734	30.894	0.000	0.00			
	-7.367	0.000	-1.861	-13.241	29.502	0.000	-0.00			
7.117	26.991	6.411	-13.589	6.411	26.991	0.000	0.00			
	-9.259	0.000	-1.861	-15.306	24.517	0.000	-0.00			
8.134	20.173	4.123	-15.877	4.123	20.173	0.000	0.00			
	-12.087	0.000	-4.954	-17.165	17.334	0.000	-0.00			
9.150	10.873	1.930	-18.070	1.930	10.873	0.000	0.00			
	-18.064	0.000	-6.170	-18.759	8.741	0.000	-0.00			
5	10.167	4.002	0.499	-1.863	20.088	0.000	-0.317	0.00		
		-24.477	7.048	-11.402	-20.088	0.000	-0.318	0.00		
	1.017	10.874	18.071	-1.929	18.758	8.740	0.000	0.00		
		-18.075	6.170	0.000	-1.929	10.874	0.000	-0.00		
	2.033	20.176	15.880	-4.120	17.162	17.331	0.000	0.00		
		-12.096	4.953	0.000	-4.120	20.176	0.000	-0.00		
	3.050	26.998	13.594	-6.406	15.301	24.508	0.000	0.00		
		-9.248	1.861	0.000	-6.406	26.998	0.000	-0.00		
	4.067	30.910	11.273	-8.727	13.234	29.485	0.000	0.00		
		-7.355	1.861	0.000	-8.727	30.910	0.000	-0.00		
5.083	31.721	8.977	-11.023	11.023	31.717	0.000	0.00			
	-5.470	0.000	-1.863	-11.023	31.721	0.000	-0.00			
6.100	30.905	8.727	-11.273	8.727	30.905	0.000	0.00			
	-7.364	0.000	-1.863	-13.234	29.489	0.000	-0.00			
7.117	26.994	6.406	-13.594	6.406	26.994	0.000	0.00			
	-9.259	0.000	-1.863	-15.300	24.513	0.000	-0.00			
8.134	20.172	4.120	-15.880	4.120	20.172	0.000	0.00			
	-12.085	0.000	-4.951	-17.161	17.335	0.000	-0.00			
9.150	10.872	1.929	-18.071	1.929	10.872	0.000	0.00			
	-18.058	0.000	-6.167	-18.757	8.744	0.000	-0.00			
6	10.167	4.015	0.501	-1.869	20.088	0.000	-0.317	0.00		
		-24.459	7.045	-11.394	-20.088	0.000	-0.317	0.00		
	1.017	10.872	18.071	-1.929	18.757	8.743	0.000	0.00		
		-18.062	6.167	0.000	-1.929	10.872	0.000	-0.00		
	2.033	20.173	15.881	-4.119	17.160	17.334	0.000	0.00		
		-12.087	4.951	0.000	-4.119	20.173	0.000	-0.00		
	3.050	26.996	13.595	-6.405	15.299	24.510	0.000	0.00		
		-9.256	1.864	0.000	-6.405	26.996	0.000	-0.00		
	4.067	30.910	11.275	-8.725	13.232	29.484	0.000	0.00		
		-7.361	1.864	0.000	-8.725	30.910	0.000	-0.00		
5.083	31.725	8.979	-11.021	11.021	31.713	0.000	0.00			
	-5.485	0.000	-1.869	-11.021	31.725	0.000	-0.00			
6.100	30.898	8.725	-11.275	8.725	30.898	0.000	0.00			
	-7.385	0.000	-1.869	-13.232	29.496	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	7.117	26.985	6.404	-13.596	6.404	26.985	0.000	0.00		
		-9.285	0.000	-1.869	-15.298	24.522	0.000	-0.00		
	8.134	20.162	4.118	-15.882	4.118	20.162	0.000	0.00		
		-12.058	0.000	-4.947	-17.159	17.345	0.000	-0.00		
9.150	10.865	1.928	-18.072	1.928	10.865	0.000	0.00			
	-18.018	0.000	-6.161	-18.756	8.753	0.000	-0.00			
7	10.167									
	0.000	4.170	0.520	-1.941	20.086	0.000	-0.314	0.00		
		-24.444	7.038	-11.391	-20.088	0.000	-0.317	0.00		
	1.017	10.868	18.074	-1.926	18.752	8.749	0.000	0.00		
		-18.053	6.160	0.000	-1.941	2.197	0.000	-0.00		
	2.033	20.172	15.890	-4.110	17.150	17.336	0.000	0.00		
		-12.086	4.944	0.000	-4.110	20.172	0.000	-0.00		
	3.050	27.009	13.610	-6.390	15.282	24.496	0.000	0.00		
		-9.250	1.871	0.000	-6.390	27.009	0.000	-0.00		
	4.067	30.948	11.295	-8.705	13.211	29.443	0.000	0.00		
		-7.347	1.871	0.000	-8.705	30.948	0.000	-0.00		
	5.083	31.796	9.003	-10.997	10.995	31.639	0.000	0.00		
		-5.696	0.000	-1.941	-10.997	31.796	0.000	-0.00		
	6.100	30.791	8.697	-11.303	8.697	30.791	0.000	0.00		
		-7.669	0.000	-1.941	-13.205	29.603	0.000	-0.00		
	7.117	26.854	6.377	-13.623	6.377	26.854	0.000	0.00		
-9.643		0.000	-1.941	-15.271	24.657	0.000	-0.00			
8.134	20.030	4.096	-15.904	4.096	20.030	0.000	0.00			
	-11.694	0.000	-4.886	-17.135	17.489	0.000	-0.00			
9.150	10.769	1.914	-18.086	1.914	10.769	0.000	0.00			
	-17.467	0.000	-5.897	-18.739	8.872	0.000	-0.00			
8	10.167									
	0.000	4.066	1.871	-0.529	20.066	0.000	-0.271	0.00		
		-24.244	6.945	-11.367	-20.088	0.000	-0.322	0.00		
	1.017	10.821	18.117	-1.883	18.685	8.825	0.000	0.00		
		-17.938	6.059	0.000	-1.883	10.821	0.000	-0.00		
	2.033	20.158	16.007	-3.993	17.004	17.352	0.000	0.00		
		-12.074	4.842	0.000	-3.993	20.158	0.000	-0.00		
	3.050	27.185	13.805	-6.195	15.055	24.291	0.000	0.00		
		-9.158	1.973	0.000	-6.195	27.185	0.000	-0.00		
	4.067	31.451	11.557	-8.443	12.911	28.869	0.000	0.00		
		-7.152	1.973	0.000	-8.443	31.451	0.000	-0.00		
	5.083	32.701	9.312	-10.688	10.642	30.601	0.000	0.00		
		-5.147	1.973	0.000	-10.688	32.701	0.000	-0.00		
	6.100	30.872	7.117	-12.883	8.318	29.290	0.000	0.00		
		-3.406	0.000	-0.862	-12.883	30.872	0.000	-0.00		
	7.117	26.111	5.022	-14.978	6.010	25.027	0.000	0.00		
-4.283		0.000	-0.862	-14.978	26.111	0.000	-0.00			
8.134	18.970	3.112	-16.888	3.788	18.187	0.000	0.00			
	-7.038	0.000	-3.501	-16.888	18.970	0.000	-0.00			
9.150	10.501	1.494	-18.506	1.973	2.876	0.000	0.00			
	-11.468	0.000	-8.443	-18.506	10.501	0.000	-0.00			
9	10.167									
	0.000	4.882	1.973	-0.938	20.041	0.000	-0.340	0.00		
		-21.724	4.817	-12.303	-20.096	0.000	-0.387	0.00		
	0.629	8.353	16.376	-3.624	18.659	6.161	0.000	0.00		
		-18.701	4.485	0.000	-4.817	5.545	0.000	-0.00		
	1.258	13.637	14.594	-5.406	17.037	11.869	0.000	0.00		
		-15.970	4.053	0.000	-5.570	6.321	0.000	-0.00		
	1.887	17.617	12.683	-7.317	15.241	16.380	0.000	0.00		
		-13.506	3.215	0.000	-7.317	17.617	0.000	-0.00		
	2.516	19.991	10.693	-9.307	13.320	19.355	0.000	0.00		
		-11.484	3.215	0.000	-9.307	19.991	0.000	-0.00		
	3.145	20.586	11.325	-8.675	11.325	20.586	0.000	0.00		
		-9.751	0.000	-2.746	-11.325	20.586	0.000	-0.00		
	3.774	19.992	9.307	-10.693	9.307	19.992	0.000	0.00		
		-11.485	0.000	-3.215	-13.320	19.355	0.000	-0.00		
	4.403	17.617	7.317	-12.683	7.317	17.617	0.000	0.00		
-13.507		0.000	-3.215	-15.241	16.379	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	5.032	13.637	5.406	-14.594	5.570	6.321	0.000	0.00		
		-15.971	0.000	-4.054	-17.037	11.869	0.000	-0.00		
	5.661	8.353	3.624	-16.376	4.817	5.545	0.000	0.00		
		-18.702	0.000	-4.485	-18.659	6.161	0.000	-0.00		
10	6.290									
	0.000	4.877	0.937	-1.971	20.096	0.000	-0.387	0.00		
		-21.726	12.304	-4.817	-20.041	0.000	-0.340	0.00		
	1.017	10.500	18.507	-1.493	18.507	10.500	0.000	0.00		
		-11.469	8.444	0.000	-1.971	2.873	0.000	-0.00		
	2.033	18.970	16.888	-3.112	16.888	18.970	0.000	0.00		
		-7.038	3.501	0.000	-3.788	18.187	0.000	-0.00		
	3.050	26.112	14.978	-5.022	14.978	26.112	0.000	0.00		
		-4.283	0.862	0.000	-6.010	25.027	0.000	-0.00		
	4.067	30.873	12.884	-7.116	12.884	30.873	0.000	0.00		
		-3.406	0.862	0.000	-8.318	29.289	0.000	-0.00		
	5.083	32.703	10.689	-9.311	10.689	32.703	0.000	0.00		
		-5.141	0.000	-1.971	-10.642	30.599	0.000	-0.00		
	6.100	31.454	8.444	-11.556	8.444	31.454	0.000	0.00		
		-7.145	0.000	-1.971	-12.912	28.866	0.000	-0.00		
	7.117	27.188	6.196	-13.804	6.196	27.188	0.000	0.00		
-9.149		0.000	-1.971	-15.056	24.287	0.000	-0.00			
8.134	20.161	3.993	-16.007	3.993	20.161	0.000	0.00			
	-12.083	0.000	-4.844	-17.004	17.349	0.000	-0.00			
9.150	10.823	1.884	-18.116	1.884	10.823	0.000	0.00			
	-17.953	0.000	-6.061	-18.686	8.822	0.000	-0.00			
11	10.167									
	0.000	4.009	0.521	-1.845	20.089	0.000	-0.323	0.00		
		-24.263	11.375	-6.948	-20.066	0.000	-0.270	0.00		
	1.017	10.770	18.085	-1.915	18.741	8.870	0.000	0.00		
		-17.470	5.900	0.000	-1.915	10.770	0.000	-0.00		
	2.033	20.030	15.901	-4.099	17.139	17.489	0.000	0.00		
		-11.695	4.889	0.000	-4.099	20.030	0.000	-0.00		
	3.050	26.849	13.618	-6.382	15.277	24.662	0.000	0.00		
		-9.645	1.938	0.000	-6.382	26.849	0.000	-0.00		
	4.067	30.777	11.296	-8.704	13.212	29.617	0.000	0.00		
		-7.675	1.938	0.000	-8.704	30.777	0.000	-0.00		
	5.083	31.822	11.006	-8.994	11.006	31.822	0.000	0.00		
		-5.704	1.938	0.000	-11.004	31.614	0.000	-0.00		
	6.100	30.986	8.715	-11.285	8.715	30.986	0.000	0.00		
		-7.244	0.000	-1.845	-13.220	29.406	0.000	-0.00		
	7.117	27.055	6.399	-13.601	6.399	27.055	0.000	0.00		
-9.119		0.000	-1.845	-15.292	24.448	0.000	-0.00			
8.134	20.218	4.118	-15.882	4.118	20.218	0.000	0.00			
	-12.214	0.000	-4.965	-17.158	17.285	0.000	-0.00			
9.150	10.902	1.930	-18.070	1.938	2.178	0.000	0.00			
	-18.251	0.000	-6.188	-18.758	8.707	0.000	-0.00			
12	10.167									
	0.000	5.612	0.702	-2.610	20.095	0.000	-0.333	0.00		
		-24.706	11.514	-7.071	-20.086	0.000	-0.312	0.00		
	1.017	10.881	18.057	-1.943	18.780	8.726	0.000	0.00		
		-18.058	6.197	0.000	-2.610	2.959	0.000	-0.00		
	2.033	20.167	15.840	-4.160	17.211	17.339	0.000	0.00		
		-12.063	4.983	0.000	-4.160	20.167	0.000	-0.00		
	3.050	26.921	13.525	-6.475	15.378	24.594	0.000	0.00		
		-9.318	1.833	0.000	-6.475	26.921	0.000	-0.00		
	4.067	30.711	11.177	-8.823	13.337	29.698	0.000	0.00		
		-7.454	1.833	0.000	-8.823	30.711	0.000	-0.00		
	5.083	32.090	11.146	-8.854	11.146	32.090	0.000	0.00		
		-7.656	0.000	-2.610	-11.140	31.362	0.000	-0.00		
	6.100	31.438	8.859	-11.141	8.859	31.438	0.000	0.00		
		-10.309	0.000	-2.610	-13.365	28.961	0.000	-0.00		
	7.117	27.640	6.534	-13.466	6.534	27.640	0.000	0.00		
-12.963		0.000	-2.610	-15.432	23.849	0.000	-0.00			
8.134	20.822	4.228	-15.772	4.228	20.822	0.000	0.00			
	-15.617	0.000	-2.610	-17.279	16.627	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
12	9.150	14.821	2.117	0.000	2.117	14.821	0.000	0.00
		-20.819	0.000	-6.561	-18.841	8.156	0.000	-0.00
13	10.167	16.973	2.117	-7.899	20.186	0.000	-0.529	0.00
	0.000	-28.111	13.093	-7.501	-20.085	0.000	-0.294	0.00
	1.017	11.114	17.857	-2.143	19.085	8.373	0.000	0.00
		-18.618	6.662	0.000	-7.899	8.942	0.000	-0.00
	2.033	20.248	15.216	-4.784	17.879	17.252	0.000	0.00
		-12.142	5.448	0.000	-7.899	0.911	0.000	-0.00
	3.050	25.843	12.318	-7.682	16.415	25.517	0.000	0.00
		-9.709	1.364	0.000	-9.235	8.060	0.000	-0.00
	4.067	36.247	14.058	-5.942	14.704	32.308	0.000	0.00
		-15.152	0.000	-7.899	-10.191	0.000	-1.172	-0.00
	5.083	40.618	12.010	-7.990	12.758	36.813	0.000	0.00
		-23.183	0.000	-7.899	-10.191	0.000	-11.533	-0.00
	6.100	41.478	9.801	-10.199	10.590	38.269	0.000	0.00
		-31.215	0.000	-7.899	-10.199	41.478	0.000	-0.00
	7.117	38.239	7.463	-12.537	8.210	35.960	0.000	0.00
		-39.246	0.000	-7.899	-12.537	38.239	0.000	-0.00
8.134	30.442	5.029	-14.971	5.631	29.218	0.000	0.00	
	-47.277	0.000	-7.899	-14.971	30.442	0.000	-0.00	
9.150	17.761	2.531	-17.469	2.864	17.422	0.000	0.00	
	-55.308	0.000	-7.899	-17.469	17.761	0.000	-0.00	
14	10.167	0.000	1.364	-0.000	20.000	0.000	-0.063	0.00
	0.000	-63.340	20.000	-10.191	-20.048	0.000	-0.000	0.00
	0.317	0.000	0.000	-0.000	20.000	0.000	-6.334	0.00
		-57.006	20.000	0.000	-0.000	0.000	0.000	-0.00
	0.633	0.000	20.000	-0.000	20.000	0.000	0.000	0.00
		-50.672	20.000	0.000	-0.000	0.000	0.000	-0.00
	0.950	0.000	20.000	-0.000	20.000	0.000	-6.334	0.00
		-44.338	20.000	0.000	-0.000	0.000	0.000	-0.00
	1.267	0.000	20.000	-0.000	20.000	0.000	0.000	0.00
		-38.004	20.000	0.000	-0.000	0.000	0.000	-0.00
	1.583	0.000	20.000	-0.000	20.000	0.000	0.000	0.00
		-31.670	20.000	0.000	-0.000	0.000	0.000	-0.00
	1.900	0.000	20.000	-0.000	20.000	0.000	0.000	0.00
		-25.336	20.000	0.000	-0.000	0.000	0.000	-0.00
	2.217	0.000	20.000	-0.000	20.000	0.000	0.000	0.00
		-19.002	20.000	0.000	-0.000	0.000	0.000	-0.00
2.534	0.000	20.000	-0.000	20.000	0.000	-6.334	0.00	
	-12.668	20.000	0.000	-0.000	0.000	0.000	-0.00	
2.850	0.000	20.000	-0.000	20.000	0.000	0.000	0.00	
	-6.334	20.000	0.000	-0.000	0.000	0.000	-0.00	
3.167	0.000	0.000	0.000	20.000	0.000	-0.000	0.00	
	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00	

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.373	-27.957
3	7.927	-21.658
4	3.288	-20.794
5	2.362	-20.741
6	2.370	-20.736
7	2.461	-20.728
8	2.400	-20.618
9	3.973	-20.212
10	3.973	-20.212
11	2.366	-20.623
12	3.312	-20.788
13	10.017	-21.687
14	1.364	-30.191

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Support	Reaction	
	Positive	Negative
15	0.000	-0.000

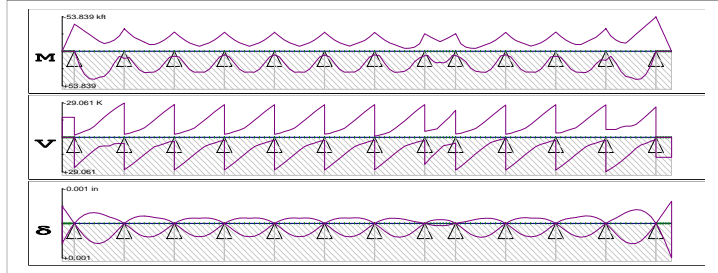
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 3F1  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-17.000	0.000	-0.000	-0.000	-0.00	-0.00
	0.250	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-4.250	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00	-0.00
	0.500	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-8.500	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00	-0.00
	0.750	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-12.750	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00	-0.00
	1.000	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-17.000	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00	-0.00
	1.250	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-21.250	0.000	0.000	-17.000	-17.000	0.000	-0.000	-0.000	-0.00	-0.00
	1.500	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-25.500	0.000	0.000	-17.000	-17.000	0.000	-0.000	-0.000	-0.00	-0.00
	1.750	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
	-29.750	0.000	0.000	-17.000	-17.000	0.000	-0.000	-0.000	-0.00	-0.00	
2.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-34.000	0.000	0.000	-17.000	-17.000	0.000	-0.000	-0.000	-0.00	-0.00	
2.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-38.250	0.000	0.000	-17.000	-17.000	0.000	-0.000	-0.000	-0.00	-0.00	
2.500											
2	0.000	0.000	0.000	-1.979	25.727	0.000	-0.000	0.000	-0.000	0.00	0.00
		-42.500	19.143	-17.000	-17.000	0.000	-0.043	0.000	-0.000	0.00	0.00
	1.013	22.006	21.735	0.000	21.735	22.006	0.000	0.000	0.000	0.00	0.00
		-37.113	5.320	0.000	-3.394	8.713	0.000	0.000	0.000	-0.00	-0.00
	2.025	36.174	17.864	0.000	17.864	36.174	0.000	0.000	0.000	0.00	0.00
		-31.727	5.320	0.000	-5.170	13.831	0.000	0.000	0.000	-0.00	-0.00
	3.038	43.161	14.209	-2.791	14.209	43.161	0.000	0.000	0.000	0.00	0.00
		-26.340	5.320	0.000	-6.627	16.321	0.000	0.000	0.000	-0.00	-0.00
	4.050	43.848	10.827	-6.173	10.827	43.848	0.000	0.000	0.000	0.00	0.00
		-20.954	5.320	0.000	-9.387	31.683	0.000	0.000	0.000	-0.00	-0.00
	5.063	41.043	4.539	-12.461	7.770	39.335	0.000	0.000	0.000	0.00	0.00
		-15.567	5.320	0.000	-13.363	36.475	0.000	0.000	0.000	-0.00	-0.00
	6.075	39.392	0.678	-16.322	7.358	2.202	0.000	0.000	0.000	0.00	0.00
		-12.024	0.000	-1.979	-17.100	34.668	0.000	0.000	0.000	-0.00	-0.00
	7.088	31.477	0.000	-19.964	7.358	9.652	0.000	0.000	0.000	0.00	0.00
	-14.028	0.000	-1.979	-20.568	27.201	0.000	0.000	0.000	-0.00	-0.00	
8.100	18.407	0.000	-23.332	5.519	12.404	0.000	0.000	0.000	0.00	0.00	
	-17.699	0.000	-5.482	-23.736	15.138	0.000	0.000	0.000	-0.00	-0.00	
9.113	8.057	2.540	-9.460	5.320	5.979	0.000	0.000	0.000	0.00	0.00	
	-23.936	0.000	-6.627	-26.575	0.000	-0.336	-0.336	-0.336	-0.00	-0.00	
10.125											
3	0.000	11.366	5.320	-1.417	27.523	0.000	-14.172	0.000	0.00	0.00	
		-35.308	7.069	-20.403	-29.030	0.000	-18.025	0.000	0.00	0.00	
	1.017	9.925	0.000	-1.417	24.649	1.901	0.000	0.000	0.00	0.00	
		-28.173	6.832	0.000	-3.406	9.051	0.000	0.000	-0.00	-0.00	
	2.033	19.989	19.571	0.000	21.448	15.050	0.000	0.000	0.00	0.00	
		-21.769	3.637	0.000	-4.914	12.490	0.000	0.000	-0.00	-0.00	
	3.050	29.186	16.097	-0.903	18.067	24.328	0.000	0.000	0.00	0.00	
		-18.071	3.637	0.000	-6.187	14.274	0.000	0.000	-0.00	-0.00	
	4.067	33.515	12.675	-4.325	14.623	29.154	0.000	0.000	0.00	0.00	
		-14.373	3.637	0.000	-7.975	26.258	0.000	0.000	-0.00	-0.00	
5.083	33.050	9.413	-7.587	11.235	29.429	0.000	0.000	0.00	0.00		
	-10.675	3.637	0.000	-11.235	30.380	0.000	0.000	-0.00	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.100	32.708	4.230	-12.770	8.020	25.536	0.000	0.00		
		-10.713	0.000	-2.636	-14.657	30.111	0.000	-0.00		
	7.117	28.149	0.841	-16.159	6.832	13.503	0.000	0.00		
		-13.393	0.000	-2.636	-18.130	25.100	0.000	-0.00		
	8.134	18.899	0.000	-19.603	5.498	12.452	0.000	0.00		
		-17.631	0.000	-5.226	-21.546	15.446	0.000	-0.00		
	9.150	9.619	3.892	-8.108	3.892	9.619	0.000	0.00		
		-23.469	0.000	-6.187	-24.793	1.691	0.000	-0.00		
	4	10.167	7.815	3.637	-0.975	27.627	0.000	-15.006	0.00	
			-30.225	6.466	-17.903	-27.734	0.000	-15.275	0.00	
1.017		9.070	8.592	-3.408	24.657	1.843	0.000	0.00		
		-23.777	6.204	0.000	-3.408	9.070	0.000	-0.00		
2.033		18.960	19.743	0.000	21.384	15.432	0.000	0.00		
		-17.899	5.249	0.000	-4.897	12.390	0.000	-0.00		
3.050		28.328	16.270	-0.730	17.954	24.888	0.000	0.00		
		-13.137	2.644	0.000	-6.157	14.125	0.000	-0.00		
4.067		32.896	12.831	-4.169	14.482	29.710	0.000	0.00		
		-10.449	2.644	0.000	-7.874	25.861	0.000	-0.00		
5	5.083	32.673	9.542	-7.458	11.085	29.869	0.000	0.00		
		-7.896	0.000	-2.683	-11.084	29.938	0.000	-0.00		
	6.100	32.837	4.162	-12.838	7.878	25.809	0.000	0.00		
		-10.624	0.000	-2.683	-14.484	29.780	0.000	-0.00		
	7.117	28.253	0.726	-16.274	6.204	14.069	0.000	0.00		
		-13.351	0.000	-2.683	-17.958	24.945	0.000	-0.00		
	8.134	18.882	0.000	-19.745	4.939	12.388	0.000	0.00		
		-17.628	0.000	-5.206	-21.391	15.464	0.000	-0.00		
	9.150	9.111	3.443	-8.557	3.443	9.111	0.000	0.00		
		-23.435	0.000	-6.157	-24.666	1.834	0.000	-0.00		
6	10.167	5.772	0.719	-2.687	27.634	0.000	-15.057	0.00		
		-29.854	6.420	-17.730	-27.641	0.000	-15.076	0.00		
	1.017	9.071	8.592	-3.408	24.656	1.845	0.000	0.00		
		-23.457	6.158	0.000	-3.408	9.071	0.000	-0.00		
	2.033	18.887	19.755	0.000	21.379	15.463	0.000	0.00		
		-17.648	5.207	0.000	-4.895	12.383	0.000	-0.00		
	3.050	28.266	16.283	-0.717	17.945	24.930	0.000	0.00		
		-13.333	2.684	0.000	-6.154	14.115	0.000	-0.00		
	4.067	32.852	12.843	-4.157	14.471	29.751	0.000	0.00		
		-10.605	2.684	0.000	-7.867	25.833	0.000	-0.00		
6	5.083	32.646	9.551	-7.449	11.073	29.901	0.000	0.00		
		-7.888	0.000	-2.687	-11.073	29.907	0.000	-0.00		
	6.100	32.847	4.157	-12.843	7.867	25.828	0.000	0.00		
		-10.620	0.000	-2.687	-14.472	29.757	0.000	-0.00		
	7.117	28.259	0.717	-16.283	6.158	14.110	0.000	0.00		
		-13.351	0.000	-2.687	-17.946	24.935	0.000	-0.00		
	8.134	18.880	0.000	-19.755	4.899	12.383	0.000	0.00		
		-17.624	0.000	-5.204	-21.379	15.465	0.000	-0.00		
	9.150	9.074	3.411	-8.589	3.411	9.074	0.000	0.00		
		-23.427	0.000	-6.154	-24.657	1.844	0.000	-0.00		
6	10.167	5.792	0.722	-2.696	27.633	0.000	-15.057	0.00		
		-29.826	6.416	-17.717	-27.635	0.000	-15.063	0.00		
	1.017	9.062	8.599	-3.401	24.654	1.848	0.000	0.00		
		-23.434	6.155	0.000	-3.401	9.062	0.000	-0.00		
	2.033	18.881	19.758	0.000	21.376	15.465	0.000	0.00		
		-17.630	5.204	0.000	-4.886	12.382	0.000	-0.00		
	3.050	28.263	16.286	-0.714	17.942	24.930	0.000	0.00		
		-13.346	2.687	0.000	-6.144	14.123	0.000	-0.00		
	4.067	32.851	12.845	-4.155	14.468	29.748	0.000	0.00		
		-10.614	2.687	0.000	-7.864	25.835	0.000	-0.00		
5.083	32.644	9.552	-7.448	11.070	29.896	0.000	0.00			
	-7.912	0.000	-2.696	-11.070	29.912	0.000	-0.00			
6.100	32.838	4.154	-12.846	7.865	25.823	0.000	0.00			
	-10.653	0.000	-2.696	-14.468	29.764	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	7.117	28.246	0.713	-16.287	6.155	14.110	0.000	0.00		
		-13.394	0.000	-2.696	-17.943	24.943	0.000	-0.00		
	8.134	18.863	0.000	-19.759	4.896	12.381	0.000	0.00		
		-17.567	0.000	-5.194	-21.377	15.473	0.000	-0.00		
	9.150	9.072	3.409	-8.591	3.409	9.072	0.000	0.00		
10.167	-23.355	0.000	-6.144	-24.657	1.846	0.000	-0.00			
7	0.000	6.022	0.751	-2.803	27.612	0.000	-15.013	0.00		
		-29.808	6.409	-17.714	-27.636	0.000	-15.073	0.00		
	1.017	8.947	8.701	-3.299	24.626	1.880	0.000	0.00		
		-23.424	6.148	0.000	-3.299	8.947	0.000	-0.00		
	2.033	18.877	19.791	0.000	21.341	15.469	0.000	0.00		
		-17.628	5.199	0.000	-4.759	12.367	0.000	-0.00		
	3.050	28.288	16.313	-0.687	17.903	24.895	0.000	0.00		
		-13.338	2.698	0.000	-6.000	14.253	0.000	-0.00		
	4.067	32.884	12.862	-4.138	14.429	29.673	0.000	0.00		
		-10.595	2.698	0.000	-7.832	25.897	0.000	-0.00		
	5.083	32.650	9.554	-7.446	11.036	29.796	0.000	0.00		
		-8.226	0.000	-2.803	-11.036	30.012	0.000	-0.00		
	6.100	32.698	4.118	-12.882	7.842	25.733	0.000	0.00		
		-11.076	0.000	-2.803	-14.436	29.893	0.000	-0.00		
	7.117	28.052	0.674	-16.326	6.148	14.077	0.000	0.00		
-13.926		0.000	-2.803	-17.916	25.076	0.000	-0.00			
8.134	18.630	0.000	-19.798	4.892	12.358	0.000	0.00			
	-16.777	0.000	-5.062	-21.361	15.570	0.000	-0.00			
9.150	9.076	3.409	-8.591	3.409	9.076	0.000	0.00			
10.167	-22.348	0.000	-6.000	-24.656	1.851	0.000	-0.00			
8	0.000	5.863	2.698	-0.762	27.321	0.000	-14.388	0.00		
		-29.590	6.307	-17.687	-27.656	0.000	-15.233	0.00		
	1.017	7.396	10.071	-1.929	24.228	2.330	0.000	0.00		
		-23.317	6.053	0.000	-1.929	7.396	0.000	-0.00		
	2.033	18.831	20.185	0.000	20.853	15.526	0.000	0.00		
		-17.621	5.135	0.000	-3.079	12.173	0.000	-0.00		
	3.050	28.539	16.592	-0.408	17.361	24.407	0.000	0.00		
		-13.205	2.845	0.000	-4.549	18.761	0.000	-0.00		
	4.067	33.133	12.992	-4.008	13.886	28.631	0.000	0.00		
		-10.313	2.845	0.000	-7.399	26.727	0.000	-0.00		
	5.083	32.677	9.563	-7.437	10.562	28.406	0.000	0.00		
		-7.421	2.845	0.000	-10.595	31.307	0.000	-0.00		
	6.100	31.427	2.952	-14.048	7.526	24.483	0.000	0.00		
		-4.529	2.845	0.000	-14.048	31.427	0.000	-0.00		
	7.117	26.416	0.000	-17.646	6.053	13.608	0.000	0.00		
-4.823		0.000	-0.971	-17.646	26.416	0.000	-0.00			
8.134	16.292	0.000	-21.240	4.839	12.045	0.000	0.00			
	-6.716	0.000	-2.856	-21.240	16.292	0.000	-0.00			
9.150	10.483	1.493	-10.507	3.418	9.136	0.000	0.00			
10.167	-11.809	0.000	-10.976	-24.652	1.878	0.000	-0.00			
9	0.000	7.039	2.845	-1.352	22.943	0.000	-5.896	0.00		
		-27.531	4.345	-18.917	-27.674	0.000	-15.378	0.00		
	0.629	6.559	6.428	-5.572	20.037	3.270	0.000	0.00		
		-24.798	4.345	0.000	-5.572	6.559	0.000	-0.00		
	1.258	12.276	15.880	-1.120	17.045	9.848	0.000	0.00		
		-22.167	3.858	0.000	-6.093	7.688	0.000	-0.00		
	1.887	16.678	12.897	-4.103	14.592	8.487	0.000	0.00		
		-19.740	3.858	0.000	-6.657	8.751	0.000	-0.00		
	2.516	18.303	10.004	-6.996	12.278	13.879	0.000	0.00		
		-17.345	3.797	0.000	-7.269	9.583	0.000	-0.00		
	3.145	17.276	7.266	-9.734	9.734	17.276	0.000	0.00		
		-15.157	0.000	-3.452	-9.734	17.276	0.000	-0.00		
	3.774	18.303	6.996	-10.004	7.269	9.584	0.000	0.00		
		-17.346	0.000	-3.798	-12.278	13.880	0.000	-0.00		
	4.403	16.679	4.103	-12.897	6.657	8.752	0.000	0.00		
-19.742		0.000	-3.858	-14.592	8.488	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
9	5.032	12.276	1.120	-15.880	6.092	7.688	0.000	0.00
		-22.168	0.000	-3.858	-17.045	9.847	0.000	-0.00
	5.661	6.559	5.571	-6.429	5.571	6.559	0.000	0.00
		-24.801	0.000	-4.346	-20.037	3.270	0.000	-0.00
10	6.290							
	0.000	7.032	1.351	-2.841	27.674	0.000	-15.379	0.00
		-27.534	18.918	-4.346	-22.943	0.000	-5.895	0.00
	1.017	10.482	10.507	-1.493	24.653	1.877	0.000	0.00
		-11.810	10.977	0.000	-3.420	9.140	0.000	-0.00
	2.033	16.291	21.241	0.000	21.241	16.291	0.000	0.00
		-6.716	2.857	0.000	-4.843	12.046	0.000	-0.00
	3.050	26.416	17.647	0.000	17.647	26.416	0.000	0.00
		-4.824	0.971	0.000	-6.057	13.606	0.000	-0.00
	4.067	31.429	14.049	-2.951	14.049	31.429	0.000	0.00
		-4.524	0.000	-2.841	-7.527	24.482	0.000	-0.00
	5.083	32.679	7.438	-9.562	10.596	31.309	0.000	0.00
		-7.413	0.000	-2.841	-10.563	28.403	0.000	-0.00
	6.100	33.137	4.009	-12.991	7.400	26.729	0.000	0.00
		-10.302	0.000	-2.841	-13.886	28.628	0.000	-0.00
	7.117	28.544	0.409	-16.591	4.549	18.762	0.000	0.00
-13.191		0.000	-2.841	-17.361	24.403	0.000	-0.00	
8.134	18.838	0.000	-20.184	3.079	12.175	0.000	0.00	
	-17.641	0.000	-5.139	-20.854	15.523	0.000	-0.00	
9.150	7.397	1.929	-10.071	1.929	7.397	0.000	0.00	
	-23.343	0.000	-6.057	-24.228	2.330	0.000	-0.00	
11	10.167							
	0.000	5.772	0.750	-2.656	27.663	0.000	-15.249	0.00
		-29.620	17.701	-6.311	-27.321	0.000	-14.384	0.00
	1.017	9.118	8.555	-3.445	24.666	1.839	0.000	0.00
		-22.351	6.003	0.000	-3.445	9.118	0.000	-0.00
	2.033	18.632	19.786	0.000	21.374	15.568	0.000	0.00
		-16.778	5.064	0.000	-4.937	12.365	0.000	-0.00
	3.050	28.044	16.316	-0.684	17.930	25.088	0.000	0.00
		-13.929	2.799	0.000	-6.198	14.032	0.000	-0.00
	4.067	32.686	12.875	-4.125	14.450	29.919	0.000	0.00
		-11.083	2.799	0.000	-7.854	25.711	0.000	-0.00
	5.083	32.680	7.456	-9.544	11.048	30.048	0.000	0.00
		-8.238	2.799	0.000	-11.048	29.761	0.000	-0.00
	6.100	32.933	4.151	-12.849	7.840	25.929	0.000	0.00
		-10.429	0.000	-2.656	-14.440	29.628	0.000	-0.00
	7.117	28.356	0.701	-16.299	6.003	14.266	0.000	0.00
-13.129		0.000	-2.656	-17.912	24.848	0.000	-0.00	
8.134	18.959	0.000	-19.778	4.760	12.376	0.000	0.00	
	-17.906	0.000	-5.246	-21.347	15.435	0.000	-0.00	
9.150	8.946	3.299	-8.701	3.299	8.946	0.000	0.00	
	-23.779	0.000	-6.198	-24.626	1.878	0.000	-0.00	
12	10.167							
	0.000	7.886	0.986	-3.667	27.738	0.000	-15.294	0.00
		-30.221	17.906	-6.460	-27.605	0.000	-14.957	0.00
	1.017	9.639	8.091	-3.909	24.797	1.687	0.000	0.00
		-23.392	6.177	0.000	-3.909	9.639	0.000	-0.00
	2.033	18.882	19.598	0.000	21.549	15.452	0.000	0.00
		-17.570	5.217	0.000	-5.520	12.454	0.000	-0.00
	3.050	28.126	16.153	-0.847	18.134	25.115	0.000	0.00
		-13.440	2.644	0.000	-6.860	13.476	0.000	-0.00
	4.067	32.677	12.762	-4.238	14.660	30.131	0.000	0.00
		-10.752	2.644	0.000	-8.024	25.518	0.000	-0.00
	5.083	33.062	7.591	-9.409	11.237	30.402	0.000	0.00
		-10.757	0.000	-3.667	-11.239	29.402	0.000	-0.00
	6.100	33.537	4.329	-12.671	7.976	26.275	0.000	0.00
		-14.485	0.000	-3.667	-14.628	29.116	0.000	-0.00
	7.117	29.215	0.906	-16.094	6.177	14.290	0.000	0.00
-18.214		0.000	-3.667	-18.073	24.279	0.000	-0.00	
8.134	20.022	0.000	-19.568	4.905	12.493	0.000	0.00	
	-21.942	0.000	-3.667	-21.456	14.988	0.000	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		12	9.150	13.405	1.914	0.000	3.398	9.042	0.000	0.00
	10.167	-28.370	0.000	-6.860	-24.658	1.821	0.000	-0.00		
13	0.000	14.427	1.800	-6.714	29.061	0.000	-18.126	0.00		
		-35.560	20.386	-7.131	-27.535	0.000	-14.274	0.00		
	1.017	7.988	9.548	-2.452	26.608	0.000	-0.364	0.00		
		-23.952	6.618	0.000	-6.714	7.601	0.000	-0.00		
	2.033	18.463	23.370	0.000	23.772	15.190	0.000	0.00		
		-17.660	5.516	0.000	-6.714	0.774	0.000	-0.00		
	3.050	31.613	20.003	0.000	20.605	27.332	0.000	0.00		
		-14.000	1.967	0.000	-8.565	11.941	0.000	-0.00		
	4.067	39.596	16.362	-0.638	17.137	34.869	0.000	0.00		
		-12.879	0.000	-6.714	-9.465	3.897	0.000	-0.00		
	5.083	41.295	12.500	-4.500	13.398	36.729	0.000	0.00		
		-19.706	0.000	-6.714	-9.465	0.000	-5.726	-0.00		
	6.100	44.092	6.158	-10.842	9.419	31.966	0.000	0.00		
		-26.532	0.000	-6.714	-10.842	44.092	0.000	-0.00		
	7.117	43.397	2.772	-14.228	6.618	16.417	0.000	0.00		
		-33.359	0.000	-6.714	-14.228	43.397	0.000	-0.00		
	8.134	36.369	0.000	-17.886	5.153	13.923	0.000	0.00		
		-40.186	0.000	-6.714	-17.886	36.369	0.000	-0.00		
	9.150	22.124	0.000	-21.760	3.366	8.778	0.000	0.00		
		-47.012	0.000	-6.714	-21.760	22.124	0.000	-0.00		
14	0.000	0.000	1.967	-0.000	17.000	0.000	-0.054	0.00		
		-53.839	17.000	-21.626	-25.797	0.000	-0.000	0.00		
	0.317	0.000	0.000	-0.000	17.000	0.000	-5.384	0.00		
		-48.455	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	12.000	-0.000	17.000	0.000	-0.000	0.00		
		-43.071	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	17.000	-0.000	17.000	0.000	-0.000	0.00		
		-37.687	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	17.000	-0.000	17.000	0.000	-0.000	0.00		
		-32.303	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	17.000	-0.000	17.000	0.000	0.000	0.00		
		-26.919	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	17.000	-0.000	17.000	0.000	-1.129	0.00		
		-21.536	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	17.000	-0.000	17.000	0.000	0.000	0.00		
		-16.152	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.534	0.000	17.000	-0.000	17.000	0.000	0.000	0.00		
		-10.768	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.850	0.000	17.000	-0.000	17.000	0.000	-2.261	0.00		
		-5.384	17.000	0.000	-0.000	0.000	0.000	-0.00		
	3.167	0.000	0.000	-0.000	17.000	0.000	-0.000	0.00		
		-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00		

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.979	-36.143
3	6.738	-31.985
4	4.612	-30.359
5	3.406	-30.294
6	3.418	-30.291
7	3.554	-30.308
8	3.460	-30.603
9	5.729	-29.709
10	5.730	-29.708
11	3.406	-30.608
12	4.654	-30.380
13	8.514	-31.463
14	1.967	-38.951

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

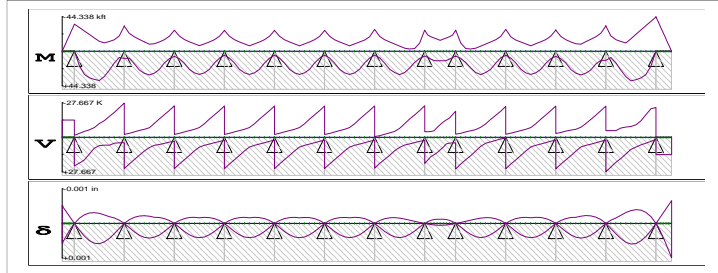
Support	Reaction	
	Positive	Negative
15	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 4F1  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (kft)		Corresponding Shear (K)		SHEAR (K)		Corresponding Moment (kft)		DEFLECT (in)	
		(max)	(min)	(+)	(-)	(max)	(min)	(+)	(-)	(max)	(min)
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	-0.00	-0.00
	0.250	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-3.500	0.000	0.000	-14.000	-14.000	0.000	0.000	0.000	-0.00	-0.00
	0.500	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-7.000	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
	0.750	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-10.500	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
	1.000	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-14.000	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
	1.250	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00
		-17.500	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
	1.500	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00
		-21.000	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
	1.750	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00
		-24.500	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
2.000	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-28.000	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00	
2.250	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-31.500	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00	
2.500											
2	0.000	0.000	0.000	0.000	-1.796	23.003	0.000	-0.000	0.00	0.00	
		-35.000	20.726	-14.000	-14.000	-14.000	0.000	-0.035	0.00	0.00	
	1.013	18.980	18.745	0.000	20.726	0.000	-14.015	0.00	0.00	0.00	
		-30.564	4.381	0.000	-3.322	8.786	0.000	-0.000	-0.00	-0.00	
	2.025	29.923	14.777	0.000	18.172	9.149	0.000	0.000	0.00	0.00	
		-26.128	4.381	0.000	-4.838	14.503	0.000	0.000	-0.00	-0.00	
	3.038	34.322	11.299	-2.701	13.389	27.193	0.000	0.000	0.00	0.00	
		-21.692	4.381	0.000	-6.135	17.816	0.000	0.000	-0.00	-0.00	
	4.050	36.455	8.828	-5.172	8.828	36.455	0.000	0.000	0.00	0.00	
		-17.256	4.381	0.000	-7.899	25.411	0.000	0.000	-0.00	-0.00	
	5.063	37.864	4.541	-9.459	6.726	20.051	0.000	0.000	0.00	0.00	
		-12.820	4.381	0.000	-11.164	29.232	0.000	0.000	-0.00	-0.00	
	6.075	32.637	0.590	-13.410	6.420	3.999	0.000	0.000	0.00	0.00	
		-10.913	0.000	-1.796	-13.443	32.436	0.000	0.000	-0.00	-0.00	
	7.088	24.481	0.000	-14.842	6.420	10.498	0.000	0.000	0.00	0.00	
		-12.732	0.000	-1.796	-16.963	22.225	0.000	0.000	-0.00	-0.00	
8.100	15.139	0.000	-19.390	4.805	12.325	0.000	0.000	0.00	0.00		
	-14.991	0.000	-3.740	-20.093	8.048	0.000	0.000	-0.00	-0.00		
9.113	8.123	0.891	-11.109	4.381	4.924	0.000	0.000	0.00	0.00		
	-19.870	0.000	-5.212	-23.865	0.000	-2.749	-0.000	-0.00	-0.00		
10.125											
3	0.000	9.360	4.381	-1.167	25.109	0.000	-16.431	0.00	0.00		
		-32.699	14.558	-20.260	-27.584	0.000	-22.465	0.00	0.00		
	1.017	8.968	8.675	-3.325	21.603	0.000	-7.565	0.00	0.00		
		-23.128	4.991	0.000	-3.325	8.968	0.000	0.000	-0.00	-0.00	
	2.033	16.459	17.039	0.000	17.926	11.523	0.000	0.000	0.00	0.00	
		-18.607	3.109	0.000	-4.481	12.489	0.000	0.000	-0.00	-0.00	
	3.050	24.193	13.412	-0.588	14.434	18.374	0.000	0.000	0.00	0.00	
		-15.446	3.109	0.000	-5.536	14.934	0.000	0.000	-0.00	-0.00	
4.067	28.478	10.911	-3.089	11.145	20.720	0.000	0.000	0.00	0.00		
	-12.285	3.109	0.000	-6.522	16.399	0.000	0.000	-0.00	-0.00		
5.083	30.511	6.539	-7.461	8.261	14.198	0.000	0.000	0.00	0.00		
	-9.124	3.109	0.000	-7.805	19.500	0.000	0.000	-0.00	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.100	28.316	2.796	-11.204	6.486	16.147	0.000	0.00		
		-9.723	0.000	-2.393	-11.204	28.316	0.000	-0.00		
	7.117	23.670	0.150	-13.850	5.833	14.403	0.000	0.00		
		-12.156	0.000	-2.393	-14.820	21.236	0.000	-0.00		
	8.134	15.428	0.000	-17.323	4.991	12.394	0.000	0.00		
		-14.955	0.000	-3.681	-18.212	9.865	0.000	-0.00		
9.150	9.678	3.944	-8.056	3.944	9.678	0.000	0.00			
	-19.425	0.000	-4.660	-21.708	0.000	-0.311	-0.00			
4	10.167									
	0.000	6.680	3.109	-0.833	25.233	0.000	-17.423	0.00		
		-27.366	12.849	-18.951	-25.410	0.000	-17.853	0.00		
	1.017	9.524	10.643	-1.357	21.541	0.000	-0.128	0.00		
		-19.661	4.668	0.000	-3.326	8.977	0.000	-0.00		
	2.033	15.514	17.197	0.000	18.051	10.073	0.000	0.00		
		-15.221	3.718	0.000	-4.457	12.343	0.000	-0.00		
	3.050	23.472	13.557	-0.443	14.645	21.193	0.000	0.00		
		-12.266	2.469	0.000	-5.494	14.727	0.000	-0.00		
	4.067	28.021	11.027	-2.973	11.027	28.021	0.000	0.00		
		-9.756	2.469	0.000	-6.471	16.198	0.000	-0.00		
	5.083	30.055	6.694	-7.306	7.916	19.736	0.000	0.00		
		-7.246	2.469	0.000	-7.894	19.761	0.000	-0.00		
	6.100	28.014	2.953	-11.047	6.473	16.170	0.000	0.00		
-9.642		0.000	-2.435	-11.047	28.014	0.000	-0.00			
7.117	23.433	0.413	-13.587	5.518	14.687	0.000	0.00			
	-12.117	0.000	-2.435	-14.676	21.106	0.000	-0.00			
8.134	15.440	0.000	-17.216	4.495	12.336	0.000	0.00			
	-14.954	0.000	-3.673	-18.092	9.879	0.000	-0.00			
9.150	9.029	3.372	-8.628	3.372	9.029	0.000	0.00			
	-19.393	0.000	-4.632	-21.552	0.000	-0.135	-0.00			
5	10.167									
	0.000	5.304	2.469	-0.662	25.240	0.000	-17.484	0.00		
		-27.125	12.818	-18.838	-25.253	0.000	-17.516	0.00		
	1.017	8.977	8.675	-3.325	21.540	0.000	-0.121	0.00		
		-19.411	4.633	0.000	-3.325	8.977	0.000	-0.00		
	2.033	15.446	17.208	0.000	18.081	9.894	0.000	0.00		
		-14.974	3.676	0.000	-4.454	12.333	0.000	-0.00		
	3.050	23.420	13.567	-0.433	14.663	21.103	0.000	0.00		
		-12.124	2.440	0.000	-5.491	14.713	0.000	-0.00		
	4.067	27.992	11.034	-2.966	11.034	27.992	0.000	0.00		
		-9.643	2.440	0.000	-6.468	16.183	0.000	-0.00		
	5.083	30.022	6.705	-7.295	7.902	19.778	0.000	0.00		
		-7.162	2.440	0.000	-7.900	19.780	0.000	-0.00		
	6.100	27.992	2.964	-11.036	6.468	16.181	0.000	0.00		
-9.634		0.000	-2.438	-11.036	27.992	0.000	-0.00			
7.117	23.417	0.430	-13.570	5.493	14.709	0.000	0.00			
	-12.113	0.000	-2.438	-14.666	21.096	0.000	-0.00			
8.134	15.440	0.000	-17.210	4.458	12.332	0.000	0.00			
	-14.950	0.000	-3.672	-18.084	9.877	0.000	-0.00			
9.150	8.982	3.329	-8.671	3.329	8.982	0.000	0.00			
	-19.387	0.000	-4.629	-21.541	0.000	-0.122	-0.00			
6	10.167									
	0.000	5.243	2.440	-0.654	25.238	0.000	-17.483	0.00		
		-27.111	12.818	-18.831	-25.242	0.000	-17.492	0.00		
	1.017	8.966	8.684	-3.316	21.538	0.000	-0.118	0.00		
		-19.392	4.630	0.000	-3.316	8.966	0.000	-0.00		
	2.033	15.441	17.207	0.000	18.081	9.881	0.000	0.00		
		-14.956	3.673	0.000	-4.446	12.331	0.000	-0.00		
	3.050	23.413	13.564	-0.436	14.662	21.095	0.000	0.00		
		-12.115	2.439	0.000	-5.485	14.717	0.000	-0.00		
	4.067	27.985	11.032	-2.968	11.032	27.985	0.000	0.00		
		-9.635	2.439	0.000	-6.466	16.185	0.000	-0.00		
	5.083	30.021	6.707	-7.293	7.903	19.785	0.000	0.00		
		-7.155	2.439	0.000	-7.897	19.791	0.000	-0.00		
	6.100	27.984	2.963	-11.037	6.466	16.179	0.000	0.00		
-9.616		0.000	-2.433	-11.037	27.984	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		6	7.117	23.404	0.429	-13.571	5.491	14.708	0.000	0.00
		-12.090	0.000	-2.433	-14.669	21.075	0.000	-0.00		
	8.134	15.424	0.000	-17.212	4.455	12.329	0.000	0.00		
		-14.894	0.000	-3.663	-18.090	9.836	0.000	-0.00		
	9.150	8.978	3.326	-8.674	3.326	8.978	0.000	0.00		
		-19.330	0.000	-4.621	-21.540	0.000	-0.119	-0.00		
	10.167									
7	0.000	5.248	0.654	-2.442	25.203	0.000	-17.407	0.00		
		-27.169	12.846	-18.837	-25.243	0.000	-17.505	0.00		
	1.017	8.816	8.817	-3.183	21.502	0.000	-0.078	0.00		
		-19.384	4.623	0.000	-3.183	8.816	0.000	-0.00		
	2.033	15.443	17.187	0.000	18.054	9.884	0.000	0.00		
		-14.954	3.671	0.000	-4.329	12.317	0.000	-0.00		
	3.050	23.364	13.510	-0.490	14.630	21.065	0.000	0.00		
		-12.105	2.449	0.000	-5.407	14.788	0.000	-0.00		
	4.067	27.917	10.996	-3.004	10.996	27.917	0.000	0.00		
		-9.616	2.449	0.000	-6.448	16.220	0.000	-0.00		
	5.083	30.034	6.711	-7.289	7.923	19.845	0.000	0.00		
		-7.169	0.000	-2.442	-7.852	19.924	0.000	-0.00		
	6.100	27.894	2.941	-11.059	6.455	16.133	0.000	0.00		
		-9.652	0.000	-2.442	-11.059	27.894	0.000	-0.00		
	7.117	23.241	0.396	-13.604	5.481	14.661	0.000	0.00		
		-12.135	0.000	-2.442	-14.726	20.793	0.000	-0.00		
	8.134	15.211	0.000	-17.247	4.449	12.296	0.000	0.00		
		-14.618	0.000	-2.442	-18.184	9.275	0.000	-0.00		
	9.150	8.980	3.326	-8.674	3.326	8.980	0.000	0.00		
		-18.556	0.000	-4.652	-21.537	0.000	-0.099	-0.00		
	10.167									
8	0.000	5.321	2.449	-0.692	24.892	0.000	-16.525	0.00		
		-28.234	18.517	-13.765	-25.267	0.000	-17.700	0.00		
	1.017	8.568	10.721	-1.279	21.015	2.096	0.000	0.00		
		-19.285	4.536	0.000	-1.407	6.806	0.000	-0.00		
	2.033	15.452	17.115	0.000	17.866	8.388	0.000	0.00		
		-14.952	3.649	0.000	-2.522	12.109	0.000	-0.00		
	3.050	23.294	13.432	-0.568	14.423	20.077	0.000	0.00		
		-11.985	2.582	0.000	-3.645	16.376	0.000	-0.00		
	4.067	27.590	10.677	-3.323	10.914	21.481	0.000	0.00		
		-9.360	2.582	0.000	-4.803	19.374	0.000	-0.00		
	5.083	30.166	6.756	-7.244	8.195	20.645	0.000	0.00		
		-6.735	2.582	0.000	-7.304	23.427	0.000	-0.00		
	6.100	27.592	2.865	-11.135	6.294	15.499	0.000	0.00		
		-4.111	2.582	0.000	-11.135	27.592	0.000	-0.00		
	7.117	21.450	0.185	-13.815	5.350	14.012	0.000	0.00		
		-2.991	0.465	0.000	-14.799	20.430	0.000	-0.00		
	8.134	14.472	2.384	-9.616	4.372	11.839	0.000	0.00		
		-3.654	0.000	-1.637	-18.130	9.600	0.000	-0.00		
	9.150	9.357	1.333	-10.667	3.330	9.009	0.000	0.00		
		-10.613	0.000	-15.188	-21.503	0.142	0.000	-0.00		
	10.167									
9	0.000	6.389	2.582	-1.227	21.021	0.000	-15.926	0.00		
		-27.265	12.388	-18.130	-25.347	0.000	-18.339	0.00		
	0.629	8.100	10.233	-1.767	18.387	0.000	-5.940	0.00		
		-20.963	4.581	0.000	-4.581	2.087	0.000	-0.00		
	1.258	10.281	9.422	-2.578	15.645	0.000	-6.373	0.00		
		-18.821	2.730	0.000	-4.675	7.934	0.000	-0.00		
	1.887	12.141	8.634	-5.366	14.143	0.000	-0.065	0.00		
		-17.255	2.472	0.000	-5.366	12.141	0.000	-0.00		
	2.516	12.394	7.701	-4.299	12.350	5.408	0.000	0.00		
		-15.700	2.472	0.000	-7.947	11.945	0.000	-0.00		
	3.145	12.237	5.150	-6.850	10.281	9.562	0.000	0.00		
		-14.183	0.000	-2.397	-10.280	9.563	0.000	-0.00		
	3.774	12.397	4.300	-7.700	7.947	11.944	0.000	0.00		
		-15.701	0.000	-2.473	-12.350	5.410	0.000	-0.00		
	4.403	12.140	5.366	-8.634	5.366	12.140	0.000	0.00		
		-17.256	0.000	-2.473	-14.143	0.000	-0.063	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
9	5.032	10.286	2.579	-9.421	4.675	7.934	0.000	0.00
		-18.823	0.000	-2.731	-15.645	0.000	-6.371	-0.00
	5.661	8.107	1.769	-10.231	4.581	2.087	0.000	0.00
10	6.290	-20.964	0.000	-4.581	-18.387	0.000	-5.938	-0.00
		0.000	6.394	1.228	-2.584	25.348	0.000	-18.342
	1.017	-27.267	18.131	-12.388	-21.021	0.000	-15.923	0.00
		9.357	10.667	-1.333	21.504	0.141	0.000	0.00
	2.033	-10.612	15.187	0.000	-3.334	9.014	0.000	-0.00
		14.472	9.617	-2.383	18.131	9.600	0.000	0.00
	3.050	-3.653	1.634	0.000	-4.376	11.840	0.000	-0.00
		21.451	13.815	-0.185	14.800	20.430	0.000	0.00
	4.067	-2.993	0.000	-0.468	-5.353	14.011	0.000	-0.00
		27.594	11.136	-2.864	11.136	27.594	0.000	0.00
	5.083	-4.114	0.000	-2.584	-6.295	15.498	0.000	-0.00
		30.169	7.245	-6.755	7.307	23.436	0.000	0.00
	6.100	-6.741	0.000	-2.584	-8.196	20.642	0.000	-0.00
		27.593	3.324	-10.676	4.804	19.376	0.000	0.00
	7.117	-9.368	0.000	-2.584	-10.915	21.477	0.000	-0.00
23.298		0.568	-13.432	3.645	16.378	0.000	0.00	
8.134	-11.995	0.000	-2.584	-14.423	20.079	0.000	-0.00	
	15.457	0.000	-17.114	2.523	12.111	0.000	0.00	
9.150	-14.971	0.000	-3.652	-17.866	8.388	0.000	-0.00	
	8.646	1.291	-10.709	1.407	6.807	0.000	0.00	
10.167	-19.305	0.000	-4.539	-21.014	2.102	0.000	-0.00	
	0.000	5.381	0.699	-2.476	25.280	0.000	-17.727	0.00
11	1.017	-28.234	13.766	-18.517	-24.891	0.000	-16.519	0.00
		9.035	8.627	-3.373	21.550	0.000	-0.113	0.00
	2.033	-18.558	4.654	0.000	-3.373	9.035	0.000	-0.00
		15.210	17.255	0.000	18.194	9.274	0.000	0.00
	3.050	-14.618	2.439	0.000	-4.490	12.302	0.000	-0.00
		23.258	13.623	-0.377	14.737	20.803	0.000	0.00
	4.067	-12.138	2.439	0.000	-5.509	14.637	0.000	-0.00
		27.918	11.072	-2.928	11.072	27.918	0.000	0.00
	5.083	-9.658	2.439	0.000	-6.461	16.121	0.000	-0.00
		30.070	7.301	-6.699	7.845	19.904	0.000	0.00
	6.100	-7.205	0.000	-2.476	-7.939	19.799	0.000	-0.00
		27.948	3.012	-10.988	6.452	16.236	0.000	0.00
	7.117	-9.723	0.000	-2.476	-10.988	27.948	0.000	-0.00
		23.421	0.502	-13.498	5.410	14.805	0.000	0.00
	8.134	-12.240	0.000	-2.476	-14.610	21.164	0.000	-0.00
15.518		0.000	-17.174	4.331	12.330	0.000	0.00	
9.150	-15.229	0.000	-3.717	-18.021	10.082	0.000	-0.00	
	9.573	1.368	-10.632	3.183	8.817	0.000	0.00	
10.167	-19.661	0.000	-4.663	-21.503	0.000	-0.086	-0.00	
	0.000	6.769	0.847	-3.148	25.417	0.000	-17.879	0.00
12	1.017	-27.438	18.962	-12.879	-25.194	0.000	-17.339	0.00
		9.718	8.022	-3.978	21.713	0.000	-0.316	0.00
	2.033	-19.365	4.652	0.000	-3.978	9.718	0.000	-0.00
		15.413	17.313	0.000	18.223	9.821	0.000	0.00
	3.050	-14.895	3.671	0.000	-5.029	12.397	0.000	-0.00
		23.646	13.839	-0.161	14.828	21.218	0.000	0.00
	4.067	-12.132	2.387	0.000	-5.874	14.363	0.000	-0.00
		28.318	11.211	-2.789	11.211	28.318	0.000	0.00
	5.083	-9.706	2.387	0.000	-6.530	16.057	0.000	-0.00
		30.526	7.466	-6.534	7.798	19.501	0.000	0.00
	6.100	-9.233	0.000	-3.148	-8.125	19.134	0.000	-0.00
		28.424	3.079	-10.921	6.523	16.408	0.000	0.00
	7.117	-12.434	0.000	-3.148	-11.155	20.683	0.000	-0.00
		24.212	0.597	-13.403	5.531	14.946	0.000	0.00
	8.134	-15.634	0.000	-3.148	-14.443	18.321	0.000	-0.00
16.489		0.000	-17.032	4.473	12.493	0.000	0.00	
		-18.835	0.000	-3.148	-17.935	11.455	0.000	-0.00

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
12	9.150	11.934	1.701	-10.299	3.315	8.958	0.000	0.00
		-23.396	0.000	-5.029	-21.552	0.000	-0.220	-0.00
13	10.167							
	0.000	11.881	1.482	-5.530	27.667	0.000	-22.703	0.00
		-32.839	20.306	-14.575	-25.119	0.000	-16.526	0.00
	1.017	8.109	11.114	-0.886	23.951	0.000	-2.850	0.00
		-19.897	5.249	0.000	-5.530	6.259	0.000	-0.00
	2.033	15.178	19.479	0.000	20.116	8.128	0.000	0.00
		-14.963	3.783	0.000	-5.530	0.637	0.000	-0.00
	3.050	24.644	14.931	0.000	16.986	22.386	0.000	0.00
		-12.701	1.785	0.000	-7.486	12.913	0.000	-0.00
	4.067	32.872	13.431	-0.569	13.467	32.655	0.000	0.00
		-10.887	1.785	0.000	-8.280	6.170	0.000	-0.00
	5.083	38.154	9.478	-4.522	9.693	37.062	0.000	0.00
		-16.228	0.000	-5.530	-8.798	19.063	0.000	-0.00
	6.100	36.772	5.188	-8.812	7.924	25.645	0.000	0.00
		-21.850	0.000	-5.530	-10.042	8.162	0.000	-0.00
	7.117	34.549	2.673	-11.327	6.132	17.898	0.000	0.00
	-27.472	0.000	-5.530	-13.376	27.498	0.000	-0.00	
8.134	30.128	0.000	-14.817	4.830	14.580	0.000	0.00	
	-33.094	0.000	-5.530	-18.163	9.400	0.000	-0.00	
9.150	19.108	0.000	-18.794	3.306	8.839	0.000	0.00	
	-38.716	0.000	-5.530	-23.129	0.000	-18.251	-0.00	
14	10.167							
	0.000	0.000	1.785	-0.000	14.000	0.000	-0.044	0.00
		-44.338	14.000	-23.124	-24.042	0.000	-44.338	0.00
	0.317	0.000	12.000	-0.000	14.000	0.000	-0.000	0.00
		-39.904	14.000	0.000	-0.000	0.000	0.000	-0.00
	0.633	0.000	12.000	-0.000	14.000	0.000	-4.434	0.00
		-35.470	14.000	0.000	-0.000	0.000	0.000	-0.00
	0.950	0.000	12.000	-0.000	14.000	0.000	-0.000	0.00
		-31.037	14.000	0.000	-0.000	0.000	0.000	-0.00
	1.267	0.000	12.000	-0.000	14.000	0.000	-0.000	0.00
		-26.603	14.000	0.000	-0.000	0.000	0.000	-0.00
	1.583	0.000	14.000	-0.000	14.000	0.000	-0.000	0.00
		-22.169	14.000	0.000	-0.000	0.000	0.000	-0.00
	1.900	0.000	14.000	-0.000	14.000	0.000	-0.930	0.00
	-17.735	14.000	0.000	-0.000	0.000	0.000	-0.00	
2.217	0.000	14.000	-0.000	14.000	0.000	0.000	0.00	
	-13.301	14.000	0.000	-0.000	0.000	0.000	-0.00	
2.534	0.000	14.000	-0.000	14.000	0.000	0.000	0.00	
	-8.868	14.000	0.000	-0.000	0.000	0.000	-0.00	
2.850	0.000	14.000	-0.000	14.000	0.000	-1.862	0.00	
	-4.434	14.000	0.000	-0.000	0.000	0.000	-0.00	
3.167	0.000	0.000	0.000	14.000	0.000	0.000	0.00	
	-0.000	0.000	-0.000	-0.000	0.000	0.000	-0.00	

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.796	-34.726
3	5.549	-35.615
4	3.942	-32.959
5	3.130	-32.887
6	3.094	-32.886
7	3.097	-32.938
8	3.140	-33.656
9	5.200	-31.208
10	5.200	-31.206
11	3.175	-33.662
12	3.995	-33.018
13	7.012	-35.656
14	1.785	-38.042

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

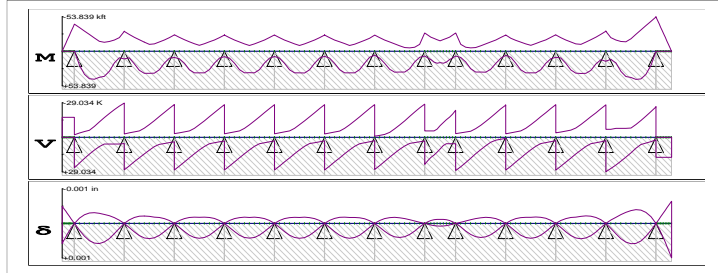
Support	Reaction	
	Positive	Negative
15	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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ID: Ohio 5C1  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (kft)		Corresponding Shear (K)		SHEAR (K)		Corresponding Moment (kft)		DEFLECT (in)		
		(max)	(min)	(+)	(-)	(max)	(min)	(+)	(-)	(max)	(min)	
1	0.000	0.000	-0.000	0.000	-0.000	0.000	-17.000	0.000	-0.000	0.000	-0.000	
	0.250	0.000	-4.250	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	-0.000	
		-8.500	0.000	-17.000	-17.000	0.000	0.000	0.000	0.000	0.000	-0.000	
	0.500	0.000	-12.750	0.000	-17.000	-17.000	0.000	0.000	0.000	0.000	-0.000	
		-17.000	0.000	-17.000	-17.000	0.000	0.000	0.000	0.000	0.000	-0.000	
	1.000	0.000	-21.250	0.000	-17.000	-17.000	0.000	-0.000	0.000	0.000	-0.000	
		-25.500	0.000	-17.000	-17.000	0.000	0.000	-0.000	0.000	0.000	-0.000	
	1.500	0.000	-29.750	0.000	-17.000	-17.000	0.000	-0.000	0.000	0.000	-0.000	
		-34.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	0.000	0.000	-0.000	
	2.000	0.000	-38.250	0.000	-17.000	-17.000	0.000	-0.000	0.000	0.000	-0.000	
		-42.500	0.000	0.000	-2.173	25.727	0.000	-0.000	0.000	-0.000	0.000	
	2	0.000	0.000	19.143	-17.000	-17.000	0.000	-0.043	0.000	0.000	0.000	
		1.013	22.006	-37.113	5.320	0.000	-3.661	8.443	0.000	0.000	0.000	-0.000
			36.174	-31.727	5.320	0.000	-4.957	14.263	0.000	0.000	0.000	-0.000
		2.025	43.161	-26.340	5.320	0.000	-6.069	18.016	0.000	0.000	0.000	-0.000
			43.848	-20.954	5.320	0.000	-9.215	32.378	0.000	0.000	0.000	-0.000
3.038		41.043	-15.567	5.320	0.000	-13.069	37.965	0.000	0.000	0.000	-0.000	
		39.392	-14.079	0.678	-16.322	5.701	0.000	-7.869	0.000	0.000	0.000	
4.050		31.477	-15.402	0.000	-0.342	-16.731	36.909	0.000	-2.097	0.000	0.000	
		18.407	-17.642	0.000	-2.173	-20.172	30.005	0.000	0.000	0.000	-0.000	
5.063		10.377	18.407	0.000	-23.332	5.701	3.675	0.000	0.000	0.000	0.000	
		10.377	-21.303	0.000	-3.279	-23.362	18.170	0.000	0.000	0.000	-0.000	
6.075		10.377	1.139	-10.861	5.701	9.446	0.000	0.000	0.000	0.000	0.000	
		-21.303	0.000	-3.973	-26.372	1.513	0.000	0.000	0.000	0.000	-0.000	
3		0.000	12.132	5.396	-1.794	27.469	0.000	-13.738	0.000	0.000	0.000	
		1.017	-31.304	4.732	-20.008	-29.003	0.000	-17.752	0.000	0.000	0.000	
			10.308	0.000	-1.794	24.197	5.060	0.000	0.000	0.000	0.000	
	2.033	-26.500	4.689	0.000	-3.788	9.441	0.000	0.000	0.000	-0.000		
		19.987	-21.934	3.775	0.000	-4.648	12.489	0.000	0.000	-0.000		
	3.050	30.020	16.921	-0.079	17.340	27.670	0.000	0.000	0.000	0.000		
		-18.120	3.751	0.000	-5.454	15.016	0.000	0.000	0.000	-0.000		
	4.067	34.647	13.233	-3.767	14.060	31.326	0.000	0.000	0.000	0.000		
-14.373		3.637	0.000	-7.751	26.712	0.000	0.000	0.000	-0.000			
5.083	34.598	6.527	-10.473	10.878	30.603	0.000	0.000	0.000	0.000			
	-10.822	2.681	0.000	-10.846	31.566	0.000	0.000	0.000	-0.000			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.100	34.333	3.382	-13.618	7.909	26.000	0.000	0.00		
		-11.762	0.000	-2.895	-14.166	32.103	0.000	-0.00		
	7.117	29.199	0.000	-17.324	6.046	14.211	0.000	0.00		
		-14.705	0.000	-2.895	-17.603	27.778	0.000	-0.00		
	8.134	18.799	0.000	-20.153	5.353	12.435	0.000	0.00		
		-17.648	0.000	-2.895	-21.046	18.489	0.000	-0.00		
9.150	10.815	1.517	-10.483	4.525	10.335	0.000	0.00			
	-21.369	0.000	-3.788	-24.521	3.621	0.000	-0.00			
4	10.167									
	0.000	9.874	3.493	-2.334	27.588	0.000	-14.694	0.00		
		-25.944	4.086	-17.376	-27.698	0.000	-14.983	0.00		
	1.017	11.863	10.309	-1.691	24.367	3.872	0.000	0.00		
		-21.843	3.864	0.000	-3.798	9.507	0.000	-0.00		
	2.033	18.907	20.237	0.000	20.814	18.846	0.000	0.00		
		-18.042	3.115	0.000	-4.625	12.361	0.000	-0.00		
	3.050	29.090	17.108	0.000	17.361	27.564	0.000	0.00		
		-14.894	2.998	0.000	-5.408	14.806	0.000	-0.00		
	4.067	33.990	13.399	-3.601	13.970	31.682	0.000	0.00		
		-11.846	2.998	0.000	-7.647	26.299	0.000	-0.00		
	5.083	33.923	9.967	-7.033	10.710	31.090	0.000	0.00		
		-9.354	2.130	0.000	-10.688	31.104	0.000	-0.00		
	6.100	33.967	3.573	-13.427	7.696	26.397	0.000	0.00		
		-11.940	0.000	-2.783	-13.985	31.756	0.000	-0.00		
	7.117	29.031	0.000	-17.137	5.451	14.747	0.000	0.00		
		-14.794	0.000	-2.874	-17.422	27.614	0.000	-0.00		
	8.134	18.784	0.000	-20.250	4.682	12.358	0.000	0.00		
-17.716		0.000	-2.874	-20.883	18.507	0.000	-0.00			
9.150	10.914	1.553	-10.447	3.864	9.587	0.000	0.00			
	-21.383	0.000	-3.862	-24.390	3.769	0.000	-0.00			
5	10.167									
	0.000	8.670	2.346	-2.771	27.575	0.000	-14.589	0.00		
		-25.553	4.037	-17.194	-27.605	0.000	-14.783	0.00		
	1.017	10.980	10.435	-1.565	24.398	3.652	0.000	0.00		
		-21.507	3.816	0.000	-3.824	9.542	0.000	-0.00		
	2.033	19.018	20.183	0.000	20.887	18.408	0.000	0.00		
		-17.760	3.056	0.000	-4.643	12.354	0.000	-0.00		
	3.050	28.978	17.072	0.000	17.362	27.560	0.000	0.00		
		-14.673	2.953	0.000	-5.418	14.779	0.000	-0.00		
	4.067	33.906	13.392	-3.608	13.955	31.695	0.000	0.00		
		-11.670	2.953	0.000	-7.658	26.346	0.000	-0.00		
	5.083	33.552	6.903	-10.097	10.682	31.080	0.000	0.00		
		-9.253	0.000	-2.094	-10.655	31.007	0.000	-0.00		
	6.100	34.012	3.549	-13.451	7.657	26.332	0.000	0.00		
		-11.690	0.000	-2.958	-14.009	31.803	0.000	-0.00		
	7.117	28.981	0.000	-17.084	5.407	14.787	0.000	0.00		
		-14.697	0.000	-2.958	-17.369	27.566	0.000	-0.00		
	8.134	18.769	0.000	-20.718	4.633	12.352	0.000	0.00		
-17.736		0.000	-3.168	-20.847	18.653	0.000	-0.00			
9.150	10.902	1.553	-10.447	3.816	9.533	0.000	0.00			
	-21.566	0.000	-3.845	-24.376	3.814	0.000	-0.00			
6	10.167									
	0.000	8.360	2.389	-2.545	27.579	0.000	-14.727	0.00		
		-25.624	17.227	-4.046	-27.581	0.000	-14.630	0.00		
	1.017	10.917	10.444	-1.556	24.388	3.772	0.000	0.00		
		-21.384	3.821	0.000	-3.814	9.530	0.000	-0.00		
	2.033	18.804	20.256	0.000	20.905	18.505	0.000	0.00		
		-17.727	3.077	0.000	-4.632	12.352	0.000	-0.00		
	3.050	29.057	17.165	0.000	17.454	27.643	0.000	0.00		
		-14.605	2.941	0.000	-5.407	14.787	0.000	-0.00		
	4.067	34.032	13.460	-3.540	14.022	31.826	0.000	0.00		
		-11.615	2.941	0.000	-7.686	26.477	0.000	-0.00		
	5.083	33.938	7.038	-9.962	10.725	31.212	0.000	0.00		
		-9.228	0.000	-2.087	-10.700	31.157	0.000	-0.00		
	6.100	34.061	3.619	-13.381	7.682	26.437	0.000	0.00		
		-11.650	0.000	-2.948	-13.964	31.725	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	7.117	29.233	0.000	-17.079	5.395	14.793	0.000	0.00		
		-14.647	0.000	-2.948	-17.362	27.559	0.000	-0.00		
	8.134	19.129	0.000	-20.200	4.635	12.350	0.000	0.00		
		-17.676	0.000	-3.158	-20.784	18.503	0.000	-0.00		
	9.150	10.701	1.525	-10.475	3.798	9.513	0.000	0.00		
-21.490		0.000	-3.834	-24.333	4.112	0.000	-0.00			
7	10.167									
	0.000	8.135	2.525	-2.276	27.555	0.000	-14.676	0.00		
		-25.536	17.186	-4.035	-27.555	0.000	-14.428	0.00		
	1.017	10.827	10.452	-1.548	24.358	3.805	0.000	0.00		
		-21.382	3.800	0.000	-3.663	9.359	0.000	-0.00		
	2.033	18.785	20.282	0.000	20.868	18.509	0.000	0.00		
		-17.713	2.786	0.000	-4.478	12.335	0.000	-0.00		
	3.050	29.018	17.123	0.000	17.413	27.606	0.000	0.00		
		-14.880	2.786	0.000	-5.269	14.912	0.000	-0.00		
	4.067	33.948	13.417	-3.583	13.981	31.748	0.000	0.00		
		-12.048	2.786	0.000	-7.630	26.539	0.000	-0.00		
	5.083	33.847	7.007	-9.993	10.690	31.108	0.000	0.00		
		-9.216	2.786	0.000	-10.656	31.257	0.000	-0.00		
	6.100	33.912	3.581	-13.419	7.658	26.344	0.000	0.00		
		-11.244	0.000	-2.892	-13.939	31.808	0.000	-0.00		
	7.117	29.022	0.000	-17.122	5.399	14.733	0.000	0.00		
		-14.203	0.000	-2.952	-17.365	27.548	0.000	-0.00		
8.134	18.885	0.000	-20.241	4.621	12.320	0.000	0.00			
	-17.204	0.000	-2.952	-20.823	18.789	0.000	-0.00			
9.150	9.528	3.800	-8.200	3.800	9.528	0.000	0.00			
	-20.432	0.000	-3.663	-24.371	3.844	0.000	-0.00			
8	10.167									
	0.000	6.410	2.949	-0.833	27.261	0.000	-14.045	0.00		
		-25.433	4.024	-17.137	-27.582	0.000	-14.644	0.00		
	1.017	10.942	10.365	-1.635	24.007	4.341	0.000	0.00		
		-21.417	3.830	0.000	-1.709	7.148	0.000	-0.00		
	2.033	18.818	20.302	0.000	20.502	18.759	0.000	0.00		
		-17.731	2.947	0.000	-2.533	14.571	0.000	-0.00		
	3.050	28.505	16.835	-0.165	16.843	27.092	0.000	0.00		
		-14.734	2.947	0.000	-4.310	20.879	0.000	-0.00		
	4.067	33.001	13.181	-3.819	13.411	30.655	0.000	0.00		
		-11.738	2.947	0.000	-7.178	28.650	0.000	-0.00		
	5.083	32.593	6.580	-10.420	10.195	29.656	0.000	0.00		
		-8.741	2.947	0.000	-10.420	32.593	0.000	-0.00		
	6.100	32.608	3.264	-13.736	7.330	25.049	0.000	0.00		
		-5.906	2.005	0.000	-13.960	31.684	0.000	-0.00		
	7.117	27.333	0.000	-17.408	5.263	14.063	0.000	0.00		
		-5.404	0.000	-0.473	-17.712	26.088	0.000	-0.00		
8.134	16.895	0.000	-21.054	4.553	11.918	0.000	0.00			
	-6.397	0.000	-1.028	-21.423	15.197	0.000	-0.00			
9.150	9.737	3.830	-8.170	3.830	9.737	0.000	0.00			
	-10.926	0.000	-14.565	-24.905	0.108	0.000	-0.00			
9	10.167									
	0.000	7.691	3.108	-1.478	22.853	0.000	-5.520	0.00		
		-28.707	5.515	-19.283	-27.957	0.000	-17.645	0.00		
	0.629	10.635	9.679	-2.321	19.719	4.797	0.000	0.00		
		-25.303	5.194	0.000	-5.516	2.513	0.000	-0.00		
	1.258	13.150	16.265	-0.735	17.129	0.000	-0.363	0.00		
		-22.190	3.167	0.000	-5.516	0.000	-0.957	-0.00		
	1.887	17.190	13.549	-3.451	14.999	7.137	0.000	0.00		
		-20.198	3.167	0.000	-5.516	0.000	-4.427	-0.00		
	2.516	18.910	10.552	-6.448	12.569	13.098	0.000	0.00		
		-18.257	3.077	0.000	-6.962	18.121	0.000	-0.00		
	3.145	17.861	7.725	-9.275	9.876	16.623	0.000	0.00		
		-16.321	3.077	0.000	-9.864	16.597	0.000	-0.00		
	3.774	18.917	6.451	-10.549	6.978	18.163	0.000	0.00		
		-18.276	0.000	-3.113	-12.538	13.179	0.000	-0.00		
4.403	17.211	3.457	-13.543	5.515	0.000	-4.425	0.00			
	-20.234	0.000	-3.113	-14.969	7.239	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR (max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	5.032	13.148	0.746	-16.254	5.515	0.000	-0.957	0.00		
		-22.192	0.000	-3.113	-17.099	0.000	-0.242	-0.00		
	5.661	10.717	2.339	-9.661	5.515	2.512	0.000	0.00		
10	6.290	-25.303	0.000	-5.190	-19.699	4.806	0.000	-0.00		
		0.000	7.738	1.487	-3.127	27.958	0.000	-17.655	0.00	
	1.017	-28.715	20.410	-5.516	-22.836	0.000	-5.502	0.00		
		9.765	8.151	-3.849	24.906	0.105	0.000	0.00		
	2.033	-10.991	14.672	0.000	-3.849	9.765	0.000	-0.00		
		16.908	21.026	0.000	21.424	15.199	0.000	0.00		
	3.050	-6.389	1.010	0.000	-4.561	11.922	0.000	-0.00		
		27.335	17.411	0.000	17.713	25.835	0.000	0.00		
	4.067	-5.397	0.471	0.000	-5.262	14.063	0.000	-0.00		
		32.681	13.782	-3.218	14.013	31.769	0.000	0.00		
	5.083	-5.958	0.000	-1.972	-7.331	25.043	0.000	-0.00		
		32.597	10.422	-6.578	10.422	32.597	0.000	0.00		
	6.100	-8.752	0.000	-2.951	-10.195	29.650	0.000	-0.00		
		32.906	3.793	-13.207	7.181	28.661	0.000	0.00		
	7.117	-11.752	0.000	-2.951	-13.411	30.651	0.000	-0.00		
28.533		0.171	-16.829	4.314	20.898	0.000	0.00			
8.134	-14.753	0.000	-2.951	-16.842	27.091	0.000	-0.00			
	19.064	0.000	-20.228	2.554	14.692	0.000	0.00			
9.150	-17.753	0.000	-2.951	-20.452	19.038	0.000	-0.00			
	11.086	1.656	-10.344	1.707	7.146	0.000	0.00			
11	10.167	-21.545	0.000	-3.849	-24.053	4.032	0.000	-0.00		
		0.000	6.546	0.851	-3.012	27.634	0.000	-15.017	0.00	
	1.017	-25.559	17.195	-4.040	-27.292	0.000	-13.838	0.00		
		9.607	8.132	-3.868	24.432	3.479	0.000	0.00		
	2.033	-20.430	3.662	0.000	-3.868	9.607	0.000	-0.00		
		18.886	20.233	0.000	20.921	18.281	0.000	0.00		
	3.050	-17.186	2.854	0.000	-4.679	12.329	0.000	-0.00		
		29.036	17.137	0.000	17.425	27.601	0.000	0.00		
	4.067	-14.339	2.794	0.000	-5.442	14.695	0.000	-0.00		
		33.941	13.434	-3.566	13.962	31.851	0.000	0.00		
	5.083	-11.565	2.673	0.000	-7.675	26.312	0.000	-0.00		
		33.922	10.018	-6.982	10.647	31.228	0.000	0.00		
	6.100	-9.367	0.000	-2.837	-10.703	31.068	0.000	-0.00		
		34.001	3.596	-13.404	7.595	26.401	0.000	0.00		
	7.117	-12.252	0.000	-2.837	-13.989	31.717	0.000	-0.00		
29.092		0.000	-17.108	5.272	14.930	0.000	0.00			
8.134	-15.136	0.000	-2.837	-17.413	27.611	0.000	-0.00			
	18.907	0.000	-20.262	4.479	12.346	0.000	0.00			
9.150	-18.021	0.000	-2.837	-20.855	18.583	0.000	-0.00			
	11.904	1.702	-10.298	3.662	9.355	0.000	0.00			
12	10.167	-21.857	0.000	-3.868	-24.345	3.900	0.000	-0.00		
		0.000	9.743	2.238	-3.512	27.703	0.000	-15.006	0.00	
	1.017	-25.957	17.382	-4.088	-27.596	0.000	-14.560	0.00		
		10.668	10.504	-1.496	24.529	3.595	0.000	0.00		
	2.033	-21.478	3.825	0.000	-4.555	10.371	0.000	-0.00		
		19.142	20.086	0.000	21.054	18.471	0.000	0.00		
	3.050	-17.671	3.115	0.000	-5.387	12.438	0.000	-0.00		
		29.420	17.287	0.000	17.609	27.782	0.000	0.00		
	4.067	-14.698	2.891	0.000	-6.083	14.174	0.000	-0.00		
		34.468	13.593	-3.407	14.171	32.121	0.000	0.00		
	5.083	-11.758	2.891	0.000	-7.919	25.982	0.000	-0.00		
		34.993	10.322	-6.678	10.848	31.589	0.000	0.00		
	6.100	-10.878	0.000	-2.727	-10.916	30.653	0.000	-0.00		
		34.764	3.725	-13.275	7.751	26.732	0.000	0.00		
	7.117	-14.485	0.000	-3.667	-14.130	31.401	0.000	-0.00		
30.093		0.043	-16.957	5.455	15.024	0.000	0.00			
8.134	-18.242	0.000	-3.807	-17.442	27.707	0.000	-0.00			
	20.022	0.000	-20.646	4.655	12.493	0.000	0.00			
		-22.112	0.000	-3.819	-20.732	19.541	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		12	9.150	13.301	2.492	0.000	3.803	9.454	0.000	0.00
	10.167	-26.710	0.000	-4.730	-24.200	5.089	0.000	-0.00		
13	0.000	15.835	2.492	-6.853	29.034	0.000	-17.854	0.00		
		-31.567	19.993	-4.788	-27.495	0.000	-13.626	0.00		
	1.017	12.789	5.307	-6.693	26.406	1.486	0.000	0.00		
		-21.495	4.033	0.000	-6.853	8.868	0.000	-0.00		
	2.033	18.463	23.370	0.000	23.400	18.216	0.000	0.00		
		-17.689	3.613	0.000	-7.604	8.009	0.000	-0.00		
	3.050	31.613	20.003	0.000	20.212	30.129	0.000	0.00		
		-15.411	2.165	0.000	-7.604	0.278	0.000	-0.00		
	4.067	39.596	16.362	-0.638	16.771	37.100	0.000	0.00		
		-14.786	0.000	-4.080	-7.604	0.000	-7.453	-0.00		
	5.083	41.295	12.500	-4.500	13.108	38.206	0.000	0.00		
		-19.706	0.000	-6.714	-7.878	40.050	0.000	-0.00		
	6.100	44.092	6.158	-10.842	9.252	32.644	0.000	0.00		
		-26.532	0.000	-6.714	-10.842	44.092	0.000	-0.00		
	7.117	43.397	2.772	-14.228	6.078	18.062	0.000	0.00		
		-33.359	0.000	-6.714	-14.228	43.397	0.000	-0.00		
	8.134	36.369	0.000	-17.886	4.968	14.299	0.000	0.00		
		-40.186	0.000	-6.714	-17.886	36.369	0.000	-0.00		
	9.150	22.124	0.000	-21.760	3.671	8.468	0.000	0.00		
		-47.012	0.000	-6.714	-21.760	22.124	0.000	-0.00		
14	10.167	0.000	2.165	-0.000	17.000	0.000	-0.054	0.00		
	0.000	-53.839	17.000	-21.810	-25.797	0.000	-0.000	0.00		
	0.317	0.000	12.000	-0.000	17.000	0.000	-5.384	0.00		
		-48.455	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	12.000	-0.000	17.000	0.000	-0.000	0.00		
		-43.071	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	12.000	-0.000	17.000	0.000	-0.711	0.00		
		-37.687	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	12.000	-0.000	17.000	0.000	-3.096	0.00		
		-32.303	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	17.000	-0.000	17.000	0.000	0.000	0.00		
		-26.919	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	17.000	-0.000	17.000	0.000	-1.843	0.00		
		-21.536	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	17.000	-0.000	17.000	0.000	-3.093	0.00		
		-16.152	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.534	0.000	17.000	-0.000	17.000	0.000	0.000	0.00		
		-10.768	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.850	0.000	17.000	-0.000	17.000	0.000	-2.261	0.00		
		-5.384	17.000	0.000	-0.000	0.000	0.000	-0.00		
	3.167	0.000	0.000	0.000	17.000	0.000	-0.000	0.00		
		-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00		

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.173	-36.143
3	7.189	-31.985
4	5.827	-31.449
5	5.117	-31.422
6	4.934	-31.335
7	4.801	-31.295
8	3.783	-31.216
9	6.262	-31.394
10	6.261	-31.355
11	3.863	-31.219
12	5.750	-31.444
13	9.345	-32.009
14	2.165	-38.951

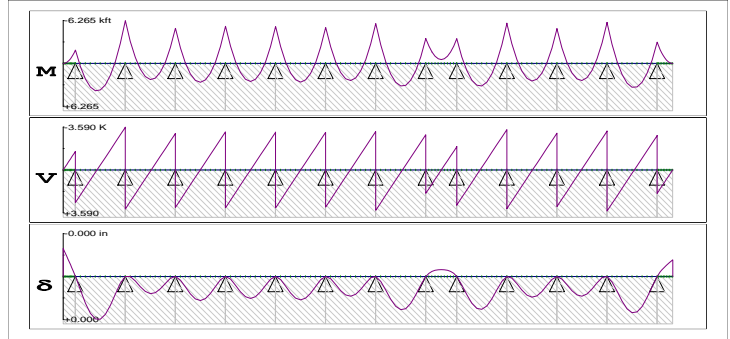
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Support	Reaction	
	Positive	Negative
15	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Wearing Surface  
 Type: Static  
 Factor: 1.000



Span	Location (ft)	Moment (kft)	Shear ( K)	Deflect (in)	Reaction ( K)
1	0.000	+0.000/ -0.000	+0.000/ +0.000	-0.00	-0.000
	0.250	-0.020	-0.156	-0.00	
	0.500	-0.078	-0.313	-0.00	
	0.750	-0.176	-0.469	-0.00	
	1.000	-0.313	-0.625	-0.00	
	1.250	-0.488	-0.781	-0.00	
	1.500	-0.703	-0.938	-0.00	
	1.750	-0.957	-1.094	-0.00	
	2.000	-1.250	-1.250	-0.00	
	2.250	-1.582	-1.406	-0.00	
	2.500				
2	0.000	-1.953	-1.563/ +2.738	+0.00	-4.301
	1.013	+0.499	+2.105	+0.00	
	2.025	+2.310	+1.473	+0.00	
	3.038	+3.481	+0.840	+0.00	
	4.050	+4.011	+0.207	+0.00	
	5.063	+3.900	-0.426	+0.00	
	6.075	+3.148	-1.059	+0.00	
	7.088	+1.756	-1.691	+0.00	
	8.100	-0.277	-2.324	+0.00	
	9.113	-2.951	-2.957	+0.00	
	10.125				
3	0.000	-6.265	-3.590/ +3.287	+0.00	-6.877
	1.017	-3.246	+2.651	+0.00	
	2.033	-0.874	+2.016	+0.00	
	3.050	+0.853	+1.381	+0.00	
	4.067	+1.934	+0.745	+0.00	
	5.083	+2.368	+0.110	+0.00	
	6.100	+2.157	-0.526	+0.00	
	7.117	+1.299	-1.161	+0.00	
	8.134	-0.204	-1.797	+0.00	
	9.150	-2.354	-2.432	+0.00	
	10.167				
4	0.000	-5.150	-3.067/ +3.149	+0.00	-6.216
	1.017	-2.271	+2.513	+0.00	
	2.033	-0.039	+1.878	+0.00	
	3.050	+1.547	+1.243	+0.00	
	4.067	+2.487	+0.607	+0.00	
	5.083	+2.782	-0.028	+0.00	
	6.100	+2.430	-0.664	+0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	Moment (kft)	Shear ( K )	Deflect (in)	Reaction ( K )	
4	7.117	+1.432		-1.299	+0.00	
	8.134	-0.212		-1.935	+0.00	
	9.150	-2.502		-2.570	+0.00	
	10.167					
5	0.000	-5.438	-3.206/	+3.181	+0.00	-6.387
	1.017	-2.527		+2.546	+0.00	
	2.033	-0.262		+1.910	+0.00	
	3.050	+1.357		+1.275	+0.00	
	4.067	+2.330		+0.639	+0.00	
	5.083	+2.657		+0.004	+0.00	
	6.100	+2.337		-0.632	+0.00	
	7.117	+1.372		-1.267	+0.00	
	8.134	-0.239		-1.903	+0.00	
	9.150	-2.496		-2.538	+0.00	
	10.167					
6	0.000	-5.400	-3.173/	+3.190	+0.00	-6.364
	1.017	-2.479		+2.555	+0.00	
	2.033	-0.204		+1.920	+0.00	
	3.050	+1.424		+1.284	+0.00	
	4.067	+2.407		+0.649	+0.00	
	5.083	+2.743		+0.013	+0.00	
	6.100	+2.434		-0.622	+0.00	
	7.117	+1.478		-1.258	+0.00	
	8.134	-0.124		-1.893	+0.00	
	9.150	-2.371		-2.529	+0.00	
	10.167					
7	0.000	-5.265	-3.164/	+3.120	+0.00	-6.284
	1.017	-2.416		+2.485	+0.00	
	2.033	-0.212		+1.850	+0.00	
	3.050	+1.345		+1.214	+0.00	
	4.067	+2.257		+0.579	+0.00	
	5.083	+2.522		-0.057	+0.00	
	6.100	+2.141		-0.692	+0.00	
	7.117	+1.114		-1.328	+0.00	
	8.134	-0.558		-1.963	+0.00	
	9.150	-2.877		-2.599	+0.00	
	10.167					
8	0.000	-5.842	-3.234/	+3.391	+0.00	-6.625
	1.017	-2.718		+2.756	+0.00	
	2.033	-0.239		+2.120	+0.00	
	3.050	+1.593		+1.485	+0.00	
	4.067	+2.780		+0.849	+0.00	
	5.083	+3.320		+0.214	+0.00	
	6.100	+3.215		-0.422	+0.00	
	7.117	+2.463		-1.057	+0.00	
	8.134	+1.065		-1.692	+0.00	
	9.150	-0.978		-2.328	+0.00	
	10.167					
9	0.000	-3.668	-2.963/	+1.968	+0.00	-4.932
	0.629	-2.554		+1.575	-0.00	
	1.258	-1.686		+1.182	-0.00	
	1.887	-1.066		+0.789	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Span	Location (ft)	Moment (kft)	Shear ( K )	Deflect (in)	Reaction ( K )	
9	2.516	-0.694		+0.396	-0.00	
	3.145	-0.568		+0.003	-0.00	
	3.774	-0.690		-0.390	-0.00	
	4.403	-1.059		-0.783	-0.00	
	5.032	-1.676		-1.177	-0.00	
	5.661	-2.540		-1.570	-0.00	
	6.290					
10	0.000	-3.651	-1.963/	+2.957	+0.00	-4.920
	1.017	-0.967		+2.322	+0.00	
	2.033	+1.070		+1.686	+0.00	
	3.050	+2.462		+1.051	+0.00	
	4.067	+3.207		+0.415	+0.00	
	5.083	+3.306		-0.220	+0.00	
	6.100	+2.759		-0.856	+0.00	
	7.117	+1.567		-1.491	+0.00	
	8.134	-0.272		-2.126	+0.00	
	9.150	-2.757		-2.762	+0.00	
	10.167					
11	0.000	-5.888	-3.397/	+3.255	+0.00	-6.652
	1.017	-2.902		+2.619	+0.00	
	2.033	-0.562		+1.984	+0.00	
	3.050	+1.132		+1.348	+0.00	
	4.067	+2.180		+0.713	+0.00	
	5.083	+2.582		+0.078	+0.00	
	6.100	+2.338		-0.558	+0.00	
	7.117	+1.448		-1.193	+0.00	
	8.134	-0.089		-1.829	+0.00	
	9.150	-2.271		-2.464	+0.00	
	10.167					
12	0.000	-5.099	-3.100/	+3.087	+0.00	-6.186
	1.017	-2.284		+2.451	+0.00	
	2.033	-0.114		+1.816	+0.00	
	3.050	+1.409		+1.181	+0.00	
	4.067	+2.286		+0.545	+0.00	
	5.083	+2.517		-0.090	+0.00	
	6.100	+2.103		-0.726	+0.00	
	7.117	+1.042		-1.361	+0.00	
	8.134	-0.665		-1.997	+0.00	
	9.150	-3.018		-2.632	+0.00	
	10.167					
13	0.000	-6.017	-3.267/	+3.461	+0.00	-6.728
	1.017	-2.822		+2.825	+0.00	
	2.033	-0.272		+2.190	+0.00	
	3.050	+1.631		+1.554	+0.00	
	4.067	+2.889		+0.919	+0.00	
	5.083	+3.500		+0.284	+0.00	
	6.100	+3.465		-0.352	+0.00	
	7.117	+2.784		-0.987	+0.00	
	8.134	+1.457		-1.623	+0.00	
	9.150	-0.515		-2.258	+0.00	
	10.167					
14	0.000	-3.134	-2.894/	+1.979	+0.00	-4.873

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Span	Location (ft)	Moment (kft)		Shear ( K)		Deflect (in)	Reaction ( K)
14	0.317		-2.539		+1.781	-0.00	
	0.633		-2.006		+1.583	-0.00	
	0.950		-1.536		+1.386	-0.00	
	1.267		-1.128		+1.188	-0.00	
	1.583		-0.784		+0.990	-0.00	
	1.900		-0.501		+0.792	-0.00	
	2.217		-0.282		+0.594	-0.00	
	2.534		-0.125		+0.396	-0.00	
	2.850		-0.031		+0.198	-0.00	
	3.167	+0.000/	+0.000	+0.000/	+0.000	-0.00	0.000

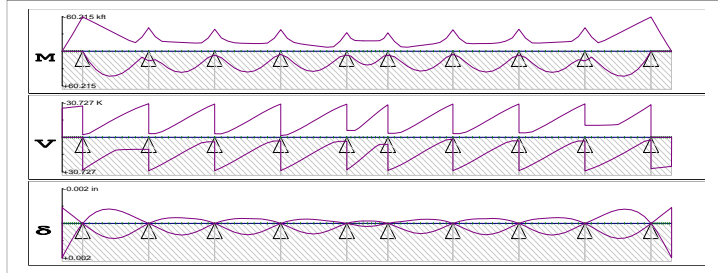
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: HS20 Lane Load  
 Type: Lane Load

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.00
		-0.000	0.000	0.000	-26.000	0.000	0.000	0.000	-0.000	-0.00	
	0.317	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00
		-5.733	0.000	-18.203	-26.203	0.000	-0.032	-0.00			
	0.633	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00
		-11.530	0.000	-18.405	-26.405	0.000	-0.128	-0.00			
	0.950	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00
		-17.391	0.000	-18.608	-26.608	0.000	-0.289	-0.00			
	1.267	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00
		-23.316	0.000	-18.811	-26.811	0.000	-0.514	-0.00			
	1.583	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00
		-29.305	0.000	-19.013	-27.013	0.000	-0.802	-0.00			
	1.900	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00
		-35.359	0.000	-19.216	-27.216	0.000	-1.155	-0.00			
2.217	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-41.477	0.000	-19.419	-27.419	0.000	-1.573	-0.00				
2.534	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-47.659	0.000	-19.622	-27.621	0.000	-2.054	-0.00				
2.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-53.905	0.000	-19.824	-27.824	0.000	-2.600	-0.00				
3.167											
2	0.000	0.000	0.000	-1.417	29.272	0.000	-3.210	0.00	0.00	0.00	
		-60.215	16.687	-20.025	-28.369	0.000	-3.292	0.00	0.00	0.00	
	1.017	18.613	17.977	-0.023	25.406	22.628	-0.468	0.00	0.00	0.00	
		-54.370	5.748	0.000	-3.673	23.038	-0.059	-0.00	-0.00	0.00	
	2.034	31.992	15.078	-2.922	21.630	40.787	0.000	0.00	0.00	0.00	
		-48.524	5.748	0.000	-7.044	39.880	0.000	-0.00	-0.00	0.00	
	3.051	40.312	12.236	-5.764	18.019	51.765	0.000	0.00	0.00	0.00	
		-42.679	5.748	0.000	-10.412	50.538	0.000	-0.00	-0.00	0.00	
	4.068	43.867	9.482	-8.518	14.610	56.224	0.000	0.00	0.00	0.00	
		-36.833	5.748	0.000	-13.732	55.202	0.000	-0.00	-0.00	0.00	
	5.085	43.069	6.843	-11.157	11.443	54.977	0.000	0.00	0.00	0.00	
		-30.988	5.748	0.000	-16.959	54.247	0.000	-0.00	-0.00	0.00	
	6.102	38.449	4.348	-13.652	11.095	1.850	-17.848	0.00	0.00	0.00	
		-25.142	5.748	0.000	-20.046	48.244	0.000	-0.00	-0.00	0.00	
7.119	30.653	2.028	-15.972	10.933	1.536	-7.721	0.00	0.00	0.00		
	-19.297	5.748	0.000	-22.947	37.955	0.000	-0.00	-0.00	0.00		
8.136	20.508	0.677	-17.323	10.827	2.536	0.000	0.00	0.00	0.00		
	-15.121	0.000	-2.225	-25.611	24.348	-1.634	-0.00	-0.00	0.00		
9.153	10.523	0.886	-17.114	10.770	13.027	0.000	0.00	0.00	0.00		
	-24.974	0.000	-13.043	-27.990	8.596	-4.297	-0.00	-0.00	0.00		
10.170											
3	0.000	17.026	7.595	-2.450	30.360	0.000	-6.293	0.00	0.00	0.00	
		-41.168	17.210	-18.096	-30.565	0.000	-6.305	0.00	0.00	0.00	
	1.017	14.986	0.000	-1.397	27.250	9.701	-4.458	0.00	0.00	0.00	
		-25.732	11.308	0.000	-3.320	20.632	0.000	-0.00	-0.00	0.00	
	2.034	21.373	16.733	-1.267	24.244	25.123	-1.954	0.00	0.00	0.00	
		-17.369	3.388	0.000	-5.098	28.349	0.000	-0.00	-0.00	0.00	
	3.051	30.056	14.296	-3.704	20.992	36.973	-0.290	0.00	0.00	0.00	
		-16.788	0.571	0.000	-7.991	38.619	0.000	-0.00	-0.00	0.00	
	4.068	35.461	11.603	-6.397	17.607	44.356	0.000	0.00	0.00	0.00	
		-16.207	0.571	0.000	-11.158	45.135	0.000	-0.00	-0.00	0.00	
5.085	37.169	8.845	-9.155	14.205	46.846	0.000	0.00	0.00	0.00		
	-15.626	0.571	0.000	-14.494	47.116	0.000	-0.00	-0.00	0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.102	35.071	6.097	-11.903	10.893	44.473	0.000	0.00		
		-15.046	0.571	0.000	-17.891	44.213	0.000	-0.00		
	7.119	29.362	3.436	-14.564	7.781	37.710	0.000	0.00		
		-14.465	0.571	0.000	-21.238	36.520	0.000	-0.00		
	8.136	20.630	1.700	-16.300	4.972	27.456	0.000	0.00		
		-14.662	0.000	-2.611	-24.421	24.593	-1.492	-0.00		
	9.153	11.122	0.903	-17.097	4.084	5.457	0.000	0.00		
		-23.171	0.000	-13.140	-27.325	9.462	-3.953	-0.00		
	4	10.170	7.186	3.018	-1.222	30.417	0.000	-5.362	0.00	
			-38.554	16.816	-16.947	-30.404	0.000	-5.358	0.00	
1.017		11.291	17.134	-0.866	27.208	9.503	-4.023	0.00		
		-23.294	12.992	0.000	-3.277	4.691	0.000	-0.00		
2.034		20.876	16.271	-1.729	24.249	24.551	-1.629	0.00		
		-17.670	3.102	0.000	-5.005	27.719	0.000	-0.00		
3.051		29.397	14.315	-3.685	21.014	36.271	-0.075	0.00		
		-15.050	2.521	0.000	-7.872	37.906	0.000	-0.00		
4.068		34.794	11.621	-6.379	17.625	43.656	0.000	0.00		
		-14.028	0.164	0.000	-11.037	44.483	0.000	-0.00		
5.085	36.534	8.850	-9.150	14.200	46.199	0.000	0.00			
	-13.861	0.164	0.000	-14.387	46.590	0.000	-0.00			
6.102	34.468	6.083	-11.917	10.857	43.874	0.000	0.00			
	-13.695	0.164	0.000	-17.810	43.823	0.000	-0.00			
7.119	28.771	3.398	-14.602	7.708	37.121	0.000	0.00			
	-13.528	0.164	0.000	-21.189	36.243	0.000	-0.00			
8.136	20.035	1.598	-16.402	4.865	26.832	0.000	0.00			
	-14.508	0.000	-2.664	-24.404	24.396	-1.502	-0.00			
9.153	10.460	0.766	-17.234	3.395	4.324	0.000	0.00			
	-22.705	0.000	-13.021	-27.334	9.323	-3.990	-0.00			
5	10.170	5.691	2.495	-0.862	30.282	0.000	-6.154	0.00		
		-38.028	16.607	-16.846	-30.141	0.000	-6.155	0.00		
	1.017	10.904	17.341	-0.659	27.127	9.525	-4.070	0.00		
		-22.924	12.738	0.000	-2.354	14.845	0.000	-0.00		
	2.034	20.691	16.338	-1.662	24.058	24.480	-1.661	0.00		
		-15.503	2.933	0.000	-4.934	27.523	0.000	-0.00		
	3.051	29.002	14.087	-3.913	20.712	35.894	-0.081	0.00		
		-12.909	1.412	0.000	-7.926	37.655	0.000	-0.00		
	4.068	34.023	11.320	-6.680	17.226	42.786	0.000	0.00		
		-11.474	1.411	0.000	-11.206	43.950	0.000	-0.00		
5.085	35.297	8.494	-9.506	13.733	44.729	0.000	0.00			
	-10.038	1.411	0.000	-14.649	45.618	0.000	-0.00			
6.102	32.769	5.699	-12.301	10.364	41.840	0.000	0.00			
	-8.603	1.411	0.000	-18.125	42.385	0.000	-0.00			
7.119	26.750	3.025	-14.975	7.246	34.753	0.000	0.00			
	-7.167	1.411	0.000	-21.500	34.514	0.000	-0.00			
8.136	18.301	1.677	-16.323	4.502	24.612	0.000	0.00			
	-8.048	0.000	-6.855	-24.640	22.817	-0.366	-0.00			
9.153	9.695	1.173	-16.827	3.602	5.986	0.000	0.00			
	-17.771	0.000	-12.805	-27.406	8.672	-2.704	-0.00			
6	10.170	7.247	2.672	-2.056	29.740	0.000	-3.850	0.00		
		-32.676	17.769	-16.158	-30.727	0.000	-3.941	0.00		
	0.633	8.444	16.106	-1.894	26.642	5.552	-4.170	0.00		
		-22.896	12.657	0.000	-6.214	3.922	0.000	-0.00		
	1.267	14.566	16.065	-1.935	23.849	15.493	-2.762	0.00		
		-18.996	3.910	0.000	-6.265	1.068	0.000	-0.00		
	1.900	19.784	13.800	-4.200	20.849	23.181	-1.685	0.00		
		-18.491	0.106	0.000	-8.480	25.516	0.000	-0.00		
	2.533	23.053	11.421	-6.579	17.728	28.158	-0.877	0.00		
		-18.424	0.106	0.000	-11.465	29.278	0.000	-0.00		
3.167	24.159	8.986	-9.014	14.570	30.178	-0.270	0.00			
	-18.357	0.106	0.000	-14.578	30.231	-0.218	-0.00			
3.800	23.031	6.552	-11.448	11.459	29.215	0.000	0.00			
	-18.291	0.106	0.000	-17.735	28.198	-0.808	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		6	4.433	19.745	4.175	-13.825	8.478	25.449	0.000	0.00
		-18.224	0.105	0.000	-20.852	23.217	-1.600	-0.00		
	5.066	14.520	1.916	-16.085	6.405	1.070	0.000	0.00		
		-18.610	0.000	-3.776	-23.846	15.537	-2.661	-0.00		
	5.700	8.434	1.914	-16.086	6.353	4.033	0.000	0.00		
		-22.506	0.000	-12.578	-26.629	5.626	-4.054	-0.00		
	6.333									
7	0.000	7.292	2.085	-2.731	30.712	0.000	-3.767	0.00		
		-32.248	16.135	-17.691	-29.732	0.000	-3.679	0.00		
	1.002	9.650	16.796	-1.204	27.364	8.614	-2.659	0.00		
		-17.596	12.803	0.000	-3.680	6.007	0.000	-0.00		
	2.003	18.126	16.275	-1.725	24.606	22.551	-0.381	0.00		
		-8.050	4.917	0.000	-4.528	24.375	0.000	-0.00		
	3.005	26.432	14.944	-3.056	21.475	34.070	0.000	0.00		
		-7.266	0.000	-1.437	-7.268	34.350	0.000	-0.00		
	4.007	32.342	12.283	-5.717	18.110	41.821	0.000	0.00		
		-8.705	0.000	-1.437	-10.380	41.306	0.000	-0.00		
	5.008	34.822	9.501	-8.499	14.645	45.010	0.000	0.00		
		-10.145	0.000	-1.437	-13.741	44.129	0.000	-0.00		
	6.010	33.566	6.688	-11.312	11.211	43.379	0.000	0.00		
		-11.585	0.000	-1.437	-17.223	42.196	0.000	-0.00		
	7.012	28.629	3.933	-14.067	7.938	37.191	0.000	0.00		
		-13.025	0.000	-1.438	-20.700	35.396	-0.145	-0.00		
	8.014	20.452	1.702	-16.298	4.949	27.215	0.000	0.00		
		-15.616	0.000	-2.994	-24.037	24.143	-1.702	-0.00		
	9.015	10.809	0.687	-17.313	2.367	14.710	0.000	0.00		
		-22.865	0.000	-12.777	-27.099	9.393	-4.064	-0.00		
	10.017									
8	0.000	5.729	0.881	-2.500	30.138	0.000	-6.067	0.00		
		-37.746	16.811	-16.616	-30.252	0.000	-6.062	0.00		
	1.017	10.414	17.241	-0.759	27.333	9.327	-3.919	0.00		
		-22.447	12.984	0.000	-3.401	4.368	0.000	-0.00		
	2.034	19.958	16.414	-1.586	24.409	24.364	-1.439	0.00		
		-14.216	2.616	0.000	-4.849	26.741	0.000	-0.00		
	3.051	28.689	14.619	-3.381	21.197	36.203	0.000	0.00		
		-13.246	0.000	-0.220	-7.689	37.027	0.000	-0.00		
	4.068	34.401	11.934	-6.066	17.818	43.791	0.000	0.00		
		-13.470	0.000	-0.220	-10.837	43.795	0.000	-0.00		
	5.085	36.487	9.166	-8.834	14.393	46.571	0.000	0.00		
		-13.694	0.000	-0.220	-14.181	46.143	0.000	-0.00		
	6.102	34.767	6.393	-11.607	11.040	44.476	0.000	0.00		
		-13.919	0.000	-0.220	-17.608	43.624	0.000	-0.00		
	7.119	29.387	3.697	-14.303	7.872	37.906	0.000	0.00		
		-15.030	0.000	-2.540	-21.001	36.258	-0.077	-0.00		
	8.136	20.876	1.724	-16.276	5.000	27.718	0.000	0.00		
		-17.668	0.000	-3.106	-24.240	24.552	-1.629	-0.00		
	9.153	11.280	0.856	-17.144	3.209	4.613	0.000	0.00		
		-23.282	0.000	-12.982	-27.202	9.509	-4.021	-0.00		
	10.170									
9	0.000	7.160	1.210	-3.015	30.391	0.000	-5.381	0.00		
		-38.534	16.944	-16.807	-30.412	0.000	-5.386	0.00		
	1.017	11.094	17.101	-0.899	27.326	9.461	-3.949	0.00		
		-23.153	13.137	0.000	-4.081	5.435	0.000	-0.00		
	2.034	20.603	16.304	-1.696	24.422	24.590	-1.488	0.00		
		-14.641	2.608	0.000	-4.967	27.428	0.000	-0.00		
	3.051	29.338	14.569	-3.431	21.238	36.516	0.000	0.00		
		-14.445	0.000	-0.575	-7.776	37.685	0.000	-0.00		
	4.068	35.052	11.907	-6.093	17.891	44.209	0.000	0.00		
		-15.030	0.000	-0.575	-10.888	44.453	0.000	-0.00		
	5.085	37.155	9.160	-8.840	14.494	47.114	0.000	0.00		
		-15.614	0.000	-0.575	-14.200	46.831	0.000	-0.00		
	6.102	35.452	6.401	-11.599	11.158	45.134	0.000	0.00		
		-16.199	0.000	-0.575	-17.603	44.346	0.000	-0.00		
	7.119	30.051	3.708	-14.292	7.991	38.619	0.000	0.00		
		-16.784	0.000	-0.575	-20.987	36.968	-0.294	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		9	8.136	21.373	1.267	-16.733	5.098	28.349	0.000	0.00
		-17.369	0.000	-1.012	-24.240	25.123	-1.954	-0.00		
	9.153	14.973	1.395	0.000	3.317	20.613	0.000	0.00		
		-25.727	0.000	-11.304	-27.246	9.705	-4.454	-0.00		
	10.170									
10	0.000	17.010	2.447	-7.588	30.564	0.000	-6.299	0.00		
		-41.160	18.095	-17.205	-30.357	0.000	-6.287	0.00		
	1.017	10.522	17.115	-0.885	27.989	8.603	-4.290	0.00		
		-24.967	13.042	0.000	-10.760	13.014	0.000	-0.00		
	2.034	20.506	17.323	-0.677	25.610	24.353	-1.628	0.00		
		-15.098	2.222	0.000	-10.817	2.534	0.000	-0.00		
	3.051	30.652	15.972	-2.028	22.946	37.960	0.000	0.00		
		-19.284	0.000	-5.742	-10.922	1.534	-7.713	-0.00		
	4.068	38.448	13.652	-4.348	20.046	48.248	0.000	0.00		
		-25.123	0.000	-5.742	-11.085	1.849	-17.829	-0.00		
	5.085	43.068	11.158	-6.842	16.958	54.251	0.000	0.00		
		-30.962	0.000	-5.742	-11.442	54.975	0.000	-0.00		
	6.102	43.866	8.519	-9.481	13.731	55.204	0.000	0.00		
		-36.801	0.000	-5.742	-14.610	56.223	0.000	-0.00		
	7.119	40.311	5.764	-12.236	10.411	50.540	0.000	0.00		
		-42.641	0.000	-5.742	-18.018	51.765	0.000	-0.00		
	8.136	31.992	2.922	-15.078	7.043	39.882	0.000	0.00		
		-48.480	0.000	-5.742	-21.630	40.786	0.000	-0.00		
	9.153	18.613	0.023	-17.977	3.672	23.038	-0.058	0.00		
		-54.319	0.000	-5.742	-25.406	22.628	-0.468	-0.00		
	10.170									
11	0.000	0.000	0.000	-9.179	28.368	0.000	-85.469	0.00		
		-60.159	21.442	-7.500	-29.272	0.000	-3.210	0.00		
	0.317	0.000	0.000	-0.000	27.824	0.000	-76.625	0.00		
		-53.848	19.824	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	0.000	-0.000	27.622	0.000	-67.845	0.00		
		-47.602	19.622	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	0.000	-0.000	27.419	0.000	-59.130	0.00		
		-41.420	19.419	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	0.000	-0.000	27.216	0.000	-50.478	0.00		
		-35.302	19.216	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	0.000	-0.000	27.013	0.000	-41.891	0.00		
		-29.248	19.013	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	0.000	-0.000	26.811	0.000	-33.368	0.00		
		-23.259	18.811	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	0.000	-0.000	26.608	0.000	-24.909	0.00		
		-17.334	18.608	0.000	-0.000	0.000	0.000	-0.00		
	2.534	0.000	0.000	-0.000	26.405	0.000	-16.514	0.00		
		-11.473	18.405	0.000	-0.000	0.000	0.000	-0.00		
	2.850	0.000	0.000	-0.000	26.203	0.000	-8.184	0.00		
		-5.676	18.203	0.000	-0.000	0.000	0.000	-0.00		
	3.167	0.000	0.000	0.000	0.000	0.000	-0.000	0.00		
		-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00		

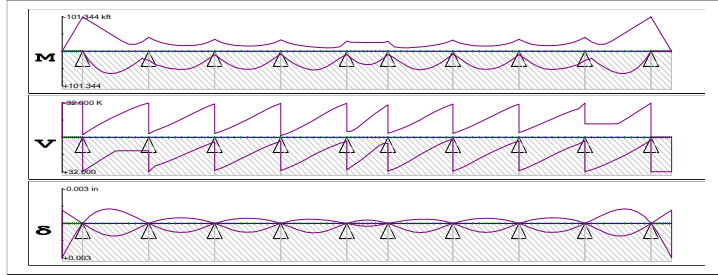
Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.390	-41.598
3	14.050	-34.026
4	5.564	-33.598
5	4.483	-33.633
6	7.516	-33.744
7	7.702	-33.612
8	4.513	-33.593
9	5.550	-33.595
10	14.037	-34.022
11	2.389	-41.588
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: HS20  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	0.317	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-10.134	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	0.633	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-20.269	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	0.950	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-30.403	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	1.267	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-40.537	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	1.583	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-50.672	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	1.900	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-60.806	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	2.217	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
	-70.941	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00	
2.534	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-81.075	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00	
2.850	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-91.209	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00	
3.167											
2	0.000	0.000	0.000	-2.525	31.959	0.000	-0.000	0.000	-0.101	0.00	0.00
		-101.344	12.635	-32.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
	1.017	28.426	27.951	-4.049	27.951	28.426	0.000	0.000	0.000	0.00	0.00
		-89.370	11.773	0.000	-6.460	25.974	0.000	0.000	0.000	-0.00	-0.00
	2.034	48.722	23.954	-8.046	23.954	48.722	0.000	0.000	0.000	0.00	0.00
		-77.396	11.773	0.000	-10.141	44.461	0.000	0.000	0.000	-0.00	-0.00
	3.051	61.200	20.059	-11.941	20.059	61.200	0.000	0.000	0.000	0.00	0.00
		-65.423	11.773	0.000	-13.593	56.160	0.000	0.000	0.000	-0.00	-0.00
	4.068	66.385	16.319	-15.681	16.319	66.385	0.000	0.000	0.000	0.00	0.00
		-53.449	11.773	0.000	-16.822	61.743	0.000	0.000	0.000	-0.00	-0.00
	5.085	65.009	12.784	-19.216	12.784	65.009	0.000	0.000	0.000	0.00	0.00
		-41.475	11.773	0.000	-19.831	61.882	0.000	0.000	0.000	-0.00	-0.00
	6.102	58.013	9.507	-22.493	12.635	0.000	-24.243	0.000	0.000	0.00	0.00
		-29.502	11.773	0.000	-22.633	57.159	0.000	0.000	0.000	-0.00	-0.00
	7.119	48.438	6.804	-25.196	12.635	0.000	-11.393	0.000	0.000	0.00	0.00
	-20.947	4.175	0.000	-25.461	46.549	0.000	0.000	0.000	-0.00	-0.00	
8.136	36.069	4.433	-27.567	12.635	1.457	0.000	0.000	0.000	0.00	0.00	
	-20.611	0.000	-3.469	-28.070	31.978	0.000	0.000	0.000	-0.00	-0.00	
9.153	21.666	2.367	-29.633	12.635	14.307	0.000	0.000	0.000	0.00	0.00	
	-27.732	0.000	-10.141	-30.266	15.868	0.000	0.000	0.000	-0.00	-0.00	
10.170											
3	0.000	27.157	12.635	-3.387	31.978	0.000	-0.151	0.000	0.00	0.00	
		-41.038	11.090	-15.133	-31.985	0.000	-0.174	0.000	0.00	0.00	
	1.017	39.307	25.708	-6.292	26.513	38.488	0.000	0.000	0.00	0.00	
		-31.621	7.213	0.000	-6.450	25.965	0.000	0.000	0.000	-0.00	-0.00
	2.034	44.819	24.603	-8.095	24.603	44.819	0.000	0.000	0.000	0.00	0.00
		-24.994	4.176	0.000	-8.749	36.199	0.000	0.000	0.000	-0.00	-0.00
	3.051	50.000	22.310	-9.690	22.310	50.000	0.000	0.000	0.000	0.00	0.00
		-20.747	4.176	0.000	-11.249	44.676	0.000	0.000	0.000	-0.00	-0.00
	4.068	52.741	19.766	-12.234	19.766	52.741	0.000	0.000	0.000	0.00	0.00
		-18.187	2.093	0.000	-13.992	50.686	0.000	0.000	0.000	-0.00	-0.00
5.085	53.816	14.972	-17.028	17.087	52.359	0.000	0.000	0.000	0.00	0.00	
	-16.861	0.618	0.000	-17.028	53.816	0.000	0.000	0.000	-0.00	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR(max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT(max) (min) (in)
3	6.102	52.509	11.884	-20.116	14.346	48.711	0.000	0.00		
		-16.560	0.172	0.000	-20.116	52.509	0.000	-0.00		
	7.119	46.478	8.795	-23.205	11.700	42.402	0.000	0.00		
		-17.869	0.000	-1.773	-23.205	46.478	0.000	-0.00		
	8.136	36.224	6.778	-25.222	9.119	33.549	0.000	0.00		
		-20.599	0.000	-3.892	-26.174	36.072	0.000	-0.00		
	9.153	23.531	4.165	-27.835	6.648	22.659	0.000	0.00		
		-26.567	0.000	-7.059	-28.866	22.378	0.000	-0.00		
	10.170									
	4	0.000	10.679	4.362	-1.939	30.865	8.750	0.000	0.00	
-35.439			12.078	-10.816	-31.104	6.966	0.000	0.00		
1.017		24.561	27.839	-4.161	28.616	23.687	0.000	0.00		
		-26.305	6.465	0.000	-5.736	21.902	0.000	-0.00		
2.034		36.918	25.249	-6.751	25.914	36.846	0.000	0.00		
		-20.992	4.096	0.000	-8.164	33.663	0.000	-0.00		
3.051		46.701	22.936	-9.064	22.936	46.701	0.000	0.00		
		-17.863	2.443	0.000	-10.806	43.369	0.000	-0.00		
4.068		52.207	19.843	-12.157	19.843	52.207	0.000	0.00		
		-16.117	1.304	0.000	-13.695	50.072	0.000	-0.00		
5.085	53.379	15.223	-16.777	16.947	52.521	0.000	0.00			
	-15.466	0.211	0.000	-16.777	53.379	0.000	-0.00			
6.102	52.054	12.035	-19.965	13.864	49.381	0.000	0.00			
	-15.810	0.000	-0.866	-19.965	52.054	0.000	-0.00			
7.119	45.647	8.798	-23.202	10.934	42.724	0.000	0.00			
	-17.211	0.000	-1.847	-23.202	45.647	0.000	-0.00			
8.136	34.582	6.395	-25.605	8.274	32.936	0.000	0.00			
	-20.627	0.000	-3.562	-26.346	34.446	0.000	-0.00			
9.153	21.084	5.810	-26.190	5.810	21.084	0.000	0.00			
	-24.932	0.000	-6.094	-29.212	19.618	0.000	-0.00			
10.170										
5	0.000	8.388	3.608	-1.341	31.034	7.108	0.000	0.00		
		-33.840	10.478	-11.433	-31.595	2.927	0.000	0.00		
	1.017	23.176	28.365	-3.635	28.642	22.513	0.000	0.00		
		-25.707	6.123	0.000	-3.635	23.176	0.000	-0.00		
	2.034	36.342	25.633	-6.367	26.120	32.209	0.000	0.00		
		-20.717	4.153	0.000	-6.367	36.342	0.000	-0.00		
	3.051	46.130	22.608	-9.392	23.125	44.451	0.000	0.00		
		-17.253	2.806	0.000	-9.392	46.130	0.000	-0.00		
	4.068	52.677	19.707	-12.293	19.794	52.648	0.000	0.00		
		-14.536	2.607	0.000	-12.614	50.850	0.000	-0.00		
5.085	55.707	16.044	-15.956	16.332	51.918	0.000	0.00			
	-12.556	1.876	0.000	-15.956	55.707	0.000	-0.00			
6.102	53.098	12.318	-19.682	13.315	48.099	0.000	0.00			
	-11.020	1.331	0.000	-19.682	53.098	0.000	-0.00			
7.119	45.148	8.710	-23.290	10.478	40.751	0.000	0.00			
	-9.975	0.670	0.000	-23.290	45.148	0.000	-0.00			
8.136	33.256	6.165	-25.835	7.891	30.959	0.000	0.00			
	-10.442	0.000	-1.744	-26.598	32.891	0.000	-0.00			
9.153	20.099	5.626	-26.374	5.626	20.099	0.000	0.00			
	-13.470	0.000	-14.319	-29.426	18.101	0.000	-0.00			
10.170										
6	0.000	9.836	3.754	-2.460	30.308	8.646	0.000	0.00		
		-29.721	5.683	-17.441	-31.571	3.113	0.000	0.00		
	0.633	19.952	27.200	-4.800	27.793	19.372	0.000	0.00		
		-26.741	0.359	0.000	-5.583	2.580	0.000	-0.00		
	1.267	28.601	24.530	-7.470	25.048	22.236	0.000	0.00		
		-26.514	0.359	0.000	-7.470	28.601	0.000	-0.00		
	1.900	34.985	21.632	-10.368	22.500	30.125	0.000	0.00		
		-26.314	0.316	0.000	-10.368	34.985	0.000	-0.00		
	2.533	38.560	18.608	-13.392	19.648	35.821	0.000	0.00		
		-26.113	0.316	0.000	-13.392	38.560	0.000	-0.00		
3.167	39.240	16.536	-15.464	16.570	38.699	0.000	0.00			
	-25.913	0.316	0.000	-16.496	38.454	0.000	-0.00			
3.800	38.715	13.475	-18.525	13.475	38.715	0.000	0.00			
	-25.925	0.000	-0.051	-19.542	35.575	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.433	35.103	10.437	-21.563	10.437	35.103	0.000	0.00		
		-25.957	0.000	-0.051	-22.360	29.928	0.000	-0.00		
	5.066	28.687	7.529	-24.471	7.529	28.687	0.000	0.00		
		-25.997	0.000	-0.093	-24.916	28.410	0.000	-0.00		
	5.700	20.018	4.854	-27.146	5.683	2.668	0.000	0.00		
		-26.056	0.000	-0.093	-27.789	19.425	0.000	-0.00		
7	6.333									
	0.000	9.906	2.513	-3.838	31.533	3.371	0.000	0.00		
		-29.239	17.731	-5.583	-30.306	8.671	0.000	0.00		
	1.002	19.947	26.331	-5.669	29.379	18.180	0.000	0.00		
		-13.178	14.577	0.000	-5.669	19.947	0.000	-0.00		
	2.003	33.102	25.787	-6.213	26.550	32.742	0.000	0.00		
		-10.479	1.773	0.000	-7.903	30.637	0.000	-0.00		
	3.005	44.786	23.244	-8.756	23.244	44.786	0.000	0.00		
		-10.122	0.000	-0.675	-10.468	40.311	0.000	-0.00		
	4.007	52.582	19.641	-12.359	19.641	52.582	0.000	0.00		
		-11.333	0.000	-1.365	-13.292	47.593	0.000	-0.00		
	5.008	55.119	15.918	-16.082	15.918	55.119	0.000	0.00		
		-12.935	0.000	-1.844	-16.324	54.732	0.000	-0.00		
	6.010	52.111	12.177	-19.823	12.652	50.336	0.000	0.00		
		-14.954	0.000	-2.104	-19.823	52.111	0.000	-0.00		
7.012	45.712	9.417	-22.583	9.417	45.712	0.000	0.00			
	-17.562	0.000	-2.908	-23.166	43.962	0.000	-0.00			
8.014	36.051	6.385	-25.615	6.385	36.051	0.000	0.00			
	-20.852	0.000	-3.828	-26.171	31.834	0.000	-0.00			
9.015	23.040	3.649	-28.351	3.649	23.040	0.000	0.00			
	-25.484	0.000	-5.669	-28.651	17.498	0.000	-0.00			
8	10.017									
	0.000	8.406	1.353	-3.610	31.613	2.786	0.000	0.00		
		-33.090	11.038	-10.468	-31.015	7.162	0.000	0.00		
	1.017	21.035	26.196	-5.804	29.229	19.496	0.000	0.00		
		-24.324	5.829	0.000	-5.804	21.035	0.000	-0.00		
	2.034	34.552	25.610	-6.390	26.352	34.408	0.000	0.00		
		-20.260	3.469	0.000	-8.264	32.872	0.000	-0.00		
	3.051	45.720	23.187	-8.813	23.187	45.720	0.000	0.00		
		-16.934	1.711	0.000	-10.925	42.676	0.000	-0.00		
	4.068	52.232	19.920	-12.080	19.920	52.232	0.000	0.00		
		-15.625	0.589	0.000	-13.843	49.298	0.000	-0.00		
	5.085	53.587	16.707	-15.293	16.707	53.587	0.000	0.00		
		-15.360	0.000	-0.368	-16.926	52.460	0.000	-0.00		
	6.102	52.171	12.175	-19.825	13.609	50.238	0.000	0.00		
		-16.010	0.000	-1.591	-19.825	52.171	0.000	-0.00		
7.119	46.687	9.079	-22.921	10.713	43.453	0.000	0.00			
	-17.843	0.000	-2.133	-22.921	46.687	0.000	-0.00			
8.136	36.916	6.737	-25.263	8.073	33.653	0.000	0.00			
	-20.996	0.000	-3.982	-25.903	36.848	0.000	-0.00			
9.153	24.543	4.145	-27.855	5.653	21.808	0.000	0.00			
	-26.301	0.000	-6.822	-28.610	23.694	0.000	-0.00			
9	10.170									
	0.000	10.645	1.923	-4.357	31.122	6.821	0.000	0.00		
		-35.396	10.811	-12.058	-30.863	8.754	0.000	0.00		
	1.017	23.430	27.849	-4.151	28.879	22.284	0.000	0.00		
		-26.528	6.962	0.000	-6.645	22.633	0.000	-0.00		
	2.034	36.167	25.232	-6.768	26.182	36.023	0.000	0.00		
		-20.568	3.887	0.000	-9.116	33.531	0.000	-0.00		
	3.051	46.461	23.209	-8.791	23.209	46.461	0.000	0.00		
		-17.848	1.769	0.000	-11.698	42.392	0.000	-0.00		
	4.068	52.509	20.116	-11.884	20.116	52.509	0.000	0.00		
		-16.548	0.000	-0.174	-14.345	48.705	0.000	-0.00		
	5.085	53.823	17.026	-14.974	17.026	53.823	0.000	0.00		
		-16.853	0.000	-0.620	-17.086	52.355	0.000	-0.00		
	6.102	52.739	12.235	-19.765	13.990	50.692	0.000	0.00		
		-18.184	0.000	-2.095	-19.765	52.739	0.000	-0.00		
7.119	49.999	9.691	-22.309	11.244	44.681	0.000	0.00			
	-20.746	0.000	-4.177	-22.309	49.999	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) Shear (-) ( K )		SHEAR (max/min) ( K )		Corresponding Moment (+) Moment (-) (kft)		DEFLECT (max/min) (in)
9	8.136	44.819	8.094	-24.603	8.744	36.199	0.000	0.00		
		-24.994	0.000	-4.177	-24.603	44.819	0.000	-0.00		
	9.153	39.306	6.291	-25.709	6.444	25.960	0.000	0.00		
		-31.618	0.000	-7.209	-26.512	38.489	0.000	-0.00		
10	10.170	27.158	3.387	-12.635	31.985	0.000	-0.174	0.00		
	0.000	-41.027	15.084	-11.127	-31.978	0.000	-0.151	0.00		
	1.017	21.659	29.634	-2.366	30.266	15.868	0.000	0.00		
		-27.729	10.141	0.000	-12.635	14.308	0.000	-0.00		
	2.034	36.065	27.567	-4.433	28.070	31.977	0.000	0.00		
		-20.609	3.469	0.000	-12.635	1.458	0.000	-0.00		
	3.051	48.436	25.196	-6.804	25.461	46.548	0.000	0.00		
		-20.946	0.000	-4.176	-12.635	0.000	-11.393	-0.00		
	4.068	58.012	22.493	-9.507	22.632	57.164	0.000	0.00		
		-29.501	0.000	-11.774	-12.635	0.000	-24.243	-0.00		
	5.085	65.008	19.216	-12.784	19.830	61.885	0.000	0.00		
		-41.475	0.000	-11.774	-12.784	65.008	0.000	-0.00		
	6.102	66.385	15.681	-16.319	16.822	61.745	0.000	0.00		
		-53.449	0.000	-11.774	-16.319	66.385	0.000	-0.00		
	7.119	61.200	11.941	-20.059	13.593	56.161	0.000	0.00		
		-65.423	0.000	-11.774	-20.059	61.200	0.000	-0.00		
	8.136	48.722	8.046	-23.954	10.141	44.462	0.000	0.00		
		-77.396	0.000	-11.774	-23.954	48.722	0.000	-0.00		
	9.153	28.426	4.049	-27.951	6.460	25.974	0.000	0.00		
		-89.370	0.000	-11.774	-27.951	28.426	0.000	-0.00		
11	10.170	0.000	0.000	-16.319	32.000	0.000	-101.344	0.00		
	0.000	-101.344	32.000	-12.635	-31.959	0.000	0.000	0.00		
	0.317	0.000	0.000	-0.000	32.000	0.000	-91.210	0.00		
		-91.210	32.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	0.000	-0.000	32.000	0.000	-81.075	0.00		
		-81.075	32.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	0.000	-0.000	32.000	0.000	-70.941	0.00		
		-70.941	32.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	0.000	-0.000	32.000	0.000	-60.806	0.00		
		-60.806	32.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	0.000	-0.000	32.000	0.000	-50.672	0.00		
		-50.672	32.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	0.000	-0.000	32.000	0.000	-40.538	0.00		
		-40.538	32.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	0.000	-0.000	32.000	0.000	-30.403	0.00		
		-30.403	32.000	0.000	-0.000	0.000	0.000	-0.00		
	2.534	0.000	0.000	-0.000	32.000	0.000	-20.269	0.00		
		-20.269	32.000	0.000	-0.000	0.000	0.000	-0.00		
	2.850	0.000	0.000	-0.000	32.000	0.000	-10.134	0.00		
		-10.134	32.000	0.000	-0.000	0.000	0.000	-0.00		
3.167	0.000	0.000	0.000	32.000	0.000	-0.000	0.00			
	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00			

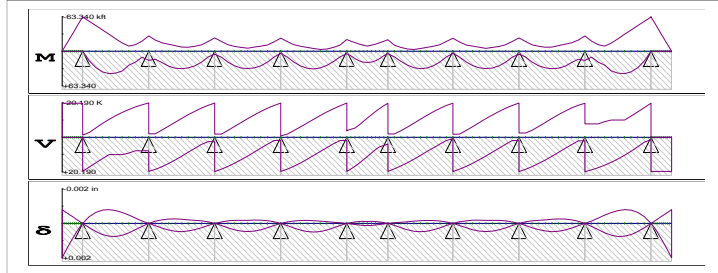
Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.236	-44.635
3	16.022	-32.126
4	5.299	-27.795
5	3.764	-30.228
6	6.345	-28.680
7	6.475	-28.423
8	3.787	-30.292
9	5.302	-27.880
10	16.022	-32.126
11	2.235	-44.635
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 2F1  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	0.317	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-6.334	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	0.633	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-12.668	0.000	0.000	-20.000	-20.000	0.000	0.000	-6.334	-0.00	-0.00
	0.950	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-19.002	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.267	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-25.336	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.583	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-31.670	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.900	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-38.004	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
2.217	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-44.338	0.000	0.000	-20.000	-20.000	0.000	0.000	-6.334	-0.00	-0.00	
2.534	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-50.672	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00	
2.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-57.006	0.000	0.000	-20.000	-20.000	0.000	0.000	-6.334	-0.00	-0.00	
3.167											
2	0.000	0.000	0.000	-1.364	20.050	0.000	-0.000	0.00	0.00	0.00	0.00
		-63.340	10.191	-20.000	-20.000	0.000	-0.063	0.00	-0.063	0.00	0.00
	1.017	17.766	17.469	-2.531	17.469	17.766	0.000	0.00	17.766	0.00	0.00
		-55.309	7.897	0.000	-2.863	17.428	0.000	-0.00	17.428	0.00	-0.00
	2.034	30.451	14.971	-5.029	14.971	30.451	0.000	0.00	30.451	0.00	0.00
		-47.277	7.897	0.000	-5.630	29.228	0.000	-0.00	29.228	0.00	-0.00
	3.051	38.250	12.537	-7.463	12.537	38.250	0.000	0.00	38.250	0.00	0.00
		-39.246	7.897	0.000	-8.210	35.972	0.000	-0.00	35.972	0.00	-0.00
	4.068	41.491	10.199	-9.801	10.199	41.491	0.000	0.00	41.491	0.00	0.00
		-31.215	7.897	0.000	-10.590	38.281	0.000	-0.00	38.281	0.00	-0.00
	5.085	40.630	7.990	-12.010	10.191	0.000	-11.521	0.00	0.000	0.00	0.00
		-23.183	7.897	0.000	-12.758	36.823	0.000	-0.00	36.823	0.00	-0.00
	6.102	36.258	5.942	-14.058	10.191	0.000	-1.157	0.00	0.000	0.00	0.00
		-15.152	7.897	0.000	-14.704	32.315	0.000	-0.00	32.315	0.00	-0.00
7.119	25.854	7.679	-12.321	9.227	8.069	0.000	0.00	8.069	0.00	0.00	
	-9.712	0.000	-1.364	-16.415	25.521	0.000	-0.00	25.521	0.00	-0.00	
8.136	20.254	4.780	-15.220	7.897	0.911	0.000	0.00	0.911	0.00	0.00	
	-12.144	0.000	-5.452	-17.879	17.253	0.000	-0.00	17.253	0.00	-0.00	
9.153	11.113	2.140	-17.860	7.897	8.942	0.000	0.00	8.942	0.00	0.00	
	-18.624	0.000	-6.665	-19.085	8.371	0.000	-0.00	8.371	0.00	-0.00	
10.170											
3	0.000	16.973	7.897	-2.117	20.087	0.000	-0.298	0.00	0.000	0.00	0.00
		-28.123	7.501	-13.100	-20.190	0.000	-0.537	0.00	-0.537	0.00	0.00
	1.017	14.821	0.000	-2.117	18.842	8.152	0.000	0.00	8.152	0.00	0.00
		-20.825	6.564	0.000	-2.117	14.821	0.000	-0.00	14.821	0.00	-0.00
	2.034	20.828	15.773	-4.227	17.279	16.627	0.000	0.00	16.627	0.00	0.00
		-15.621	2.610	0.000	-4.227	20.828	0.000	-0.00	20.828	0.00	-0.00
	3.051	27.648	13.466	-6.534	15.433	23.852	0.000	0.00	23.852	0.00	0.00
		-12.967	2.610	0.000	-6.534	27.648	0.000	-0.00	27.648	0.00	-0.00
4.068	31.448	11.141	-8.859	13.365	28.968	0.000	0.00	28.968	0.00	0.00	
	-10.312	2.610	0.000	-8.859	31.448	0.000	-0.00	31.448	0.00	-0.00	
5.085	32.099	8.854	-11.146	11.141	31.371	0.000	0.00	31.371	0.00	0.00	
	-7.658	2.610	0.000	-11.146	32.099	0.000	-0.00	32.099	0.00	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)	
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)	
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)	
3	6.102	30.720	8.822	-11.178	8.822	30.720	0.000	0.00	
		-7.456	0.000	-1.833	-13.338	29.705	0.000	-0.00	
	7.119	26.930	6.474	-13.526	6.474	26.930	0.000	0.00	
		-9.320	0.000	-1.833	-15.379	24.598	0.000	-0.00	
	8.136	20.173	4.159	-15.841	4.159	20.173	0.000	0.00	
		-12.065	0.000	-4.986	-17.212	17.340	0.000	-0.00	
	9.153	10.883	1.941	-18.059	2.610	2.960	0.000	0.00	
		-18.065	0.000	-6.200	-18.780	8.724	0.000	-0.00	
	10.170								
		0.000	5.614	2.610	-0.702	20.088	0.000	-0.316	0.00
4	0.000	-24.718	7.072	-11.520	-20.097	0.000	-0.337	0.00	
		10.904	18.071	-1.929	18.759	8.705	0.000	0.00	
	1.017	-18.257	6.192	0.000	-1.937	2.178	0.000	-0.00	
		20.224	15.882	-4.118	17.159	17.286	0.000	0.00	
	2.034	-12.216	4.969	0.000	-4.118	20.224	0.000	-0.00	
		27.064	13.601	-6.399	15.293	24.452	0.000	0.00	
	3.051	-9.122	1.845	0.000	-6.399	27.064	0.000	-0.00	
		30.995	11.285	-8.715	13.221	29.413	0.000	0.00	
	4.068	-7.246	1.845	0.000	-8.715	30.995	0.000	-0.00	
		31.830	8.994	-11.006	11.005	31.623	0.000	0.00	
5.085	-5.703	0.000	-1.937	-11.006	31.830	0.000	-0.00		
	30.788	8.705	-11.295	8.705	30.788	0.000	0.00		
6.102	-7.673	0.000	-1.937	-13.213	29.622	0.000	-0.00		
	26.859	6.382	-13.618	6.382	26.859	0.000	0.00		
7.119	-9.644	0.000	-1.937	-15.278	24.664	0.000	-0.00		
	20.038	4.098	-15.902	4.098	20.038	0.000	0.00		
8.136	-11.701	0.000	-4.893	-17.140	17.489	0.000	-0.00		
	10.773	1.914	-18.086	1.914	10.773	0.000	0.00		
9.153	-17.482	0.000	-5.901	-18.741	8.867	0.000	-0.00		
	10.170								
5	0.000	4.009	1.845	-0.521	20.068	0.000	-0.274	0.00	
		-24.277	6.949	-11.383	-20.091	0.000	-0.327	0.00	
	1.017	10.826	18.117	-1.883	18.687	8.819	0.000	0.00	
		-17.960	6.066	0.000	-1.883	10.826	0.000	-0.00	
	2.034	20.167	16.006	-3.994	17.007	17.350	0.000	0.00	
		-12.086	4.848	0.000	-3.994	20.167	0.000	-0.00	
	3.051	27.194	13.802	-6.198	15.059	24.294	0.000	0.00	
		-9.152	1.970	0.000	-6.198	27.194	0.000	-0.00	
	4.068	31.458	11.553	-8.447	12.916	28.879	0.000	0.00	
		-7.149	1.970	0.000	-8.447	31.458	0.000	-0.00	
5.085	32.704	9.308	-10.692	10.647	30.620	0.000	0.00		
	-5.146	1.970	0.000	-10.692	32.704	0.000	-0.00		
6.102	30.874	7.114	-12.886	8.323	29.316	0.000	0.00		
	-3.469	0.000	-0.878	-12.886	30.874	0.000	-0.00		
7.119	26.115	5.021	-14.979	6.014	25.056	0.000	0.00		
	-4.362	0.000	-0.878	-14.979	26.115	0.000	-0.00		
8.136	18.970	3.111	-16.889	3.791	18.214	0.000	0.00		
	-7.085	0.000	-3.530	-16.889	18.970	0.000	-0.00		
9.153	10.488	1.491	-18.509	1.970	2.866	0.000	0.00		
	-11.494	0.000	-8.447	-18.509	10.488	0.000	-0.00		
6	10.170								
		0.000	4.869	1.970	-0.931	20.042	0.000	-0.346	0.00
	0.000	-21.759	5.553	-11.023	-20.098	0.000	-0.391	0.00	
		8.378	16.432	-3.568	18.658	6.189	0.000	0.00	
	0.633	-18.695	4.794	0.000	-4.704	5.538	0.000	-0.00	
		13.725	14.650	-5.350	17.035	11.929	0.000	0.00	
	1.267	-15.921	4.024	0.000	-5.453	6.387	0.000	-0.00	
		17.762	12.738	-7.262	15.235	16.464	0.000	0.00	
	1.900	-13.430	3.241	0.000	-7.262	17.762	0.000	-0.00	
		20.184	10.747	-9.253	13.311	19.453	0.000	0.00	
2.533	-11.378	3.241	0.000	-9.253	20.184	0.000	-0.00		
	20.814	8.727	-11.273	11.312	20.686	0.000	0.00		
3.167	-9.633	2.734	0.000	-11.273	20.814	0.000	-0.00		
	20.082	9.291	-10.709	9.291	20.082	0.000	0.00		
3.800	-11.245	0.000	-3.109	-13.269	19.606	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft)		DEFLECT (max) (min) (in)
6	4.433	17.689	7.299	-12.701	7.299	17.689	0.000	0.00		
		-13.214	0.000	-3.109	-15.191	16.642	0.000	-0.00		
	5.066	13.686	5.387	-14.613	5.553	6.375	0.000	0.00		
		-15.626	0.000	-3.943	-16.989	12.133	0.000	-0.00		
	5.700	8.382	3.606	-16.394	4.794	5.595	0.000	0.00		
-18.298		0.000	-4.349	-18.610	6.420	0.000	-0.00			
7	6.333	4.874	0.931	-2.011	20.000	0.000	-0.101	0.00		
		-21.271	12.240	-4.704	-19.993	0.000	-0.088	0.00		
	1.002	10.453	18.494	-1.506	18.494	10.453	0.000	0.00		
		-11.236	8.447	0.000	-2.011	2.860	0.000	-0.00		
	2.003	18.814	16.873	-3.127	16.873	18.814	0.000	0.00		
		-7.125	3.435	0.000	-3.851	18.029	0.000	-0.00		
	3.005	25.848	14.964	-5.036	14.964	25.848	0.000	0.00		
		-4.370	0.890	0.000	-6.056	24.731	0.000	-0.00		
	4.007	30.528	12.873	-7.127	12.873	30.528	0.000	0.00		
		-3.478	0.890	0.000	-8.350	28.911	0.000	-0.00		
	5.008	32.316	10.684	-9.316	10.684	32.316	0.000	0.00		
		-5.196	0.000	-2.011	-10.661	30.195	0.000	-0.00		
	6.010	31.069	8.447	-11.553	8.447	31.069	0.000	0.00		
		-7.210	0.000	-2.011	-12.921	28.489	0.000	-0.00		
	7.012	26.856	6.211	-13.789	6.211	26.856	0.000	0.00		
-9.224		0.000	-2.011	-15.058	23.982	0.000	-0.00			
8.014	19.935	4.024	-15.976	4.024	19.935	0.000	0.00			
	-12.209	0.000	-4.784	-17.002	17.143	0.000	-0.00			
9.015	10.761	1.935	-18.065	1.935	10.761	0.000	0.00			
	-17.974	0.000	-6.011	-18.684	8.725	0.000	-0.00			
8	10.017	4.037	0.532	-1.848	20.091	0.000	-0.330	0.00		
		-24.107	11.199	-6.978	-20.020	0.000	-0.353	0.00		
	1.017	10.727	18.093	-1.907	18.720	9.018	0.000	0.00		
		-17.207	5.862	0.000	-1.907	10.727	0.000	-0.00		
	2.034	19.974	15.912	-4.088	17.119	17.613	0.000	0.00		
		-11.496	4.805	0.000	-4.088	19.974	0.000	-0.00		
	3.051	26.796	13.630	-6.370	15.258	24.760	0.000	0.00		
		-9.442	1.897	0.000	-6.370	26.796	0.000	-0.00		
	4.068	30.736	11.308	-8.692	13.197	29.689	0.000	0.00		
		-7.513	1.897	0.000	-8.692	30.736	0.000	-0.00		
	5.085	31.871	10.992	-9.008	10.992	31.871	0.000	0.00		
		-5.584	1.897	0.000	-10.993	31.587	0.000	-0.00		
	6.102	31.015	8.705	-11.295	8.705	31.015	0.000	0.00		
		-7.240	0.000	-1.848	-13.211	29.393	0.000	-0.00		
	7.119	27.070	6.392	-13.608	6.392	27.070	0.000	0.00		
-9.119		0.000	-1.848	-15.285	24.445	0.000	-0.00			
8.136	20.224	4.113	-15.887	4.113	20.224	0.000	0.00			
	-12.216	0.000	-4.965	-17.154	17.286	0.000	-0.00			
9.153	10.902	1.928	-18.072	1.928	10.902	0.000	0.00			
	-18.253	0.000	-6.188	-18.757	8.707	0.000	-0.00			
9	10.170	5.617	0.703	-2.610	20.097	0.000	-0.337	0.00		
		-24.712	11.520	-7.069	-20.087	0.000	-0.315	0.00		
	1.017	10.880	18.059	-1.941	18.780	8.728	0.000	0.00		
		-18.045	6.198	0.000	-2.610	2.962	0.000	-0.00		
	2.034	20.169	15.842	-4.158	17.211	17.345	0.000	0.00		
		-12.053	4.984	0.000	-4.158	20.169	0.000	-0.00		
	3.051	26.925	13.527	-6.473	15.378	24.603	0.000	0.00		
		-9.334	1.836	0.000	-6.473	26.925	0.000	-0.00		
	4.068	30.717	11.178	-8.822	13.337	29.709	0.000	0.00		
		-7.467	1.836	0.000	-8.822	30.717	0.000	-0.00		
5.085	32.101	11.145	-8.855	11.145	32.101	0.000	0.00			
	-7.657	0.000	-2.610	-11.140	31.369	0.000	-0.00			
6.102	31.449	8.858	-11.142	8.858	31.449	0.000	0.00			
	-10.312	0.000	-2.610	-13.365	28.966	0.000	-0.00			
7.119	27.649	6.533	-13.467	6.533	27.649	0.000	0.00			
	-12.966	0.000	-2.610	-15.432	23.852	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		9	8.136	20.828	4.227	-15.773	4.227	20.828	0.000	0.00
		-15.621	0.000	-2.610	-17.279	16.627	0.000	-0.00		
	9.153	14.821	2.117	0.000	2.117	14.821	0.000	0.00		
		-20.825	0.000	-6.564	-18.842	8.152	0.000	-0.00		
	10.170									
10	0.000	16.974	2.117	-7.897	20.190	0.000	-0.537	0.00		
		-28.122	13.100	-7.501	-20.087	0.000	-0.298	0.00		
	1.017	11.113	17.860	-2.140	19.085	8.372	0.000	0.00		
		-18.623	6.665	0.000	-7.897	8.942	0.000	-0.00		
	2.034	20.254	15.220	-4.780	17.879	17.254	0.000	0.00		
		-12.143	5.451	0.000	-7.897	0.911	0.000	-0.00		
	3.051	25.854	12.321	-7.679	16.415	25.522	0.000	0.00		
		-9.713	1.364	0.000	-9.227	8.069	0.000	-0.00		
	4.068	36.258	14.058	-5.942	14.704	32.316	0.000	0.00		
		-15.152	0.000	-7.897	-10.191	0.000	-1.157	-0.00		
	5.085	40.630	12.010	-7.990	12.758	36.823	0.000	0.00		
		-23.183	0.000	-7.897	-10.191	0.000	-11.521	-0.00		
	6.102	41.490	9.801	-10.199	10.590	38.281	0.000	0.00		
		-31.215	0.000	-7.897	-10.199	41.490	0.000	-0.00		
	7.119	38.250	7.463	-12.537	8.210	35.972	0.000	0.00		
		-39.246	0.000	-7.897	-12.537	38.250	0.000	-0.00		
	8.136	30.451	5.029	-14.971	5.630	29.228	0.000	0.00		
		-47.277	0.000	-7.897	-14.971	30.451	0.000	-0.00		
	9.153	17.766	2.531	-17.469	2.863	17.428	0.000	0.00		
		-55.309	0.000	-7.897	-17.469	17.766	0.000	-0.00		
	10.170									
11	0.000	0.000	0.000	-10.199	20.000	0.000	-63.340	0.00		
		-63.340	20.000	-7.897	-20.050	0.000	0.000	0.00		
	0.317	0.000	0.000	-0.000	20.000	0.000	-57.006	0.00		
		-57.006	20.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	0.000	-0.000	20.000	0.000	-50.672	0.00		
		-50.672	20.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	0.000	-0.000	20.000	0.000	-44.338	0.00		
		-44.338	20.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	0.000	-0.000	20.000	0.000	-38.004	0.00		
		-38.004	20.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	0.000	-0.000	20.000	0.000	-31.670	0.00		
		-31.670	20.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	0.000	-0.000	20.000	0.000	-25.336	0.00		
		-25.336	20.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	0.000	-0.000	20.000	0.000	-19.002	0.00		
		-19.002	20.000	0.000	-0.000	0.000	0.000	-0.00		
	2.534	0.000	0.000	-0.000	20.000	0.000	-12.668	0.00		
		-12.668	20.000	0.000	-0.000	0.000	0.000	-0.00		
	2.850	0.000	0.000	-0.000	20.000	0.000	-6.334	0.00		
		-6.334	20.000	0.000	-0.000	0.000	0.000	-0.00		
	3.167	0.000	0.000	0.000	20.000	0.000	0.000	0.00		
		-0.000	20.000	0.000	-0.000	0.000	-0.000	-0.00		

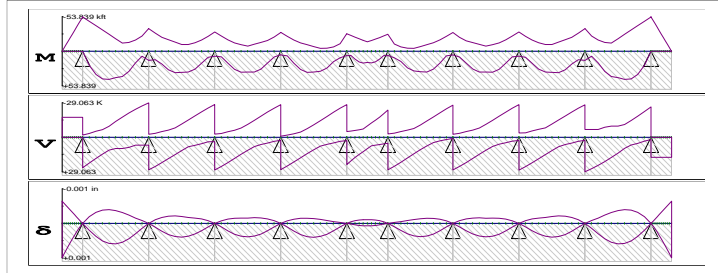
Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.364	-30.191
3	10.014	-21.691
4	3.312	-20.792
5	2.365	-20.628
6	3.856	-20.213
7	3.962	-20.025
8	2.380	-20.568
9	3.314	-20.788
10	10.014	-21.691
11	1.364	-30.191
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 3F1  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00
		-0.000	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	-0.00
	0.317	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00
		-5.384	0.000	0.000	-17.000	-17.000	0.000	0.000	-2.256	-0.00
	0.633	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00
		-10.768	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00
	0.950	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00
		-16.152	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00
	1.267	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00
		-21.536	0.000	0.000	-17.000	-17.000	0.000	0.000	-1.119	-0.00
	1.583	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00
		-26.919	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00
	1.900	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00
		-32.303	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00
2.217	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	
	-37.687	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	
2.534	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	
	-43.071	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	
2.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-48.455	0.000	0.000	-17.000	-17.000	0.000	0.000	-5.384	-0.00	
3.167										
2	0.000	0.000	0.000	-1.968	25.758	0.000	-0.000	0.000	-0.054	0.00
		-53.839	21.949	-17.000	-17.000	0.000	0.000	0.000	0.000	0.00
	1.017	22.132	21.762	0.000	21.762	22.132	0.000	0.000	0.000	0.00
		-47.012	6.712	0.000	-3.365	8.782	0.000	0.000	-0.000	-0.00
	2.034	36.384	17.888	0.000	17.888	36.384	0.000	0.000	0.000	0.00
		-40.186	6.712	0.000	-5.153	13.928	0.000	0.000	-0.000	-0.00
	3.051	43.415	14.230	-2.770	14.230	43.415	0.000	0.000	0.000	0.00
		-33.359	6.712	0.000	-6.618	16.420	0.000	0.000	-0.000	-0.00
	4.068	44.111	10.844	-6.156	10.844	44.111	0.000	0.000	0.000	0.00
		-26.532	6.712	0.000	-9.422	31.985	0.000	0.000	-0.000	-0.00
	5.085	41.315	4.498	-12.502	9.465	0.000	-5.711	0.000	0.000	0.00
		-19.706	6.712	0.000	-13.401	36.746	0.000	0.000	-0.000	-0.00
	6.102	39.613	0.636	-16.364	9.465	3.915	0.000	0.000	0.000	0.00
		-12.879	6.712	0.000	-17.140	34.882	0.000	0.000	-0.000	-0.00
7.119	31.626	0.000	-20.006	8.558	11.950	0.000	0.000	0.000	0.00	
	-14.007	0.000	-1.968	-20.608	27.339	0.000	0.000	-0.000	-0.00	
8.136	18.470	0.000	-23.372	6.712	0.774	0.000	0.000	0.000	0.00	
	-17.667	0.000	-5.523	-23.775	15.191	0.000	0.000	-0.000	-0.00	
9.153	7.983	2.445	-9.555	6.712	7.601	0.000	0.000	0.000	0.00	
	-23.965	0.000	-6.618	-26.611	0.000	0.000	-0.369	-0.000	-0.00	
10.170										
3	0.000	14.427	6.712	-1.799	27.538	0.000	-14.288	0.000	0.00	
		-35.581	7.137	-20.385	-29.063	0.000	-18.136	0.000	0.00	
	1.017	13.384	0.000	-1.910	24.662	1.814	0.000	0.000	0.00	
		-28.383	6.860	0.000	-3.396	9.043	0.000	0.000	-0.00	
	2.034	20.030	19.569	0.000	21.459	14.989	0.000	0.000	0.00	
		-21.952	3.668	0.000	-4.905	12.497	0.000	0.000	-0.00	
	3.051	29.226	16.095	-0.905	18.076	24.286	0.000	0.000	0.00	
		-18.221	3.668	0.000	-6.178	14.293	0.000	0.000	-0.00	
4.068	33.549	12.672	-4.328	14.630	29.127	0.000	0.000	0.00		
	-14.491	3.668	0.000	-7.977	26.289	0.000	0.000	-0.00		
5.085	33.074	9.410	-7.590	11.241	29.415	0.000	0.000	0.00		
	-10.761	3.668	0.000	-11.239	30.415	0.000	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.102	32.689	4.237	-12.763	8.025	25.531	0.000	0.00		
		-10.757	0.000	-2.644	-14.662	30.142	0.000	-0.00		
	7.119	28.137	0.846	-16.154	6.860	13.479	0.000	0.00		
		-13.446	0.000	-2.644	-18.137	25.122	0.000	-0.00		
	8.136	18.889	0.000	-19.599	5.520	12.458	0.000	0.00		
		-17.578	0.000	-5.222	-21.552	15.454	0.000	-0.00		
	9.153	9.640	3.907	-8.093	3.907	9.640	0.000	0.00		
		-23.406	0.000	-6.178	-24.800	1.682	0.000	-0.00		
	4	10.170	7.889	3.668	-0.987	27.608	0.000	-14.967	0.00	
			-30.240	6.466	-17.905	-27.741	0.000	-15.303	0.00	
1.017		8.949	8.702	-3.298	24.630	1.873	0.000	0.00		
		-23.792	6.199	0.000	-3.298	8.949	0.000	-0.00		
2.034		18.967	19.779	0.000	21.350	15.436	0.000	0.00		
		-17.913	5.251	0.000	-4.762	12.380	0.000	-0.00		
3.051		28.366	16.300	-0.700	17.916	24.856	0.000	0.00		
		-13.136	2.656	0.000	-6.005	14.268	0.000	-0.00		
4.068		32.945	12.850	-4.150	14.443	29.640	0.000	0.00		
		-10.435	2.656	0.000	-7.842	25.941	0.000	-0.00		
5	5.085	32.692	9.544	-7.456	11.051	29.775	0.000	0.00		
		-8.239	0.000	-2.799	-11.050	30.059	0.000	-0.00		
	6.102	32.700	4.124	-12.876	7.855	25.725	0.000	0.00		
		-11.086	0.000	-2.799	-14.453	29.928	0.000	-0.00		
	7.119	28.056	0.683	-16.317	6.199	14.036	0.000	0.00		
		-13.932	0.000	-2.799	-17.933	25.093	0.000	-0.00		
	8.136	18.642	0.000	-19.787	4.937	12.369	0.000	0.00		
		-16.794	0.000	-5.071	-21.377	15.569	0.000	-0.00		
	9.153	9.118	3.444	-8.556	3.444	9.118	0.000	0.00		
		-22.376	0.000	-6.005	-24.669	1.835	0.000	-0.00		
6	10.170	5.774	2.656	-0.750	27.327	0.000	-14.402	0.00		
		-29.641	6.318	-17.700	-27.666	0.000	-15.256	0.00		
	1.017	7.416	10.057	-1.943	24.236	2.320	0.000	0.00		
		-23.357	6.059	0.000	-1.943	7.416	0.000	-0.00		
	2.034	18.845	20.183	0.000	20.863	15.524	0.000	0.00		
		-17.648	5.145	0.000	-3.097	12.181	0.000	-0.00		
	3.051	28.555	16.592	-0.408	17.371	24.416	0.000	0.00		
		-13.199	2.840	0.000	-4.555	18.768	0.000	-0.00		
	4.068	33.153	12.994	-4.006	13.895	28.651	0.000	0.00		
		-10.310	2.840	0.000	-7.406	26.732	0.000	-0.00		
7	5.085	32.695	9.564	-7.436	10.571	28.432	0.000	0.00		
		-7.422	2.840	0.000	-10.602	31.310	0.000	-0.00		
	6.102	31.431	2.947	-14.053	7.532	24.508	0.000	0.00		
		-4.533	2.840	0.000	-14.053	31.431	0.000	-0.00		
	7.119	26.426	0.000	-17.650	6.059	13.615	0.000	0.00		
		-4.933	0.000	-0.993	-17.650	26.426	0.000	-0.00		
	8.136	16.304	0.000	-21.243	4.843	12.053	0.000	0.00		
		-6.805	0.000	-2.919	-21.243	16.304	0.000	-0.00		
	9.153	10.367	1.476	-10.524	3.419	9.139	0.000	0.00		
		-11.852	0.000	-11.102	-24.654	1.882	0.000	-0.00		
8	10.170	7.021	2.840	-1.342	23.012	0.000	-5.998	0.00		
		-27.539	4.350	-19.022	-27.678	0.000	-15.395	0.00		
	0.633	6.526	6.615	-5.385	20.100	3.255	0.000	0.00		
		-24.785	4.350	0.000	-5.385	6.526	0.000	-0.00		
	1.267	12.362	15.996	-1.004	17.103	9.906	0.000	0.00		
		-22.106	3.886	0.000	-5.909	7.773	0.000	-0.00		
	1.900	16.853	13.001	-3.999	14.564	8.619	0.000	0.00		
		-19.645	3.886	0.000	-6.480	8.949	0.000	-0.00		
	2.533	18.534	10.093	-6.907	12.243	14.030	0.000	0.00		
		-17.216	3.825	0.000	-7.103	9.880	0.000	-0.00		
3.167	17.537	7.344	-9.656	9.690	17.429	0.000	0.00			
	-14.998	3.466	0.000	-9.656	17.537	0.000	-0.00			
3.800	18.434	6.943	-10.057	7.274	9.618	0.000	0.00			
	-16.899	0.000	-3.634	-12.207	14.154	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.433	16.767	4.041	-12.959	6.662	8.794	0.000	0.00		
		-19.202	0.000	-3.640	-14.523	8.772	0.000	-0.00		
	5.066	12.301	1.051	-15.949	6.096	7.743	0.000	0.00		
		-21.507	0.000	-3.640	-17.054	10.151	0.000	-0.00		
	5.700	6.886	1.493	-10.507	5.573	6.630	0.000	0.00		
-24.075		0.000	-4.165	-20.057	3.507	0.000	-0.00			
7	0.000	7.029	1.342	-2.899	27.551	0.000	-14.917	0.00		
		-26.713	18.802	-4.165	-22.974	0.000	-5.751	0.00		
	1.002	10.508	10.483	-1.517	24.514	2.042	0.000	0.00		
		-11.393	10.755	0.000	-3.564	9.206	0.000	-0.00		
	2.003	16.179	21.106	0.000	21.106	16.179	0.000	0.00		
		-6.815	2.797	0.000	-4.933	11.921	0.000	-0.00		
	3.005	26.065	17.522	0.000	17.522	26.065	0.000	0.00		
		-4.957	1.010	0.000	-6.108	13.401	0.000	-0.00		
	4.007	30.913	13.939	-3.061	13.939	30.913	0.000	0.00		
		-4.589	0.000	-2.899	-7.511	23.951	0.000	-0.00		
	5.008	32.119	7.492	-9.508	10.506	30.719	0.000	0.00		
		-7.493	0.000	-2.899	-10.516	27.816	0.000	-0.00		
	6.010	32.590	4.082	-12.918	7.336	26.155	0.000	0.00		
		-10.398	0.000	-2.899	-13.813	28.076	0.000	-0.00		
	7.012	28.106	0.498	-16.502	4.513	18.279	0.000	0.00		
-13.302		0.000	-2.899	-17.267	23.975	0.000	-0.00			
8.014	18.588	0.000	-20.085	3.105	12.031	0.000	0.00			
	-17.787	0.000	-5.078	-20.744	15.296	0.000	-0.00			
9.015	7.373	1.992	-10.008	1.992	7.373	0.000	0.00			
	-23.311	0.000	-6.108	-24.110	2.357	0.000	-0.00			
8	0.000	5.814	0.766	-2.661	27.653	0.000	-15.157	0.00		
		-29.479	17.680	-6.249	-27.212	0.000	-14.054	0.00		
	1.017	9.121	8.556	-3.444	24.653	1.949	0.000	0.00		
		-21.817	5.925	0.000	-3.444	9.121	0.000	-0.00		
	2.034	18.531	19.806	0.000	21.358	15.682	0.000	0.00		
		-16.349	4.884	0.000	-4.935	12.358	0.000	-0.00		
	3.051	27.963	16.335	-0.665	17.913	25.194	0.000	0.00		
		-13.570	2.726	0.000	-6.196	14.020	0.000	-0.00		
	4.068	32.633	12.893	-4.107	14.432	30.008	0.000	0.00		
		-10.798	2.726	0.000	-7.844	25.682	0.000	-0.00		
	5.085	32.740	7.439	-9.561	11.031	30.115	0.000	0.00		
		-8.026	2.726	0.000	-11.034	29.727	0.000	-0.00		
	6.102	32.981	4.131	-12.869	7.825	25.973	0.000	0.00		
		-10.425	0.000	-2.661	-14.425	29.604	0.000	-0.00		
	7.119	28.385	0.680	-16.320	5.925	14.340	0.000	0.00		
-13.132		0.000	-2.661	-17.897	24.839	0.000	-0.00			
8.136	18.964	0.000	-19.799	4.694	12.373	0.000	0.00			
	-17.913	0.000	-5.249	-21.333	15.438	0.000	-0.00			
9.153	8.890	3.246	-8.754	3.246	8.890	0.000	0.00			
	-23.789	0.000	-6.196	-24.616	1.888	0.000	-0.00			
9	0.000	7.893	0.988	-3.668	27.742	0.000	-15.309	0.00		
		-30.232	17.904	-6.462	-27.598	0.000	-14.946	0.00		
	1.017	9.640	8.093	-3.907	24.800	1.683	0.000	0.00		
		-23.372	6.173	0.000	-3.907	9.640	0.000	-0.00		
	2.034	18.882	19.601	0.000	21.552	15.457	0.000	0.00		
		-17.550	5.218	0.000	-5.520	12.457	0.000	-0.00		
	3.051	28.130	16.155	-0.845	18.136	25.127	0.000	0.00		
		-13.424	2.640	0.000	-6.860	13.478	0.000	-0.00		
	4.068	32.684	12.764	-4.236	14.661	30.146	0.000	0.00		
		-10.739	2.640	0.000	-8.024	25.528	0.000	-0.00		
	5.085	33.074	7.590	-9.410	11.238	30.418	0.000	0.00		
		-10.760	0.000	-3.668	-11.240	29.412	0.000	-0.00		
	6.102	33.550	4.327	-12.673	7.976	26.291	0.000	0.00		
		-14.490	0.000	-3.668	-14.629	29.125	0.000	-0.00		
	7.119	29.227	0.904	-16.096	6.173	14.298	0.000	0.00		
-18.221		0.000	-3.668	-18.075	24.285	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear(+/-) ( K )		SHEAR (max/min) ( K )		Corresponding Moment(+/-) (kft)		DEFLECT (max/min) (in)
9	8.136	20.030	0.000	-19.570	4.900	12.497	0.000	0.00		
		-21.952	0.000	-3.668	-21.458	14.989	0.000	-0.00		
	9.153	13.385	1.911	0.000	3.393	9.040	0.000	0.00		
		-28.383	0.000	-6.860	-24.661	1.815	0.000	-0.00		
10	10.170	14.428	1.799	-6.713	29.063	0.000	-18.136	0.00		
	0.000	-35.580	20.385	-7.137	-27.538	0.000	-14.286	0.00		
	1.017	7.983	9.555	-2.445	26.611	0.000	-0.369	0.00		
		-23.962	6.618	0.000	-6.713	7.601	0.000	-0.00		
	2.034	18.470	23.372	0.000	23.775	15.191	0.000	0.00		
		-17.665	5.522	0.000	-6.713	0.774	0.000	-0.00		
	3.051	31.625	20.006	0.000	20.608	27.340	0.000	0.00		
		-14.009	1.968	0.000	-8.558	11.950	0.000	-0.00		
	4.068	39.613	16.364	-0.636	17.140	34.882	0.000	0.00		
		-12.879	0.000	-6.713	-9.465	3.915	0.000	-0.00		
	5.085	41.315	12.503	-4.497	13.401	36.747	0.000	0.00		
		-19.706	0.000	-6.713	-9.465	0.000	-5.711	-0.00		
	6.102	44.111	6.157	-10.843	9.422	31.985	0.000	0.00		
		-26.532	0.000	-6.713	-10.843	44.111	0.000	-0.00		
	7.119	43.415	2.770	-14.230	6.618	16.421	0.000	0.00		
		-33.359	0.000	-6.713	-14.230	43.415	0.000	-0.00		
8.136	36.383	0.000	-17.888	5.152	13.928	0.000	0.00			
	-40.186	0.000	-6.713	-17.888	36.383	0.000	-0.00			
9.153	22.132	0.000	-21.762	3.365	8.782	0.000	0.00			
	-47.012	0.000	-6.713	-21.762	22.132	0.000	-0.00			
11	10.170	0.000	0.000	-17.636	17.000	0.000	-53.839	0.00		
	0.000	-53.839	17.000	-6.713	-25.758	0.000	0.000	0.00		
	0.317	0.000	0.000	-0.000	17.000	0.000	-48.455	0.00		
		-48.455	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	0.000	-0.000	17.000	0.000	-43.071	0.00		
		-43.071	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	0.000	-0.000	17.000	0.000	-37.687	0.00		
		-37.687	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	0.000	-0.000	17.000	0.000	-32.303	0.00		
		-32.303	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	0.000	-0.000	17.000	0.000	-26.920	0.00		
		-26.920	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	0.000	-0.000	17.000	0.000	-21.536	0.00		
		-21.536	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	0.000	-0.000	17.000	0.000	-16.152	0.00		
		-16.152	17.000	0.000	-0.000	0.000	0.000	-0.00		
2.534	0.000	0.000	-0.000	17.000	0.000	-10.768	0.00			
	-10.768	17.000	0.000	-0.000	0.000	0.000	-0.00			
2.850	0.000	0.000	-0.000	17.000	0.000	-5.384	0.00			
	-5.384	17.000	0.000	-0.000	0.000	0.000	-0.00			
3.167	0.000	0.000	0.000	17.000	0.000	-0.000	0.00			
	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00			

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.968	-38.949
3	8.512	-31.468
4	4.654	-30.383
5	3.406	-30.608
6	5.514	-29.700
7	5.714	-29.506
8	3.427	-30.522
9	4.657	-30.390
10	8.512	-31.468
11	1.968	-38.950
12	0.000	-0.000

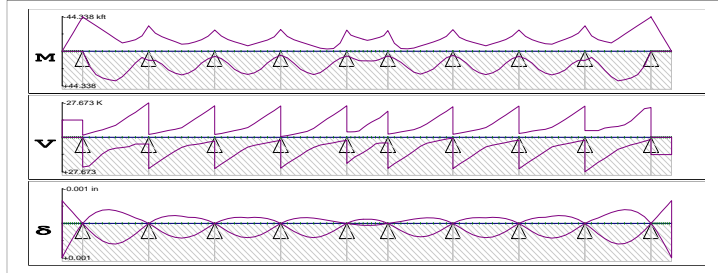
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 4F1  
 Type: Truck

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	-0.00	-0.00
	0.317	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-4.434	0.000	0.000	-14.000	-14.000	0.000	0.000	-1.858	-0.00	-0.00
	0.633	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-8.868	0.000	0.000	-14.000	-14.000	0.000	0.000	0.000	0.00	-0.00
	0.950	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-13.301	0.000	0.000	-14.000	-14.000	0.000	0.000	0.000	0.00	-0.00
	1.267	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-17.735	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.921	-0.00	-0.00
	1.583	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-22.169	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
	1.900	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00
		-26.603	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
2.217	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-31.037	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00	
2.534	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-35.470	0.000	0.000	-14.000	-14.000	0.000	0.000	-4.434	-0.00	-0.00	
2.850	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-39.904	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00	
3.167											
2	0.000	0.000	0.000	-1.785	24.043	0.000	-44.338	0.00	0.00	0.00	0.00
		-44.338	24.043	-14.000	-14.000	0.000	-0.044	0.00	0.00	0.00	0.00
	1.017	19.117	18.798	0.000	23.129	0.000	-18.240	0.00	0.00	0.00	0.00
		-38.716	5.528	0.000	-3.306	8.842	0.000	-0.00	-0.00	0.00	0.00
	2.034	30.144	14.820	0.000	18.163	9.419	0.000	0.00	0.00	0.00	0.00
		-33.094	5.528	0.000	-4.831	14.582	0.000	0.00	-0.00	0.00	0.00
	3.051	34.565	11.329	-2.671	13.375	27.522	0.000	0.00	0.00	0.00	0.00
		-27.472	5.528	0.000	-6.133	17.899	0.000	0.00	-0.00	0.00	0.00
	4.068	36.796	8.811	-5.189	10.043	8.178	0.000	0.00	0.00	0.00	0.00
		-21.850	5.528	0.000	-7.926	25.661	0.000	0.00	-0.00	0.00	0.00
	5.085	38.177	4.521	-9.479	8.792	19.087	0.000	0.00	0.00	0.00	0.00
		-16.228	5.528	0.000	-9.695	37.080	0.000	0.00	-0.00	0.00	0.00
	6.102	32.891	0.567	-13.433	8.280	6.188	0.000	0.00	0.00	0.00	0.00
		-10.893	0.000	-1.785	-13.469	32.669	0.000	0.00	-0.00	0.00	0.00
7.119	24.658	0.000	-14.938	7.481	12.922	0.000	0.00	0.00	0.00	0.00	
	-12.708	0.000	-1.785	-16.987	22.399	0.000	0.00	-0.00	0.00	0.00	
8.136	15.184	0.000	-19.485	5.528	0.637	0.000	0.00	0.00	0.00	0.00	
	-14.974	0.000	-3.792	-20.117	8.135	0.000	0.00	-0.00	0.00	0.00	
9.153	8.107	0.886	-11.114	5.528	6.259	0.000	0.00	0.00	0.00	0.00	
	-19.913	0.000	-5.257	-23.958	0.000	-2.860	-0.00	-0.00	0.00	0.00	
10.170											
3	0.000	11.881	5.528	-1.482	25.125	0.000	-16.546	0.00	0.00	0.00	0.00
		-32.849	14.575	-20.311	-27.673	0.000	-22.721	0.00	0.00	0.00	0.00
	1.017	11.914	10.302	-1.698	21.558	0.000	-0.230	0.00	0.00	0.00	0.00
		-23.417	5.031	0.000	-3.315	8.961	0.000	0.00	-0.00	0.00	0.00
	2.034	16.495	17.035	0.000	17.940	11.454	0.000	0.00	0.00	0.00	0.00
		-18.848	3.149	0.000	-4.474	12.497	0.000	0.00	-0.00	0.00	0.00
	3.051	24.222	13.406	-0.594	14.447	18.326	0.000	0.00	0.00	0.00	0.00
		-15.646	3.149	0.000	-5.533	14.949	0.000	0.00	-0.00	0.00	0.00
4.068	28.434	10.923	-3.077	11.158	20.692	0.000	0.00	0.00	0.00	0.00	
	-12.443	3.149	0.000	-6.524	16.409	0.000	0.00	-0.00	0.00	0.00	
5.085	30.540	6.533	-7.467	8.127	19.144	0.000	0.00	0.00	0.00	0.00	
	-9.240	3.149	0.000	-7.801	19.511	0.000	0.00	-0.00	0.00	0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
3	6.102	28.331	2.787	-11.213	6.534	16.054	0.000	0.00
		-9.713	0.000	-2.388	-11.213	28.331	0.000	-0.00
	7.119	23.655	0.159	-13.841	5.877	14.364	0.000	0.00
		-12.141	0.000	-2.388	-14.830	21.228	0.000	-0.00
	8.136	15.419	0.000	-17.315	5.031	12.400	0.000	0.00
		-14.907	0.000	-3.678	-18.224	9.826	0.000	-0.00
	9.153	9.721	3.979	-8.021	3.979	9.721	0.000	0.00
		-19.381	0.000	-4.657	-21.719	0.000	-0.324	-0.00
	10.170							
	4	0.000	6.774	3.149	-0.847	25.200	0.000	-17.356
-27.449			12.874	-18.977	-25.423	0.000	-17.896	0.00
1.017		9.571	10.632	-1.368	21.509	0.000	-0.094	0.00
		-19.676	4.667	0.000	-3.185	8.821	0.000	-0.00
2.034		15.524	17.177	0.000	18.023	10.086	0.000	0.00
		-15.240	3.724	0.000	-4.333	12.334	0.000	-0.00
3.051		23.432	13.502	-0.498	14.612	21.173	0.000	0.00
		-12.245	2.476	0.000	-5.412	14.807	0.000	-0.00
4.068		27.961	10.990	-3.010	10.990	27.961	0.000	0.00
		-9.727	2.476	0.000	-6.454	16.237	0.000	-0.00
5.085	30.084	6.698	-7.302	7.941	19.808	0.000	0.00	
	-7.209	2.476	0.000	-7.848	19.912	0.000	-0.00	
6.102	27.932	2.927	-11.073	6.463	16.123	0.000	0.00	
	-9.664	0.000	-2.440	-11.073	27.932	0.000	-0.00	
7.119	23.270	0.375	-13.625	5.511	14.640	0.000	0.00	
	-12.146	0.000	-2.440	-14.738	20.816	0.000	-0.00	
8.136	15.218	0.000	-17.257	4.492	12.306	0.000	0.00	
	-14.627	0.000	-2.440	-18.194	9.286	0.000	-0.00	
9.153	9.038	3.374	-8.626	3.374	9.038	0.000	0.00	
	-18.581	0.000	-4.652	-21.555	0.000	-0.121	-0.00	
10.170								
5	0.000	5.382	2.476	-0.699	24.896	0.000	-16.528	0.00
		-28.185	18.384	-13.830	-25.285	0.000	-17.740	0.00
	1.017	8.643	10.711	-1.289	21.022	0.463	0.000	0.00
		-19.321	4.544	0.000	-1.426	6.830	0.000	-0.00
	2.034	15.463	17.117	0.000	17.863	8.395	0.000	0.00
		-14.983	3.659	0.000	-2.544	12.117	0.000	-0.00
	3.051	23.306	13.432	-0.568	14.422	20.089	0.000	0.00
		-12.002	2.583	0.000	-3.667	16.364	0.000	-0.00
	4.068	27.608	10.676	-3.324	10.918	21.486	0.000	0.00
		-9.376	2.583	0.000	-4.826	19.338	0.000	-0.00
5.085	30.186	6.755	-7.245	8.195	20.641	0.000	0.00	
	-6.749	2.583	0.000	-7.305	23.457	0.000	-0.00	
6.102	27.606	2.862	-11.138	6.299	15.507	0.000	0.00	
	-4.122	2.583	0.000	-11.138	27.606	0.000	-0.00	
7.119	21.451	0.180	-13.820	5.356	14.022	0.000	0.00	
	-3.010	0.449	0.000	-14.804	20.427	0.000	-0.00	
8.136	14.359	2.364	-9.636	4.378	11.849	0.000	0.00	
	-3.686	0.000	-1.676	-18.138	9.569	0.000	-0.00	
9.153	9.228	1.314	-10.686	3.334	9.017	0.000	0.00	
	-10.591	0.000	-15.214	-21.508	0.139	0.000	-0.00	
10.170								
6	0.000	6.385	2.583	-1.221	21.063	0.000	-15.985	0.00
		-27.324	12.458	-18.138	-25.354	0.000	-18.360	0.00
	0.633	8.110	10.239	-1.761	18.424	0.000	-5.919	0.00
		-20.927	4.552	0.000	-4.388	2.028	0.000	-0.00
	1.267	10.302	9.428	-2.572	15.706	0.000	-0.200	0.00
		-18.778	2.759	0.000	-4.519	8.011	0.000	-0.00
	1.900	12.305	8.751	-5.249	14.109	0.055	0.000	0.00
		-17.171	2.509	0.000	-5.249	12.305	0.000	-0.00
	2.533	12.426	7.707	-4.293	12.308	5.551	0.000	0.00
		-15.582	2.472	0.000	-7.835	12.176	0.000	-0.00
3.167	12.540	5.261	-6.739	10.228	9.714	0.000	0.00	
	-14.032	2.433	0.000	-10.170	9.850	0.000	-0.00	
3.800	12.730	4.396	-7.604	7.883	12.085	0.000	0.00	
	-15.164	0.000	-2.221	-12.236	5.753	0.000	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
6	4.433	12.245	5.288	-8.712	5.326	9.859	0.000	0.00
		-16.570	0.000	-2.221	-14.021	0.343	0.000	-0.00
	5.066	10.610	2.645	-9.355	4.685	7.974	0.000	0.00
		-18.088	0.000	-2.536	-15.613	0.000	-0.106	-0.00
7	5.700	8.392	1.820	-10.180	4.552	2.137	0.000	0.00
		-20.204	0.000	-4.388	-18.387	0.000	-5.718	-0.00
	6.333	6.392	1.220	-2.637	25.081	0.000	-17.483	0.00
		-26.714	18.041	-12.217	-21.018	0.000	-15.728	0.00
8	1.002	9.381	10.646	-1.354	21.254	0.000	-1.197	0.00
		-10.487	15.022	0.000	-3.417	8.998	0.000	-0.00
	2.003	14.419	9.594	-2.406	18.041	9.429	0.000	0.00
		-3.686	1.421	0.000	-4.421	11.705	0.000	-0.00
	3.005	21.110	13.628	-0.372	14.722	20.033	0.000	0.00
		-3.187	0.000	-0.648	-5.373	13.828	0.000	-0.00
	4.007	27.012	11.081	-2.919	11.081	27.012	0.000	0.00
		-4.173	0.000	-2.637	-6.299	15.306	0.000	-0.00
	5.008	29.493	7.218	-6.782	7.229	27.826	0.000	0.00
		-6.814	0.000	-2.637	-8.142	20.124	0.000	-0.00
	6.010	26.942	3.326	-10.674	4.792	19.167	0.000	0.00
		-9.455	0.000	-2.637	-10.824	20.975	0.000	-0.00
	7.012	22.886	0.698	-13.302	3.642	16.189	0.000	0.00
		-12.097	0.000	-2.637	-14.396	19.558	0.000	-0.00
	8.014	15.267	0.000	-16.944	2.535	11.973	0.000	0.00
		-15.084	0.000	-3.592	-17.824	8.064	0.000	-0.00
9.015	8.626	1.304	-10.696	1.446	6.771	0.000	0.00	
	-19.293	0.000	-4.421	-20.878	0.000	-6.434	-0.00	
9	10.017	5.419	0.714	-2.481	25.275	0.000	-17.659	0.00
		-28.003	13.549	-18.739	-24.674	0.000	-15.921	0.00
	1.017	9.039	8.626	-3.374	21.538	0.001	0.000	0.00
		-17.967	4.420	0.000	-3.374	9.039	0.000	-0.00
	2.034	15.116	17.274	0.000	18.191	9.304	0.000	0.00
		-14.096	2.351	0.000	-4.489	12.291	0.000	-0.00
	3.051	23.192	13.641	-0.359	14.734	20.837	0.000	0.00
		-11.705	2.351	0.000	-5.506	14.618	0.000	-0.00
	4.068	27.974	11.062	-2.938	11.062	27.974	0.000	0.00
		-9.313	2.351	0.000	-6.458	16.101	0.000	-0.00
	5.085	30.136	7.285	-6.715	7.824	19.984	0.000	0.00
		-7.195	0.000	-2.481	-7.951	19.838	0.000	-0.00
	6.102	27.928	3.027	-10.973	6.376	16.386	0.000	0.00
		-9.718	0.000	-2.481	-10.973	27.928	0.000	-0.00
	7.119	23.436	0.494	-13.506	5.330	14.882	0.000	0.00
		-12.241	0.000	-2.481	-14.596	21.159	0.000	-0.00
8.136	15.523	0.000	-17.189	4.247	12.325	0.000	0.00	
	-15.240	0.000	-3.723	-18.010	10.088	0.000	-0.00	
9.153	9.574	1.370	-10.630	3.101	8.726	0.000	0.00	
	-19.673	0.000	-4.665	-21.492	0.000	-0.075	-0.00	
9	10.170	6.777	0.849	-3.150	25.424	0.000	-17.902	0.00
		-27.463	18.885	-12.944	-25.183	0.000	-17.320	0.00
	1.017	9.722	8.021	-3.979	21.719	0.000	-0.323	0.00
		-19.354	4.653	0.000	-3.979	9.722	0.000	-0.00
	2.034	15.411	17.316	0.000	18.228	9.807	0.000	0.00
		-14.880	3.674	0.000	-5.031	12.400	0.000	-0.00
	3.051	23.649	13.842	-0.158	14.832	21.218	0.000	0.00
		-12.149	2.389	0.000	-5.877	14.363	0.000	-0.00
	4.068	28.328	11.213	-2.787	11.213	28.328	0.000	0.00
		-9.719	2.389	0.000	-6.534	16.053	0.000	-0.00
	5.085	30.541	7.467	-6.533	7.799	19.516	0.000	0.00
		-9.239	0.000	-3.150	-8.127	19.146	0.000	-0.00
	6.102	28.431	3.078	-10.922	6.524	16.411	0.000	0.00
		-12.442	0.000	-3.150	-11.158	20.692	0.000	-0.00
	7.119	24.221	0.596	-13.404	5.530	14.952	0.000	0.00
		-15.645	0.000	-3.150	-14.446	18.326	0.000	-0.00

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
9	8.136	16.495	0.000	-17.034	4.470	12.497	0.000	0.00
		-18.848	0.000	-3.150	-17.939	11.454	0.000	-0.00
	9.153	11.914	1.698	-10.302	3.311	8.956	0.000	0.00
		-23.417	0.000	-5.031	-21.557	0.000	-0.229	-0.00
10	10.170							
	0.000	11.882	1.482	-5.528	27.673	0.000	-22.722	0.00
		-32.850	20.311	-14.575	-25.124	0.000	-16.543	0.00
	1.017	8.099	11.115	-0.885	23.958	0.000	-2.860	0.00
		-19.911	5.257	0.000	-5.528	6.260	0.000	-0.00
	2.034	15.183	19.485	0.000	20.117	8.135	0.000	0.00
		-14.972	3.792	0.000	-5.528	0.638	0.000	-0.00
	3.051	24.658	14.938	0.000	16.987	22.399	0.000	0.00
		-12.707	1.785	0.000	-7.481	12.922	0.000	-0.00
	4.068	32.890	13.433	-0.567	13.469	32.669	0.000	0.00
		-10.892	1.785	0.000	-8.280	6.188	0.000	-0.00
	5.085	38.177	9.480	-4.520	9.695	37.080	0.000	0.00
		-16.228	0.000	-5.528	-8.792	19.087	0.000	-0.00
	6.102	36.796	5.189	-8.811	7.926	25.661	0.000	0.00
		-21.850	0.000	-5.528	-10.043	8.178	0.000	-0.00
	7.119	34.565	2.671	-11.329	6.133	17.900	0.000	0.00
-27.472		0.000	-5.528	-13.375	27.521	0.000	-0.00	
8.136	30.144	0.000	-14.820	4.830	14.583	0.000	0.00	
	-33.094	0.000	-5.528	-18.163	9.419	0.000	-0.00	
9.153	19.117	0.000	-18.798	3.306	8.842	0.000	0.00	
	-38.716	0.000	-5.528	-23.129	0.000	-18.240	-0.00	
11	10.170							
	0.000	0.000	0.000	-18.245	14.000	0.000	-44.338	0.00
		-44.338	14.000	-5.528	-24.043	0.000	-44.338	0.00
	0.317	0.000	0.000	-0.000	14.000	0.000	-39.904	0.00
		-39.904	14.000	0.000	-0.000	0.000	0.000	-0.00
	0.633	0.000	0.000	-0.000	14.000	0.000	-35.470	0.00
		-35.470	14.000	0.000	-0.000	0.000	0.000	-0.00
	0.950	0.000	0.000	-0.000	14.000	0.000	-31.037	0.00
		-31.037	14.000	0.000	-0.000	0.000	0.000	-0.00
	1.267	0.000	0.000	-0.000	14.000	0.000	-26.603	0.00
		-26.603	14.000	0.000	-0.000	0.000	0.000	-0.00
	1.583	0.000	0.000	-0.000	14.000	0.000	-22.169	0.00
		-22.169	14.000	0.000	-0.000	0.000	0.000	-0.00
	1.900	0.000	0.000	-0.000	14.000	0.000	-17.735	0.00
		-17.735	14.000	0.000	-0.000	0.000	0.000	-0.00
	2.217	0.000	0.000	-0.000	14.000	0.000	-13.301	0.00
-13.301		14.000	0.000	-0.000	0.000	0.000	-0.00	
2.534	0.000	0.000	-0.000	14.000	0.000	-8.868	0.00	
	-8.868	14.000	0.000	-0.000	0.000	0.000	-0.00	
2.850	0.000	0.000	-0.000	14.000	0.000	-4.434	0.00	
	-4.434	14.000	0.000	-0.000	0.000	0.000	-0.00	
3.167	0.000	14.000	0.000	14.000	0.000	-0.000	0.00	
	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00	

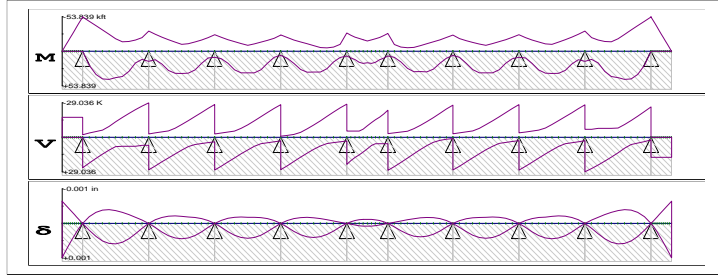
Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.785	-38.043
3	7.010	-35.660
4	3.996	-33.021
5	3.175	-33.657
6	4.987	-31.210
7	5.187	-30.963
8	3.194	-33.583
9	3.998	-33.047
10	7.010	-35.660
11	1.785	-38.043
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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ID: Ohio 5C1  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	-0.000	0.000	0.00
		-0.000	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	-0.000	-0.00
	0.317	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-5.384	0.000	0.000	-17.000	-17.000	0.000	0.000	-2.294	0.000	-0.00
	0.633	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-10.768	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	0.000	-0.00
	0.950	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-16.152	0.000	0.000	-17.000	-17.000	0.000	0.000	-2.908	0.000	-0.00
	1.267	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-21.536	0.000	0.000	-17.000	-17.000	0.000	0.000	-1.417	0.000	-0.00
	1.583	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
		-26.919	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	0.000	-0.00
	1.900	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00
		-32.303	0.000	0.000	-17.000	-17.000	0.000	0.000	-2.927	0.000	-0.00
2.217	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-37.687	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.540	0.000	-0.00	
2.534	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-43.071	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	0.000	-0.00	
2.850	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.000	0.00	
	-48.455	0.000	0.000	-17.000	-17.000	0.000	0.000	-5.384	0.000	-0.00	
3.167											
2	0.000	0.000	0.000	-2.166	25.758	0.000	-0.000	0.000	-0.054	0.000	0.00
		-53.839	21.949	-17.000	-17.000	0.000	0.000	0.000	0.000	0.000	0.00
	1.017	22.132	21.762	0.000	21.762	22.132	0.000	0.000	0.000	0.000	0.00
		-47.012	6.712	0.000	-3.672	8.470	0.000	0.000	0.000	-0.000	-0.00
	2.034	36.384	17.888	0.000	17.888	36.384	0.000	0.000	0.000	0.000	0.00
		-40.186	6.712	0.000	-4.969	14.301	0.000	0.000	0.000	-0.000	-0.00
	3.051	43.415	14.230	-2.770	14.230	43.415	0.000	0.000	0.000	0.000	0.00
		-33.359	6.712	0.000	-6.080	18.063	0.000	0.000	0.000	-0.000	-0.00
	4.068	44.111	10.844	-6.156	10.844	44.111	0.000	0.000	0.000	0.000	0.00
		-26.532	6.712	0.000	-9.255	32.662	0.000	0.000	0.000	-0.000	-0.00
	5.085	41.315	4.498	-12.502	7.879	40.065	0.000	0.000	0.000	0.000	0.00
		-19.706	6.712	0.000	-13.111	38.221	0.000	0.000	0.000	-0.000	-0.00
	6.102	39.613	0.636	-16.364	7.604	0.000	0.000	-7.439	0.000	0.000	0.00
		-14.785	4.079	0.000	-16.774	37.112	0.000	0.000	0.000	-0.000	-0.00
7.119	31.626	0.000	-20.006	7.604	0.294	0.000	0.000	0.000	0.000	0.00	
	-15.416	0.000	-2.166	-20.215	30.136	0.000	0.000	0.000	-0.000	-0.00	
8.136	18.470	0.000	-23.372	7.604	8.027	0.000	0.000	0.000	0.000	0.00	
	-17.673	0.000	-2.573	-23.403	18.219	0.000	0.000	0.000	-0.000	-0.00	
9.153	12.783	6.684	-5.316	6.852	8.877	0.000	0.000	0.000	0.000	0.00	
	-21.507	0.000	-4.040	-26.408	1.487	0.000	0.000	0.000	-0.000	-0.00	
10.170											
3	0.000	15.846	6.852	-2.497	27.466	0.000	-13.709	0.000	0.000	0.00	
		-31.588	4.793	-19.992	-29.036	0.000	-17.859	0.000	0.000	0.00	
	1.017	13.307	0.000	-2.497	24.201	5.093	0.000	0.000	0.000	0.00	
		-26.724	4.734	0.000	-3.804	9.458	0.000	0.000	0.000	-0.00	
	2.034	20.030	20.647	0.000	20.734	19.540	0.000	0.000	0.000	0.00	
		-22.119	3.816	0.000	-4.657	12.497	0.000	0.000	0.000	-0.00	
	3.051	30.104	16.958	-0.042	17.444	27.710	0.000	0.000	0.000	0.00	
		-18.249	3.805	0.000	-5.457	15.026	0.000	0.000	0.000	-0.00	
4.068	34.776	13.275	-3.725	14.132	31.407	0.000	0.000	0.000	0.00		
	-14.491	3.668	0.000	-7.753	26.744	0.000	0.000	0.000	-0.00		
5.085	34.999	6.677	-10.323	10.917	30.661	0.000	0.000	0.000	0.00		
	-10.876	2.730	0.000	-10.850	31.601	0.000	0.000	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.102	34.477	3.403	-13.597	7.920	25.988	0.000	0.00		
		-11.766	0.000	-2.892	-14.173	32.131	0.000	-0.00		
	7.119	29.426	0.000	-17.290	6.086	14.176	0.000	0.00		
		-14.707	0.000	-2.892	-17.612	27.788	0.000	-0.00		
	8.136	19.142	0.000	-20.088	5.389	12.442	0.000	0.00		
		-17.718	0.000	-3.680	-21.057	18.474	0.000	-0.00		
	9.153	10.672	1.496	-10.504	4.556	10.375	0.000	0.00		
		-21.493	0.000	-3.804	-24.531	3.597	0.000	-0.00		
	4	10.170	9.758	3.518	-2.239	27.568	0.000	-14.648	0.00	
			-25.976	4.093	-17.381	-27.705	0.000	-15.011	0.00	
1.017		11.902	10.298	-1.702	24.350	3.898	0.000	0.00		
		-21.869	3.869	0.000	-3.665	9.361	0.000	-0.00		
2.034		18.915	20.263	0.000	20.861	18.586	0.000	0.00		
		-18.026	2.841	0.000	-4.483	12.350	0.000	-0.00		
3.051		29.105	17.112	0.000	17.417	27.619	0.000	0.00		
		-15.137	2.841	0.000	-5.277	14.931	0.000	-0.00		
4.068		34.017	13.406	-3.594	13.993	31.728	0.000	0.00		
		-12.247	2.841	0.000	-7.597	26.411	0.000	-0.00		
5.085	33.944	6.984	-10.016	10.706	31.080	0.000	0.00			
	-9.357	2.841	0.000	-10.650	31.239	0.000	-0.00			
6.102	33.964	3.566	-13.434	7.677	26.322	0.000	0.00			
	-11.564	0.000	-2.671	-13.965	31.860	0.000	-0.00			
7.119	29.055	0.000	-17.137	5.445	14.698	0.000	0.00			
	-14.344	0.000	-2.794	-17.428	27.608	0.000	-0.00			
8.136	18.897	0.000	-20.233	4.681	12.333	0.000	0.00			
	-17.192	0.000	-2.861	-20.923	18.287	0.000	-0.00			
9.153	9.611	3.869	-8.131	3.869	9.611	0.000	0.00			
	-20.459	0.000	-3.665	-24.434	3.484	0.000	-0.00			
5	10.170	6.547	3.012	-0.851	27.270	0.000	-14.059	0.00		
		-25.577	4.045	-17.194	-27.636	0.000	-15.019	0.00		
	1.017	11.084	10.345	-1.655	24.053	4.035	0.000	0.00		
		-21.558	3.850	0.000	-1.729	7.174	0.000	-0.00		
	2.034	19.066	20.237	0.000	20.455	19.041	0.000	0.00		
		-17.762	2.949	0.000	-2.552	14.689	0.000	-0.00		
	3.051	28.542	16.833	-0.167	16.854	27.106	0.000	0.00		
		-14.763	2.949	0.000	-4.309	20.913	0.000	-0.00		
	4.068	32.920	13.211	-3.789	13.422	30.676	0.000	0.00		
		-11.764	2.949	0.000	-7.175	28.687	0.000	-0.00		
5.085	32.634	6.585	-10.415	10.204	29.681	0.000	0.00			
	-8.765	2.949	0.000	-10.415	32.634	0.000	-0.00			
6.102	32.694	3.217	-13.783	7.337	25.070	0.000	0.00			
	-5.970	1.957	0.000	-14.008	31.806	0.000	-0.00			
7.119	27.351	0.000	-17.412	5.266	14.074	0.000	0.00			
	-5.495	0.000	-0.515	-17.708	25.880	0.000	-0.00			
8.136	16.922	0.000	-21.027	4.564	11.931	0.000	0.00			
	-6.517	0.000	-1.028	-21.419	15.248	0.000	-0.00			
9.153	9.767	3.850	-8.150	3.850	9.767	0.000	0.00			
	-10.951	0.000	-14.627	-24.902	0.150	0.000	-0.00			
6	10.170	7.727	3.126	-1.477	22.928	0.000	-5.625	0.00		
		-28.673	5.482	-20.364	-27.955	0.000	-17.621	0.00		
	0.633	10.720	9.671	-2.329	19.792	5.092	0.000	0.00		
		-25.258	5.161	0.000	-5.336	2.466	0.000	-0.00		
	1.267	13.210	16.332	-0.668	17.072	0.000	-0.134	0.00		
		-22.129	3.146	0.000	-5.336	0.000	-0.914	-0.00		
	1.900	17.356	13.616	-3.384	14.935	7.382	0.000	0.00		
		-20.137	3.146	0.000	-5.336	0.000	-4.293	-0.00		
	2.533	19.103	10.609	-6.391	12.497	13.344	0.000	0.00		
		-18.145	3.146	0.000	-6.932	18.326	0.000	-0.00		
3.167	18.064	7.776	-9.224	9.834	16.812	0.000	0.00			
	-16.152	3.146	0.000	-9.798	17.245	0.000	-0.00			
3.800	19.078	6.405	-10.595	6.924	18.335	0.000	0.00			
	-17.822	0.000	-2.923	-12.493	13.381	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.433	17.326	3.400	-13.600	5.482	0.000	-4.370	0.00		
		-19.687	0.000	-2.981	-14.917	7.455	0.000	-0.00		
	5.066	13.336	0.694	-16.306	5.482	0.000	-0.898	0.00		
		-21.575	0.000	-2.981	-17.037	0.002	0.000	-0.00		
	5.700	10.856	2.355	-9.645	5.482	2.574	0.000	0.00		
-24.591		0.000	-5.009	-19.805	4.731	0.000	-0.00			
7	0.000	7.735	1.477	-3.191	27.840	0.000	-17.203	0.00		
		-27.947	19.533	-5.336	-22.938	0.000	-5.675	0.00		
	1.002	9.676	8.106	-3.894	24.772	0.263	0.000	0.00		
		-10.557	14.876	0.000	-3.894	9.676	0.000	-0.00		
	2.003	16.804	20.893	0.000	21.292	15.080	0.000	0.00		
		-6.547	1.038	0.000	-4.574	11.770	0.000	-0.00		
	3.005	26.996	17.289	0.000	17.598	25.479	0.000	0.00		
		-5.608	0.438	0.000	-5.255	13.896	0.000	-0.00		
	4.007	32.184	13.675	-3.325	13.913	31.254	0.000	0.00		
		-6.226	0.000	-2.113	-7.293	24.553	0.000	-0.00		
	5.008	32.036	10.346	-6.654	10.346	32.036	0.000	0.00		
		-8.850	0.000	-3.010	-10.132	29.107	0.000	-0.00		
	6.010	32.364	3.869	-13.131	7.122	28.120	0.000	0.00		
		-11.865	0.000	-3.010	-13.325	30.134	0.000	-0.00		
	7.012	28.105	0.264	-16.736	4.271	20.450	0.000	0.00		
-14.881		0.000	-3.010	-16.738	26.687	0.000	-0.00			
8.014	18.829	0.000	-20.112	2.576	14.629	0.000	0.00			
	-17.896	0.000	-3.010	-20.349	18.805	0.000	-0.00			
9.015	11.073	1.676	-10.324	1.707	7.059	0.000	0.00			
	-21.530	0.000	-3.894	-23.950	4.036	0.000	-0.00			
8	0.000	6.593	0.868	-3.018	27.649	0.000	-15.123	0.00		
		-25.456	17.179	-3.987	-27.154	0.000	-13.714	0.00		
	1.017	9.619	8.130	-3.870	24.452	3.355	0.000	0.00		
		-19.878	3.523	0.000	-3.870	9.619	0.000	-0.00		
	2.034	18.780	20.252	0.000	20.919	18.316	0.000	0.00		
		-16.754	2.753	0.000	-4.678	12.320	0.000	-0.00		
	3.051	28.953	17.158	0.000	17.413	27.681	0.000	0.00		
		-13.980	2.721	0.000	-5.440	14.675	0.000	-0.00		
	4.068	33.893	13.452	-3.548	13.943	31.945	0.000	0.00		
		-11.294	2.603	0.000	-7.666	26.277	0.000	-0.00		
	5.085	33.901	10.031	-6.969	10.624	31.315	0.000	0.00		
		-9.360	0.000	-2.842	-10.689	31.029	0.000	-0.00		
	6.102	33.977	3.614	-13.386	7.570	26.465	0.000	0.00		
		-12.251	0.000	-2.842	-13.973	31.691	0.000	-0.00		
	7.119	29.087	0.000	-17.092	5.185	15.014	0.000	0.00		
-15.141		0.000	-2.842	-17.397	27.601	0.000	-0.00			
8.136	18.912	0.000	-20.285	4.392	12.340	0.000	0.00			
	-18.032	0.000	-2.842	-20.843	18.587	0.000	-0.00			
9.153	11.906	1.705	-10.295	3.582	9.268	0.000	0.00			
	-21.871	0.000	-3.870	-24.336	3.914	0.000	-0.00			
9	0.000	9.573	2.046	-3.601	27.706	0.000	-15.018	0.00		
		-25.977	17.381	-4.093	-27.558	0.000	-14.627	0.00		
	1.017	10.569	10.519	-1.481	24.532	3.587	0.000	0.00		
		-21.456	3.799	0.000	-4.556	10.376	0.000	-0.00		
	2.034	19.142	20.088	0.000	21.059	18.467	0.000	0.00		
		-17.687	3.675	0.000	-5.389	12.442	0.000	-0.00		
	3.051	29.429	17.290	0.000	17.612	27.788	0.000	0.00		
		-14.683	2.888	0.000	-6.086	14.175	0.000	-0.00		
	4.068	34.485	13.595	-3.405	14.173	32.134	0.000	0.00		
		-11.747	2.888	0.000	-7.920	25.988	0.000	-0.00		
	5.085	35.008	10.320	-6.680	10.849	31.605	0.000	0.00		
		-10.874	0.000	-2.731	-10.917	30.660	0.000	-0.00		
	6.102	34.776	3.725	-13.275	7.751	26.748	0.000	0.00		
		-14.490	0.000	-3.668	-14.132	31.407	0.000	-0.00		
	7.119	30.105	0.042	-16.958	5.453	15.031	0.000	0.00		
-18.262		0.000	-3.796	-17.445	27.711	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		9	8.136	20.030	0.000	-20.649	4.652	12.497	0.000	0.00
		-22.123	0.000	-3.808	-20.736	19.540	0.000	-0.00		
	9.153	13.306	2.496	0.000	3.799	9.453	0.000	0.00		
		-26.724	0.000	-4.735	-24.204	5.090	0.000	-0.00		
	10.170									
10	0.000	15.844	2.496	-6.852	29.036	0.000	-17.860	0.00		
		-31.589	19.992	-4.793	-27.465	0.000	-13.707	0.00		
	1.017	12.783	5.316	-6.684	26.408	1.486	0.000	0.00		
		-21.509	4.040	0.000	-6.852	8.876	0.000	-0.00		
	2.034	18.470	23.372	0.000	23.403	18.218	0.000	0.00		
		-17.754	3.476	0.000	-7.604	8.028	0.000	-0.00		
	3.051	31.625	20.006	0.000	20.215	30.136	0.000	0.00		
		-15.419	2.166	0.000	-7.604	0.294	0.000	-0.00		
	4.068	39.613	16.364	-0.636	16.774	37.112	0.000	0.00		
		-14.784	0.000	-4.080	-7.604	0.000	-7.439	-0.00		
	5.085	41.315	12.503	-4.497	13.111	38.222	0.000	0.00		
		-19.686	0.000	-6.706	-7.879	40.065	0.000	-0.00		
	6.102	44.111	6.157	-10.843	9.255	32.662	0.000	0.00		
		-26.506	0.000	-6.706	-10.843	44.111	0.000	-0.00		
	7.119	43.415	2.770	-14.230	6.080	18.063	0.000	0.00		
		-33.326	0.000	-6.706	-14.230	43.415	0.000	-0.00		
	8.136	36.383	0.000	-17.888	4.969	14.301	0.000	0.00		
		-40.145	0.000	-6.706	-17.888	36.383	0.000	-0.00		
	9.153	22.132	0.000	-21.762	3.672	8.470	0.000	0.00		
		-46.965	0.000	-6.706	-21.762	22.132	0.000	-0.00		
	10.170									
11	0.000	0.000	0.000	-17.636	17.000	0.000	-53.839	0.00		
		-53.839	17.000	-6.852	-25.758	0.000	0.000	0.00		
	0.317	0.000	0.000	-0.000	17.000	0.000	-48.455	0.00		
		-48.455	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.633	0.000	0.000	-0.000	17.000	0.000	-43.071	0.00		
		-43.071	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.950	0.000	0.000	-0.000	17.000	0.000	-37.687	0.00		
		-37.687	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.267	0.000	0.000	-0.000	17.000	0.000	-32.303	0.00		
		-32.303	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.583	0.000	0.000	-0.000	17.000	0.000	-26.920	0.00		
		-26.920	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.900	0.000	0.000	-0.000	17.000	0.000	-21.536	0.00		
		-21.536	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.217	0.000	0.000	-0.000	17.000	0.000	-16.152	0.00		
		-16.152	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.534	0.000	0.000	-0.000	17.000	0.000	-10.768	0.00		
		-10.768	17.000	0.000	-0.000	0.000	0.000	-0.00		
	2.850	0.000	0.000	-0.000	17.000	0.000	-5.384	0.00		
		-5.384	17.000	0.000	-0.000	0.000	0.000	-0.00		
	3.167	0.000	0.000	0.000	17.000	0.000	0.000	0.00		
		-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00		

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.166	-38.949
3	9.349	-32.010
4	5.757	-31.445
5	3.863	-31.227
6	6.065	-31.337
7	6.246	-31.180
8	3.886	-31.196
9	5.648	-31.443
10	9.348	-32.010
11	2.166	-38.936
12	0.000	-0.000

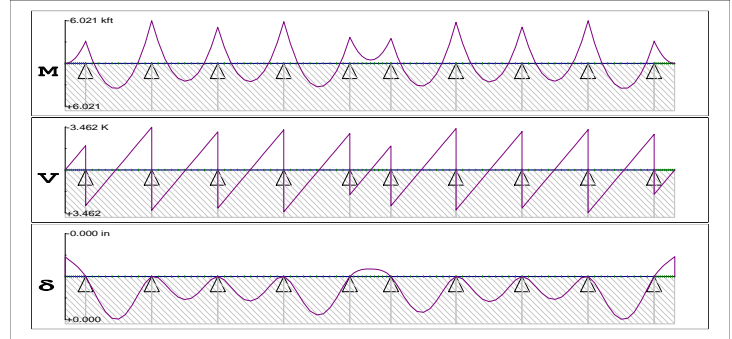
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Wearing Surface

Type: Static

Factor: 1.000



Span	Location (ft)	Moment (kft)	Shear (K)	Deflect (in)	Reaction (K)	
1	0.000	+0.000/ -0.000	+0.000/ -0.000	-0.00	0.000	
	0.317	-0.031	-0.198	-0.00		
	0.633	-0.125	-0.396	-0.00		
	0.950	-0.282	-0.594	-0.00		
	1.267	-0.501	-0.792	-0.00		
	1.583	-0.784	-0.990	-0.00		
	1.900	-1.128	-1.188	-0.00		
	2.217	-1.536	-1.386	-0.00		
	2.534	-2.006	-1.583	-0.00		
	2.850	-2.539	-1.781	-0.00		
	3.167					
	2	0.000	-3.134	-1.979/ +2.894	+0.00	-4.874
		1.017	-0.514	+2.259	+0.00	
2.034		+1.460	+1.623	+0.00		
3.051		+2.787	+0.987	+0.00		
4.068		+3.468	+0.352	+0.00		
5.085		+3.503	-0.284	+0.00		
6.102		+2.891	-0.919	+0.00		
7.119		+1.633	-1.555	+0.00		
8.136		-0.272	-2.191	+0.00		
9.153		-2.823	-2.826	+0.00		
10.170						
3	0.000	-6.021	-3.462/ +3.268	+0.00	-6.730	
	1.017	-3.020	+2.633	+0.00		
	2.034	-0.666	+1.997	+0.00		
	3.051	+1.042	+1.361	+0.00		
	4.068	+2.103	+0.726	+0.00		
	5.085	+2.518	+0.090	+0.00		
	6.102	+2.286	-0.546	+0.00		
	7.119	+1.408	-1.181	+0.00		
	8.136	-0.117	-1.817	+0.00		
	9.153	-2.288	-2.452	+0.00		
10.170						
4	0.000	-5.105	-3.088/ +3.102	+0.00	-6.190	
	1.017	-2.274	+2.466	+0.00		
	2.034	-0.089	+1.831	+0.00		
	3.051	+1.450	+1.195	+0.00		
	4.068	+2.342	+0.559	+0.00		
	5.085	+2.587	-0.076	+0.00		
	6.102	+2.187	-0.712	+0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	Moment (kft)	Shear ( K )	Deflect (in)	Reaction ( K )	
4	7.119	+1.139		-1.348	+0.00	
	8.136	-0.554		-1.983	+0.00	
	9.153	-2.894		-2.619	+0.00	
	10.170					
5	0.000	-5.881	-3.254/	+3.393	+0.00	-6.648
	1.017	-2.753		+2.758	+0.00	
	2.034	-0.272		+2.122	+0.00	
	3.051	+1.563		+1.486	+0.00	
	4.068	+2.751		+0.851	+0.00	
	5.085	+3.293		+0.215	+0.00	
	6.102	+3.189		-0.421	+0.00	
	7.119	+2.438		-1.056	+0.00	
	8.136	+1.041		-1.692	+0.00	
	9.153	-1.003		-2.327	+0.00	
	10.170					
6	0.000	-3.693	-2.963/	+2.005	+0.00	-4.969
	0.633	-2.549		+1.610	-0.00	
	1.267	-1.655		+1.214	-0.00	
	1.900	-1.011		+0.818	-0.00	
	2.533	-0.618		+0.422	-0.00	
	3.167	-0.476		+0.026	-0.00	
	3.800	-0.585		-0.369	-0.00	
	4.433	-0.944		-0.765	-0.00	
	5.066	-1.554		-1.161	-0.00	
	5.700	-2.415		-1.557	-0.00	
	6.333					
7	0.000	-3.526	-1.953/	+2.904	+0.00	-4.857
	1.002	-0.931		+2.278	+0.00	
	2.003	+1.037		+1.652	+0.00	
	3.005	+2.378		+1.026	+0.00	
	4.007	+3.092		+0.400	+0.00	
	5.008	+3.179		-0.226	+0.00	
	6.010	+2.639		-0.852	+0.00	
	7.012	+1.471		-1.479	+0.00	
	8.014	-0.323		-2.105	+0.00	
	9.015	-2.745		-2.731	+0.00	
	10.017					
8	0.000	-5.794	-3.357/	+3.244	+0.00	-6.600
	1.017	-2.818		+2.608	+0.00	
	2.034	-0.489		+1.972	+0.00	
	3.051	+1.193		+1.337	+0.00	
	4.068	+2.229		+0.701	+0.00	
	5.085	+2.619		+0.065	+0.00	
	6.102	+2.363		-0.570	+0.00	
	7.119	+1.460		-1.206	+0.00	
	8.136	-0.090		-1.841	+0.00	
	9.153	-2.286		-2.477	+0.00	
	10.170					
9	0.000	-5.128	-3.113/	+3.091	+0.00	-6.204
	1.017	-2.308		+2.455	+0.00	
	2.034	-0.134		+1.820	+0.00	
	3.051	+1.393		+1.184	+0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



Span	Location (ft)	Moment (kft)	Shear (K)	Deflect (in)	Reaction (K)	
9	4.068	+2.274		+0.548	+0.00	
	5.085	+2.509		-0.087	+0.00	
	6.102	+2.097		-0.723	+0.00	
	7.119	+1.039		-1.358	+0.00	
	8.136	-0.666		-1.994	+0.00	
	9.153	-3.017		-2.630	+0.00	
	10.170					
10	0.000	-6.015	-3.265/	+3.461	+0.00	-6.727
	1.017	-2.818		+2.826	+0.00	
	2.034	-0.267		+2.190	+0.00	
	3.051	+1.637		+1.554	+0.00	
	4.068	+2.895		+0.919	+0.00	
	5.085	+3.506		+0.283	+0.00	
	6.102	+3.471		-0.352	+0.00	
	7.119	+2.789		-0.988	+0.00	
	8.136	+1.461		-1.624	+0.00	
	9.153	-0.513		-2.259	+0.00	
10.170						
11	0.000	-3.134	-2.895/	+1.979	+0.00	-4.874
	0.317	-2.539		+1.781	-0.00	
	0.633	-2.006		+1.583	-0.00	
	0.950	-1.536		+1.386	-0.00	
	1.267	-1.128		+1.188	-0.00	
	1.583	-0.784		+0.990	-0.00	
	1.900	-0.501		+0.792	-0.00	
	2.217	-0.282		+0.594	-0.00	
	2.534	-0.125		+0.396	-0.00	
	2.850	-0.031		+0.198	-0.00	
	3.167	-0.000/	+0.000	-0.000/	+0.000	-0.000

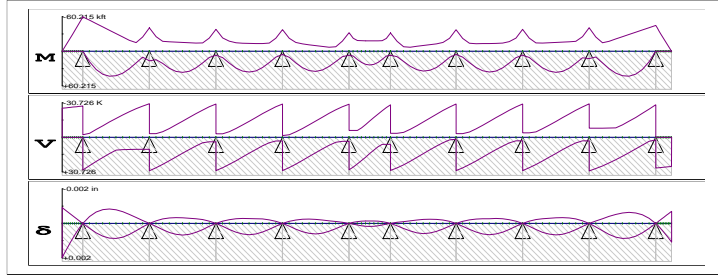
Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: HS20 Lane Load  
 Type: Lane Load

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	-0.000	0.00	
		-0.000	0.000	0.000	0.000	-26.000	0.000	0.000	0.000	-0.00	
	0.317	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-5.733	0.000	0.000	-18.203	-26.203	0.000	-0.032	-0.000	-0.00	
	0.633	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-11.530	0.000	0.000	-18.405	-26.405	0.000	-0.128	-0.000	-0.00	
	0.950	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-17.391	0.000	0.000	-18.608	-26.608	0.000	-0.289	-0.000	-0.00	
	1.267	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-23.316	0.000	0.000	-18.811	-26.811	0.000	-0.514	-0.000	-0.00	
	1.583	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-29.305	0.000	0.000	-19.013	-27.013	0.000	-0.802	-0.000	-0.00	
	1.900	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-35.359	0.000	0.000	-19.216	-27.216	0.000	-1.155	-0.000	-0.00	
2	2.217	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-41.477	0.000	0.000	-19.419	-27.419	0.000	-1.573	-0.000	-0.00	
	2.534	0.000	0.000	0.000	-18.000	0.000	0.000	0.000	0.000	0.00	
		-47.659	0.000	0.000	-19.622	-27.621	0.000	-2.054	-0.000	-0.00	
	2.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	
		-53.905	0.000	0.000	-19.824	-27.824	0.000	-2.600	-0.000	-0.00	
	3.167	0.000	0.000	0.000	-1.417	29.272	0.000	-3.210	0.00		
		-60.215	16.687	-20.025	-28.369	0.000	-3.292	0.00			
	1.017	18.613	17.977	-0.023	25.406	22.628	-0.468	0.00			
		-54.370	5.748	0.000	-3.673	23.038	-0.059	-0.00			
	2.034	31.992	15.078	-2.922	21.630	40.787	0.000	0.00			
		-48.524	5.748	0.000	-7.044	39.880	0.000	-0.00			
	3.051	40.312	12.236	-5.764	18.019	51.765	0.000	0.00			
		-42.679	5.748	0.000	-10.412	50.538	0.000	-0.00			
4.068	43.867	9.482	-8.518	14.610	56.224	0.000	0.00				
	-36.833	5.748	0.000	-13.732	55.202	0.000	-0.00				
5.085	43.069	6.843	-11.157	11.443	54.977	0.000	0.00				
	-30.988	5.748	0.000	-16.959	54.247	0.000	-0.00				
6.102	38.449	4.348	-13.652	11.095	1.850	-17.848	0.00				
	-25.142	5.748	0.000	-20.046	48.244	0.000	-0.00				
7.119	30.653	2.028	-15.972	10.933	1.536	-7.721	0.00				
	-19.297	5.748	0.000	-22.947	37.955	0.000	-0.00				
8.136	20.508	0.677	-17.323	10.827	2.536	0.000	0.00				
	-15.121	0.000	-2.225	-25.611	24.348	-1.634	-0.00				
9.153	10.523	0.886	-17.114	10.770	13.027	0.000	0.00				
	-24.974	0.000	-13.043	-27.990	8.596	-4.297	-0.00				
3	10.170	17.026	7.595	-2.450	30.360	0.000	-6.293	0.00			
		-41.168	17.210	-18.096	-30.565	0.000	-6.305	0.00			
	1.017	14.986	0.000	-1.397	27.250	9.701	-4.458	0.00			
		-25.732	11.308	0.000	-3.320	20.632	0.000	-0.00			
	2.034	21.373	16.733	-1.267	24.244	25.123	-1.954	0.00			
		-17.369	3.388	0.000	-5.098	28.349	0.000	-0.00			
	3.051	30.056	14.296	-3.704	20.992	36.973	-0.290	0.00			
		-16.788	0.571	0.000	-7.991	38.619	0.000	-0.00			
	4.068	35.461	11.603	-6.397	17.607	44.356	0.000	0.00			
		-16.207	0.571	0.000	-11.158	45.135	0.000	-0.00			
5.085	37.169	8.845	-9.155	14.205	46.846	0.000	0.00				
	-15.626	0.571	0.000	-14.494	47.116	0.000	-0.00				

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.102	35.071	6.097	-11.903	10.893	44.473	0.000	0.00		
		-15.046	0.571	0.000	-17.891	44.213	0.000	-0.00		
	7.119	29.362	3.436	-14.564	7.781	37.710	0.000	0.00		
		-14.465	0.571	0.000	-21.238	36.520	0.000	-0.00		
	8.136	20.630	1.700	-16.300	4.972	27.456	0.000	0.00		
		-14.662	0.000	-2.611	-24.421	24.593	-1.492	-0.00		
	9.153	11.122	0.903	-17.097	4.084	5.457	0.000	0.00		
		-23.171	0.000	-13.140	-27.325	9.462	-3.953	-0.00		
	10.170									
	4	0.000	7.186	3.018	-1.222	30.417	0.000	-5.362	0.00	
-38.554			16.816	-16.947	-30.404	0.000	-5.358	0.00		
1.017		11.291	17.134	-0.866	27.208	9.503	-4.023	0.00		
		-23.294	12.992	0.000	-3.277	4.691	0.000	-0.00		
2.034		20.876	16.271	-1.729	24.249	24.551	-1.629	0.00		
		-17.670	3.102	0.000	-5.005	27.719	0.000	-0.00		
3.051		29.397	14.315	-3.685	21.014	36.271	-0.075	0.00		
		-15.050	2.521	0.000	-7.872	37.906	0.000	-0.00		
4.068		34.794	11.621	-6.379	17.625	43.656	0.000	0.00		
		-14.028	0.164	0.000	-11.037	44.483	0.000	-0.00		
5.085	36.534	8.850	-9.150	14.200	46.199	0.000	0.00			
	-13.861	0.164	0.000	-14.387	46.590	0.000	-0.00			
6.102	34.468	6.083	-11.917	10.857	43.874	0.000	0.00			
	-13.695	0.164	0.000	-17.810	43.823	0.000	-0.00			
7.119	28.771	3.398	-14.602	7.708	37.121	0.000	0.00			
	-13.528	0.164	0.000	-21.189	36.243	0.000	-0.00			
8.136	20.035	1.598	-16.402	4.865	26.832	0.000	0.00			
	-14.508	0.000	-2.664	-24.404	24.396	-1.502	-0.00			
9.153	10.460	0.766	-17.234	3.395	4.324	0.000	0.00			
	-22.705	0.000	-13.021	-27.334	9.323	-3.990	-0.00			
10.170										
5	0.000	5.691	2.495	-0.862	30.282	0.000	-6.154	0.00		
		-38.027	16.606	-16.846	-30.141	0.000	-6.155	0.00		
	1.017	10.904	17.341	-0.659	27.127	9.525	-4.070	0.00		
		-22.924	12.738	0.000	-2.354	14.845	0.000	-0.00		
	2.034	20.691	16.338	-1.662	24.058	24.480	-1.661	0.00		
		-15.503	2.933	0.000	-4.934	27.523	0.000	-0.00		
	3.051	29.002	14.087	-3.913	20.712	35.894	-0.081	0.00		
		-12.909	1.412	0.000	-7.926	37.655	0.000	-0.00		
	4.068	34.023	11.319	-6.681	17.226	42.786	0.000	0.00		
		-11.474	1.411	0.000	-11.206	43.950	0.000	-0.00		
5.085	35.296	8.493	-9.507	13.733	44.729	0.000	0.00			
	-10.038	1.411	0.000	-14.649	45.618	0.000	-0.00			
6.102	32.768	5.698	-12.302	10.364	41.840	0.000	0.00			
	-8.603	1.411	0.000	-18.125	42.385	0.000	-0.00			
7.119	26.749	3.025	-14.975	7.246	34.753	0.000	0.00			
	-7.167	1.411	0.000	-21.500	34.514	0.000	-0.00			
8.136	18.300	1.677	-16.323	4.502	24.612	0.000	0.00			
	-8.048	0.000	-6.855	-24.640	22.817	-0.366	-0.00			
9.153	9.693	1.173	-16.827	3.602	5.986	0.000	0.00			
	-17.771	0.000	-12.805	-27.406	8.672	-2.704	-0.00			
10.170										
6	0.000	7.245	2.671	-2.055	29.740	0.000	-3.850	0.00		
		-32.676	17.769	-16.158	-30.726	0.000	-3.943	0.00		
	0.633	8.443	16.107	-1.893	26.642	5.552	-4.170	0.00		
		-22.896	12.657	0.000	-6.212	3.922	0.000	-0.00		
	1.267	14.566	16.065	-1.935	23.849	15.493	-2.762	0.00		
		-18.996	3.912	0.000	-6.264	1.068	0.000	-0.00		
	1.900	19.784	13.800	-4.200	20.849	23.181	-1.685	0.00		
		-18.490	0.107	0.000	-8.478	25.517	0.000	-0.00		
	2.533	23.053	11.421	-6.579	17.728	28.158	-0.877	0.00		
		-18.422	0.107	0.000	-11.464	29.281	0.000	-0.00		
3.167	24.159	8.986	-9.014	14.570	30.178	-0.270	0.00			
	-18.354	0.107	0.000	-14.576	30.234	-0.214	-0.00			
3.800	23.031	6.552	-11.448	11.459	29.215	0.000	0.00			
	-18.286	0.107	0.000	-17.733	28.203	-0.803	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		6	4.433	19.745	4.175	-13.825	8.478	25.449	0.000	0.00
		-18.218	0.107	0.000	-20.851	23.223	-1.594	-0.00		
	5.066	14.520	1.916	-16.085	6.405	1.070	0.000	0.00		
		-18.604	0.000	-3.774	-23.844	15.543	-2.655	-0.00		
	5.700	8.434	1.914	-16.086	6.353	4.033	0.000	0.00		
		-22.499	0.000	-12.576	-26.628	5.633	-4.046	-0.00		
	6.333									
7	0.000	7.292	2.085	-2.731	30.709	0.000	-3.758	0.00		
		-32.240	16.131	-17.689	-29.731	0.000	-3.670	0.00		
	1.002	9.650	16.796	-1.204	27.361	8.619	-2.654	0.00		
		-17.591	12.799	0.000	-3.680	6.007	0.000	-0.00		
	2.003	18.126	16.275	-1.725	24.602	22.553	-0.380	0.00		
		-8.049	4.913	0.000	-4.528	24.375	0.000	-0.00		
	3.005	26.430	14.941	-3.059	21.471	34.068	0.000	0.00		
		-7.266	0.000	-1.437	-7.268	34.350	0.000	-0.00		
	4.007	32.337	12.279	-5.721	18.106	41.816	0.000	0.00		
		-8.705	0.000	-1.437	-10.380	41.306	0.000	-0.00		
	5.008	34.813	9.498	-8.502	14.641	45.002	0.000	0.00		
		-10.145	0.000	-1.437	-13.741	44.129	0.000	-0.00		
	6.010	33.554	6.684	-11.316	11.208	43.367	0.000	0.00		
		-11.585	0.000	-1.437	-17.223	42.196	0.000	-0.00		
	7.012	28.613	3.929	-14.071	7.934	37.176	0.000	0.00		
		-13.025	0.000	-1.438	-20.700	35.396	-0.145	-0.00		
	8.014	20.433	1.698	-16.302	4.946	27.196	0.000	0.00		
		-15.616	0.000	-2.994	-24.037	24.143	-1.702	-0.00		
	9.015	10.786	0.683	-17.317	2.364	14.687	0.000	0.00		
		-22.865	0.000	-12.777	-27.099	9.393	-4.064	-0.00		
	10.017									
8	0.000	5.703	0.877	-2.488	30.135	0.000	-6.093	0.00		
		-37.746	16.811	-16.616	-30.240	0.000	-6.089	0.00		
	1.017	10.400	17.253	-0.747	27.333	9.327	-3.919	0.00		
		-22.447	12.984	0.000	-3.389	4.354	0.000	-0.00		
	2.034	19.957	16.427	-1.573	24.409	24.364	-1.439	0.00		
		-14.216	2.616	0.000	-4.837	26.739	0.000	-0.00		
	3.051	28.689	14.619	-3.381	21.197	36.203	0.000	0.00		
		-13.236	0.000	-0.208	-7.677	37.037	0.000	-0.00		
	4.068	34.401	11.934	-6.066	17.818	43.791	0.000	0.00		
		-13.448	0.000	-0.208	-10.825	43.818	0.000	-0.00		
	5.085	36.487	9.166	-8.834	14.393	46.571	0.000	0.00		
		-13.659	0.000	-0.208	-14.169	46.178	0.000	-0.00		
	6.102	34.767	6.393	-11.607	11.040	44.476	0.000	0.00		
		-13.871	0.000	-0.208	-17.596	43.671	0.000	-0.00		
	7.119	29.387	3.697	-14.303	7.872	37.906	0.000	0.00		
		-14.371	0.000	-2.406	-20.989	36.318	-0.017	-0.00		
	8.136	20.876	1.724	-16.276	5.000	27.718	0.000	0.00		
		-16.873	0.000	-2.973	-24.228	24.624	-1.557	-0.00		
	9.153	11.280	0.856	-17.144	3.209	4.613	0.000	0.00		
		-23.198	0.000	-12.969	-27.190	9.593	-3.937	-0.00		
	10.170									
9	0.000	7.160	1.210	-3.015	30.346	0.000	-5.285	0.00		
		-38.438	16.899	-16.795	-30.400	0.000	-5.290	0.00		
	1.017	11.094	17.101	-0.899	27.281	9.512	-3.898	0.00		
		-23.102	13.092	0.000	-4.081	5.435	0.000	-0.00		
	2.034	20.603	16.304	-1.696	24.377	24.595	-1.483	0.00		
		-14.636	2.562	0.000	-4.967	27.428	0.000	-0.00		
	3.051	29.298	14.524	-3.476	21.194	36.476	0.000	0.00		
		-14.445	0.000	-0.575	-7.776	37.685	0.000	-0.00		
	4.068	34.966	11.863	-6.137	17.846	44.124	0.000	0.00		
		-15.030	0.000	-0.575	-10.888	44.453	0.000	-0.00		
	5.085	37.024	9.115	-8.885	14.449	46.983	0.000	0.00		
		-15.614	0.000	-0.575	-14.200	46.831	0.000	-0.00		
	6.102	35.275	6.357	-11.644	11.113	44.957	0.000	0.00		
		-16.199	0.000	-0.575	-17.603	44.346	0.000	-0.00		
	7.119	29.829	3.664	-14.336	7.946	38.396	0.000	0.00		
		-16.784	0.000	-0.575	-20.987	36.968	-0.294	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
9	8.136	21.105	1.222	-16.778	5.053	28.081	0.000	0.00
		-17.369	0.000	-3.378	-24.240	25.123	-1.954	-0.00
	9.153	11.502	0.899	0.000	3.254	3.828	0.000	0.00
		-25.727	0.000	-11.304	-27.246	9.705	-4.454	-0.00
10	10.170	13.035	1.952	-5.739	30.519	0.000	-6.658	0.00
	0.000	-41.160	18.095	-17.205	-30.189	0.000	-6.646	0.00
		1.017	10.332	17.282	-0.718	27.989	8.603	-4.290
	2.034	-24.967	13.042	0.000	-8.163	10.074	0.000	-0.00
		20.487	17.490	-0.510	25.610	24.353	-1.628	0.00
	3.051	-15.098	2.222	0.000	-8.220	2.235	0.000	-0.00
		30.652	15.972	-2.028	22.946	37.960	0.000	0.00
	4.068	-17.616	0.000	-3.892	-8.325	1.685	-5.371	-0.00
		38.448	13.652	-4.348	20.046	48.248	0.000	0.00
	5.085	-21.575	0.000	-3.892	-8.488	2.170	-12.846	-0.00
		43.068	11.158	-6.842	16.958	54.251	0.000	0.00
	6.102	-25.533	0.000	-3.892	-11.275	55.466	0.000	-0.00
		43.866	8.519	-9.481	13.731	55.204	0.000	0.00
	7.119	-29.492	0.000	-3.892	-14.443	56.884	0.000	-0.00
		40.311	5.764	-12.236	10.411	50.540	0.000	0.00
	8.136	-33.450	0.000	-3.892	-17.851	52.595	0.000	-0.00
31.992		2.922	-15.078	7.043	39.882	0.000	0.00	
9.153	-37.409	0.000	-3.892	-21.463	41.787	0.000	-0.00	
	18.613	0.023	-17.977	3.672	23.038	-0.058	0.00	
10.170	-41.367	0.000	-3.893	-25.239	23.799	0.000	-0.00	
	0.000	0.000	0.000	-9.179	27.888	0.000	-64.640	0.00
11	0.242	-45.326	20.962	-5.651	-29.105	0.000	-1.869	0.00
		0.000	0.000	-0.000	27.392	0.000	-58.002	0.00
	0.483	-40.621	19.392	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	27.237	0.000	-51.401	0.00
	0.725	-35.953	19.237	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	27.083	0.000	-44.837	0.00
	0.967	-31.323	19.083	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	26.928	0.000	-38.310	0.00
	1.208	-26.730	18.928	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	26.773	0.000	-31.821	0.00
	1.450	-22.174	18.773	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	26.619	0.000	-25.370	0.00
	1.692	-17.656	18.619	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	26.464	0.000	-18.956	0.00
	1.933	-13.175	18.464	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	26.309	0.000	-12.579	0.00
2.175	-8.731	18.309	0.000	-0.000	0.000	0.000	-0.00	
	0.000	18.000	0.000	26.155	0.000	-6.239	0.00	
2.417	-4.325	18.155	0.000	-0.000	0.000	-0.000	-0.00	
	0.000	0.000	0.000	0.000	0.000	0.000	0.00	
		-0.000	0.000	-0.000	0.000	0.000	-0.00	

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.390	-41.598
3	14.050	-34.026
4	5.564	-33.598
5	4.483	-33.633
6	7.514	-33.744
7	7.702	-33.607
8	4.497	-33.593
9	5.550	-33.538
10	10.744	-34.022
11	2.389	-38.511
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

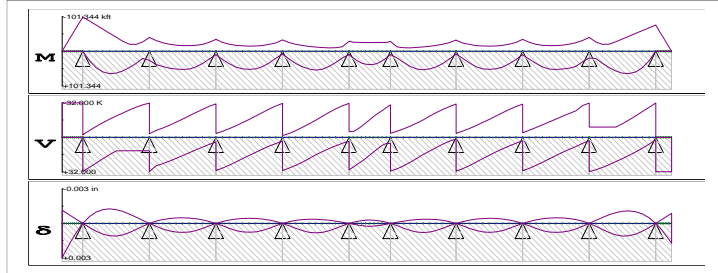
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ID: HS20

Type: Truck

Factors:

Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (kft)		Corresponding Shear (K)		SHEAR (K)		Corresponding Moment (kft)		DEFLECT (in)	
		(max)	(min)	(+)	(-)	(max)	(min)	(+)	(-)	(max)	(min)
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	0.317	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-10.134	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	0.633	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-20.269	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	0.950	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-30.403	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	1.267	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-40.537	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	1.583	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-50.672	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	1.900	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-60.806	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
	2.217	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00
		-70.941	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00
2.534	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-81.075	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00	
2.850	0.000	0.000	0.000	-32.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-91.209	0.000	0.000	-32.000	-32.000	0.000	0.000	0.000	-0.00	-0.00	
3.167											
2	0.000	0.000	0.000	-2.525	31.959	0.000	-0.000	0.00	0.00		
		-101.344	12.635	-32.000	-32.000	0.000	-0.101	0.00	0.00		
	1.017	28.426	27.951	-4.049	27.951	28.426	0.000	0.00	0.00		
		-89.370	11.773	0.000	-6.460	25.974	0.000	-0.00	-0.00		
	2.034	48.722	23.954	-8.046	23.954	48.722	0.000	0.00	0.00		
		-77.396	11.773	0.000	-10.141	44.461	0.000	-0.00	-0.00		
	3.051	61.200	20.059	-11.941	20.059	61.200	0.000	0.00	0.00		
		-65.423	11.773	0.000	-13.593	56.160	0.000	-0.00	-0.00		
	4.068	66.385	16.319	-15.681	16.319	66.385	0.000	0.00	0.00		
		-53.449	11.773	0.000	-16.822	61.743	0.000	-0.00	-0.00		
	5.085	65.009	12.784	-19.216	12.784	65.009	0.000	0.00	0.00		
		-41.475	11.773	0.000	-19.831	61.882	0.000	-0.00	-0.00		
	6.102	58.013	9.507	-22.493	12.635	0.000	-24.243	0.00	0.00		
		-29.502	11.773	0.000	-22.633	57.159	0.000	-0.00	-0.00		
	7.119	48.438	6.804	-25.196	12.635	0.000	-11.393	0.00	0.00		
		-20.947	4.175	0.000	-25.461	46.549	0.000	-0.00	-0.00		
8.136	36.069	4.433	-27.567	12.635	1.457	0.000	0.00	0.00			
	-20.611	0.000	-3.469	-28.070	31.978	0.000	-0.00	-0.00			
9.153	21.666	2.367	-29.633	12.635	14.307	0.000	0.00	0.00			
	-27.732	0.000	-10.141	-30.266	15.868	0.000	-0.00	-0.00			
10.170											
3	0.000	27.157	12.635	-3.387	31.978	0.000	-0.151	0.00	0.00		
		-41.038	11.090	-15.133	-31.985	0.000	-0.174	0.00	0.00		
	1.017	39.307	25.708	-6.292	26.513	38.488	0.000	0.00	0.00		
		-31.621	7.213	0.000	-6.450	25.965	0.000	-0.00	-0.00		
	2.034	44.819	24.603	-8.095	24.603	44.819	0.000	0.00	0.00		
		-24.994	4.176	0.000	-8.749	36.199	0.000	-0.00	-0.00		
	3.051	50.000	22.310	-9.690	22.310	50.000	0.000	0.00	0.00		
		-20.747	4.176	0.000	-11.249	44.676	0.000	-0.00	-0.00		
	4.068	52.741	19.766	-12.234	19.766	52.741	0.000	0.00	0.00		
		-18.187	2.093	0.000	-13.992	50.686	0.000	-0.00	-0.00		
5.085	53.816	14.972	-17.028	17.087	52.359	0.000	0.00	0.00			
	-16.861	0.618	0.000	-17.028	53.816	0.000	-0.00	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR(max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT(max) (min) (in)
3	6.102	52.509	11.884	-20.116	14.346	48.711	0.000	0.00		
		-16.560	0.172	0.000	-20.116	52.509	0.000	-0.00		
	7.119	46.478	8.795	-23.205	11.700	42.402	0.000	0.00		
		-17.869	0.000	-1.773	-23.205	46.478	0.000	-0.00		
	8.136	36.224	6.778	-25.222	9.119	33.549	0.000	0.00		
		-20.599	0.000	-3.892	-26.174	36.072	0.000	-0.00		
	9.153	23.531	4.165	-27.835	6.648	22.659	0.000	0.00		
		-26.567	0.000	-7.059	-28.866	22.378	0.000	-0.00		
	4	10.170	10.679	4.362	-1.939	30.865	8.750	0.000	0.00	
			-35.439	12.078	-10.816	-31.104	6.966	0.000	0.00	
1.017		24.561	27.839	-4.161	28.616	23.687	0.000	0.00		
		-26.305	6.465	0.000	-5.736	21.902	0.000	-0.00		
2.034		36.918	25.249	-6.751	25.914	36.846	0.000	0.00		
		-20.992	4.096	0.000	-8.164	33.663	0.000	-0.00		
3.051		46.701	22.936	-9.064	22.936	46.701	0.000	0.00		
		-17.863	2.443	0.000	-10.806	43.369	0.000	-0.00		
4.068		52.207	19.843	-12.157	19.843	52.207	0.000	0.00		
		-16.117	1.304	0.000	-13.695	50.072	0.000	-0.00		
5.085	53.379	15.223	-16.777	16.947	52.521	0.000	0.00			
	-15.466	0.211	0.000	-16.777	53.379	0.000	-0.00			
6.102	52.054	12.035	-19.965	13.864	49.381	0.000	0.00			
	-15.810	0.000	-0.866	-19.965	52.054	0.000	-0.00			
7.119	45.647	8.798	-23.202	10.934	42.724	0.000	0.00			
	-17.211	0.000	-1.847	-23.202	45.647	0.000	-0.00			
8.136	34.582	6.395	-25.605	8.274	32.936	0.000	0.00			
	-20.627	0.000	-3.562	-26.346	34.446	0.000	-0.00			
9.153	21.084	5.810	-26.190	5.810	21.084	0.000	0.00			
	-24.932	0.000	-6.094	-29.212	19.618	0.000	-0.00			
5	10.170	8.388	3.608	-1.341	31.034	7.108	0.000	0.00		
		-33.840	10.478	-11.433	-31.595	2.927	0.000	0.00		
	1.017	23.176	28.365	-3.635	28.642	22.513	0.000	0.00		
		-25.707	6.123	0.000	-3.635	23.176	0.000	-0.00		
	2.034	36.342	25.633	-6.367	26.120	32.209	0.000	0.00		
		-20.717	4.153	0.000	-6.367	36.342	0.000	-0.00		
	3.051	46.130	22.608	-9.392	23.125	44.451	0.000	0.00		
		-17.253	2.806	0.000	-9.392	46.130	0.000	-0.00		
	4.068	52.677	19.707	-12.293	19.794	52.648	0.000	0.00		
		-14.536	2.607	0.000	-12.614	50.850	0.000	-0.00		
5.085	55.707	16.044	-15.956	16.332	51.918	0.000	0.00			
	-12.556	1.876	0.000	-15.956	55.707	0.000	-0.00			
6.102	53.098	12.318	-19.682	13.315	48.099	0.000	0.00			
	-11.020	1.331	0.000	-19.682	53.098	0.000	-0.00			
7.119	45.148	8.710	-23.290	10.478	40.751	0.000	0.00			
	-9.975	0.670	0.000	-23.290	45.148	0.000	-0.00			
8.136	33.256	6.165	-25.835	7.891	30.959	0.000	0.00			
	-10.442	0.000	-1.744	-26.598	32.891	0.000	-0.00			
9.153	20.099	5.626	-26.374	5.626	20.099	0.000	0.00			
	-13.470	0.000	-14.319	-29.426	18.101	0.000	-0.00			
6	10.170	9.836	3.754	-2.460	30.308	8.646	0.000	0.00		
		-29.721	5.683	-17.441	-31.571	3.113	0.000	0.00		
	0.633	19.952	27.200	-4.800	27.793	19.372	0.000	0.00		
		-26.741	0.359	0.000	-5.583	2.580	0.000	-0.00		
	1.267	28.601	24.530	-7.470	25.048	22.236	0.000	0.00		
		-26.514	0.359	0.000	-7.470	28.601	0.000	-0.00		
	1.900	34.985	21.632	-10.368	22.500	30.125	0.000	0.00		
		-26.314	0.316	0.000	-10.368	34.985	0.000	-0.00		
	2.533	38.560	18.608	-13.392	19.648	35.821	0.000	0.00		
		-26.113	0.316	0.000	-13.392	38.560	0.000	-0.00		
3.167	39.240	16.536	-15.464	16.570	38.699	0.000	0.00			
	-25.913	0.316	0.000	-16.496	38.454	0.000	-0.00			
3.800	38.715	13.475	-18.525	13.475	38.715	0.000	0.00			
	-25.925	0.000	-0.051	-19.542	35.575	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		6	4.433	35.103	10.437	-21.563	10.437	35.103	0.000	0.00
		-25.957	0.000	-0.051	-22.360	29.928	0.000	-0.00		
	5.066	28.687	7.529	-24.471	7.529	28.687	0.000	0.00		
		-25.997	0.000	-0.093	-24.916	28.410	0.000	-0.00		
	5.700	20.018	4.854	-27.146	5.683	2.668	0.000	0.00		
		-26.056	0.000	-0.093	-27.789	19.425	0.000	-0.00		
	6.333									
7	0.000	9.906	2.513	-3.838	31.533	3.371	0.000	0.00		
		-29.239	17.731	-5.583	-30.306	8.671	0.000	0.00		
	1.002	19.947	26.331	-5.669	29.379	18.180	0.000	0.00		
		-13.178	14.577	0.000	-5.669	19.947	0.000	-0.00		
	2.003	33.102	25.787	-6.213	26.550	32.742	0.000	0.00		
		-10.479	1.773	0.000	-7.903	30.637	0.000	-0.00		
	3.005	44.786	23.244	-8.756	23.244	44.786	0.000	0.00		
		-10.122	0.000	-0.675	-10.468	40.311	0.000	-0.00		
	4.007	52.582	19.641	-12.359	19.641	52.582	0.000	0.00		
		-11.333	0.000	-1.365	-13.292	47.593	0.000	-0.00		
	5.008	55.119	15.918	-16.082	15.918	55.119	0.000	0.00		
		-12.935	0.000	-1.844	-16.324	54.732	0.000	-0.00		
	6.010	52.111	12.177	-19.823	12.652	50.336	0.000	0.00		
		-14.954	0.000	-2.104	-19.823	52.111	0.000	-0.00		
	7.012	45.712	9.417	-22.583	9.417	45.712	0.000	0.00		
		-17.562	0.000	-2.908	-23.166	43.962	0.000	-0.00		
	8.014	36.051	6.385	-25.615	6.385	36.051	0.000	0.00		
		-20.852	0.000	-3.828	-26.171	31.834	0.000	-0.00		
	9.015	23.040	3.649	-28.351	3.649	23.040	0.000	0.00		
		-25.484	0.000	-5.669	-28.651	17.498	0.000	-0.00		
	10.017									
8	0.000	8.406	1.353	-3.610	31.613	2.786	0.000	0.00		
		-33.090	11.038	-10.468	-31.015	7.162	0.000	0.00		
	1.017	21.035	26.196	-5.804	29.229	19.496	0.000	0.00		
		-24.324	5.829	0.000	-5.804	21.035	0.000	-0.00		
	2.034	34.552	25.610	-6.390	26.352	34.408	0.000	0.00		
		-20.260	3.469	0.000	-8.264	32.872	0.000	-0.00		
	3.051	45.720	23.187	-8.813	23.187	45.720	0.000	0.00		
		-16.934	1.711	0.000	-10.925	42.676	0.000	-0.00		
	4.068	52.232	19.920	-12.080	19.920	52.232	0.000	0.00		
		-15.625	0.589	0.000	-13.843	49.298	0.000	-0.00		
	5.085	53.587	16.707	-15.293	16.707	53.587	0.000	0.00		
		-15.360	0.000	-0.368	-16.740	52.998	0.000	-0.00		
	6.102	52.171	12.175	-19.825	13.609	50.238	0.000	0.00		
		-16.010	0.000	-1.591	-19.825	52.171	0.000	-0.00		
	7.119	46.687	9.079	-22.921	10.713	43.453	0.000	0.00		
		-17.843	0.000	-2.133	-22.921	46.687	0.000	-0.00		
	8.136	36.916	6.737	-25.263	8.073	33.653	0.000	0.00		
		-20.996	0.000	-3.982	-25.903	36.848	0.000	-0.00		
	9.153	24.543	4.145	-27.855	5.653	21.808	0.000	0.00		
		-26.301	0.000	-6.822	-28.610	23.694	0.000	-0.00		
	10.170									
9	0.000	10.645	1.923	-4.357	31.122	6.821	0.000	0.00		
		-35.397	10.769	-12.106	-30.863	8.754	0.000	0.00		
	1.017	23.430	27.849	-4.151	28.879	22.284	0.000	0.00		
		-26.512	7.314	0.000	-6.645	22.633	0.000	-0.00		
	2.034	36.167	25.232	-6.768	26.182	36.023	0.000	0.00		
		-20.568	3.887	0.000	-9.116	33.531	0.000	-0.00		
	3.051	46.461	23.209	-8.791	23.209	46.461	0.000	0.00		
		-17.848	1.769	0.000	-11.698	42.392	0.000	-0.00		
	4.068	52.509	20.116	-11.884	20.116	52.509	0.000	0.00		
		-16.548	0.000	-0.174	-14.345	48.705	0.000	-0.00		
	5.085	53.823	17.026	-14.974	17.026	53.823	0.000	0.00		
		-16.853	0.000	-0.620	-17.086	52.355	0.000	-0.00		
	6.102	52.739	12.235	-19.765	13.990	50.692	0.000	0.00		
		-18.184	0.000	-2.095	-19.765	52.739	0.000	-0.00		
	7.119	49.999	9.691	-22.309	11.244	44.681	0.000	0.00		
		-20.746	0.000	-4.177	-22.309	49.999	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
		9	8.136	44.819	8.094	-24.603	8.744	36.199	0.000	0.00
		-24.994	0.000	-4.177	-24.603	44.819	0.000	-0.00		
	9.153	31.536	0.000	-25.054	5.692	20.694	0.000	0.00		
		-31.618	0.000	-7.209	-29.521	17.427	0.000	-0.00		
	10.170									
10	0.000	20.724	2.585	-9.642	31.985	0.000	-0.174	0.00		
		-41.027	15.084	-11.127	-31.978	0.000	-0.151	0.00		
	1.017	21.659	29.634	-2.366	30.266	15.868	0.000	0.00		
		-27.729	10.141	0.000	-9.642	10.918	0.000	-0.00		
	2.034	36.065	27.567	-4.433	28.070	31.977	0.000	0.00		
		-20.609	3.469	0.000	-9.642	1.112	0.000	-0.00		
	3.051	48.436	25.196	-6.804	25.461	46.548	0.000	0.00		
		-20.936	0.000	-4.663	-9.642	0.000	-8.694	-0.00		
	4.068	58.012	22.493	-9.507	22.632	57.164	0.000	0.00		
		-28.238	0.000	-8.046	-9.642	0.000	-18.499	-0.00		
	5.085	65.008	19.216	-12.784	19.830	61.885	0.000	0.00		
		-36.421	0.000	-8.046	-12.784	65.008	0.000	-0.00		
	6.102	66.385	15.681	-16.319	16.822	61.745	0.000	0.00		
		-44.603	0.000	-8.046	-16.319	66.385	0.000	-0.00		
	7.119	61.200	11.941	-20.059	13.593	56.161	0.000	0.00		
		-52.786	0.000	-8.046	-20.059	61.200	0.000	-0.00		
	8.136	48.722	8.046	-23.954	10.141	44.462	0.000	0.00		
		-60.969	0.000	-8.046	-23.954	48.722	0.000	-0.00		
	9.153	28.426	4.049	-27.951	6.460	25.974	0.000	0.00		
		-69.152	0.000	-8.046	-27.951	28.426	0.000	-0.00		
	10.170									
11	0.000	0.000	0.000	-16.319	32.000	0.000	-77.334	0.00		
		-77.334	32.000	-9.642	-31.959	0.000	0.000	0.00		
	0.242	0.000	0.000	-0.000	32.000	0.000	-69.601	0.00		
		-69.601	32.000	0.000	-0.000	0.000	0.000	-0.00		
	0.483	0.000	0.000	-0.000	32.000	0.000	-61.867	0.00		
		-61.867	32.000	0.000	-0.000	0.000	0.000	-0.00		
	0.725	0.000	0.000	-0.000	32.000	0.000	-54.134	0.00		
		-54.134	32.000	0.000	-0.000	0.000	0.000	-0.00		
	0.967	0.000	0.000	-0.000	32.000	0.000	-46.401	0.00		
		-46.401	32.000	0.000	-0.000	0.000	0.000	-0.00		
	1.208	0.000	0.000	-0.000	32.000	0.000	-38.667	0.00		
		-38.667	32.000	0.000	-0.000	0.000	0.000	-0.00		
	1.450	0.000	0.000	-0.000	32.000	0.000	-30.934	0.00		
		-30.934	32.000	0.000	-0.000	0.000	0.000	-0.00		
	1.692	0.000	0.000	-0.000	32.000	0.000	-23.200	0.00		
		-23.200	32.000	0.000	-0.000	0.000	0.000	-0.00		
	1.933	0.000	0.000	-0.000	32.000	0.000	-15.467	0.00		
		-15.467	32.000	0.000	-0.000	0.000	0.000	-0.00		
	2.175	0.000	32.000	0.000	32.000	0.000	-7.733	0.00		
		-7.733	32.000	0.000	-0.000	0.000	-0.000	-0.00		
	2.417	0.000	0.000	0.000	32.000	0.000	0.000	0.00		
		-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00		

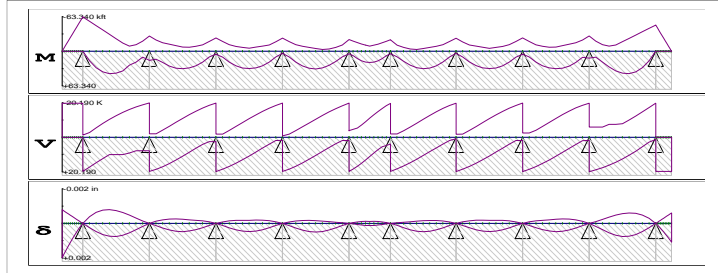
Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.236	-44.635
3	16.022	-32.126
4	5.299	-27.795
5	3.764	-30.228
6	6.345	-28.680
7	6.475	-28.423
8	3.787	-30.292
9	5.302	-27.880
10	12.226	-32.126
11	2.235	-41.642
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 2F1  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	0.317	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-6.334	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	0.633	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-12.668	0.000	0.000	-20.000	-20.000	0.000	0.000	-6.334	-0.00	-0.00
	0.950	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-19.002	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.267	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-25.336	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.583	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-31.670	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
	1.900	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
		-38.004	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00
2.217	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-44.338	0.000	0.000	-20.000	-20.000	0.000	0.000	-6.334	-0.00	-0.00	
2.534	0.000	0.000	0.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-50.672	0.000	0.000	-20.000	-20.000	0.000	0.000	0.000	-0.00	-0.00	
2.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-57.006	0.000	0.000	-20.000	-20.000	0.000	0.000	-6.334	-0.00	-0.00	
3.167											
2	0.000	0.000	0.000	-1.364	20.050	0.000	-0.000	0.000	-0.063	0.00	0.00
		-63.340	10.191	-20.000	-20.000	0.000	0.000	0.000	0.000	0.00	0.00
	1.017	17.766	17.469	-2.531	17.469	17.766	0.000	17.766	0.000	0.00	0.00
		-55.309	7.897	0.000	-2.863	17.428	0.000	17.428	0.000	-0.00	-0.00
	2.034	30.451	14.971	-5.029	14.971	30.451	0.000	30.451	0.000	0.00	0.00
		-47.277	7.897	0.000	-5.630	29.228	0.000	29.228	0.000	-0.00	-0.00
	3.051	38.250	12.537	-7.463	12.537	38.250	0.000	38.250	0.000	0.00	0.00
		-39.246	7.897	0.000	-8.210	35.972	0.000	35.972	0.000	-0.00	-0.00
	4.068	41.491	10.199	-9.801	10.199	41.491	0.000	41.491	0.000	0.00	0.00
		-31.215	7.897	0.000	-10.590	38.281	0.000	38.281	0.000	-0.00	-0.00
	5.085	40.630	7.990	-12.010	10.191	0.000	-11.521	0.000	-11.521	0.00	0.00
		-23.183	7.897	0.000	-12.758	36.823	0.000	36.823	0.000	-0.00	-0.00
	6.102	36.258	5.942	-14.058	10.191	0.000	-1.157	0.000	-1.157	0.00	0.00
		-15.152	7.897	0.000	-14.704	32.315	0.000	32.315	0.000	-0.00	-0.00
7.119	25.854	7.679	-12.321	9.227	8.069	0.000	8.069	0.000	0.00	0.00	
	-9.712	0.000	-1.364	-16.415	25.521	0.000	25.521	0.000	-0.00	-0.00	
8.136	20.254	4.780	-15.220	7.897	0.911	0.000	0.911	0.000	0.00	0.00	
	-12.144	0.000	-5.452	-17.879	17.253	0.000	17.253	0.000	-0.00	-0.00	
9.153	11.113	2.140	-17.860	7.897	8.942	0.000	8.942	0.000	0.00	0.00	
	-18.624	0.000	-6.665	-19.085	8.371	0.000	8.371	0.000	-0.00	-0.00	
10.170											
3	0.000	16.973	7.897	-2.117	20.087	0.000	-0.298	0.000	-0.298	0.00	0.00
		-28.123	7.501	-13.100	-20.190	0.000	-0.537	0.000	-0.537	0.00	0.00
	1.017	14.821	0.000	-2.117	18.842	8.152	0.000	8.152	0.000	0.00	0.00
		-20.825	6.564	0.000	-2.117	14.821	0.000	14.821	0.000	-0.00	-0.00
	2.034	20.828	15.773	-4.227	17.279	16.627	0.000	16.627	0.000	0.00	0.00
		-15.621	2.610	0.000	-4.227	20.828	0.000	20.828	0.000	-0.00	-0.00
	3.051	27.648	13.466	-6.534	15.433	23.852	0.000	23.852	0.000	0.00	0.00
		-12.967	2.610	0.000	-6.534	27.648	0.000	27.648	0.000	-0.00	-0.00
4.068	31.448	11.141	-8.859	13.365	28.968	0.000	28.968	0.000	0.00	0.00	
	-10.312	2.610	0.000	-8.859	31.448	0.000	31.448	0.000	-0.00	-0.00	
5.085	32.099	8.854	-11.146	11.141	31.371	0.000	31.371	0.000	0.00	0.00	
	-7.658	2.610	0.000	-11.146	32.099	0.000	32.099	0.000	-0.00	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)	
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)	
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)	
3	6.102	30.720	8.822	-11.178	8.822	30.720	0.000	0.00	
		-7.456	0.000	-1.833	-13.338	29.705	0.000	-0.00	
	7.119	26.930	6.474	-13.526	6.474	26.930	0.000	0.00	
		-9.320	0.000	-1.833	-15.379	24.598	0.000	-0.00	
	8.136	20.173	4.159	-15.841	4.159	20.173	0.000	0.00	
		-12.065	0.000	-4.986	-17.212	17.340	0.000	-0.00	
	9.153	10.883	1.941	-18.059	2.610	2.960	0.000	0.00	
		-18.065	0.000	-6.200	-18.780	8.724	0.000	-0.00	
	10.170								
		0.000	5.614	2.610	-0.702	20.088	0.000	-0.316	0.00
4	0.000	-24.718	7.072	-11.520	-20.097	0.000	-0.337	0.00	
		10.904	18.071	-1.929	18.759	8.705	0.000	0.00	
	1.017	-18.257	6.192	0.000	-1.937	2.178	0.000	-0.00	
		20.224	15.882	-4.118	17.159	17.286	0.000	0.00	
	2.034	-12.216	4.969	0.000	-4.118	20.224	0.000	-0.00	
		27.064	13.601	-6.399	15.293	24.452	0.000	0.00	
	3.051	-9.122	1.845	0.000	-6.399	27.064	0.000	-0.00	
		30.995	11.285	-8.715	13.221	29.413	0.000	0.00	
	4.068	-7.246	1.845	0.000	-8.715	30.995	0.000	-0.00	
		31.830	8.994	-11.006	11.005	31.623	0.000	0.00	
5.085	-5.703	0.000	-1.937	-11.006	31.830	0.000	-0.00		
	30.788	8.705	-11.295	8.705	30.788	0.000	0.00		
6.102	-7.673	0.000	-1.937	-13.213	29.622	0.000	-0.00		
	26.859	6.382	-13.618	6.382	26.859	0.000	0.00		
7.119	-9.644	0.000	-1.937	-15.278	24.664	0.000	-0.00		
	20.038	4.098	-15.902	4.098	20.038	0.000	0.00		
8.136	-11.701	0.000	-4.893	-17.140	17.489	0.000	-0.00		
	10.773	1.914	-18.086	1.914	10.773	0.000	0.00		
9.153	-17.482	0.000	-5.901	-18.741	8.867	0.000	-0.00		
	10.170								
5	0.000	4.009	1.845	-0.521	20.068	0.000	-0.274	0.00	
		-24.277	6.949	-11.383	-20.091	0.000	-0.327	0.00	
	1.017	10.826	18.117	-1.883	18.687	8.819	0.000	0.00	
		-17.960	6.066	0.000	-1.883	10.826	0.000	-0.00	
	2.034	20.167	16.006	-3.994	17.007	17.350	0.000	0.00	
		-12.086	4.848	0.000	-3.994	20.167	0.000	-0.00	
	3.051	27.194	13.802	-6.198	15.059	24.294	0.000	0.00	
		-9.152	1.970	0.000	-6.198	27.194	0.000	-0.00	
	4.068	31.458	11.553	-8.447	12.916	28.879	0.000	0.00	
		-7.149	1.970	0.000	-8.447	31.458	0.000	-0.00	
5.085	32.704	9.308	-10.692	10.647	30.620	0.000	0.00		
	-5.146	1.970	0.000	-10.692	32.704	0.000	-0.00		
6.102	30.874	7.114	-12.886	8.323	29.316	0.000	0.00		
	-3.469	0.000	-0.878	-12.886	30.874	0.000	-0.00		
7.119	26.115	5.021	-14.979	6.014	25.056	0.000	0.00		
	-4.362	0.000	-0.878	-14.979	26.115	0.000	-0.00		
8.136	18.970	3.111	-16.889	3.791	18.214	0.000	0.00		
	-7.085	0.000	-3.530	-16.889	18.970	0.000	-0.00		
9.153	10.488	1.491	-18.509	1.970	2.866	0.000	0.00		
	-11.494	0.000	-8.447	-18.509	10.488	0.000	-0.00		
6	10.170								
		0.000	4.869	1.970	-0.931	20.042	0.000	-0.346	0.00
	0.000	-21.759	5.553	-11.023	-20.098	0.000	-0.391	0.00	
		8.378	16.432	-3.568	18.658	6.189	0.000	0.00	
	0.633	-18.695	4.794	0.000	-4.704	5.538	0.000	-0.00	
		13.725	14.650	-5.350	17.035	11.929	0.000	0.00	
	1.267	-15.921	4.024	0.000	-5.453	6.387	0.000	-0.00	
		17.762	12.738	-7.262	15.235	16.464	0.000	0.00	
	1.900	-13.430	3.241	0.000	-7.262	17.762	0.000	-0.00	
		20.184	10.747	-9.253	13.311	19.453	0.000	0.00	
2.533	-11.378	3.241	0.000	-9.253	20.184	0.000	-0.00		
	20.814	8.727	-11.273	11.312	20.686	0.000	0.00		
3.167	-9.633	2.734	0.000	-11.273	20.814	0.000	-0.00		
	20.082	9.291	-10.709	9.291	20.082	0.000	0.00		
3.800	-11.245	0.000	-3.109	-13.269	19.606	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.433	17.689	7.299	-12.701	7.299	17.689	0.000	0.00		
		-13.214	0.000	-3.109	-15.191	16.642	0.000	-0.00		
	5.066	13.686	5.387	-14.613	5.553	6.375	0.000	0.00		
		-15.626	0.000	-3.943	-16.989	12.133	0.000	-0.00		
	5.700	8.382	3.606	-16.394	4.794	5.595	0.000	0.00		
-18.298		0.000	-4.349	-18.610	6.420	0.000	-0.00			
7	6.333									
	0.000	4.874	0.931	-2.011	20.000	0.000	-0.101	0.00		
		-21.271	12.240	-4.704	-19.993	0.000	-0.088	0.00		
	1.002	10.453	18.494	-1.506	18.494	10.453	0.000	0.00		
		-11.236	8.447	0.000	-2.011	2.860	0.000	-0.00		
	2.003	18.814	16.873	-3.127	16.873	18.814	0.000	0.00		
		-7.125	3.435	0.000	-3.851	18.029	0.000	-0.00		
	3.005	25.848	14.964	-5.036	14.964	25.848	0.000	0.00		
		-4.370	0.890	0.000	-6.056	24.731	0.000	-0.00		
	4.007	30.528	12.873	-7.127	12.873	30.528	0.000	0.00		
		-3.478	0.890	0.000	-8.350	28.911	0.000	-0.00		
	5.008	32.316	10.684	-9.316	10.684	32.316	0.000	0.00		
		-5.196	0.000	-2.011	-10.661	30.195	0.000	-0.00		
	6.010	31.069	8.447	-11.553	8.447	31.069	0.000	0.00		
		-7.210	0.000	-2.011	-12.921	28.489	0.000	-0.00		
7.012	26.856	6.211	-13.789	6.211	26.856	0.000	0.00			
	-9.224	0.000	-2.011	-15.058	23.982	0.000	-0.00			
8.014	19.935	4.024	-15.976	4.024	19.935	0.000	0.00			
	-12.209	0.000	-4.784	-17.002	17.143	0.000	-0.00			
9.015	10.761	1.935	-18.065	1.935	10.761	0.000	0.00			
	-17.974	0.000	-6.011	-18.684	8.725	0.000	-0.00			
8	10.017									
	0.000	4.037	0.532	-1.848	20.091	0.000	-0.330	0.00		
		-24.107	11.199	-6.978	-20.020	0.000	-0.353	0.00		
	1.017	10.727	18.093	-1.907	18.720	9.018	0.000	0.00		
		-17.207	5.862	0.000	-1.907	10.727	0.000	-0.00		
	2.034	19.974	15.912	-4.088	17.119	17.613	0.000	0.00		
		-11.496	4.805	0.000	-4.088	19.974	0.000	-0.00		
	3.051	26.796	13.630	-6.370	15.258	24.760	0.000	0.00		
		-9.442	1.897	0.000	-6.370	26.796	0.000	-0.00		
	4.068	30.736	11.308	-8.692	13.197	29.689	0.000	0.00		
		-7.513	1.897	0.000	-8.692	30.736	0.000	-0.00		
	5.085	31.871	10.992	-9.008	10.992	31.871	0.000	0.00		
		-5.584	1.897	0.000	-10.993	31.587	0.000	-0.00		
	6.102	31.015	8.705	-11.295	8.705	31.015	0.000	0.00		
		-7.240	0.000	-1.848	-13.211	29.393	0.000	-0.00		
7.119	27.070	6.392	-13.608	6.392	27.070	0.000	0.00			
	-9.119	0.000	-1.848	-15.285	24.445	0.000	-0.00			
8.136	20.224	4.113	-15.887	4.113	20.224	0.000	0.00			
	-12.216	0.000	-4.965	-17.154	17.286	0.000	-0.00			
9.153	10.902	1.928	-18.072	1.928	10.902	0.000	0.00			
	-18.253	0.000	-6.188	-18.757	8.707	0.000	-0.00			
9	10.170									
	0.000	5.617	0.703	-2.610	20.097	0.000	-0.337	0.00		
		-24.712	11.520	-7.069	-20.087	0.000	-0.315	0.00		
	1.017	10.880	18.059	-1.941	18.780	8.728	0.000	0.00		
		-18.045	6.198	0.000	-2.610	2.962	0.000	-0.00		
	2.034	20.169	15.842	-4.158	17.211	17.345	0.000	0.00		
		-12.053	4.984	0.000	-4.158	20.169	0.000	-0.00		
	3.051	26.925	13.527	-6.473	15.378	24.603	0.000	0.00		
		-9.334	1.836	0.000	-6.473	26.925	0.000	-0.00		
	4.068	30.717	11.178	-8.822	13.337	29.709	0.000	0.00		
		-7.467	1.836	0.000	-8.822	30.717	0.000	-0.00		
	5.085	32.101	11.145	-8.855	11.145	32.101	0.000	0.00		
		-7.657	0.000	-2.610	-11.140	31.369	0.000	-0.00		
	6.102	31.449	8.858	-11.142	8.858	31.449	0.000	0.00		
		-10.312	0.000	-2.610	-13.365	28.966	0.000	-0.00		
7.119	27.649	6.533	-13.467	6.533	27.649	0.000	0.00			
	-12.966	0.000	-2.610	-15.432	23.852	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR (max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	8.136	20.828	4.227	-15.773	4.227	20.828	0.000	0.00		
		-15.621	0.000	-2.610	-17.279	16.627	0.000	-0.00		
	9.153	11.344	1.994	-18.006	1.994	11.344	0.000	0.00		
10	10.170	-20.825	0.000	-6.564	-18.842	8.152	0.000	-0.00		
		0.000	12.952	1.615	-6.026	20.190	0.000	-0.537	0.00	
	1.017	-28.122	13.100	-7.501	-20.087	0.000	-0.298	0.00		
		11.113	17.860	-2.140	19.085	8.372	0.000	0.00		
	2.034	-18.623	6.665	0.000	-6.026	6.824	0.000	-0.00		
		20.254	15.220	-4.780	17.879	17.254	0.000	0.00		
	3.051	-12.143	5.451	0.000	-6.026	0.695	0.000	-0.00		
		29.093	15.913	-4.087	16.415	25.522	0.000	0.00		
	4.068	-9.713	1.364	0.000	-7.682	6.358	0.000	-0.00		
		36.258	14.058	-5.942	14.704	32.316	0.000	0.00		
	5.085	-11.562	0.000	-6.026	-7.682	0.000	-1.456	-0.00		
		40.630	12.010	-7.990	12.758	36.823	0.000	0.00		
	6.102	-17.691	0.000	-6.026	-7.990	40.630	0.000	-0.00		
		41.490	9.801	-10.199	10.590	38.281	0.000	0.00		
	7.119	-23.819	0.000	-6.026	-10.199	41.490	0.000	-0.00		
38.250		7.463	-12.537	8.210	35.972	0.000	0.00			
8.136	-29.948	0.000	-6.026	-12.537	38.250	0.000	-0.00			
	30.451	5.029	-14.971	5.630	29.228	0.000	0.00			
9.153	-36.077	0.000	-6.026	-14.971	30.451	0.000	-0.00			
	17.766	2.531	-17.469	2.863	17.428	0.000	0.00			
11	10.170	-42.205	0.000	-6.026	-17.469	17.766	0.000	-0.00		
		0.000	0.000	-10.199	20.000	0.000	-48.334	0.00		
	0.242	-48.334	20.000	-7.682	-20.050	0.000	0.000	0.00		
		0.000	0.000	-0.000	20.000	0.000	-43.501	0.00		
	0.483	-43.501	20.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	0.000	-0.000	20.000	0.000	-38.667	0.00		
	0.725	-38.667	20.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	0.000	-0.000	20.000	0.000	-33.834	0.00		
	0.967	-33.834	20.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	0.000	-0.000	20.000	0.000	-29.000	0.00		
	1.208	-29.000	20.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	0.000	-0.000	20.000	0.000	-24.167	0.00		
	1.450	-24.167	20.000	0.000	-0.000	0.000	0.000	-0.00		
		0.000	0.000	-0.000	20.000	0.000	-19.334	0.00		
	1.692	-19.334	20.000	0.000	-0.000	0.000	0.000	-0.00		
0.000		0.000	-0.000	20.000	0.000	-14.500	0.00			
1.933	-14.500	20.000	0.000	-0.000	0.000	0.000	-0.00			
	0.000	0.000	-0.000	20.000	0.000	-9.667	0.00			
2.175	-9.667	20.000	0.000	-0.000	0.000	0.000	-0.00			
	0.000	20.000	0.000	20.000	0.000	-4.833	0.00			
2.417	-4.833	20.000	0.000	-0.000	0.000	-0.000	-0.00			
	0.000	0.000	-0.000	20.000	0.000	0.000	0.00			
		-0.000	0.000	0.000	-0.000	0.000	-0.000	-0.00		

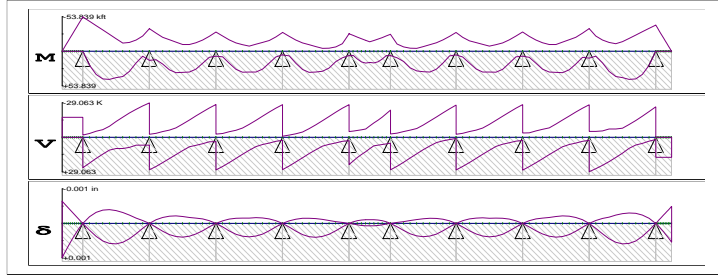
Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.364	-30.191
3	10.014	-21.691
4	3.312	-20.792
5	2.365	-20.628
6	3.856	-20.213
7	3.962	-20.025
8	2.380	-20.568
9	3.314	-20.788
10	7.642	-21.691
11	1.364	-27.682
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 3F1  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+) (-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+) (-) (kft)		DEFLECT (max/min) (in)	
1	0.000	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	-0.00	-0.00
	0.317	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-5.384	0.000	0.000	-17.000	-17.000	0.000	0.000	-2.256	-0.00	-0.00
	0.633	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-10.768	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00	-0.00
	0.950	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-16.152	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00	-0.00
	1.267	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-21.536	0.000	0.000	-17.000	-17.000	0.000	0.000	-1.119	-0.00	-0.00
	1.583	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-26.919	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00	-0.00
	1.900	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00
		-32.303	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	-0.00
2.217	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-37.687	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	-0.00	
2.534	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-43.071	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00	-0.00	
2.850	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-48.455	0.000	0.000	-17.000	-17.000	0.000	0.000	-5.384	-0.00	-0.00	
3.167											
2	0.000	0.000	0.000	-1.968	25.758	0.000	-0.000	0.00	0.00	0.00	0.00
		-53.839	21.949	-17.000	-17.000	0.000	-0.054	0.00	-0.00	0.00	0.00
	1.017	22.132	21.762	0.000	21.762	22.132	0.000	0.00	0.00	0.00	0.00
		-47.012	6.712	0.000	-3.365	8.782	0.000	-0.00	-0.00	-0.00	-0.00
	2.034	36.384	17.888	0.000	17.888	36.384	0.000	0.00	0.00	0.00	0.00
		-40.186	6.712	0.000	-5.153	13.928	0.000	-0.00	-0.00	-0.00	-0.00
	3.051	43.415	14.230	-2.770	14.230	43.415	0.000	0.00	0.00	0.00	0.00
		-33.359	6.712	0.000	-6.618	16.420	0.000	-0.00	-0.00	-0.00	-0.00
	4.068	44.111	10.844	-6.156	10.844	44.111	0.000	0.00	0.00	0.00	0.00
		-26.532	6.712	0.000	-9.422	31.985	0.000	-0.00	-0.00	-0.00	-0.00
	5.085	41.315	4.498	-12.502	9.465	0.000	-5.711	0.00	0.00	0.00	0.00
		-19.706	6.712	0.000	-13.401	36.746	0.000	-0.00	-0.00	-0.00	-0.00
	6.102	39.613	0.636	-16.364	9.465	3.915	0.000	0.00	0.00	0.00	0.00
		-12.879	6.712	0.000	-17.140	34.882	0.000	-0.00	-0.00	-0.00	-0.00
7.119	31.626	0.000	-20.006	8.558	11.950	0.000	0.00	0.00	0.00	0.00	
	-14.007	0.000	-1.968	-20.608	27.339	0.000	-0.00	-0.00	-0.00	-0.00	
8.136	18.470	0.000	-23.372	6.712	0.774	0.000	0.00	0.00	0.00	0.00	
	-17.667	0.000	-5.523	-23.775	15.191	0.000	-0.00	-0.00	-0.00	-0.00	
9.153	7.983	2.445	-9.555	6.712	7.601	0.000	0.00	0.00	0.00	0.00	
	-23.965	0.000	-6.618	-26.611	0.000	-0.369	-0.00	-0.00	-0.00	-0.00	
10.170											
3	0.000	14.427	6.712	-1.799	27.538	0.000	-14.288	0.00	0.00	0.00	0.00
		-35.581	7.137	-20.385	-29.063	0.000	-18.136	0.00	0.00	0.00	0.00
	1.017	13.384	0.000	-1.910	24.662	1.814	0.000	0.00	0.00	0.00	0.00
		-28.383	6.860	0.000	-3.396	9.043	0.000	-0.00	-0.00	-0.00	-0.00
	2.034	20.030	19.569	0.000	21.459	14.989	0.000	0.00	0.00	0.00	0.00
		-21.952	3.668	0.000	-4.905	12.497	0.000	-0.00	-0.00	-0.00	-0.00
	3.051	29.226	16.095	-0.905	18.076	24.286	0.000	0.00	0.00	0.00	0.00
		-18.221	3.668	0.000	-6.178	14.293	0.000	-0.00	-0.00	-0.00	-0.00
4.068	33.549	12.672	-4.328	14.630	29.127	0.000	0.00	0.00	0.00	0.00	
	-14.491	3.668	0.000	-7.977	26.289	0.000	-0.00	-0.00	-0.00	-0.00	
5.085	33.074	9.410	-7.590	11.241	29.415	0.000	0.00	0.00	0.00	0.00	
	-10.761	3.668	0.000	-11.239	30.415	0.000	-0.00	-0.00	-0.00	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR(max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT(max) (min) (in)
3	6.102	32.689	4.237	-12.763	8.025	25.531	0.000	0.00		
		-10.757	0.000	-2.644	-14.662	30.142	0.000	-0.00		
	7.119	28.137	0.846	-16.154	6.860	13.479	0.000	0.00		
		-13.446	0.000	-2.644	-18.137	25.122	0.000	-0.00		
	8.136	18.889	0.000	-19.599	5.520	12.458	0.000	0.00		
		-17.578	0.000	-5.222	-21.552	15.454	0.000	-0.00		
9.153	9.640	3.907	-8.093	3.907	9.640	0.000	0.00			
		-23.406	0.000	-6.178	-24.800	1.682	0.000	-0.00		
4	10.170									
	0.000	7.889	3.668	-0.987	27.608	0.000	-14.967	0.00		
		-30.240	6.466	-17.905	-27.741	0.000	-15.303	0.00		
	1.017	8.949	8.702	-3.298	24.630	1.873	0.000	0.00		
		-23.792	6.199	0.000	-3.298	8.949	0.000	-0.00		
	2.034	18.967	19.779	0.000	21.350	15.436	0.000	0.00		
		-17.913	5.251	0.000	-4.762	12.380	0.000	-0.00		
	3.051	28.366	16.300	-0.700	17.916	24.856	0.000	0.00		
		-13.136	2.656	0.000	-6.005	14.268	0.000	-0.00		
	4.068	32.945	12.850	-4.150	14.443	29.640	0.000	0.00		
		-10.435	2.656	0.000	-7.842	25.941	0.000	-0.00		
	5.085	32.692	9.544	-7.456	11.051	29.775	0.000	0.00		
		-8.239	0.000	-2.799	-11.050	30.059	0.000	-0.00		
	6.102	32.700	4.124	-12.876	7.855	25.725	0.000	0.00		
		-11.086	0.000	-2.799	-14.453	29.928	0.000	-0.00		
7.119	28.056	0.683	-16.317	6.199	14.036	0.000	0.00			
	-13.932	0.000	-2.799	-17.933	25.093	0.000	-0.00			
8.136	18.642	0.000	-19.787	4.937	12.369	0.000	0.00			
	-16.794	0.000	-5.071	-21.377	15.569	0.000	-0.00			
9.153	9.118	3.444	-8.556	3.444	9.118	0.000	0.00			
		-22.376	0.000	-6.005	-24.669	1.835	0.000	-0.00		
5	10.170									
	0.000	5.774	2.656	-0.750	27.327	0.000	-14.402	0.00		
		-29.641	6.318	-17.700	-27.666	0.000	-15.256	0.00		
	1.017	7.416	10.057	-1.943	24.236	2.320	0.000	0.00		
		-23.357	6.059	0.000	-1.943	7.416	0.000	-0.00		
	2.034	18.845	20.183	0.000	20.863	15.524	0.000	0.00		
		-17.648	5.145	0.000	-3.097	12.181	0.000	-0.00		
	3.051	28.555	16.592	-0.408	17.371	24.416	0.000	0.00		
		-13.199	2.840	0.000	-4.555	18.768	0.000	-0.00		
	4.068	33.153	12.994	-4.006	13.895	28.651	0.000	0.00		
		-10.310	2.840	0.000	-7.406	26.732	0.000	-0.00		
	5.085	32.695	9.564	-7.436	10.571	28.432	0.000	0.00		
		-7.422	2.840	0.000	-10.602	31.310	0.000	-0.00		
	6.102	31.431	2.947	-14.053	7.532	24.508	0.000	0.00		
		-4.533	2.840	0.000	-14.053	31.431	0.000	-0.00		
7.119	26.426	0.000	-17.650	6.059	13.615	0.000	0.00			
	-4.933	0.000	-0.993	-17.650	26.426	0.000	-0.00			
8.136	16.304	0.000	-21.243	4.843	12.053	0.000	0.00			
	-6.805	0.000	-2.919	-21.243	16.304	0.000	-0.00			
9.153	10.367	1.476	-10.524	3.419	9.139	0.000	0.00			
		-11.852	0.000	-11.102	-24.654	1.882	0.000	-0.00		
6	10.170									
	0.000	7.021	2.840	-1.342	23.012	0.000	-5.998	0.00		
		-27.539	4.350	-19.022	-27.678	0.000	-15.395	0.00		
	0.633	6.526	6.615	-5.385	20.100	3.255	0.000	0.00		
		-24.785	4.350	0.000	-5.385	6.526	0.000	-0.00		
	1.267	12.362	15.996	-1.004	17.103	9.906	0.000	0.00		
		-22.106	3.886	0.000	-5.909	7.773	0.000	-0.00		
	1.900	16.853	13.001	-3.999	14.564	8.619	0.000	0.00		
		-19.645	3.886	0.000	-6.480	8.949	0.000	-0.00		
	2.533	18.534	10.093	-6.907	12.243	14.030	0.000	0.00		
		-17.216	3.825	0.000	-7.103	9.880	0.000	-0.00		
	3.167	17.537	7.344	-9.656	9.690	17.429	0.000	0.00		
		-14.998	3.466	0.000	-9.656	17.537	0.000	-0.00		
	3.800	18.434	6.943	-10.057	7.274	9.618	0.000	0.00		
			-16.899	0.000	-3.634	-12.207	14.154	0.000	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.433	16.767	4.041	-12.959	6.662	8.794	0.000	0.00		
		-19.202	0.000	-3.640	-14.523	8.772	0.000	-0.00		
	5.066	12.301	1.051	-15.949	6.096	7.743	0.000	0.00		
		-21.507	0.000	-3.640	-17.054	10.151	0.000	-0.00		
	5.700	6.886	1.493	-10.507	5.573	6.630	0.000	0.00		
-24.075		0.000	-4.165	-20.057	3.507	0.000	-0.00			
7	6.333	7.029	1.342	-2.899	27.551	0.000	-14.917	0.00		
		-26.713	18.802	-4.165	-22.974	0.000	-5.751	0.00		
	1.002	10.508	10.483	-1.517	24.514	2.042	0.000	0.00		
		-11.393	10.755	0.000	-3.564	9.206	0.000	-0.00		
	2.003	16.179	21.106	0.000	21.106	16.179	0.000	0.00		
		-6.815	2.797	0.000	-4.933	11.921	0.000	-0.00		
	3.005	26.065	17.522	0.000	17.522	26.065	0.000	0.00		
		-4.957	1.010	0.000	-6.108	13.401	0.000	-0.00		
	4.007	30.913	13.939	-3.061	13.939	30.913	0.000	0.00		
		-4.589	0.000	-2.899	-7.511	23.951	0.000	-0.00		
	5.008	32.119	7.492	-9.508	10.506	30.719	0.000	0.00		
		-7.493	0.000	-2.899	-10.516	27.816	0.000	-0.00		
	6.010	32.590	4.082	-12.918	7.336	26.155	0.000	0.00		
		-10.398	0.000	-2.899	-13.813	28.076	0.000	-0.00		
	7.012	28.106	0.498	-16.502	4.513	18.279	0.000	0.00		
-13.302		0.000	-2.899	-17.267	23.975	0.000	-0.00			
8.014	18.588	0.000	-20.085	3.105	12.031	0.000	0.00			
	-17.787	0.000	-5.078	-20.744	15.296	0.000	-0.00			
9.015	7.373	1.992	-10.008	1.992	7.373	0.000	0.00			
	-23.311	0.000	-6.108	-24.110	2.357	0.000	-0.00			
8	10.017	5.814	0.766	-2.661	27.653	0.000	-15.157	0.00		
		-29.479	17.680	-6.249	-27.212	0.000	-14.054	0.00		
	1.017	9.121	8.556	-3.444	24.653	1.949	0.000	0.00		
		-21.817	5.925	0.000	-3.444	9.121	0.000	-0.00		
	2.034	18.531	19.806	0.000	21.358	15.682	0.000	0.00		
		-16.349	4.884	0.000	-4.935	12.358	0.000	-0.00		
	3.051	27.963	16.335	-0.665	17.913	25.194	0.000	0.00		
		-13.570	2.726	0.000	-6.196	14.020	0.000	-0.00		
	4.068	32.633	12.893	-4.107	14.432	30.008	0.000	0.00		
		-10.798	2.726	0.000	-7.844	25.682	0.000	-0.00		
	5.085	32.740	7.439	-9.561	11.031	30.115	0.000	0.00		
		-8.026	2.726	0.000	-11.034	29.727	0.000	-0.00		
	6.102	32.981	4.131	-12.869	7.825	25.973	0.000	0.00		
		-10.425	0.000	-2.661	-14.425	29.604	0.000	-0.00		
	7.119	28.385	0.680	-16.320	5.925	14.340	0.000	0.00		
-13.132		0.000	-2.661	-17.897	24.839	0.000	-0.00			
8.136	18.964	0.000	-19.799	4.694	12.373	0.000	0.00			
	-17.913	0.000	-5.249	-21.333	15.438	0.000	-0.00			
9.153	8.890	3.246	-8.754	3.246	8.890	0.000	0.00			
	-23.789	0.000	-6.196	-24.616	1.888	0.000	-0.00			
9	10.170	7.893	0.988	-3.668	27.742	0.000	-15.309	0.00		
		-30.232	17.904	-6.462	-27.598	0.000	-14.946	0.00		
	1.017	9.640	8.093	-3.907	24.800	1.683	0.000	0.00		
		-23.372	6.173	0.000	-3.907	9.640	0.000	-0.00		
	2.034	18.882	19.601	0.000	21.552	15.457	0.000	0.00		
		-17.550	5.218	0.000	-5.520	12.457	0.000	-0.00		
	3.051	28.130	16.155	-0.845	18.136	25.127	0.000	0.00		
		-13.424	2.640	0.000	-6.860	13.478	0.000	-0.00		
	4.068	32.684	12.764	-4.236	14.661	30.146	0.000	0.00		
		-10.739	2.640	0.000	-8.024	25.528	0.000	-0.00		
	5.085	33.074	7.590	-9.410	11.238	30.418	0.000	0.00		
		-10.760	0.000	-3.668	-11.240	29.412	0.000	-0.00		
	6.102	33.550	4.327	-12.673	7.976	26.291	0.000	0.00		
		-14.490	0.000	-3.668	-14.629	29.125	0.000	-0.00		
	7.119	29.227	0.904	-16.096	6.173	14.298	0.000	0.00		
-18.221		0.000	-3.668	-18.075	24.285	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
9	8.136	20.030	0.000	-19.570	4.900	12.497	0.000	0.00
		-21.952	0.000	-3.668	-21.458	14.989	0.000	-0.00
	9.153	9.613	1.373	0.000	3.393	9.040	0.000	0.00
		-28.383	0.000	-6.860	-24.661	1.815	0.000	-0.00
10	10.170	11.010	1.373	-5.122	29.063	0.000	-18.136	0.00
	0.000	-35.580	20.385	-7.137	-27.538	0.000	-14.286	0.00
		1.017	7.983	9.555	-2.445	26.611	0.000	-0.369
	2.034	-23.962	6.618	0.000	-5.122	5.800	0.000	-0.00
		18.470	23.372	0.000	23.775	15.191	0.000	0.00
	3.051	-17.665	5.522	0.000	-5.425	12.447	0.000	-0.00
		31.625	20.006	0.000	20.608	27.340	0.000	0.00
	4.068	-14.009	1.968	0.000	-7.110	9.531	0.000	-0.00
		39.613	16.364	-0.636	17.140	34.882	0.000	0.00
	5.085	-12.007	1.968	0.000	-7.110	2.300	0.000	-0.00
		41.315	12.503	-4.497	13.401	36.747	0.000	0.00
	6.102	-15.037	0.000	-5.122	-7.783	39.578	0.000	-0.00
		44.111	6.157	-10.843	9.422	31.985	0.000	0.00
	7.119	-20.247	0.000	-5.122	-10.843	44.111	0.000	-0.00
		43.415	2.770	-14.230	6.618	16.421	0.000	0.00
	8.136	-25.456	0.000	-5.122	-14.230	43.415	0.000	-0.00
36.383		0.000	-17.888	5.152	13.928	0.000	0.00	
9.153	-30.665	0.000	-5.122	-17.888	36.383	0.000	-0.00	
	22.132	0.000	-21.762	3.365	8.782	0.000	0.00	
10.170	-35.875	0.000	-5.122	-21.762	22.132	0.000	-0.00	
	0.000	0.000	0.000	-17.636	17.000	0.000	-41.084	0.00
11	0.242	-41.084	17.000	-18.784	-25.758	0.000	0.000	0.00
		0.000	0.000	-0.000	17.000	0.000	-36.976	0.00
	0.483	-36.976	17.000	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	17.000	0.000	-32.867	0.00
	0.725	-32.867	17.000	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	17.000	0.000	-28.759	0.00
	0.967	-28.759	17.000	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	17.000	0.000	-24.650	0.00
	1.208	-24.650	17.000	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	17.000	0.000	-20.542	0.00
	1.450	-20.542	17.000	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	17.000	0.000	-16.434	0.00
	1.692	-16.434	17.000	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	17.000	0.000	-12.325	0.00
	1.933	-12.325	17.000	0.000	-0.000	0.000	0.000	-0.00
		0.000	0.000	-0.000	17.000	0.000	-8.217	0.00
2.175	-8.217	17.000	0.000	-0.000	0.000	0.000	-0.00	
	0.000	17.000	0.000	17.000	0.000	-4.108	0.00	
2.417	-4.108	17.000	0.000	-0.000	0.000	-0.000	-0.00	
	0.000	17.000	0.000	17.000	0.000	0.000	0.00	
		-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.00

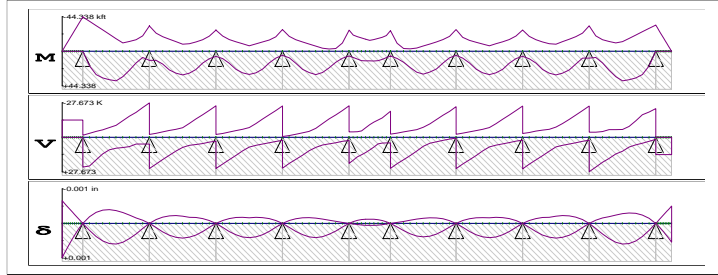
Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.968	-38.949
3	8.512	-31.468
4	4.654	-30.383
5	3.406	-30.608
6	5.514	-29.700
7	5.714	-29.506
8	3.427	-30.522
9	4.657	-30.390
10	6.495	-32.010
11	1.968	-35.784
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 4F1  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (max/min) (kft)		Corresponding Shear (+/-) (K)		SHEAR (max/min) (K)		Corresponding Moment (+/-) (kft)		DEFLECT (max/min) (in)	
		(max)	(min)	Shear (+)	Shear (-)	(max)	(min)	Moment (+)	Moment (-)	(max)	(min)
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	-0.000	0.00	0.00
		-0.000	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	-0.00	-0.00
	0.317	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-4.434	0.000	0.000	-14.000	-14.000	0.000	0.000	-1.858	-0.00	-0.00
	0.633	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-8.868	0.000	0.000	-14.000	-14.000	0.000	0.000	0.000	-0.00	-0.00
	0.950	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-13.301	0.000	0.000	-14.000	-14.000	0.000	0.000	0.000	-0.00	-0.00
	1.267	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-17.735	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.921	-0.00	-0.00
	1.583	0.000	0.000	0.000	-14.000	0.000	0.000	0.000	0.000	0.00	0.00
		-22.169	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
	1.900	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00
		-26.603	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00
2.217	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-31.037	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00	
2.534	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-35.470	0.000	0.000	-14.000	-14.000	0.000	0.000	-4.434	-0.00	-0.00	
2.850	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	0.00	
	-39.904	0.000	0.000	-14.000	-14.000	0.000	0.000	-0.000	-0.00	-0.00	
3.167	0.000	0.000	0.000	-1.785	24.043	0.000	-44.338	0.00	0.00	0.00	
2	0.000	-44.338	24.043	-14.000	-14.000	0.000	-0.044	0.00	0.00	0.00	
	1.017	19.117	18.798	0.000	23.129	0.000	-18.240	0.00	0.00	0.00	
		-38.716	5.528	0.000	-3.306	8.842	0.000	-0.00	-0.00	-0.00	
	2.034	30.144	14.820	0.000	18.163	9.419	0.000	0.00	0.00	0.00	
		-33.094	5.528	0.000	-4.831	14.582	0.000	-0.00	-0.00	-0.00	
	3.051	34.565	11.329	-2.671	13.375	27.522	0.000	0.00	0.00	0.00	
		-27.472	5.528	0.000	-6.133	17.899	0.000	-0.00	-0.00	-0.00	
	4.068	36.796	8.811	-5.189	10.043	8.178	0.000	0.00	0.00	0.00	
		-21.850	5.528	0.000	-7.926	25.661	0.000	-0.00	-0.00	-0.00	
	5.085	38.177	4.521	-9.479	8.792	19.087	0.000	0.00	0.00	0.00	
		-16.228	5.528	0.000	-9.695	37.080	0.000	-0.00	-0.00	-0.00	
	6.102	32.891	0.567	-13.433	8.280	6.188	0.000	0.00	0.00	0.00	
		-10.893	0.000	-1.785	-13.469	32.669	0.000	-0.00	-0.00	-0.00	
	7.119	24.658	0.000	-14.938	7.481	12.922	0.000	0.00	0.00	0.00	
	-12.708	0.000	-1.785	-16.987	22.399	0.000	-0.00	-0.00	-0.00		
8.136	15.184	0.000	-19.485	5.528	0.637	0.000	0.00	0.00	0.00		
	-14.974	0.000	-3.792	-20.117	8.135	0.000	-0.00	-0.00	-0.00		
9.153	8.107	0.886	-11.114	5.528	6.259	0.000	0.00	0.00	0.00		
	-19.913	0.000	-5.257	-23.958	0.000	0.000	-2.860	-0.00	-0.00		
10.170	0.000	11.881	5.528	-1.482	25.125	0.000	-16.546	0.00	0.00		
3	0.000	-32.849	14.575	-20.311	-27.673	0.000	-22.721	0.00	0.00		
	1.017	11.914	10.302	-1.698	21.558	0.000	-0.230	0.00	0.00		
		-23.417	5.031	0.000	-3.315	8.961	0.000	-0.00	-0.00		
	2.034	16.495	17.035	0.000	17.940	11.454	0.000	0.00	0.00		
		-18.848	3.149	0.000	-4.474	12.497	0.000	-0.00	-0.00		
	3.051	24.222	13.406	-0.594	14.447	18.326	0.000	0.00	0.00		
		-15.646	3.149	0.000	-5.533	14.949	0.000	-0.00	-0.00		
	4.068	28.434	10.923	-3.077	11.158	20.692	0.000	0.00	0.00		
	-12.443	3.149	0.000	-6.524	16.409	0.000	-0.00	-0.00			
5.085	30.540	6.533	-7.467	8.127	19.144	0.000	0.00	0.00			
	-9.240	3.149	0.000	-7.801	19.511	0.000	-0.00	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
3	6.102	28.331	2.787	-11.213	6.534	16.054	0.000	0.00
		-9.713	0.000	-2.388	-11.213	28.331	0.000	-0.00
	7.119	23.655	0.159	-13.841	5.877	14.364	0.000	0.00
		-12.141	0.000	-2.388	-14.830	21.228	0.000	-0.00
	8.136	15.419	0.000	-17.315	5.031	12.400	0.000	0.00
		-14.907	0.000	-3.678	-18.224	9.826	0.000	-0.00
9.153	9.721	3.979	-8.021	3.979	9.721	0.000	0.00	
		-19.381	0.000	-4.657	-21.719	0.000	-0.324	-0.00
4	10.170							
	0.000	6.774	3.149	-0.847	25.200	0.000	-17.356	0.00
		-27.449	12.874	-18.977	-25.423	0.000	-17.896	0.00
	1.017	9.571	10.632	-1.368	21.509	0.000	-0.094	0.00
		-19.676	4.667	0.000	-3.185	8.821	0.000	-0.00
	2.034	15.524	17.177	0.000	18.023	10.086	0.000	0.00
		-15.240	3.724	0.000	-4.333	12.334	0.000	-0.00
	3.051	23.432	13.502	-0.498	14.612	21.173	0.000	0.00
		-12.245	2.476	0.000	-5.412	14.807	0.000	-0.00
	4.068	27.961	10.990	-3.010	10.990	27.961	0.000	0.00
		-9.727	2.476	0.000	-6.454	16.237	0.000	-0.00
	5.085	30.084	6.698	-7.302	7.941	19.808	0.000	0.00
		-7.209	2.476	0.000	-7.848	19.912	0.000	-0.00
	6.102	27.932	2.927	-11.073	6.463	16.123	0.000	0.00
		-9.664	0.000	-2.440	-11.073	27.932	0.000	-0.00
	7.119	23.270	0.375	-13.625	5.511	14.640	0.000	0.00
-12.146		0.000	-2.440	-14.738	20.816	0.000	-0.00	
8.136	15.218	0.000	-17.257	4.492	12.306	0.000	0.00	
	-14.627	0.000	-2.440	-18.194	9.286	0.000	-0.00	
9.153	9.038	3.374	-8.626	3.374	9.038	0.000	0.00	
	-18.581	0.000	-4.652	-21.555	0.000	-0.121	-0.00	
5	10.170							
	0.000	5.382	2.476	-0.699	24.896	0.000	-16.528	0.00
		-28.185	18.384	-13.830	-25.285	0.000	-17.740	0.00
	1.017	8.643	10.711	-1.289	21.022	0.463	0.000	0.00
		-19.321	4.544	0.000	-1.426	6.830	0.000	-0.00
	2.034	15.463	17.117	0.000	17.863	8.395	0.000	0.00
		-14.983	3.659	0.000	-2.544	12.117	0.000	-0.00
	3.051	23.306	13.432	-0.568	14.422	20.089	0.000	0.00
		-12.002	2.583	0.000	-3.667	16.364	0.000	-0.00
	4.068	27.608	10.676	-3.324	10.918	21.486	0.000	0.00
		-9.376	2.583	0.000	-4.826	19.338	0.000	-0.00
	5.085	30.186	6.755	-7.245	8.195	20.641	0.000	0.00
		-6.749	2.583	0.000	-7.305	23.457	0.000	-0.00
	6.102	27.606	2.862	-11.138	6.299	15.507	0.000	0.00
		-4.122	2.583	0.000	-11.138	27.606	0.000	-0.00
	7.119	21.451	0.180	-13.820	5.356	14.022	0.000	0.00
-3.010		0.449	0.000	-14.804	20.427	0.000	-0.00	
8.136	14.359	2.364	-9.636	4.378	11.849	0.000	0.00	
	-3.686	0.000	-1.676	-18.138	9.569	0.000	-0.00	
9.153	9.228	1.314	-10.686	3.334	9.017	0.000	0.00	
	-10.591	0.000	-15.214	-21.508	0.139	0.000	-0.00	
6	10.170							
	0.000	6.385	2.583	-1.221	21.063	0.000	-15.985	0.00
		-27.324	12.458	-18.138	-25.354	0.000	-18.360	0.00
	0.633	8.110	10.239	-1.761	18.424	0.000	-5.919	0.00
		-20.927	4.552	0.000	-4.388	2.028	0.000	-0.00
	1.267	10.302	9.428	-2.572	15.706	0.000	-0.200	0.00
		-18.778	2.759	0.000	-4.519	8.011	0.000	-0.00
	1.900	12.305	8.751	-5.249	14.109	0.055	0.000	0.00
		-17.171	2.509	0.000	-5.249	12.305	0.000	-0.00
	2.533	12.426	7.707	-4.293	12.308	5.551	0.000	0.00
		-15.582	2.472	0.000	-7.835	12.176	0.000	-0.00
	3.167	12.540	5.261	-6.739	10.228	9.714	0.000	0.00
		-14.032	2.433	0.000	-10.170	9.850	0.000	-0.00
	3.800	12.730	4.396	-7.604	7.883	12.085	0.000	0.00
		-15.164	0.000	-2.221	-12.236	5.753	0.000	-0.00

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max)	Corresponding		SHEAR (max)	Corresponding		DEFLECT (max)
		(min)	Shear(+)	Shear(-)	(min)	Moment(+)	Moment(-)	(min)
		(kft)	( K)	( K)	( K)	(kft)	(kft)	(in)
6	4.433	12.245	5.288	-8.712	5.326	9.859	0.000	0.00
		-16.570	0.000	-2.221	-14.021	0.343	0.000	-0.00
	5.066	10.610	2.645	-9.355	4.685	7.974	0.000	0.00
		-18.088	0.000	-2.536	-15.613	0.000	-0.106	-0.00
	5.700	8.392	1.820	-10.180	4.552	2.137	0.000	0.00
		-20.204	0.000	-4.388	-18.387	0.000	-5.718	-0.00
7	6.333	6.392	1.220	-2.637	25.081	0.000	-17.483	0.00
		-26.714	18.041	-12.217	-21.018	0.000	-15.728	0.00
	1.002	9.381	10.646	-1.354	21.254	0.000	-1.197	0.00
		-10.487	15.022	0.000	-3.417	8.998	0.000	-0.00
	2.003	14.419	9.594	-2.406	18.041	9.429	0.000	0.00
		-3.686	1.421	0.000	-4.421	11.705	0.000	-0.00
	3.005	21.110	13.628	-0.372	14.722	20.033	0.000	0.00
		-3.187	0.000	-0.648	-5.373	13.828	0.000	-0.00
	4.007	27.012	11.081	-2.919	11.081	27.012	0.000	0.00
		-4.173	0.000	-2.637	-6.299	15.306	0.000	-0.00
	5.008	29.493	7.218	-6.782	7.229	27.826	0.000	0.00
		-6.814	0.000	-2.637	-8.142	20.124	0.000	-0.00
	6.010	26.942	3.326	-10.674	4.792	19.167	0.000	0.00
		-9.455	0.000	-2.637	-10.824	20.975	0.000	-0.00
	7.012	22.886	0.698	-13.302	3.642	16.189	0.000	0.00
-12.097		0.000	-2.637	-14.396	19.558	0.000	-0.00	
8.014	15.267	0.000	-16.944	2.535	11.973	0.000	0.00	
	-15.084	0.000	-3.592	-17.824	8.064	0.000	-0.00	
9.015	8.626	1.304	-10.696	1.446	6.771	0.000	0.00	
	-19.293	0.000	-4.421	-20.878	0.000	-6.434	-0.00	
8	10.017	5.419	0.714	-2.481	25.275	0.000	-17.659	0.00
		-28.003	13.549	-18.739	-24.674	0.000	-15.921	0.00
	1.017	9.039	8.626	-3.374	21.538	0.001	0.000	0.00
		-17.967	4.420	0.000	-3.374	9.039	0.000	-0.00
	2.034	15.116	17.274	0.000	18.191	9.304	0.000	0.00
		-14.096	2.351	0.000	-4.489	12.291	0.000	-0.00
	3.051	23.192	13.641	-0.359	14.734	20.837	0.000	0.00
		-11.705	2.351	0.000	-5.506	14.618	0.000	-0.00
	4.068	27.974	11.062	-2.938	11.062	27.974	0.000	0.00
		-9.313	2.351	0.000	-6.458	16.101	0.000	-0.00
	5.085	30.136	7.285	-6.715	7.824	19.984	0.000	0.00
		-7.195	0.000	-2.481	-7.951	19.838	0.000	-0.00
	6.102	27.928	3.027	-10.973	6.376	16.386	0.000	0.00
		-9.718	0.000	-2.481	-10.973	27.928	0.000	-0.00
	7.119	23.436	0.494	-13.506	5.330	14.882	0.000	0.00
-12.241		0.000	-2.481	-14.596	21.159	0.000	-0.00	
8.136	15.523	0.000	-17.189	4.247	12.325	0.000	0.00	
	-15.240	0.000	-3.723	-18.010	10.088	0.000	-0.00	
9.153	9.574	1.370	-10.630	3.101	8.726	0.000	0.00	
	-19.673	0.000	-4.665	-21.492	0.000	-0.075	-0.00	
9	10.170	6.777	0.849	-3.150	25.424	0.000	-17.902	0.00
		-27.463	18.885	-12.944	-25.183	0.000	-17.320	0.00
	1.017	9.722	8.021	-3.979	21.719	0.000	-0.323	0.00
		-19.354	4.653	0.000	-3.979	9.722	0.000	-0.00
	2.034	15.411	17.316	0.000	18.228	9.807	0.000	0.00
		-14.880	3.674	0.000	-5.031	12.400	0.000	-0.00
	3.051	23.649	13.842	-0.158	14.832	21.218	0.000	0.00
		-12.149	2.389	0.000	-5.877	14.363	0.000	-0.00
	4.068	28.328	11.213	-2.787	11.213	28.328	0.000	0.00
		-9.719	2.389	0.000	-6.534	16.053	0.000	-0.00
	5.085	30.541	7.467	-6.533	7.799	19.516	0.000	0.00
		-9.239	0.000	-3.150	-8.292	14.104	0.000	-0.00
	6.102	28.431	3.078	-10.922	6.524	16.411	0.000	0.00
		-12.442	0.000	-3.150	-11.158	20.692	0.000	-0.00
	7.119	24.221	0.596	-13.404	5.530	14.952	0.000	0.00
-15.645		0.000	-3.150	-14.446	18.326	0.000	-0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K) ( K)		SHEAR(max) (min) ( K)		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT(max) (min) (in)
		9	8.136	16.495	0.000	-17.034	4.470	12.497	0.000	0.00
		-18.848	0.000	-3.150	-17.939	11.454	0.000	-0.00		
	9.153	8.956	3.311	-8.689	3.311	8.956	0.000	0.00		
		-23.417	0.000	-5.031	-21.605	0.000	-7.583	-0.00		
	10.170									
10	0.000	9.067	1.131	-4.218	27.673	0.000	-22.722	0.00		
		-32.850	20.311	-14.575	-25.124	0.000	-16.543	0.00		
	1.017	8.099	11.115	-0.885	23.958	0.000	-2.860	0.00		
		-19.911	5.257	0.000	-4.218	4.777	0.000	-0.00		
	2.034	15.183	19.485	0.000	20.117	8.135	0.000	0.00		
		-14.972	3.792	0.000	-4.727	12.367	0.000	-0.00		
	3.051	24.658	14.938	0.000	16.987	22.399	0.000	0.00		
		-12.707	1.785	0.000	-6.206	10.346	0.000	-0.00		
	4.068	32.890	13.433	-0.567	13.469	32.669	0.000	0.00		
		-10.892	1.785	0.000	-6.206	4.034	0.000	-0.00		
	5.085	38.177	9.480	-4.520	11.195	29.456	0.000	0.00		
		-12.384	0.000	-4.218	-6.344	20.592	0.000	-0.00		
	6.102	36.796	5.189	-8.811	7.926	25.661	0.000	0.00		
		-16.674	0.000	-4.218	-8.811	36.796	0.000	-0.00		
	7.119	34.565	2.671	-11.329	6.133	17.900	0.000	0.00		
		-20.964	0.000	-4.218	-13.375	27.521	0.000	-0.00		
	8.136	30.144	0.000	-14.820	4.830	14.583	0.000	0.00		
		-25.254	0.000	-4.218	-18.163	9.419	0.000	-0.00		
	9.153	19.117	0.000	-18.798	3.306	8.842	0.000	0.00		
		-29.544	0.000	-4.218	-20.344	0.000	-13.144	-0.00		
	10.170									
11	0.000	0.000	0.000	-18.245	14.000	0.000	-33.834	0.00		
		-33.834	14.000	-20.344	-23.064	0.000	0.000	0.00		
	0.242	0.000	0.000	-0.000	14.000	0.000	-30.450	0.00		
		-30.450	14.000	0.000	-0.000	0.000	0.000	-0.00		
	0.483	0.000	0.000	-0.000	14.000	0.000	-27.067	0.00		
		-27.067	14.000	0.000	-0.000	0.000	0.000	-0.00		
	0.725	0.000	0.000	-0.000	14.000	0.000	-23.684	0.00		
		-23.684	14.000	0.000	-0.000	0.000	0.000	-0.00		
	0.967	0.000	0.000	-0.000	14.000	0.000	-20.300	0.00		
		-20.300	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.208	0.000	0.000	-0.000	14.000	0.000	-16.917	0.00		
		-16.917	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.450	0.000	0.000	-0.000	14.000	0.000	-13.534	0.00		
		-13.534	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.692	0.000	0.000	-0.000	14.000	0.000	-10.150	0.00		
		-10.150	14.000	0.000	-0.000	0.000	0.000	-0.00		
	1.933	0.000	0.000	-0.000	14.000	0.000	-6.767	0.00		
		-6.767	14.000	0.000	-0.000	0.000	0.000	-0.00		
	2.175	0.000	14.000	0.000	14.000	0.000	-3.383	0.00		
		-3.383	14.000	0.000	-0.000	0.000	-0.000	-0.00		
	2.417	0.000	0.000	0.000	14.000	0.000	0.000	0.00		
		-0.000	0.000	-0.000	-0.000	0.000	0.000	-0.00		

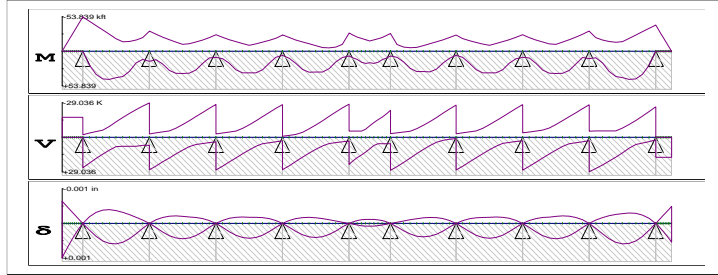
Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	1.785	-38.043
3	7.010	-35.660
4	3.996	-33.021
5	3.175	-33.657
6	4.987	-31.210
7	5.187	-30.963
8	3.194	-33.583
9	3.998	-33.047
10	5.349	-35.660
11	1.785	-34.344
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Ohio 5C1  
 Type: Truck

Factors:  
 Moment: 1.000  
 Shear: 1.000  
 Deflection: 1.000



Span	Location (ft)	MOMENT (kft)		Corresponding Shear (K)		SHEAR (K)		Corresponding Moment (kft)		DEFLECT (in)	
		(max)	(min)	(+)	(-)	(max)	(min)	(+)	(-)	(max)	(min)
1	0.000	0.000	0.000	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	0.00
		-0.000	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	-0.00	
	0.317	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	
		-5.384	0.000	0.000	-17.000	-17.000	0.000	0.000	-2.294	-0.00	
	0.633	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	
		-10.768	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00	
	0.950	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	
		-16.152	0.000	0.000	-17.000	-17.000	0.000	0.000	-2.908	-0.00	
	1.267	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	
		-21.536	0.000	0.000	-17.000	-17.000	0.000	0.000	-1.417	-0.00	
	1.583	0.000	0.000	0.000	-17.000	0.000	0.000	0.000	0.000	0.00	
		-26.919	0.000	0.000	-17.000	-17.000	0.000	0.000	0.000	-0.00	
	1.900	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00	
		-32.303	0.000	0.000	-17.000	-17.000	0.000	0.000	-2.927	-0.00	
2.217	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00		
	-37.687	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.540	-0.00		
2.534	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00		
	-43.071	0.000	0.000	-17.000	-17.000	0.000	0.000	-0.000	-0.00		
2.850	0.000	0.000	0.000	-12.000	0.000	0.000	0.000	0.000	0.00		
	-48.455	0.000	0.000	-17.000	-17.000	0.000	0.000	-5.384	-0.00		
3.167											
2	0.000	0.000	0.000	-2.166	25.758	0.000	-0.000	0.00			
		-53.839	21.949	-17.000	-17.000	0.000	-0.054	0.00			
	1.017	22.132	21.762	0.000	21.762	22.132	0.000	0.00			
		-47.012	6.712	0.000	-3.672	8.470	0.000	-0.00			
	2.034	36.384	17.888	0.000	17.888	36.384	0.000	0.00			
		-40.186	6.712	0.000	-4.969	14.301	0.000	-0.00			
	3.051	43.415	14.230	-2.770	14.230	43.415	0.000	0.00			
		-33.359	6.712	0.000	-6.080	18.063	0.000	-0.00			
	4.068	44.111	10.844	-6.156	10.844	44.111	0.000	0.00			
		-26.532	6.712	0.000	-9.255	32.662	0.000	-0.00			
	5.085	41.315	4.498	-12.502	7.879	40.065	0.000	0.00			
		-19.706	6.712	0.000	-13.111	38.221	0.000	-0.00			
	6.102	39.613	0.636	-16.364	7.604	0.000	-7.439	0.00			
		-14.785	4.079	0.000	-16.774	37.112	0.000	-0.00			
7.119	31.626	0.000	-20.006	7.604	0.294	0.000	0.00				
	-15.416	0.000	-2.166	-20.215	30.136	0.000	-0.00				
8.136	18.470	0.000	-23.372	7.604	8.027	0.000	0.00				
	-17.673	0.000	-2.573	-23.403	18.219	0.000	-0.00				
9.153	12.783	6.684	-5.316	6.852	8.877	0.000	0.00				
	-21.507	0.000	-4.040	-26.408	1.487	0.000	-0.00				
10.170											
3	0.000	15.846	6.852	-2.497	27.466	0.000	-13.709	0.00			
		-31.588	4.793	-19.992	-29.036	0.000	-17.859	0.00			
	1.017	13.307	0.000	-2.497	24.201	5.093	0.000	0.00			
		-26.724	4.734	0.000	-3.804	9.458	0.000	-0.00			
	2.034	20.030	20.647	0.000	20.734	19.540	0.000	0.00			
		-22.119	3.816	0.000	-4.657	12.497	0.000	-0.00			
	3.051	30.104	16.958	-0.042	17.444	27.710	0.000	0.00			
		-18.249	3.805	0.000	-5.457	15.026	0.000	-0.00			
4.068	34.776	13.275	-3.725	14.132	31.407	0.000	0.00				
	-14.491	3.668	0.000	-7.753	26.744	0.000	-0.00				
5.085	34.999	6.677	-10.323	10.917	30.661	0.000	0.00				
	-10.876	2.730	0.000	-10.850	31.601	0.000	-0.00				

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
3	6.102	34.477	3.403	-13.597	7.920	25.988	0.000	0.00		
		-11.766	0.000	-2.892	-14.173	32.131	0.000	-0.00		
	7.119	29.426	0.000	-17.290	6.086	14.176	0.000	0.00		
		-14.707	0.000	-2.892	-17.612	27.788	0.000	-0.00		
	8.136	19.142	0.000	-20.088	5.389	12.442	0.000	0.00		
-17.718		0.000	-3.680	-21.057	18.474	0.000	-0.00			
9.153	10.672	1.496	-10.504	4.556	10.375	0.000	0.00			
	-21.493	0.000	-3.804	-24.531	3.597	0.000	-0.00			
4	10.170									
	0.000	9.758	3.518	-2.239	27.568	0.000	-14.648	0.00		
		-25.976	4.093	-17.381	-27.705	0.000	-15.011	0.00		
	1.017	11.902	10.298	-1.702	24.350	3.898	0.000	0.00		
		-21.869	3.869	0.000	-3.665	9.361	0.000	-0.00		
	2.034	18.915	20.263	0.000	20.861	18.586	0.000	0.00		
		-18.026	2.841	0.000	-4.483	12.350	0.000	-0.00		
	3.051	29.105	17.112	0.000	17.417	27.619	0.000	0.00		
		-15.137	2.841	0.000	-5.277	14.931	0.000	-0.00		
	4.068	34.017	13.406	-3.594	13.993	31.728	0.000	0.00		
		-12.247	2.841	0.000	-7.597	26.411	0.000	-0.00		
	5.085	33.944	6.984	-10.016	10.706	31.080	0.000	0.00		
		-9.357	2.841	0.000	-10.650	31.239	0.000	-0.00		
	6.102	33.964	3.566	-13.434	7.677	26.322	0.000	0.00		
		-11.564	0.000	-2.671	-13.965	31.860	0.000	-0.00		
7.119	29.055	0.000	-17.137	5.445	14.698	0.000	0.00			
	-14.344	0.000	-2.794	-17.428	27.608	0.000	-0.00			
8.136	18.897	0.000	-20.233	4.681	12.333	0.000	0.00			
	-17.192	0.000	-2.861	-20.923	18.287	0.000	-0.00			
9.153	9.611	3.869	-8.131	3.869	9.611	0.000	0.00			
	-20.459	0.000	-3.665	-24.434	3.484	0.000	-0.00			
5	10.170									
	0.000	6.547	3.012	-0.851	27.270	0.000	-14.059	0.00		
		-25.577	4.045	-17.194	-27.636	0.000	-15.019	0.00		
	1.017	11.084	10.345	-1.655	24.053	4.035	0.000	0.00		
		-21.558	3.850	0.000	-1.729	7.174	0.000	-0.00		
	2.034	19.066	20.237	0.000	20.455	19.041	0.000	0.00		
		-17.762	2.949	0.000	-2.552	14.689	0.000	-0.00		
	3.051	28.542	16.833	-0.167	16.854	27.106	0.000	0.00		
		-14.763	2.949	0.000	-4.309	20.913	0.000	-0.00		
	4.068	32.920	13.211	-3.789	13.422	30.676	0.000	0.00		
		-11.764	2.949	0.000	-7.175	28.687	0.000	-0.00		
	5.085	32.634	6.585	-10.415	10.204	29.681	0.000	0.00		
		-8.765	2.949	0.000	-10.415	32.634	0.000	-0.00		
	6.102	32.694	3.217	-13.783	7.337	25.070	0.000	0.00		
		-5.970	1.957	0.000	-14.008	31.806	0.000	-0.00		
7.119	27.351	0.000	-17.412	5.266	14.074	0.000	0.00			
	-5.495	0.000	-0.515	-17.708	25.880	0.000	-0.00			
8.136	16.922	0.000	-21.027	4.564	11.931	0.000	0.00			
	-6.517	0.000	-1.028	-21.419	15.248	0.000	-0.00			
9.153	9.767	3.850	-8.150	3.850	9.767	0.000	0.00			
	-10.951	0.000	-14.627	-24.902	0.150	0.000	-0.00			
6	10.170									
	0.000	7.727	3.126	-1.477	22.928	0.000	-5.625	0.00		
		-28.673	5.482	-20.364	-27.955	0.000	-17.621	0.00		
	0.633	10.720	9.671	-2.329	19.792	5.092	0.000	0.00		
		-25.258	5.161	0.000	-5.336	2.466	0.000	-0.00		
	1.267	13.210	16.332	-0.668	17.072	0.000	-0.134	0.00		
		-22.129	3.146	0.000	-5.336	0.000	-0.914	-0.00		
	1.900	17.356	13.616	-3.384	14.935	7.382	0.000	0.00		
		-20.137	3.146	0.000	-5.336	0.000	-4.293	-0.00		
	2.533	19.103	10.609	-6.391	12.499	12.811	0.000	0.00		
		-18.145	3.146	0.000	-6.932	18.326	0.000	-0.00		
	3.167	18.064	7.776	-9.224	9.834	16.812	0.000	0.00		
		-16.152	3.146	0.000	-9.798	17.245	0.000	-0.00		
	3.800	19.078	6.405	-10.595	6.924	18.335	0.000	0.00		
		-17.837	0.000	-2.943	-12.493	13.381	0.000	-0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

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Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
6	4.433	17.326	3.400	-13.600	5.482	0.000	-4.370	0.00		
		-19.700	0.000	-2.943	-14.917	7.455	0.000	-0.00		
	5.066	13.336	0.694	-16.306	5.482	0.000	-0.898	0.00		
		-21.575	0.000	-2.981	-17.037	0.002	0.000	-0.00		
	5.700	10.856	2.355	-9.645	5.482	2.574	0.000	0.00		
-24.591		0.000	-5.009	-19.805	4.731	0.000	-0.00			
7	0.000	7.735	1.477	-3.191	27.840	0.000	-17.203	0.00		
		-27.947	19.533	-5.336	-22.938	0.000	-5.675	0.00		
	1.002	9.676	8.106	-3.894	24.772	0.263	0.000	0.00		
		-10.568	14.152	0.000	-3.894	9.676	0.000	-0.00		
	2.003	16.804	20.893	0.000	21.292	15.080	0.000	0.00		
		-6.547	1.038	0.000	-4.574	11.770	0.000	-0.00		
	3.005	26.996	17.289	0.000	17.598	25.479	0.000	0.00		
		-5.608	0.438	0.000	-5.255	13.896	0.000	-0.00		
	4.007	32.011	13.566	-3.434	13.836	31.317	0.000	0.00		
		-6.226	0.000	-2.113	-7.293	24.553	0.000	-0.00		
	5.008	32.036	10.346	-6.654	10.346	32.036	0.000	0.00		
		-8.850	0.000	-3.010	-10.132	29.107	0.000	-0.00		
	6.010	32.365	3.869	-13.131	7.122	28.120	0.000	0.00		
		-11.865	0.000	-3.010	-13.325	30.134	0.000	-0.00		
	7.012	28.105	0.264	-16.736	4.271	20.450	0.000	0.00		
-14.881		0.000	-3.010	-16.738	26.687	0.000	-0.00			
8.014	18.578	0.000	-20.190	2.576	14.629	0.000	0.00			
	-17.896	0.000	-3.010	-20.459	18.193	0.000	-0.00			
9.015	11.073	1.676	-10.324	1.707	7.059	0.000	0.00			
	-21.530	0.000	-3.894	-23.950	4.036	0.000	-0.00			
8	0.000	6.593	0.868	-3.018	27.649	0.000	-15.123	0.00		
		-25.456	17.179	-3.987	-27.154	0.000	-13.714	0.00		
	1.017	9.619	8.130	-3.870	24.452	3.355	0.000	0.00		
		-19.878	3.523	0.000	-3.870	9.619	0.000	-0.00		
	2.034	18.780	20.252	0.000	20.919	18.316	0.000	0.00		
		-16.754	2.753	0.000	-4.678	12.320	0.000	-0.00		
	3.051	28.953	17.158	0.000	17.413	27.681	0.000	0.00		
		-13.977	2.652	0.000	-5.440	14.675	0.000	-0.00		
	4.068	33.893	13.452	-3.548	13.943	31.945	0.000	0.00		
		-11.281	2.651	0.000	-7.666	26.277	0.000	-0.00		
	5.085	33.901	10.031	-6.969	10.624	31.315	0.000	0.00		
		-9.360	0.000	-2.842	-10.689	31.029	0.000	-0.00		
	6.102	33.977	3.614	-13.386	7.570	26.465	0.000	0.00		
		-12.251	0.000	-2.842	-13.973	31.691	0.000	-0.00		
	7.119	29.087	0.000	-17.092	5.185	15.014	0.000	0.00		
-15.141		0.000	-2.842	-17.397	27.601	0.000	-0.00			
8.136	18.912	0.000	-20.285	4.392	12.340	0.000	0.00			
	-18.032	0.000	-2.842	-20.843	18.587	0.000	-0.00			
9.153	11.906	1.705	-10.295	3.582	9.268	0.000	0.00			
	-21.871	0.000	-3.870	-24.336	3.914	0.000	-0.00			
9	0.000	9.573	2.046	-3.601	27.706	0.000	-15.018	0.00		
		-25.977	17.381	-4.093	-27.558	0.000	-14.627	0.00		
	1.017	10.569	10.519	-1.481	24.532	3.587	0.000	0.00		
		-21.456	3.799	0.000	-4.556	10.376	0.000	-0.00		
	2.034	19.142	20.088	0.000	21.059	18.467	0.000	0.00		
		-17.687	3.675	0.000	-5.389	12.442	0.000	-0.00		
	3.051	29.429	17.290	0.000	17.612	27.788	0.000	0.00		
		-14.683	2.888	0.000	-6.086	14.175	0.000	-0.00		
	4.068	34.485	13.595	-3.405	14.173	32.134	0.000	0.00		
		-11.747	2.888	0.000	-7.920	25.988	0.000	-0.00		
	5.085	35.008	10.320	-6.680	10.849	31.605	0.000	0.00		
		-10.874	0.000	-2.731	-10.917	30.660	0.000	-0.00		
	6.102	34.776	3.725	-13.275	7.751	26.748	0.000	0.00		
		-14.490	0.000	-3.668	-14.132	31.407	0.000	-0.00		
	7.119	30.105	0.042	-16.958	5.453	15.031	0.000	0.00		
-18.262		0.000	-3.796	-17.445	27.711	0.000	-0.00			

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



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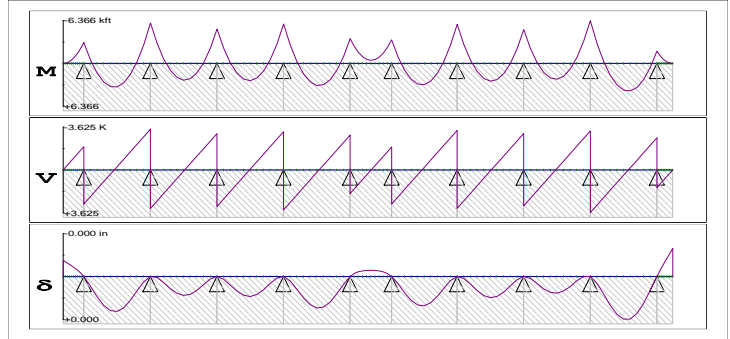
Span	Location (ft)	MOMENT (max) (min) (kft)		Corresponding Shear(+) Shear(-) ( K ) ( K )		SHEAR (max) (min) ( K )		Corresponding Moment(+) Moment(-) (kft) (kft)		DEFLECT (max) (min) (in)
9	8.136	20.030	0.000	-20.649	4.652	12.497	0.000	0.00		
		-22.123	0.000	-3.808	-20.736	19.540	0.000	-0.00		
	9.153	9.929	1.684	0.000	3.799	9.453	0.000	0.00		
		-26.724	0.000	-4.735	-24.204	5.090	0.000	-0.00		
10	10.170									
	0.000	11.642	1.684	-5.184	29.036	0.000	-17.860	0.00		
		-31.589	19.992	-4.793	-27.465	0.000	-13.707	0.00		
	1.017	10.428	10.861	-1.139	26.408	1.486	0.000	0.00		
		-21.509	4.040	0.000	-5.475	9.029	0.000	-0.00		
	2.034	18.470	23.372	0.000	23.403	18.218	0.000	0.00		
		-17.754	3.476	0.000	-5.475	3.461	0.000	-0.00		
	3.051	31.625	20.006	0.000	20.215	30.136	0.000	0.00		
		-15.419	2.166	0.000	-5.475	0.000	-2.107	-0.00		
	4.068	39.613	16.364	-0.636	16.774	37.112	0.000	0.00		
		-14.107	0.170	0.000	-5.475	0.000	-7.675	-0.00		
	5.085	41.315	12.503	-4.497	13.111	38.221	0.000	0.00		
		-15.037	0.000	-5.122	-7.879	40.065	0.000	-0.00		
	6.102	44.111	6.157	-10.843	9.255	32.662	0.000	0.00		
		-20.246	0.000	-5.122	-10.843	44.111	0.000	-0.00		
	7.119	43.415	2.770	-14.230	6.080	18.063	0.000	0.00		
		-25.456	0.000	-5.122	-14.230	43.415	0.000	-0.00		
	8.136	36.383	0.000	-17.888	4.969	14.301	0.000	0.00		
		-30.665	0.000	-5.122	-17.888	36.383	0.000	-0.00		
	9.153	22.132	0.000	-21.762	3.672	8.470	0.000	0.00		
	-35.874	0.000	-5.122	-21.762	22.132	0.000	-0.00			
11	10.170									
	0.000	0.000	0.000	-17.636	17.000	0.000	-41.084	0.00		
		-41.084	17.000	-18.640	-25.758	0.000	0.000	0.00		
	0.242	0.000	0.000	-0.000	17.000	0.000	-36.976	0.00		
		-36.976	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.483	0.000	0.000	-0.000	17.000	0.000	-32.867	0.00		
		-32.867	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.725	0.000	0.000	-0.000	17.000	0.000	-28.759	0.00		
		-28.759	17.000	0.000	-0.000	0.000	0.000	-0.00		
	0.967	0.000	0.000	-0.000	17.000	0.000	-24.650	0.00		
		-24.650	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.208	0.000	0.000	-0.000	17.000	0.000	-20.542	0.00		
		-20.542	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.450	0.000	0.000	-0.000	17.000	0.000	-16.434	0.00		
		-16.434	17.000	0.000	-0.000	0.000	0.000	-0.00		
	1.692	0.000	0.000	-0.000	17.000	0.000	-12.325	0.00		
	-12.325	17.000	0.000	-0.000	0.000	0.000	-0.00			
1.933	0.000	0.000	-0.000	17.000	0.000	-8.217	0.00			
	-8.217	17.000	0.000	-0.000	0.000	0.000	-0.00			
2.175	0.000	17.000	0.000	17.000	0.000	-4.108	0.00			
	-4.108	17.000	0.000	-0.000	0.000	-0.000	-0.00			
2.417	0.000	17.000	0.000	17.000	0.000	0.000	0.00			
	-0.000	0.000	-0.000	-0.000	0.000	0.000	-0.00			

Support	Reaction	
	Positive	Negative
1	0.000	-0.000
2	2.166	-38.949
3	9.349	-32.010
4	5.757	-31.445
5	3.863	-31.227
6	6.065	-31.337
7	6.246	-31.180
8	3.886	-31.309
9	5.648	-31.443
10	6.868	-32.010
11	2.166	-35.784
12	0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Bentley Tel:(800) 778-4277 Fax:(813) 980-3642 Net: www.bentley.com

ID: Wearing Surface  
 Type: Static  
 Factor: 1.000



Span	Location (ft)	Moment (kft)	Shear (K)	Deflect (in)	Reaction (K)	
1	0.000	+0.000/ -0.000	+0.000/ -0.000	-0.00	0.000	
	0.317	-0.031	-0.198	-0.00		
	0.633	-0.125	-0.396	-0.00		
	0.950	-0.282	-0.594	-0.00		
	1.267	-0.501	-0.792	-0.00		
	1.583	-0.784	-0.990	-0.00		
	1.900	-1.128	-1.188	-0.00		
	2.217	-1.536	-1.386	-0.00		
	2.534	-2.006	-1.583	-0.00		
	2.850	-2.539	-1.781	-0.00		
	3.167					
	2	0.000	-3.134	-1.979/ +2.894	+0.00	-4.874
		1.017	-0.514	+2.259	+0.00	
2.034		+1.460	+1.623	+0.00		
3.051		+2.787	+0.987	+0.00		
4.068		+3.468	+0.352	+0.00		
5.085		+3.503	-0.284	+0.00		
6.102		+2.891	-0.919	+0.00		
7.119		+1.633	-1.555	+0.00		
8.136		-0.272	-2.191	+0.00		
9.153		-2.823	-2.826	+0.00		
10.170						
3		0.000	-6.021	-3.462/ +3.268	+0.00	-6.730
		1.017	-3.020	+2.633	+0.00	
	2.034	-0.666	+1.997	+0.00		
	3.051	+1.042	+1.361	+0.00		
	4.068	+2.103	+0.726	+0.00		
	5.085	+2.518	+0.090	+0.00		
	6.102	+2.286	-0.546	+0.00		
	7.119	+1.408	-1.181	+0.00		
	8.136	-0.117	-1.817	+0.00		
	9.153	-2.288	-2.453	+0.00		
	10.170					
	4	0.000	-5.105	-3.088/ +3.102	+0.00	-6.190
		1.017	-2.274	+2.466	+0.00	
2.034		-0.089	+1.831	+0.00		
3.051		+1.450	+1.195	+0.00		
4.068		+2.342	+0.559	+0.00		
5.085		+2.588	-0.076	+0.00		
6.102		+2.187	-0.712	+0.00		

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Span	Location (ft)	Moment (kft)	Shear ( K )	Deflect (in)	Reaction ( K )	
4	7.119	+1.140		-1.347	+0.00	
	8.136	-0.554		-1.983	+0.00	
	9.153	-2.894		-2.619	+0.00	
	10.170					
5	0.000	-5.880	-3.254/	+3.393	+0.00	-6.647
	1.017	-2.753		+2.757	+0.00	
	2.034	-0.272		+2.122	+0.00	
	3.051	+1.563		+1.486	+0.00	
	4.068	+2.751		+0.850	+0.00	
	5.085	+3.293		+0.215	+0.00	
	6.102	+3.188		-0.421	+0.00	
	7.119	+2.437		-1.056	+0.00	
	8.136	+1.039		-1.692	+0.00	
	9.153	-1.005		-2.328	+0.00	
	10.170					
6	0.000	-3.695	-2.963/	+2.007	+0.00	-4.970
	0.633	-2.549		+1.611	-0.00	
	1.267	-1.654		+1.215	-0.00	
	1.900	-1.010		+0.820	-0.00	
	2.533	-0.616		+0.424	-0.00	
	3.167	-0.473		+0.028	-0.00	
	3.800	-0.581		-0.368	-0.00	
	4.433	-0.939		-0.764	-0.00	
	5.066	-1.548		-1.159	-0.00	
	5.700	-2.408		-1.555	-0.00	
	6.333					
7	0.000	-3.518	-1.951/	+2.901	+0.00	-4.852
	1.002	-0.926		+2.274	+0.00	
	2.003	+1.039		+1.648	+0.00	
	3.005	+2.376		+1.022	+0.00	
	4.007	+3.087		+0.396	+0.00	
	5.008	+3.170		-0.230	+0.00	
	6.010	+2.626		-0.856	+0.00	
	7.012	+1.456		-1.482	+0.00	
	8.014	-0.342		-2.108	+0.00	
	9.015	-2.768		-2.734	+0.00	
	10.017					
8	0.000	-5.820	-3.360/	+3.255	+0.00	-6.615
	1.017	-2.832		+2.620	+0.00	
	2.034	-0.491		+1.984	+0.00	
	3.051	+1.203		+1.349	+0.00	
	4.068	+2.252		+0.713	+0.00	
	5.085	+2.653		+0.077	+0.00	
	6.102	+2.409		-0.558	+0.00	
	7.119	+1.518		-1.194	+0.00	
	8.136	-0.020		-1.830	+0.00	
	9.153	-2.204		-2.465	+0.00	
	10.170					
9	0.000	-5.034	-3.101/	+3.047	+0.00	-6.148
	1.017	-2.258		+2.412	+0.00	
	2.034	-0.129		+1.776	+0.00	
	3.051	+1.354		+1.140	+0.00	

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.

Span	Location (ft)	Moment (kft)	Shear ( K )	Deflect (in)	Reaction ( K )	
9	4.068	+2.191		+0.505	+0.00	
	5.085	+2.381		-0.131	+0.00	
	6.102	+1.924		-0.767	+0.00	
	7.119	+0.821		-1.402	+0.00	
	8.136	-0.928		-2.038	+0.00	
	9.153	-3.324		-2.673	-0.00	
	10.170					
10	0.000	-6.366	-3.309/	+3.625	+0.00	-6.934
	1.017	-3.003		+2.989	+0.00	
	2.034	-0.286		+2.353	+0.00	
	3.051	+1.784		+1.718	+0.00	
	4.068	+3.208		+1.082	+0.00	
	5.085	+3.985		+0.446	+0.00	
	6.102	+4.116		-0.189	+0.00	
	7.119	+3.600		-0.825	+0.00	
	8.136	+2.438		-1.460	+0.00	
	9.153	+0.630		-2.096	+0.00	
10.170						
11	0.000	-1.825	-2.732/	+1.510	+0.00	-4.242
	0.242	-1.478		+1.359	-0.00	
	0.483	-1.168		+1.208	-0.00	
	0.725	-0.894		+1.057	-0.00	
	0.967	-0.657		+0.906	-0.00	
	1.208	-0.456		+0.755	-0.00	
	1.450	-0.292		+0.604	-0.00	
	1.692	-0.164		+0.453	-0.00	
	1.933	-0.073		+0.302	-0.00	
	2.175	-0.018		+0.151	-0.00	
	2.417	-0.000/	+0.000	-0.000/	+0.000	-0.000

Moment causing bottom tension and Shear causing left-up/right-down are positive. Deflection down is positive. Reaction down is positive.



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Job No  
**P402110046**Sheet No  
**1**

Rev

Part Section M, Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 1.std Date/Time 01-Mar-2012 14:53

## Job Information

	Engineer	Checked	Approved
<b>Name:</b>	M Johnson	J Kemnitz	
<b>Date:</b>	14-Feb-12	29-Feb-12	

**Structure Type** SPACE FRAME

Number of Nodes	4	Highest Node	4
Number of Elements	3	Highest Beam	3

Number of Basic Load Cases	8
Number of Combination Load Cases	2

*Included in this printout are data for:*

<b>All</b>	The Whole Structure
------------	---------------------

*Included in this printout are results for load cases:*

Type	L/C	Name
Primary	1	DEAD LOAD
Primary	3	LIVE LOAD 1
Primary	4	LIVE LOAD 2
Primary	5	LIVE LOAD 3
Primary	6	LIVE LOAD 4
Primary	7	LIVE LOAD 5
Primary	8	LIVE LOAD 6
Primary	2	SOIL LOAD
Combination	9	DEAD PLUS SOIL
Combination	10	DL PLUS SOIL POS MOM

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	9.000	0.000
2	0.000	28.050	0.000
3	37.000	28.050	0.000
4	37.000	0.000	0.000

## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	2	19.050	2	0
2	2	3	37.000	1	0
3	4	3	28.050	2	0



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Job No  
**P402110046**Sheet No  
**2**

Rev

Part Section M, Frame 1

Job Title Main Avenue Rating

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By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 1.std Date/Time 01-Mar-2012 14:53

## Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE
2	Rect 36.00x21.00	756.000	27.8E+3	81.6E+3	70.7E+3	CONCRETE

## Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

## Basic Load Cases

Number	Name
1	DEAD LOAD
3	LIVE LOAD 1
4	LIVE LOAD 2
5	LIVE LOAD 3
6	LIVE LOAD 4
7	LIVE LOAD 5
8	LIVE LOAD 6
2	SOIL LOAD

## Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	DEAD PLUS SOIL	1	DEAD LOAD	1.00
		2	SOIL LOAD	1.15
10	DL PLUS SOIL POS MOM	1	DEAD LOAD	1.00
		2	SOIL LOAD	0.50



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Job No <b>P402110046</b>	Sheet No <b>3</b>	Rev
Part Section M, Frame 1		
Ref		
By M Johnson	Date 14-Feb-12	Chd J Kemnitz
Client ODOT	File Section M Frame 1.std	Date/Time 01-Mar-2012 14:53

## Beam Force Detail

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			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
1	1:DEAD LOAD	0.000	55.555	-7.359	0.000	0.000	0.000	0.000	0.000	-329.173	
		1.905	54.051	-7.359	0.000	0.000	0.000	0.000	0.000	-160.949	
		3.810	52.548	-7.359	0.000	0.000	0.000	0.000	0.000	7.275	
		5.715	51.044	-7.359	0.000	0.000	0.000	0.000	0.000	175.500	
		7.620	49.540	-7.359	0.000	0.000	0.000	0.000	0.000	343.724	
		9.525	48.037	-7.359	0.000	0.000	0.000	0.000	0.000	511.948	
		11.430	46.533	-7.359	0.000	0.000	0.000	0.000	0.000	680.172	
		13.335	45.030	-7.359	0.000	0.000	0.000	0.000	0.000	848.397	
		15.240	43.526	-7.359	0.000	0.000	0.000	0.000	0.000	1.02E+3	
		17.145	42.023	-7.359	0.000	0.000	0.000	0.000	0.000	1.18E+3	
19.050	40.519	-7.359	0.000	0.000	0.000	0.000	0.000	1.35E+3			
	3:LIVE LOAD 1	0.000	80.396	-11.431	0.000	0.000	0.000	0.000	0.000	-505.581	
		1.905	80.396	-11.431	0.000	0.000	0.000	0.000	0.000	-244.272	
		3.810	80.396	-11.431	0.000	0.000	0.000	0.000	0.000	17.037	
		5.715	80.396	-11.431	0.000	0.000	0.000	0.000	0.000	278.347	
		7.620	80.396	-11.431	0.000	0.000	0.000	0.000	0.000	539.656	
		9.525	80.396	-11.431	0.000	0.000	0.000	0.000	0.000	800.965	
		11.430	80.396	-11.431	0.000	0.000	0.000	0.000	0.000	1.06E+3	
		13.335	80.396	-11.431	0.000	0.000	0.000	0.000	0.000	1.32E+3	
		15.240	80.396	-11.431	0.000	0.000	0.000	0.000	0.000	1.58E+3	
		17.145	80.396	-11.431	0.000	0.000	0.000	0.000	0.000	1.85E+3	
19.050	80.396	-11.431	0.000	0.000	0.000	0.000	0.000	2.11E+3			
	4:LIVE LOAD 2	0.000	54.728	-11.457	0.000	0.000	0.000	0.000	0.000	-502.938	
		1.905	54.728	-11.457	0.000	0.000	0.000	0.000	0.000	-241.028	
		3.810	54.728	-11.457	0.000	0.000	0.000	0.000	0.000	20.883	
		5.715	54.728	-11.457	0.000	0.000	0.000	0.000	0.000	282.793	
		7.620	54.728	-11.457	0.000	0.000	0.000	0.000	0.000	544.703	
		9.525	54.728	-11.457	0.000	0.000	0.000	0.000	0.000	806.613	
		11.430	54.728	-11.457	0.000	0.000	0.000	0.000	0.000	1.07E+3	
		13.335	54.728	-11.457	0.000	0.000	0.000	0.000	0.000	1.33E+3	
		15.240	54.728	-11.457	0.000	0.000	0.000	0.000	0.000	1.59E+3	
		17.145	54.728	-11.457	0.000	0.000	0.000	0.000	0.000	1.85E+3	
19.050	54.728	-11.457	0.000	0.000	0.000	0.000	0.000	2.12E+3			
	5:LIVE LOAD 3	0.000	67.622	-12.085	0.000	0.000	0.000	0.000	0.000	-532.702	
		1.905	67.622	-12.085	0.000	0.000	0.000	0.000	0.000	-256.437	
		3.810	67.622	-12.085	0.000	0.000	0.000	0.000	0.000	19.828	
		5.715	67.622	-12.085	0.000	0.000	0.000	0.000	0.000	296.093	
		7.620	67.622	-12.085	0.000	0.000	0.000	0.000	0.000	572.358	
		9.525	67.622	-12.085	0.000	0.000	0.000	0.000	0.000	848.623	
		11.430	67.622	-12.085	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		13.335	67.622	-12.085	0.000	0.000	0.000	0.000	0.000	1.4E+3	
15.240	67.622	-12.085	0.000	0.000	0.000	0.000	0.000	1.68E+3			



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Job No  
**P402110046**

Sheet No  
**4**

Rev

Part Section M, Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 1.std Date/Time 01-Mar-2012 14:53

## Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		17.145	67.622	-12.085	0.000	0.000	0.000	0.000	0.000	1.95E+3	
		19.050	67.622	-12.085	0.000	0.000	0.000	0.000	0.000	2.23E+3	
	6:LIVE LOAD 4	0.000	73.180	-11.968	0.000	0.000	0.000	0.000	0.000	-526.194	
		1.905	73.180	-11.968	0.000	0.000	0.000	0.000	0.000	-252.607	
		3.810	73.180	-11.968	0.000	0.000	0.000	0.000	0.000	20.980	
		5.715	73.180	-11.968	0.000	0.000	0.000	0.000	0.000	294.567	
		7.620	73.180	-11.968	0.000	0.000	0.000	0.000	0.000	568.154	
		9.525	73.180	-11.968	0.000	0.000	0.000	0.000	0.000	841.740	
		11.430	73.180	-11.968	0.000	0.000	0.000	0.000	0.000	1.12E+3	
		13.335	73.180	-11.968	0.000	0.000	0.000	0.000	0.000	1.39E+3	
		15.240	73.180	-11.968	0.000	0.000	0.000	0.000	0.000	1.66E+3	
		17.145	73.180	-11.968	0.000	0.000	0.000	0.000	0.000	1.94E+3	
		19.050	73.180	-11.968	0.000	0.000	0.000	0.000	0.000	2.21E+3	
	7:LIVE LOAD 5	0.000	62.079	-11.973	0.000	0.000	0.000	0.000	0.000	-528.931	
		1.905	62.079	-11.973	0.000	0.000	0.000	0.000	0.000	-255.234	
		3.810	62.079	-11.973	0.000	0.000	0.000	0.000	0.000	18.462	
		5.715	62.079	-11.973	0.000	0.000	0.000	0.000	0.000	292.159	
		7.620	62.079	-11.973	0.000	0.000	0.000	0.000	0.000	565.855	
		9.525	62.079	-11.973	0.000	0.000	0.000	0.000	0.000	839.552	
		11.430	62.079	-11.973	0.000	0.000	0.000	0.000	0.000	1.11E+3	
		13.335	62.079	-11.973	0.000	0.000	0.000	0.000	0.000	1.39E+3	
		15.240	62.079	-11.973	0.000	0.000	0.000	0.000	0.000	1.66E+3	
		17.145	62.079	-11.973	0.000	0.000	0.000	0.000	0.000	1.93E+3	
		19.050	62.079	-11.973	0.000	0.000	0.000	0.000	0.000	2.21E+3	
	8:LIVE LOAD 6	0.000	49.845	-11.619	0.000	0.000	0.000	0.000	0.000	-514.072	
		1.905	49.845	-11.619	0.000	0.000	0.000	0.000	0.000	-248.457	
		3.810	49.845	-11.619	0.000	0.000	0.000	0.000	0.000	17.158	
		5.715	49.845	-11.619	0.000	0.000	0.000	0.000	0.000	282.773	
		7.620	49.845	-11.619	0.000	0.000	0.000	0.000	0.000	548.388	
		9.525	49.845	-11.619	0.000	0.000	0.000	0.000	0.000	814.003	
		11.430	49.845	-11.619	0.000	0.000	0.000	0.000	0.000	1.08E+3	
		13.335	49.845	-11.619	0.000	0.000	0.000	0.000	0.000	1.35E+3	
		15.240	49.845	-11.619	0.000	0.000	0.000	0.000	0.000	1.61E+3	
		17.145	49.845	-11.619	0.000	0.000	0.000	0.000	0.000	1.88E+3	
		19.050	49.845	-11.619	0.000	0.000	0.000	0.000	0.000	2.14E+3	
	2:SOIL LOAD	0.000	-0.050	7.240	0.000	0.000	0.000	0.000	0.000	181.701	
		1.905	-0.050	4.117	0.000	0.000	0.000	0.000	0.000	56.465	
		3.810	-0.050	1.411	0.000	0.000	0.000	0.000	0.000	-3.722	
		5.715	-0.050	0.221	0.000	0.000	0.000	0.000	0.000	-20.462	
		7.620	-0.050	-0.065	0.000	0.000	0.000	0.000	0.000	-20.490	
		9.525	-0.050	-0.089	0.000	0.000	0.000	0.000	0.000	-18.472	
		11.430	-0.050	-0.089	0.000	0.000	0.000	0.000	0.000	-16.443	
		13.335	-0.050	-0.089	0.000	0.000	0.000	0.000	0.000	-14.415	
		15.240	-0.050	-0.089	0.000	0.000	0.000	0.000	0.000	-12.387	





Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**5**

Rev

Part Section M, Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 1.std Date/Time 01-Mar-2012 14:53

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		17.145	-0.050	-0.089	0.000	0.000	0.000	0.000	0.000	-10.358	
		19.050	-0.050	-0.089	0.000	0.000	0.000	0.000	0.000	-8.330	
	9:DEAD PLUS	0.000	55.498	0.967	0.000	0.000	0.000	0.000	0.000	-120.217	
		1.905	53.994	-2.625	0.000	0.000	0.000	0.000	0.000	-96.014	
		3.810	52.491	-5.736	0.000	0.000	0.000	0.000	0.000	2.995	
		5.715	50.987	-7.104	0.000	0.000	0.000	0.000	0.000	151.969	
		7.620	49.484	-7.434	0.000	0.000	0.000	0.000	0.000	320.160	
		9.525	47.980	-7.461	0.000	0.000	0.000	0.000	0.000	490.706	
		11.430	46.476	-7.461	0.000	0.000	0.000	0.000	0.000	661.263	
		13.335	44.973	-7.461	0.000	0.000	0.000	0.000	0.000	831.819	
		15.240	43.469	-7.461	0.000	0.000	0.000	0.000	0.000	1E+3	
		17.145	41.966	-7.461	0.000	0.000	0.000	0.000	0.000	1.17E+3	
		19.050	40.462	-7.461	0.000	0.000	0.000	0.000	0.000	1.34E+3	
	10:DL PLUS S	0.000	55.530	-3.739	0.000	0.000	0.000	0.000	0.000	-238.322	
		1.905	54.026	-5.301	0.000	0.000	0.000	0.000	0.000	-132.716	
		3.810	52.523	-6.653	0.000	0.000	0.000	0.000	0.000	5.414	
		5.715	51.019	-7.248	0.000	0.000	0.000	0.000	0.000	165.269	
		7.620	49.516	-7.392	0.000	0.000	0.000	0.000	0.000	333.479	
		9.525	48.012	-7.403	0.000	0.000	0.000	0.000	0.000	502.712	
		11.430	46.509	-7.403	0.000	0.000	0.000	0.000	0.000	671.951	
		13.335	45.005	-7.403	0.000	0.000	0.000	0.000	0.000	841.189	
		15.240	43.502	-7.403	0.000	0.000	0.000	0.000	0.000	1.01E+3	
		17.145	41.998	-7.403	0.000	0.000	0.000	0.000	0.000	1.18E+3	
		19.050	40.494	-7.403	0.000	0.000	0.000	0.000	0.000	1.35E+3	
2	1:DEAD LOAD	0.000	7.359	40.519	0.000	0.000	0.000	0.000	0.000	1.35E+3	
		3.700	7.359	33.100	0.000	0.000	0.000	0.000	0.000	-263.690	
		7.400	7.359	25.478	0.000	0.000	0.000	0.000	0.000	-1.56E+3	
		11.100	7.359	17.654	0.000	0.000	0.000	0.000	0.000	-2.51E+3	
		14.800	7.359	9.627	0.000	0.000	0.000	0.000	0.000	-3.13E+3	
		18.500	7.359	1.398	0.000	0.000	0.000	0.000	0.000	-3.4E+3	
		22.200	7.359	-9.102	0.000	0.000	0.000	0.000	0.000	-3.16E+3	
		25.900	7.359	-17.766	0.000	0.000	0.000	0.000	0.000	-2.55E+3	
		29.600	7.359	-26.631	0.000	0.000	0.000	0.000	0.000	-1.57E+3	
		33.300	7.359	-35.700	0.000	0.000	0.000	0.000	0.000	-196.789	
		37.000	7.359	-44.970	0.000	0.000	0.000	0.000	0.000	1.57E+3	
	3:LIVE LOAD 1	0.000	11.431	80.396	0.000	0.000	0.000	0.000	0.000	2.11E+3	
		3.700	11.431	53.036	0.000	0.000	0.000	0.000	0.000	-440.634	
		7.400	11.431	34.796	0.000	0.000	0.000	0.000	0.000	-2.62E+3	
		11.100	11.431	21.296	0.000	0.000	0.000	0.000	0.000	-4.11E+3	
		14.800	11.431	12.296	0.000	0.000	0.000	0.000	0.000	-4.96E+3	
		18.500	11.431	-10.504	0.000	0.000	0.000	0.000	0.000	-5.37E+3	
		22.200	11.431	-15.064	0.000	0.000	0.000	0.000	0.000	-4.86E+3	
		25.900	11.431	-33.304	0.000	0.000	0.000	0.000	0.000	-3.91E+3	
		29.600	11.431	-46.984	0.000	0.000	0.000	0.000	0.000	-2.3E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
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Rev

Part Section M, Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 1.std Date/Time 01-Mar-2012 14:53

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	11.431	-56.104	0.000	0.000	0.000	0.000	0.000	-54.135	
		37.000	11.431	-56.104	0.000	0.000	0.000	0.000	0.000	2.44E+3	
	4:LIVE LOAD 2	0.000	11.457	54.728	0.000	0.000	0.000	0.000	0.000	2.12E+3	
		3.700	11.457	54.728	0.000	0.000	0.000	0.000	0.000	-313.779	
		7.400	11.457	45.608	0.000	0.000	0.000	0.000	0.000	-2.5E+3	
		11.100	11.457	31.928	0.000	0.000	0.000	0.000	0.000	-4.05E+3	
		14.800	11.457	13.688	0.000	0.000	0.000	0.000	0.000	-4.94E+3	
		18.500	11.457	9.128	0.000	0.000	0.000	0.000	0.000	-5.38E+3	
		22.200	11.457	-13.672	0.000	0.000	0.000	0.000	0.000	-4.91E+3	
		25.900	11.457	-22.792	0.000	0.000	0.000	0.000	0.000	-4E+3	
		29.600	11.457	-36.472	0.000	0.000	0.000	0.000	0.000	-2.44E+3	
		33.300	11.457	-54.712	0.000	0.000	0.000	0.000	0.000	-181.808	
		37.000	11.457	-82.072	0.000	0.000	0.000	0.000	0.000	2.44E+3	
	5:LIVE LOAD 3	0.000	12.085	67.622	0.000	0.000	0.000	0.000	0.000	2.23E+3	
		3.700	12.085	63.062	0.000	0.000	0.000	0.000	0.000	-626.534	
		7.400	12.085	44.822	0.000	0.000	0.000	0.000	0.000	-2.71E+3	
		11.100	12.085	31.142	0.000	0.000	0.000	0.000	0.000	-4.23E+3	
		14.800	12.085	22.022	0.000	0.000	0.000	0.000	0.000	-5.24E+3	
		18.500	12.085	-0.778	0.000	0.000	0.000	0.000	0.000	-5.39E+3	
		22.200	12.085	-23.578	0.000	0.000	0.000	0.000	0.000	-5.17E+3	
		25.900	12.085	-32.698	0.000	0.000	0.000	0.000	0.000	-4.09E+3	
		29.600	12.085	-46.378	0.000	0.000	0.000	0.000	0.000	-2.5E+3	
		33.300	12.085	-64.618	0.000	0.000	0.000	0.000	0.000	-350.080	
		37.000	12.085	-69.178	0.000	0.000	0.000	0.000	0.000	2.58E+3	
	6:LIVE LOAD 4	0.000	11.968	73.180	0.000	0.000	0.000	0.000	0.000	2.21E+3	
		3.700	11.968	50.380	0.000	0.000	0.000	0.000	0.000	-574.380	
		7.400	11.968	41.260	0.000	0.000	0.000	0.000	0.000	-2.67E+3	
		11.100	11.968	27.580	0.000	0.000	0.000	0.000	0.000	-4.2E+3	
		14.800	11.968	9.340	0.000	0.000	0.000	0.000	0.000	-5.11E+3	
		18.500	11.968	4.780	0.000	0.000	0.000	0.000	0.000	-5.42E+3	
		22.200	11.968	-18.020	0.000	0.000	0.000	0.000	0.000	-5.03E+3	
		25.900	11.968	-27.140	0.000	0.000	0.000	0.000	0.000	-4.04E+3	
		29.600	11.968	-40.820	0.000	0.000	0.000	0.000	0.000	-2.44E+3	
		33.300	11.968	-59.060	0.000	0.000	0.000	0.000	0.000	-210.976	
		37.000	11.968	-63.620	0.000	0.000	0.000	0.000	0.000	2.55E+3	
	7:LIVE LOAD 5	0.000	11.973	62.079	0.000	0.000	0.000	0.000	0.000	2.21E+3	
		3.700	11.973	57.519	0.000	0.000	0.000	0.000	0.000	-484.438	
		7.400	11.973	39.279	0.000	0.000	0.000	0.000	0.000	-2.65E+3	
		11.100	11.973	25.599	0.000	0.000	0.000	0.000	0.000	-4.17E+3	
		14.800	11.973	16.479	0.000	0.000	0.000	0.000	0.000	-5.1E+3	
		18.500	11.973	-6.321	0.000	0.000	0.000	0.000	0.000	-5.42E+3	
		22.200	11.973	-10.881	0.000	0.000	0.000	0.000	0.000	-5.05E+3	
		25.900	11.973	-29.121	0.000	0.000	0.000	0.000	0.000	-4.06E+3	
		29.600	11.973	-42.801	0.000	0.000	0.000	0.000	0.000	-2.47E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
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Rev

Part Section M, Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 1.std Date/Time 01-Mar-2012 14:53

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	11.973	-51.921	0.000	0.000	0.000	0.000	0.000	-300.371	
		37.000	11.973	-74.721	0.000	0.000	0.000	0.000	0.000	2.55E+3	
	8:LIVE LOAD 6	0.000	11.619	49.845	0.000	0.000	0.000	0.000	0.000	2.14E+3	
		3.700	11.619	49.845	0.000	0.000	0.000	0.000	0.000	-71.058	
		7.400	11.619	49.845	0.000	0.000	0.000	0.000	0.000	-2.28E+3	
		11.100	11.619	34.665	0.000	0.000	0.000	0.000	0.000	-4.16E+3	
		14.800	11.619	24.545	0.000	0.000	0.000	0.000	0.000	-5.4E+3	
		18.500	11.619	-0.755	0.000	0.000	0.000	0.000	0.000	-5.89E+3	
		22.200	11.619	-26.055	0.000	0.000	0.000	0.000	0.000	-5.34E+3	
		25.900	11.619	-36.175	0.000	0.000	0.000	0.000	0.000	-4.03E+3	
		29.600	11.619	-51.355	0.000	0.000	0.000	0.000	0.000	-2.08E+3	
		33.300	11.619	-51.355	0.000	0.000	0.000	0.000	0.000	196.968	
		37.000	11.619	-51.355	0.000	0.000	0.000	0.000	0.000	2.48E+3	
	2:SOIL LOAD	0.000	0.089	-0.050	0.000	0.000	0.000	0.000	0.000	-8.330	
		3.700	0.089	-0.050	0.000	0.000	0.000	0.000	0.000	-6.132	
		7.400	0.089	-0.050	0.000	0.000	0.000	0.000	0.000	-3.934	
		11.100	0.089	-0.050	0.000	0.000	0.000	0.000	0.000	-1.736	
		14.800	0.089	-0.050	0.000	0.000	0.000	0.000	0.000	0.462	
		18.500	0.089	-0.050	0.000	0.000	0.000	0.000	0.000	2.659	
		22.200	0.089	-0.050	0.000	0.000	0.000	0.000	0.000	4.857	
		25.900	0.089	-0.050	0.000	0.000	0.000	0.000	0.000	7.055	
		29.600	0.089	-0.050	0.000	0.000	0.000	0.000	0.000	9.253	
		33.300	0.089	-0.050	0.000	0.000	0.000	0.000	0.000	11.451	
		37.000	0.089	-0.050	0.000	0.000	0.000	0.000	0.000	13.648	
	9:DEAD PLUS	0.000	7.461	40.462	0.000	0.000	0.000	0.000	0.000	1.34E+3	
		3.700	7.461	33.043	0.000	0.000	0.000	0.000	0.000	-270.742	
		7.400	7.461	25.421	0.000	0.000	0.000	0.000	0.000	-1.56E+3	
		11.100	7.461	17.597	0.000	0.000	0.000	0.000	0.000	-2.52E+3	
		14.800	7.461	9.571	0.000	0.000	0.000	0.000	0.000	-3.13E+3	
		18.500	7.461	1.341	0.000	0.000	0.000	0.000	0.000	-3.39E+3	
		22.200	7.461	-9.159	0.000	0.000	0.000	0.000	0.000	-3.15E+3	
		25.900	7.461	-17.823	0.000	0.000	0.000	0.000	0.000	-2.55E+3	
		29.600	7.461	-26.688	0.000	0.000	0.000	0.000	0.000	-1.56E+3	
		33.300	7.461	-35.757	0.000	0.000	0.000	0.000	0.000	-183.621	
		37.000	7.461	-45.027	0.000	0.000	0.000	0.000	0.000	1.59E+3	
	10:DL PLUS S	0.000	7.403	40.494	0.000	0.000	0.000	0.000	0.000	1.35E+3	
		3.700	7.403	33.075	0.000	0.000	0.000	0.000	0.000	-266.756	
		7.400	7.403	25.454	0.000	0.000	0.000	0.000	0.000	-1.56E+3	
		11.100	7.403	17.629	0.000	0.000	0.000	0.000	0.000	-2.51E+3	
		14.800	7.403	9.603	0.000	0.000	0.000	0.000	0.000	-3.13E+3	
		18.500	7.403	1.373	0.000	0.000	0.000	0.000	0.000	-3.39E+3	
		22.200	7.403	-9.127	0.000	0.000	0.000	0.000	0.000	-3.16E+3	
		25.900	7.403	-17.790	0.000	0.000	0.000	0.000	0.000	-2.55E+3	
		29.600	7.403	-26.656	0.000	0.000	0.000	0.000	0.000	-1.56E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**8**

Rev

Part Section M, Frame 1

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 1.std Date/Time 01-Mar-2012 14:53

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	7.403	-35.724	0.000	0.000	0.000	0.000	0.000	-191.064	
		37.000	7.403	-44.995	0.000	0.000	0.000	0.000	0.000	1.58E+3	
3	1:DEAD LOAD	0.000	67.109	7.359	0.000	0.000	0.000	0.000	0.000	906.497	
		2.805	64.895	7.359	0.000	0.000	0.000	0.000	0.000	658.796	
		5.610	62.682	7.359	0.000	0.000	0.000	0.000	0.000	411.096	
		8.415	60.468	7.359	0.000	0.000	0.000	0.000	0.000	163.396	
		11.220	58.254	7.359	0.000	0.000	0.000	0.000	0.000	-84.305	
		14.025	56.040	7.359	0.000	0.000	0.000	0.000	0.000	-332.005	
		16.830	53.826	7.359	0.000	0.000	0.000	0.000	0.000	-579.705	
		19.635	51.612	7.359	0.000	0.000	0.000	0.000	0.000	-827.405	
		22.440	49.398	7.359	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		25.245	47.184	7.359	0.000	0.000	0.000	0.000	0.000	-1.32E+3	
		28.050	44.970	7.359	0.000	0.000	0.000	0.000	0.000	-1.57E+3	
	3:LIVE LOAD 1	0.000	56.104	11.431	0.000	0.000	0.000	0.000	0.000	1.41E+3	
		2.805	56.104	11.431	0.000	0.000	0.000	0.000	0.000	1.03E+3	
		5.610	56.104	11.431	0.000	0.000	0.000	0.000	0.000	641.217	
		8.415	56.104	11.431	0.000	0.000	0.000	0.000	0.000	256.454	
		11.220	56.104	11.431	0.000	0.000	0.000	0.000	0.000	-128.308	
		14.025	56.104	11.431	0.000	0.000	0.000	0.000	0.000	-513.070	
		16.830	56.104	11.431	0.000	0.000	0.000	0.000	0.000	-897.833	
		19.635	56.104	11.431	0.000	0.000	0.000	0.000	0.000	-1.28E+3	
		22.440	56.104	11.431	0.000	0.000	0.000	0.000	0.000	-1.67E+3	
		25.245	56.104	11.431	0.000	0.000	0.000	0.000	0.000	-2.05E+3	
		28.050	56.104	11.431	0.000	0.000	0.000	0.000	0.000	-2.44E+3	
	4:LIVE LOAD 2	0.000	82.072	11.457	0.000	0.000	0.000	0.000	0.000	1.42E+3	
		2.805	82.072	11.457	0.000	0.000	0.000	0.000	0.000	1.03E+3	
		5.610	82.072	11.457	0.000	0.000	0.000	0.000	0.000	644.447	
		8.415	82.072	11.457	0.000	0.000	0.000	0.000	0.000	258.800	
		11.220	82.072	11.457	0.000	0.000	0.000	0.000	0.000	-126.848	
		14.025	82.072	11.457	0.000	0.000	0.000	0.000	0.000	-512.495	
		16.830	82.072	11.457	0.000	0.000	0.000	0.000	0.000	-898.142	
		19.635	82.072	11.457	0.000	0.000	0.000	0.000	0.000	-1.28E+3	
		22.440	82.072	11.457	0.000	0.000	0.000	0.000	0.000	-1.67E+3	
		25.245	82.072	11.457	0.000	0.000	0.000	0.000	0.000	-2.06E+3	
		28.050	82.072	11.457	0.000	0.000	0.000	0.000	0.000	-2.44E+3	
	5:LIVE LOAD 3	0.000	69.178	12.085	0.000	0.000	0.000	0.000	0.000	1.49E+3	
		2.805	69.178	12.085	0.000	0.000	0.000	0.000	0.000	1.09E+3	
		5.610	69.178	12.085	0.000	0.000	0.000	0.000	0.000	678.754	
		8.415	69.178	12.085	0.000	0.000	0.000	0.000	0.000	271.970	
		11.220	69.178	12.085	0.000	0.000	0.000	0.000	0.000	-134.814	
		14.025	69.178	12.085	0.000	0.000	0.000	0.000	0.000	-541.598	
		16.830	69.178	12.085	0.000	0.000	0.000	0.000	0.000	-948.382	
		19.635	69.178	12.085	0.000	0.000	0.000	0.000	0.000	-1.36E+3	
		22.440	69.178	12.085	0.000	0.000	0.000	0.000	0.000	-1.76E+3	



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Job Title Main Avenue Rating

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By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 1.std Date/Time 01-Mar-2012 14:53

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	
		25.245	69.178	12.085	0.000	0.000	0.000	0.000	-2.17E+3
		28.050	69.178	12.085	0.000	0.000	0.000	0.000	-2.58E+3
	6:LIVE LOAD 4	0.000	63.620	11.968	0.000	0.000	0.000	0.000	1.48E+3
		2.805	63.620	11.968	0.000	0.000	0.000	0.000	1.08E+3
		5.610	63.620	11.968	0.000	0.000	0.000	0.000	672.794
		8.415	63.620	11.968	0.000	0.000	0.000	0.000	269.953
		11.220	63.620	11.968	0.000	0.000	0.000	0.000	-132.887
		14.025	63.620	11.968	0.000	0.000	0.000	0.000	-535.728
		16.830	63.620	11.968	0.000	0.000	0.000	0.000	-938.568
		19.635	63.620	11.968	0.000	0.000	0.000	0.000	-1.34E+3
		22.440	63.620	11.968	0.000	0.000	0.000	0.000	-1.74E+3
		25.245	63.620	11.968	0.000	0.000	0.000	0.000	-2.15E+3
		28.050	63.620	11.968	0.000	0.000	0.000	0.000	-2.55E+3
	7:LIVE LOAD 5	0.000	74.721	11.973	0.000	0.000	0.000	0.000	1.48E+3
		2.805	74.721	11.973	0.000	0.000	0.000	0.000	1.07E+3
		5.610	74.721	11.973	0.000	0.000	0.000	0.000	671.898
		8.415	74.721	11.973	0.000	0.000	0.000	0.000	268.896
		11.220	74.721	11.973	0.000	0.000	0.000	0.000	-134.106
		14.025	74.721	11.973	0.000	0.000	0.000	0.000	-537.107
		16.830	74.721	11.973	0.000	0.000	0.000	0.000	-940.109
		19.635	74.721	11.973	0.000	0.000	0.000	0.000	-1.34E+3
		22.440	74.721	11.973	0.000	0.000	0.000	0.000	-1.75E+3
		25.245	74.721	11.973	0.000	0.000	0.000	0.000	-2.15E+3
		28.050	74.721	11.973	0.000	0.000	0.000	0.000	-2.55E+3
	8:LIVE LOAD 6	0.000	51.355	11.619	0.000	0.000	0.000	0.000	1.43E+3
		2.805	51.355	11.619	0.000	0.000	0.000	0.000	1.04E+3
		5.610	51.355	11.619	0.000	0.000	0.000	0.000	651.709
		8.415	51.355	11.619	0.000	0.000	0.000	0.000	260.606
		11.220	51.355	11.619	0.000	0.000	0.000	0.000	-130.496
		14.025	51.355	11.619	0.000	0.000	0.000	0.000	-521.599
		16.830	51.355	11.619	0.000	0.000	0.000	0.000	-912.701
		19.635	51.355	11.619	0.000	0.000	0.000	0.000	-1.3E+3
		22.440	51.355	11.619	0.000	0.000	0.000	0.000	-1.69E+3
		25.245	51.355	11.619	0.000	0.000	0.000	0.000	-2.09E+3
		28.050	51.355	11.619	0.000	0.000	0.000	0.000	-2.48E+3
	2:SOIL LOAD	0.000	0.050	0.089	0.000	0.000	0.000	0.000	16.218
		2.805	0.050	0.089	0.000	0.000	0.000	0.000	13.231
		5.610	0.050	0.089	0.000	0.000	0.000	0.000	10.245
		8.415	0.050	0.089	0.000	0.000	0.000	0.000	7.258
		11.220	0.050	0.089	0.000	0.000	0.000	0.000	4.272
		14.025	0.050	0.089	0.000	0.000	0.000	0.000	1.285
		16.830	0.050	0.089	0.000	0.000	0.000	0.000	-1.702
		19.635	0.050	0.089	0.000	0.000	0.000	0.000	-4.688
		22.440	0.050	0.089	0.000	0.000	0.000	0.000	-7.675



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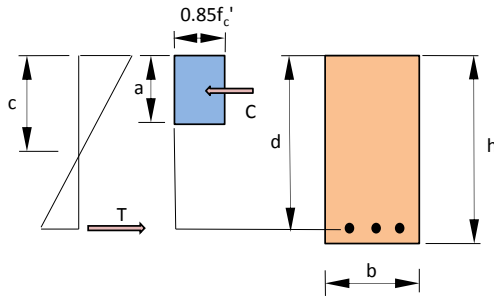
Client ODOT

File Section M Frame 1.std Date/Time 01-Mar-2012 14:53

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	
		25.245	0.050	0.089	0.000	0.000	0.000	0.000	-10.662
		28.050	0.050	0.089	0.000	0.000	0.000	0.000	-13.648
	9:DEAD PLUS	0.000	67.166	7.461	0.000	0.000	0.000	0.000	925.147
		2.805	64.952	7.461	0.000	0.000	0.000	0.000	674.012
		5.610	62.738	7.461	0.000	0.000	0.000	0.000	422.878
		8.415	60.525	7.461	0.000	0.000	0.000	0.000	171.743
		11.220	58.311	7.461	0.000	0.000	0.000	0.000	-79.392
		14.025	56.097	7.461	0.000	0.000	0.000	0.000	-330.527
		16.830	53.883	7.461	0.000	0.000	0.000	0.000	-581.662
		19.635	51.669	7.461	0.000	0.000	0.000	0.000	-832.797
		22.440	49.455	7.461	0.000	0.000	0.000	0.000	-1.08E+3
		25.245	47.241	7.461	0.000	0.000	0.000	0.000	-1.34E+3
		28.050	45.027	7.461	0.000	0.000	0.000	0.000	-1.59E+3
	10:DL PLUS S	0.000	67.134	7.403	0.000	0.000	0.000	0.000	914.606
		2.805	64.920	7.403	0.000	0.000	0.000	0.000	665.412
		5.610	62.706	7.403	0.000	0.000	0.000	0.000	416.218
		8.415	60.492	7.403	0.000	0.000	0.000	0.000	167.025
		11.220	58.279	7.403	0.000	0.000	0.000	0.000	-82.169
		14.025	56.065	7.403	0.000	0.000	0.000	0.000	-331.362
		16.830	53.851	7.403	0.000	0.000	0.000	0.000	-580.556
		19.635	51.637	7.403	0.000	0.000	0.000	0.000	-829.750
		22.440	49.423	7.403	0.000	0.000	0.000	0.000	-1.08E+3
		25.245	47.209	7.403	0.000	0.000	0.000	0.000	-1.33E+3
		28.050	44.995	7.403	0.000	0.000	0.000	0.000	-1.58E+3

### Floor Beam Postive Moment Section



b =	91.38	in
d =	48	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	14.1	in <sup>2</sup>
% Steel Loss =	0%	

(5-1 1/4" □ & 5-1 1/8" □)  
from 49/246 of original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	14.141	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	221.16	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.800		
a =	1.335	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1656.5	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load Plus Soil Load Moment

(Soil Load Moment has been factored by 0.5)

Total Service Positive Moment = 282.9 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	38.9	42	28	36.1	34.7	36.1	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	50.6	54.6	36.4	46.9	45.1	46.9	kips
Reaction per Wheel (LL+I) =	25.3	27.3	18.2	23.5	22.6	23.5	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

		From STAAD					
Max. Positive LL+I Moment =	490.67	529.8	353.2	455.3	437.7	455.3	ft*kips

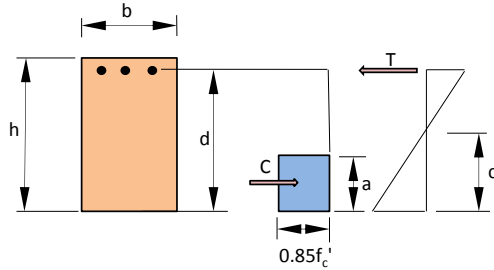
Maximum Positive Moment results from 2 lanes loaded.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.12	40.4 Tons	HS22.4
Operating	HS20	36 Tons	RF=1.87	67.4 Tons	HS37.4
	2F1	15 Tons	RF=2.81	42.1 Tons	
	3F1	23 Tons	RF=2.18	50.1 Tons	
	4F1	27 Tons	RF=2.26	61.2 Tons	
	5C1	40 Tons	RF=2.18	87.1 Tons	
	Ohio Legal %	220%			

### Floor Beam Negative Moment Section

(North side of floorbeam controls)



b =	21	in
d =	66	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	9.35	in <sup>2</sup>
% Steel Loss =	0%	

5-1 1/8" □ &  
3-1" □ from  
49/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	9.350	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	49.50	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.85		
a =	5.762	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1460.7	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

Taken at face of Column (Soil Load Moment has been increased by 1.15 factor)

Total Service Negative Moment = 53.4 ft\*kips From Staad

#### Live Load Moment

Taken at face of Column

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. Negative LL+I Moment =	103.67	111.9	74.6	96.2	92.5	96.2	ft*kips	

Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=5.73	206.2 Tons	HS114.6
Operating	HS20	36 Tons	RF=9.56	344.2 Tons	HS191.2
	2F1	15 Tons	RF=14.34	215.1 Tons	
	3F1	23 Tons	RF=11.12	255.8 Tons	
	4F1	27 Tons	RF=11.57	312.5 Tons	
	5C1	40 Tons	RF=11.12	445.0 Tons	
	Ohio Legal %	1110%			





Made by: **MJJ** Date: **2/14/2012** Job No: **P402110046**  
 Checked by: **JMK** Date: **2/29/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Built Concrete Frame Rating Section M (Frame 1)**

## Floor Beam Shear Section

### Section Capacity

*Taken at face of column (North end of cap controls)*

$A_{sh} = 0.62 \text{ in}^2$   
 $s = 12 \text{ in}$   
 $d = 67 \text{ in}$   
 $\alpha = 30 \text{ degrees}$   
 $V_c = 154.1 \text{ kips}$

*Total Bar area per space (assumed double leg #5's)*  
*Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)*  
*d used for shear*  
*angle of shear reinforcement (30 degrees assumed)*  
*Shear strength provided by concrete (AASHTO 8-49)*

$V_s = 156.0 \text{ kips}$  (AASHTO Eq. 8-54)

$\phi V_n = 263.7 \text{ kips}$  Shear Capacity of Section

**Dead Load plus Soil Load Shear** (Taken at face of column) (Soil Load Moment has been increased by 1.15 factor)

Total Service Shear = **38.2** kips From Staad

### Live Load Shear

*(Live Load shear is taken at face of column)*

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<b>73</b>	78.8	52.5	67.7	65.1	67.7	kips

*Maximum Shear results from 3 lanes loaded.*

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.25	45.0 Tons	HS25.0
Operating	HS20	36 Tons	RF=2.09	75.2 Tons	HS41.8
	2F1	15 Tons	RF=3.13	47.0 Tons	
	3F1	23 Tons	RF=2.43	55.9 Tons	
	4F1	27 Tons	RF=2.53	68.3 Tons	
	5C1	40 Tons	RF=2.43	97.2 Tons	
	Ohio Legal %	245%			



**Column Section** (Top of South Column controls)

h =	36	in	Column Depth
b =	21	in	Column Width
A <sub>s</sub> =	11.35	in <sup>2</sup>	Area of Tension Steel (10 -1 1/8" □ bars) (Sheet 49/246 original plans)
A' <sub>s</sub> =	4	in <sup>2</sup>	Area of Compression Steel (4- 1" □ bars) (Sheet 49/246 original plans)
d =	30	in	Distance from compression face to centroid of tension steel
d' =	3	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	3	ksi	Concrete Strength
f <sub>y</sub> =	33	ksi	Steel Yield Stress
E <sub>s</sub> =	29000	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	0.003	in/in	Ultimate concrete strain
β <sub>1</sub> =	0.85		
d" =	12	in	Distance from centroid of gross section to centroid of tension steel (Moment taken at top of column below chamfer)

**Dead Loads plus Soil Loads** (Soil Loads have been increased by 1.15 factor)

Total Service Moment =	104.2	ft-kips	From Staad
Total Service Axial Force =	44.4	kips	From Staad

**Live Loads** (Moment taken at top of column below chamfer)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	169.3		182.7	121.8	157.1	151.0	157.1	ft-kips
Max. LL+I Axial Force =	69.2		74.7	46.1	89.2	66.5	72.0	kips

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	18.49	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	21.75	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	33	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	747.5	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	1261.9	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	2395.2	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	1676.6	kips		



Made by:	MJJ	Date:	2/14/2012	Job No:	P402110046
Checked by:	JMK	Date:	2/29/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	As-Built Concrete Frame Rating Section M (Frame 1)				

**Pure Bending Capacity** (Ignoring compression steel)

$a =$	6.994	in	$a = A_s * f_y / 0.85 * f'_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	827.2	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	744.5	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **17.58** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d - c) / c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c - d') / c, f_y)$	Stress in compression steel
$a =$	14.94534659	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	800.3	kips	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	390.4	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	869.2	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	26.71	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	207.9	219.9	157.8	251.3	202.1	213.9	kips
$M_u =$	502.7	532.0	399.8	476.3	463.0	476.3	ft-kips
$e =$	29.02	29.04	30.40	22.74	27.50	26.71	in
$\phi P_n =$	355.1	354.9	336.4	465.4	377.8	390.4	kips
$\phi M_n =$	858.8	858.7	852.2	882.0	865.8	869.2	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

Column Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.82	65.7 Tons	HS36.5
Operating	HS20	36 Tons	RF=3.04	109.6 Tons	HS60.9
	2F1	15 Tons	RF=4.53	67.9 Tons	
	3F1	23 Tons	RF=3.52	80.9 Tons	
	4F1	27 Tons	RF=3.70	99.9 Tons	
	5C1	40 Tons	RF=3.56	142.2 Tons	
Ohio Legal %	350%				

Floor Beam Load Rating Summary:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.12	40.4 Tons	HS22.4
Operating	HS20	36 Tons	RF=1.87	67.4 Tons	HS37.4
	2F1	15 Tons	RF=2.81	42.1 Tons	
	3F1	23 Tons	RF=2.18	50.1 Tons	
	4F1	27 Tons	RF=2.26	61.2 Tons	
	5C1	40 Tons	RF=2.18	87.1 Tons	
Ohio Legal %	220%				

Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment



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Rev

Part Section M, Frame 13

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 13.std Date/Time 01-Mar-2012 14:55

## Job Information

	Engineer	Checked	Approved
Name:	M Johnson	J Kemnitz	
Date:	14-Feb-12	29-Feb-12	

Structure Type SPACE FRAME

Number of Nodes	4	Highest Node	4
Number of Elements	3	Highest Beam	3

Number of Basic Load Cases	8
Number of Combination Load Cases	2

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	DEAD LOAD
Primary	3	LIVE LOAD 1
Primary	4	LIVE LOAD 2
Primary	5	LIVE LOAD 3
Primary	6	LIVE LOAD 4
Primary	7	LIVE LOAD 5
Primary	8	LIVE LOAD 6
Primary	2	SOIL LOAD
Combination	9	DEAD PLUS SOIL
Combination	10	DL AND SOIL POS MOM

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	1.000	0.000
2	0.000	18.530	0.000
3	37.000	18.530	0.000
4	37.000	0.000	0.000

## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	2	17.530	2	0
2	2	3	37.000	1	0
3	4	3	18.530	2	0



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### Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE
2	Rect 36.00x21.00	756.000	27.8E+3	81.6E+3	70.7E+3	CONCRETE

### Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

### Basic Load Cases

Number	Name
1	DEAD LOAD
3	LIVE LOAD 1
4	LIVE LOAD 2
5	LIVE LOAD 3
6	LIVE LOAD 4
7	LIVE LOAD 5
8	LIVE LOAD 6
2	SOIL LOAD

### Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	DEAD PLUS SOIL	1	DEAD LOAD	1.00
		2	SOIL LOAD	1.15
10	DL AND SOIL POS MOM	1	DEAD LOAD	1.00
		2	SOIL LOAD	0.50



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## Beam Force Detail

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	Shear		Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)
1	1:DEAD LOAD	0.000	63.197	-12.316	0.000	0.000	0.000	-794.767
		1.753	61.813	-12.316	0.000	0.000	0.000	-535.689
		3.506	60.430	-12.316	0.000	0.000	0.000	-276.611
		5.259	59.046	-12.316	0.000	0.000	0.000	-17.533
		7.012	57.663	-12.316	0.000	0.000	0.000	241.546
		8.765	56.279	-12.316	0.000	0.000	0.000	500.624
		10.518	54.895	-12.316	0.000	0.000	0.000	759.702
		12.271	53.512	-12.316	0.000	0.000	0.000	1.02E+3
		14.024	52.128	-12.316	0.000	0.000	0.000	1.28E+3
		15.777	50.745	-12.316	0.000	0.000	0.000	1.54E+3
	17.530	49.361	-12.316	0.000	0.000	0.000	1.8E+3	
	3:LIVE LOAD 1	0.000	85.837	-18.979	0.000	0.000	0.000	-1.22E+3
		1.753	85.837	-18.979	0.000	0.000	0.000	-819.467
		3.506	85.837	-18.979	0.000	0.000	0.000	-420.230
		5.259	85.837	-18.979	0.000	0.000	0.000	-20.992
		7.012	85.837	-18.979	0.000	0.000	0.000	378.245
		8.765	85.837	-18.979	0.000	0.000	0.000	777.483
		10.518	85.837	-18.979	0.000	0.000	0.000	1.18E+3
		12.271	85.837	-18.979	0.000	0.000	0.000	1.58E+3
		14.024	85.837	-18.979	0.000	0.000	0.000	1.98E+3
		15.777	85.837	-18.979	0.000	0.000	0.000	2.37E+3
	17.530	85.837	-18.979	0.000	0.000	0.000	2.77E+3	
	4:LIVE LOAD 2	0.000	58.477	-18.979	0.000	0.000	0.000	-1.22E+3
		1.753	58.477	-18.979	0.000	0.000	0.000	-820.177
		3.506	58.477	-18.979	0.000	0.000	0.000	-420.932
		5.259	58.477	-18.979	0.000	0.000	0.000	-21.687
		7.012	58.477	-18.979	0.000	0.000	0.000	377.558
		8.765	58.477	-18.979	0.000	0.000	0.000	776.802
		10.518	58.477	-18.979	0.000	0.000	0.000	1.18E+3
		12.271	58.477	-18.979	0.000	0.000	0.000	1.58E+3
		14.024	58.477	-18.979	0.000	0.000	0.000	1.97E+3
		15.777	58.477	-18.979	0.000	0.000	0.000	2.37E+3
	17.530	58.477	-18.979	0.000	0.000	0.000	2.77E+3	
	5:LIVE LOAD 3	0.000	72.149	-20.012	0.000	0.000	0.000	-1.29E+3
		1.753	72.149	-20.012	0.000	0.000	0.000	-864.508
		3.506	72.149	-20.012	0.000	0.000	0.000	-443.530
		5.259	72.149	-20.012	0.000	0.000	0.000	-22.552
		7.012	72.149	-20.012	0.000	0.000	0.000	398.426
		8.765	72.149	-20.012	0.000	0.000	0.000	819.404
		10.518	72.149	-20.012	0.000	0.000	0.000	1.24E+3
		12.271	72.149	-20.012	0.000	0.000	0.000	1.66E+3
	14.024	72.149	-20.012	0.000	0.000	0.000	2.08E+3	



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Part Section M, Frame 13

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By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 13.std Date/Time 01-Mar-2012 14:55

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		15.777	72.149	-20.012	0.000	0.000	0.000	0.000	0.000	2.5E+3	
		17.530	72.149	-20.012	0.000	0.000	0.000	0.000	0.000	2.92E+3	
	6:LIVE LOAD 4	0.000	78.022	-19.821	0.000	0.000	0.000	0.000	0.000	-1.27E+3	
		1.753	78.022	-19.821	0.000	0.000	0.000	0.000	0.000	-854.194	
		3.506	78.022	-19.821	0.000	0.000	0.000	0.000	0.000	-437.230	
		5.259	78.022	-19.821	0.000	0.000	0.000	0.000	0.000	-20.266	
		7.012	78.022	-19.821	0.000	0.000	0.000	0.000	0.000	396.698	
		8.765	78.022	-19.821	0.000	0.000	0.000	0.000	0.000	813.662	
		10.518	78.022	-19.821	0.000	0.000	0.000	0.000	0.000	1.23E+3	
		12.271	78.022	-19.821	0.000	0.000	0.000	0.000	0.000	1.65E+3	
		14.024	78.022	-19.821	0.000	0.000	0.000	0.000	0.000	2.06E+3	
		15.777	78.022	-19.821	0.000	0.000	0.000	0.000	0.000	2.48E+3	
		17.530	78.022	-19.821	0.000	0.000	0.000	0.000	0.000	2.9E+3	
	7:LIVE LOAD 5	0.000	66.280	-19.824	0.000	0.000	0.000	0.000	0.000	-1.28E+3	
		1.753	66.280	-19.824	0.000	0.000	0.000	0.000	0.000	-858.407	
		3.506	66.280	-19.824	0.000	0.000	0.000	0.000	0.000	-441.400	
		5.259	66.280	-19.824	0.000	0.000	0.000	0.000	0.000	-24.393	
		7.012	66.280	-19.824	0.000	0.000	0.000	0.000	0.000	392.615	
		8.765	66.280	-19.824	0.000	0.000	0.000	0.000	0.000	809.622	
		10.518	66.280	-19.824	0.000	0.000	0.000	0.000	0.000	1.23E+3	
		12.271	66.280	-19.824	0.000	0.000	0.000	0.000	0.000	1.64E+3	
		14.024	66.280	-19.824	0.000	0.000	0.000	0.000	0.000	2.06E+3	
		15.777	66.280	-19.824	0.000	0.000	0.000	0.000	0.000	2.48E+3	
		17.530	66.280	-19.824	0.000	0.000	0.000	0.000	0.000	2.89E+3	
	8:LIVE LOAD 6	0.000	53.454	-19.276	0.000	0.000	0.000	0.000	0.000	-1.24E+3	
		1.753	53.454	-19.276	0.000	0.000	0.000	0.000	0.000	-832.919	
		3.506	53.454	-19.276	0.000	0.000	0.000	0.000	0.000	-427.424	
		5.259	53.454	-19.276	0.000	0.000	0.000	0.000	0.000	-21.929	
		7.012	53.454	-19.276	0.000	0.000	0.000	0.000	0.000	383.565	
		8.765	53.454	-19.276	0.000	0.000	0.000	0.000	0.000	789.060	
		10.518	53.454	-19.276	0.000	0.000	0.000	0.000	0.000	1.19E+3	
		12.271	53.454	-19.276	0.000	0.000	0.000	0.000	0.000	1.6E+3	
		14.024	53.454	-19.276	0.000	0.000	0.000	0.000	0.000	2.01E+3	
		15.777	53.454	-19.276	0.000	0.000	0.000	0.000	0.000	2.41E+3	
		17.530	53.454	-19.276	0.000	0.000	0.000	0.000	0.000	2.82E+3	
	2:SOIL LOAD	0.000	-0.910	34.969	0.000	0.000	0.000	0.000	0.000	1.41E+3	
		1.753	-0.910	27.061	0.000	0.000	0.000	0.000	0.000	770.583	
		3.506	-0.910	19.282	0.000	0.000	0.000	0.000	0.000	289.022	
		5.259	-0.910	12.285	0.000	0.000	0.000	0.000	0.000	-39.803	
		7.012	-0.910	6.591	0.000	0.000	0.000	0.000	0.000	-238.285	
		8.765	-0.910	2.188	0.000	0.000	0.000	0.000	0.000	-332.158	
		10.518	-0.910	-0.737	0.000	0.000	0.000	0.000	0.000	-339.581	
		12.271	-0.910	-2.372	0.000	0.000	0.000	0.000	0.000	-300.324	
		14.024	-0.910	-2.971	0.000	0.000	0.000	0.000	0.000	-239.739	



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By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 13.std Date/Time 01-Mar-2012 14:55

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		15.777	-0.910	-3.072	0.000	0.000	0.000	0.000	0.000	-175.175	
		17.530	-0.910	-3.072	0.000	0.000	0.000	0.000	0.000	-110.547	
	9:DEAD PLUS	0.000	62.151	27.898	0.000	0.000	0.000	0.000	0.000	830.853	
		1.753	60.767	18.804	0.000	0.000	0.000	0.000	0.000	350.482	
		3.506	59.383	9.858	0.000	0.000	0.000	0.000	0.000	55.764	
		5.259	58.000	1.811	0.000	0.000	0.000	0.000	0.000	-63.306	
		7.012	56.616	-4.737	0.000	0.000	0.000	0.000	0.000	-32.482	
		8.765	55.233	-9.799	0.000	0.000	0.000	0.000	0.000	118.642	
		10.518	53.849	-13.164	0.000	0.000	0.000	0.000	0.000	369.184	
		12.271	52.466	-15.043	0.000	0.000	0.000	0.000	0.000	673.407	
		14.024	51.082	-15.733	0.000	0.000	0.000	0.000	0.000	1E+3	
		15.777	49.698	-15.849	0.000	0.000	0.000	0.000	0.000	1.34E+3	
		17.530	48.315	-15.849	0.000	0.000	0.000	0.000	0.000	1.67E+3	
	10:DL AND SO	0.000	62.742	5.168	0.000	0.000	0.000	0.000	0.000	-87.976	
		1.753	61.358	1.215	0.000	0.000	0.000	0.000	0.000	-150.397	
		3.506	59.975	-2.675	0.000	0.000	0.000	0.000	0.000	-132.100	
		5.259	58.591	-6.174	0.000	0.000	0.000	0.000	0.000	-37.434	
		7.012	57.208	-9.021	0.000	0.000	0.000	0.000	0.000	122.403	
		8.765	55.824	-11.222	0.000	0.000	0.000	0.000	0.000	334.544	
		10.518	54.440	-12.685	0.000	0.000	0.000	0.000	0.000	589.911	
		12.271	53.057	-13.502	0.000	0.000	0.000	0.000	0.000	868.618	
		14.024	51.673	-13.802	0.000	0.000	0.000	0.000	0.000	1.16E+3	
		15.777	50.290	-13.852	0.000	0.000	0.000	0.000	0.000	1.45E+3	
		17.530	48.906	-13.852	0.000	0.000	0.000	0.000	0.000	1.74E+3	
2	1:DEAD LOAD	0.000	12.316	44.661	0.000	0.000	0.000	0.000	0.000	1.8E+3	
		3.700	12.316	36.238	0.000	0.000	0.000	0.000	0.000	20.432	
		7.400	12.316	27.701	0.000	0.000	0.000	0.000	0.000	-1.39E+3	
		11.100	12.316	19.050	0.000	0.000	0.000	0.000	0.000	-2.43E+3	
		14.800	12.316	10.285	0.000	0.000	0.000	0.000	0.000	-3.09E+3	
		18.500	12.316	1.405	0.000	0.000	0.000	0.000	0.000	-3.37E+3	
		22.200	12.316	-9.654	0.000	0.000	0.000	0.000	0.000	-3.12E+3	
		25.900	12.316	-18.778	0.000	0.000	0.000	0.000	0.000	-2.48E+3	
		29.600	12.316	-28.015	0.000	0.000	0.000	0.000	0.000	-1.44E+3	
		33.300	12.316	-37.367	0.000	0.000	0.000	0.000	0.000	-1.345	
		37.000	12.316	-46.833	0.000	0.000	0.000	0.000	0.000	1.84E+3	
	3:LIVE LOAD 1	0.000	18.979	85.837	0.000	0.000	0.000	0.000	0.000	2.77E+3	
		3.700	18.979	56.917	0.000	0.000	0.000	0.000	0.000	42.182	
		7.400	18.979	37.637	0.000	0.000	0.000	0.000	0.000	-2.3E+3	
		11.100	18.979	23.177	0.000	0.000	0.000	0.000	0.000	-3.92E+3	
		14.800	18.979	13.537	0.000	0.000	0.000	0.000	0.000	-4.84E+3	
		18.500	18.979	-10.563	0.000	0.000	0.000	0.000	0.000	-5.29E+3	
		22.200	18.979	-15.383	0.000	0.000	0.000	0.000	0.000	-4.79E+3	
		25.900	18.979	-34.663	0.000	0.000	0.000	0.000	0.000	-3.81E+3	
		29.600	18.979	-49.123	0.000	0.000	0.000	0.000	0.000	-2.12E+3	





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Job Title Main Avenue Rating

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By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 13.std Date/Time 01-Mar-2012 14:55

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	18.979	-58.763	0.000	0.000	0.000	0.000	0.000	227.335	
		37.000	18.979	-58.763	0.000	0.000	0.000	0.000	0.000	2.84E+3	
	4:LIVE LOAD 2	0.000	18.979	58.477	0.000	0.000	0.000	0.000	0.000	2.77E+3	
		3.700	18.979	58.477	0.000	0.000	0.000	0.000	0.000	176.632	
		7.400	18.979	48.837	0.000	0.000	0.000	0.000	0.000	-2.16E+3	
		11.100	18.979	34.377	0.000	0.000	0.000	0.000	0.000	-3.83E+3	
		14.800	18.979	15.097	0.000	0.000	0.000	0.000	0.000	-4.8E+3	
		18.500	18.979	10.277	0.000	0.000	0.000	0.000	0.000	-5.29E+3	
		22.200	18.979	-13.823	0.000	0.000	0.000	0.000	0.000	-4.82E+3	
		25.900	18.979	-23.463	0.000	0.000	0.000	0.000	0.000	-3.89E+3	
		29.600	18.979	-37.923	0.000	0.000	0.000	0.000	0.000	-2.27E+3	
		33.300	18.979	-57.203	0.000	0.000	0.000	0.000	0.000	92.910	
		37.000	18.979	-86.123	0.000	0.000	0.000	0.000	0.000	2.84E+3	
	5:LIVE LOAD 3	0.000	20.012	72.149	0.000	0.000	0.000	0.000	0.000	2.92E+3	
		3.700	20.012	67.329	0.000	0.000	0.000	0.000	0.000	-124.891	
		7.400	20.012	48.049	0.000	0.000	0.000	0.000	0.000	-2.35E+3	
		11.100	20.012	33.589	0.000	0.000	0.000	0.000	0.000	-4E+3	
		14.800	20.012	23.949	0.000	0.000	0.000	0.000	0.000	-5.09E+3	
		18.500	20.012	-0.151	0.000	0.000	0.000	0.000	0.000	-5.28E+3	
		22.200	20.012	-24.251	0.000	0.000	0.000	0.000	0.000	-5.08E+3	
		25.900	20.012	-33.891	0.000	0.000	0.000	0.000	0.000	-3.97E+3	
		29.600	20.012	-48.351	0.000	0.000	0.000	0.000	0.000	-2.31E+3	
		33.300	20.012	-67.631	0.000	0.000	0.000	0.000	0.000	-71.338	
		37.000	20.012	-72.451	0.000	0.000	0.000	0.000	0.000	2.99E+3	
	6:LIVE LOAD 4	0.000	19.821	78.022	0.000	0.000	0.000	0.000	0.000	2.9E+3	
		3.700	19.821	53.922	0.000	0.000	0.000	0.000	0.000	-74.041	
		7.400	19.821	44.282	0.000	0.000	0.000	0.000	0.000	-2.32E+3	
		11.100	19.821	29.822	0.000	0.000	0.000	0.000	0.000	-3.97E+3	
		14.800	19.821	10.542	0.000	0.000	0.000	0.000	0.000	-4.96E+3	
		18.500	19.821	5.722	0.000	0.000	0.000	0.000	0.000	-5.31E+3	
		22.200	19.821	-18.378	0.000	0.000	0.000	0.000	0.000	-4.93E+3	
		25.900	19.821	-28.018	0.000	0.000	0.000	0.000	0.000	-3.91E+3	
		29.600	19.821	-42.478	0.000	0.000	0.000	0.000	0.000	-2.26E+3	
		33.300	19.821	-61.758	0.000	0.000	0.000	0.000	0.000	72.264	
		37.000	19.821	-66.578	0.000	0.000	0.000	0.000	0.000	2.96E+3	
	7:LIVE LOAD 5	0.000	19.824	66.280	0.000	0.000	0.000	0.000	0.000	2.89E+3	
		3.700	19.824	61.460	0.000	0.000	0.000	0.000	0.000	19.318	
		7.400	19.824	42.180	0.000	0.000	0.000	0.000	0.000	-2.3E+3	
		11.100	19.824	27.720	0.000	0.000	0.000	0.000	0.000	-3.94E+3	
		14.800	19.824	18.080	0.000	0.000	0.000	0.000	0.000	-4.94E+3	
		18.500	19.824	-6.020	0.000	0.000	0.000	0.000	0.000	-5.31E+3	
		22.200	19.824	-10.840	0.000	0.000	0.000	0.000	0.000	-4.95E+3	
		25.900	19.824	-30.120	0.000	0.000	0.000	0.000	0.000	-3.94E+3	
		29.600	19.824	-44.580	0.000	0.000	0.000	0.000	0.000	-2.28E+3	



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Job No  
**P402110046**

Sheet No  
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Rev

Part Section M, Frame 13

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 13.std Date/Time 01-Mar-2012 14:55

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	19.824	-54.220	0.000	0.000	0.000	0.000	0.000	-20.920	
		37.000	19.824	-78.320	0.000	0.000	0.000	0.000	0.000	2.96E+3	
	8:LIVE LOAD 6	0.000	19.276	53.454	0.000	0.000	0.000	0.000	0.000	2.82E+3	
		3.700	19.276	53.454	0.000	0.000	0.000	0.000	0.000	443.181	
		7.400	19.276	53.454	0.000	0.000	0.000	0.000	0.000	-1.93E+3	
		11.100	19.276	37.374	0.000	0.000	0.000	0.000	0.000	-3.95E+3	
		14.800	19.276	26.654	0.000	0.000	0.000	0.000	0.000	-5.29E+3	
		18.500	19.276	-0.146	0.000	0.000	0.000	0.000	0.000	-5.83E+3	
		22.200	19.276	-26.946	0.000	0.000	0.000	0.000	0.000	-5.28E+3	
		25.900	19.276	-37.666	0.000	0.000	0.000	0.000	0.000	-3.92E+3	
		29.600	19.276	-53.746	0.000	0.000	0.000	0.000	0.000	-1.89E+3	
		33.300	19.276	-53.746	0.000	0.000	0.000	0.000	0.000	495.078	
		37.000	19.276	-53.746	0.000	0.000	0.000	0.000	0.000	2.88E+3	
	2:SOIL LOAD	0.000	3.072	-0.910	0.000	0.000	0.000	0.000	0.000	-110.547	
		3.700	3.072	-0.910	0.000	0.000	0.000	0.000	0.000	-70.154	
		7.400	3.072	-0.910	0.000	0.000	0.000	0.000	0.000	-29.762	
		11.100	3.072	-0.910	0.000	0.000	0.000	0.000	0.000	10.631	
		14.800	3.072	-0.910	0.000	0.000	0.000	0.000	0.000	51.023	
		18.500	3.072	-0.910	0.000	0.000	0.000	0.000	0.000	91.416	
		22.200	3.072	-0.910	0.000	0.000	0.000	0.000	0.000	131.809	
		25.900	3.072	-0.910	0.000	0.000	0.000	0.000	0.000	172.201	
		29.600	3.072	-0.910	0.000	0.000	0.000	0.000	0.000	212.594	
		33.300	3.072	-0.910	0.000	0.000	0.000	0.000	0.000	252.986	
		37.000	3.072	-0.910	0.000	0.000	0.000	0.000	0.000	293.379	
	9:DEAD PLUS	0.000	15.849	43.615	0.000	0.000	0.000	0.000	0.000	1.67E+3	
		3.700	15.849	35.192	0.000	0.000	0.000	0.000	0.000	-60.246	
		7.400	15.849	26.655	0.000	0.000	0.000	0.000	0.000	-1.42E+3	
		11.100	15.849	18.003	0.000	0.000	0.000	0.000	0.000	-2.42E+3	
		14.800	15.849	9.238	0.000	0.000	0.000	0.000	0.000	-3.03E+3	
		18.500	15.849	0.359	0.000	0.000	0.000	0.000	0.000	-3.27E+3	
		22.200	15.849	-10.700	0.000	0.000	0.000	0.000	0.000	-2.97E+3	
		25.900	15.849	-19.824	0.000	0.000	0.000	0.000	0.000	-2.28E+3	
		29.600	15.849	-29.062	0.000	0.000	0.000	0.000	0.000	-1.2E+3	
		33.300	15.849	-38.413	0.000	0.000	0.000	0.000	0.000	289.589	
		37.000	15.849	-47.879	0.000	0.000	0.000	0.000	0.000	2.18E+3	
	10:DL AND SO	0.000	13.852	44.206	0.000	0.000	0.000	0.000	0.000	1.74E+3	
		3.700	13.852	35.783	0.000	0.000	0.000	0.000	0.000	-14.645	
		7.400	13.852	27.246	0.000	0.000	0.000	0.000	0.000	-1.4E+3	
		11.100	13.852	18.595	0.000	0.000	0.000	0.000	0.000	-2.42E+3	
		14.800	13.852	9.830	0.000	0.000	0.000	0.000	0.000	-3.06E+3	
		18.500	13.852	0.950	0.000	0.000	0.000	0.000	0.000	-3.33E+3	
		22.200	13.852	-10.109	0.000	0.000	0.000	0.000	0.000	-3.06E+3	
		25.900	13.852	-19.233	0.000	0.000	0.000	0.000	0.000	-2.39E+3	
		29.600	13.852	-28.470	0.000	0.000	0.000	0.000	0.000	-1.33E+3	



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Part Section M, Frame 13		
Ref		
By M Johnson	Date 14-Feb-12	Chd J Kemnitz
Client ODOT	File Section M Frame 13.std	Date/Time 01-Mar-2012 14:55

Job Title Main Avenue Rating
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### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	13.852	-37.822	0.000	0.000	0.000	0.000	0.000	125.148	
		37.000	13.852	-47.287	0.000	0.000	0.000	0.000	0.000	1.99E+3	
3	1:DEAD LOAD	0.000	66.158	12.316	0.000	0.000	0.000	0.000	0.000	894.437	
		1.853	64.695	12.316	0.000	0.000	0.000	0.000	0.000	620.580	
		3.706	63.233	12.316	0.000	0.000	0.000	0.000	0.000	346.723	
		5.559	61.770	12.316	0.000	0.000	0.000	0.000	0.000	72.865	
		7.412	60.308	12.316	0.000	0.000	0.000	0.000	0.000	-200.992	
		9.265	58.845	12.316	0.000	0.000	0.000	0.000	0.000	-474.849	
		11.118	57.383	12.316	0.000	0.000	0.000	0.000	0.000	-748.707	
		12.971	55.920	12.316	0.000	0.000	0.000	0.000	0.000	-1.02E+3	
		14.824	54.458	12.316	0.000	0.000	0.000	0.000	0.000	-1.3E+3	
		16.677	52.995	12.316	0.000	0.000	0.000	0.000	0.000	-1.57E+3	
		18.530	51.533	12.316	0.000	0.000	0.000	0.000	0.000	-1.84E+3	
	3:LIVE LOAD 1	0.000	58.763	18.979	0.000	0.000	0.000	0.000	0.000	1.38E+3	
		1.853	58.763	18.979	0.000	0.000	0.000	0.000	0.000	961.702	
		3.706	58.763	18.979	0.000	0.000	0.000	0.000	0.000	539.690	
		5.559	58.763	18.979	0.000	0.000	0.000	0.000	0.000	117.677	
		7.412	58.763	18.979	0.000	0.000	0.000	0.000	0.000	-304.335	
		9.265	58.763	18.979	0.000	0.000	0.000	0.000	0.000	-726.347	
		11.118	58.763	18.979	0.000	0.000	0.000	0.000	0.000	-1.15E+3	
		12.971	58.763	18.979	0.000	0.000	0.000	0.000	0.000	-1.57E+3	
		14.824	58.763	18.979	0.000	0.000	0.000	0.000	0.000	-1.99E+3	
		16.677	58.763	18.979	0.000	0.000	0.000	0.000	0.000	-2.41E+3	
		18.530	58.763	18.979	0.000	0.000	0.000	0.000	0.000	-2.84E+3	
	4:LIVE LOAD 2	0.000	86.123	18.979	0.000	0.000	0.000	0.000	0.000	1.38E+3	
		1.853	86.123	18.979	0.000	0.000	0.000	0.000	0.000	961.098	
		3.706	86.123	18.979	0.000	0.000	0.000	0.000	0.000	539.078	
		5.559	86.123	18.979	0.000	0.000	0.000	0.000	0.000	117.058	
		7.412	86.123	18.979	0.000	0.000	0.000	0.000	0.000	-304.962	
		9.265	86.123	18.979	0.000	0.000	0.000	0.000	0.000	-726.981	
		11.118	86.123	18.979	0.000	0.000	0.000	0.000	0.000	-1.15E+3	
		12.971	86.123	18.979	0.000	0.000	0.000	0.000	0.000	-1.57E+3	
		14.824	86.123	18.979	0.000	0.000	0.000	0.000	0.000	-1.99E+3	
		16.677	86.123	18.979	0.000	0.000	0.000	0.000	0.000	-2.42E+3	
		18.530	86.123	18.979	0.000	0.000	0.000	0.000	0.000	-2.84E+3	
	5:LIVE LOAD 3	0.000	72.451	20.012	0.000	0.000	0.000	0.000	0.000	1.46E+3	
		1.853	72.451	20.012	0.000	0.000	0.000	0.000	0.000	1.01E+3	
		3.706	72.451	20.012	0.000	0.000	0.000	0.000	0.000	568.706	
		5.559	72.451	20.012	0.000	0.000	0.000	0.000	0.000	123.713	
		7.412	72.451	20.012	0.000	0.000	0.000	0.000	0.000	-321.280	
		9.265	72.451	20.012	0.000	0.000	0.000	0.000	0.000	-766.273	
		11.118	72.451	20.012	0.000	0.000	0.000	0.000	0.000	-1.21E+3	
		12.971	72.451	20.012	0.000	0.000	0.000	0.000	0.000	-1.66E+3	
		14.824	72.451	20.012	0.000	0.000	0.000	0.000	0.000	-2.1E+3	



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Part Section M, Frame 13

Job Title Main Avenue Rating

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By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 13.std Date/Time 01-Mar-2012 14:55

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		16.677	72.451	20.012	0.000	0.000	0.000	0.000	0.000	-2.55E+3	
		18.530	72.451	20.012	0.000	0.000	0.000	0.000	0.000	-2.99E+3	
	6:LIVE LOAD 4	0.000	66.578	19.821	0.000	0.000	0.000	0.000	0.000	1.45E+3	
		1.853	66.578	19.821	0.000	0.000	0.000	0.000	0.000	1.01E+3	
		3.706	66.578	19.821	0.000	0.000	0.000	0.000	0.000	565.136	
		5.559	66.578	19.821	0.000	0.000	0.000	0.000	0.000	124.386	
		7.412	66.578	19.821	0.000	0.000	0.000	0.000	0.000	-316.363	
		9.265	66.578	19.821	0.000	0.000	0.000	0.000	0.000	-757.113	
		11.118	66.578	19.821	0.000	0.000	0.000	0.000	0.000	-1.2E+3	
		12.971	66.578	19.821	0.000	0.000	0.000	0.000	0.000	-1.64E+3	
		14.824	66.578	19.821	0.000	0.000	0.000	0.000	0.000	-2.08E+3	
		16.677	66.578	19.821	0.000	0.000	0.000	0.000	0.000	-2.52E+3	
		18.530	66.578	19.821	0.000	0.000	0.000	0.000	0.000	-2.96E+3	
	7:LIVE LOAD 5	0.000	78.320	19.824	0.000	0.000	0.000	0.000	0.000	1.44E+3	
		1.853	78.320	19.824	0.000	0.000	0.000	0.000	0.000	1E+3	
		3.706	78.320	19.824	0.000	0.000	0.000	0.000	0.000	561.504	
		5.559	78.320	19.824	0.000	0.000	0.000	0.000	0.000	120.708	
		7.412	78.320	19.824	0.000	0.000	0.000	0.000	0.000	-320.087	
		9.265	78.320	19.824	0.000	0.000	0.000	0.000	0.000	-760.883	
		11.118	78.320	19.824	0.000	0.000	0.000	0.000	0.000	-1.2E+3	
		12.971	78.320	19.824	0.000	0.000	0.000	0.000	0.000	-1.64E+3	
		14.824	78.320	19.824	0.000	0.000	0.000	0.000	0.000	-2.08E+3	
		16.677	78.320	19.824	0.000	0.000	0.000	0.000	0.000	-2.52E+3	
		18.530	78.320	19.824	0.000	0.000	0.000	0.000	0.000	-2.96E+3	
	8:LIVE LOAD 6	0.000	53.746	19.276	0.000	0.000	0.000	0.000	0.000	1.4E+3	
		1.853	53.746	19.276	0.000	0.000	0.000	0.000	0.000	976.230	
		3.706	53.746	19.276	0.000	0.000	0.000	0.000	0.000	547.604	
		5.559	53.746	19.276	0.000	0.000	0.000	0.000	0.000	118.978	
		7.412	53.746	19.276	0.000	0.000	0.000	0.000	0.000	-309.648	
		9.265	53.746	19.276	0.000	0.000	0.000	0.000	0.000	-738.275	
		11.118	53.746	19.276	0.000	0.000	0.000	0.000	0.000	-1.17E+3	
		12.971	53.746	19.276	0.000	0.000	0.000	0.000	0.000	-1.6E+3	
		14.824	53.746	19.276	0.000	0.000	0.000	0.000	0.000	-2.02E+3	
		16.677	53.746	19.276	0.000	0.000	0.000	0.000	0.000	-2.45E+3	
		18.530	53.746	19.276	0.000	0.000	0.000	0.000	0.000	-2.88E+3	
	2:SOIL LOAD	0.000	0.910	3.072	0.000	0.000	0.000	0.000	0.000	389.776	
		1.853	0.910	3.072	0.000	0.000	0.000	0.000	0.000	321.461	
		3.706	0.910	3.072	0.000	0.000	0.000	0.000	0.000	253.145	
		5.559	0.910	3.072	0.000	0.000	0.000	0.000	0.000	184.830	
		7.412	0.910	3.072	0.000	0.000	0.000	0.000	0.000	116.514	
		9.265	0.910	3.072	0.000	0.000	0.000	0.000	0.000	48.199	
		11.118	0.910	3.072	0.000	0.000	0.000	0.000	0.000	-20.117	
		12.971	0.910	3.072	0.000	0.000	0.000	0.000	0.000	-88.432	
		14.824	0.910	3.072	0.000	0.000	0.000	0.000	0.000	-156.748	



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Job No  
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Part Section M, Frame 13

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

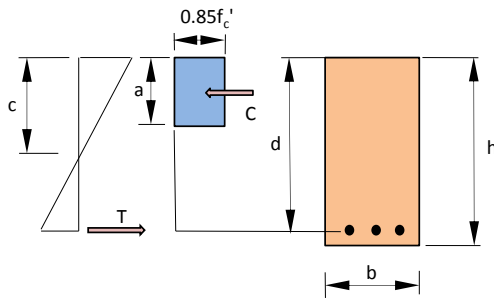
Client ODOT

File Section M Frame 13.std Date/Time 01-Mar-2012 14:55

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial	Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	
		16.677	0.910	3.072	0.000	0.000	0.000	0.000	-225.063
		18.530	0.910	3.072	0.000	0.000	0.000	0.000	-293.379
	9:DEAD PLUS	0.000	67.204	15.849	0.000	0.000	0.000	0.000	1.34E+3
		1.853	65.741	15.849	0.000	0.000	0.000	0.000	990.260
		3.706	64.279	15.849	0.000	0.000	0.000	0.000	637.839
		5.559	62.816	15.849	0.000	0.000	0.000	0.000	285.419
		7.412	61.354	15.849	0.000	0.000	0.000	0.000	-67.001
		9.265	59.891	15.849	0.000	0.000	0.000	0.000	-419.421
		11.118	58.429	15.849	0.000	0.000	0.000	0.000	-771.841
		12.971	56.966	15.849	0.000	0.000	0.000	0.000	-1.12E+3
		14.824	55.504	15.849	0.000	0.000	0.000	0.000	-1.48E+3
		16.677	54.041	15.849	0.000	0.000	0.000	0.000	-1.83E+3
		18.530	52.579	15.849	0.000	0.000	0.000	0.000	-2.18E+3
	10:DL AND SO	0.000	66.613	13.852	0.000	0.000	0.000	0.000	1.09E+3
		1.853	65.150	13.852	0.000	0.000	0.000	0.000	781.310
		3.706	63.688	13.852	0.000	0.000	0.000	0.000	473.295
		5.559	62.225	13.852	0.000	0.000	0.000	0.000	165.280
		7.412	60.763	13.852	0.000	0.000	0.000	0.000	-142.735
		9.265	59.300	13.852	0.000	0.000	0.000	0.000	-450.750
		11.118	57.838	13.852	0.000	0.000	0.000	0.000	-758.765
		12.971	56.375	13.852	0.000	0.000	0.000	0.000	-1.07E+3
		14.824	54.913	13.852	0.000	0.000	0.000	0.000	-1.37E+3
		16.677	53.450	13.852	0.000	0.000	0.000	0.000	-1.68E+3
		18.530	51.987	13.852	0.000	0.000	0.000	0.000	-1.99E+3

### Floor Beam Postive Moment Section



b =	98.8	in	
d =	48	in	
f'c =	4.5	ksi	
fy =	33	ksi	
φ =	0.9		
Area of Steel =	12.7	in <sup>2</sup>	(10-1 1/8" □)
% Steel Loss =	0%		from 49/246 of original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

As =	12.656	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρb =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*Asb =	239.22	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β1 =	0.8		
a =	1.105	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φMn =	1486.3	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

(Soil Load moment has been factored by 0.5)

Total Service Positive Moment = 277.2 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	41.6	44.6	30.2	39	38	38.7	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	54.1	58.0	39.3	50.7	49.4	50.3	kips
Reaction per Wheel (LL+I) =	27.0	29.0	19.6	25.4	24.7	25.2	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

From STAAD							
Max. Positive LL+I Moment =	486.17	521.2	352.9	455.8	444.1	452.3	ft*kips

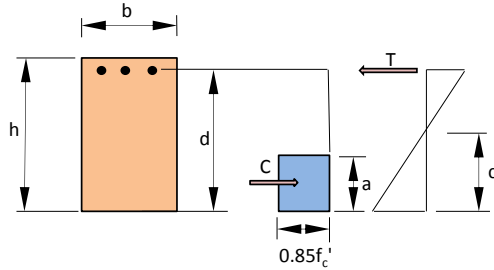
Maximum Positive Moment results from 2 lanes loaded.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.00	35.8 Tons	HS19.9
Operating	HS20	36 Tons	RF=1.66	59.8 Tons	HS33.2
	2F1	15 Tons	RF=2.45	36.8 Tons	
	3F1	23 Tons	RF=1.90	43.7 Tons	
	4F1	27 Tons	RF=1.95	52.7 Tons	
	5C1	40 Tons	RF=1.92	76.6 Tons	
	Ohio Legal %	190%			

### Floor Beam Negative Moment Section

(North side of floorbeam controls)



b =	<b>21</b>	in
d =	<b>66</b>	in
f <sub>c</sub> ' =	<b>3</b>	ksi
f <sub>y</sub> =	<b>33</b>	ksi
φ =	<b>0.9</b>	
Area of Steel =	<b>9.35</b>	in <sup>2</sup>
% Steel Loss =	<b>0%</b>	

(5-1 1/8" □,  
3-1" □) from  
49/246 of  
original plans

### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	<b>9.350</b>	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	<b>0.048</b>		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	<b>49.50</b>	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	<b>0.85</b>		
a =	<b>5.762</b>	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	<b>1460.7</b>	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

### Dead Load plus Soil Load Moment

Moment taken at face of column

(Soil Load moment has 1.15 factor included)

Total Service Negative Moment = **76.2** ft\*kips From Staad

### Live Load Moment

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Negative LL+I Moment =	<b>143.33</b>	153.7	104.1	134.4	130.9	133.3	ft*kips

Maximum Negative Moment results from 3 lanes loaded.

### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=4.08	147.0 Tons	HS81.7
Operating	HS20	36 Tons	RF=6.82	245.4 Tons	HS136.3
	2F1	15 Tons	RF=10.07	151.0 Tons	
	3F1	23 Tons	RF=7.79	179.3 Tons	
	4F1	27 Tons	RF=8.00	216.0 Tons	
	5C1	40 Tons	RF=7.86	314.2 Tons	
	Ohio Legal %	780%			



Made by: **MJJ** Date: **2/14/2012** Job No: **P402110046**  
 Checked by: **JMK** Date: **3/1/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Built Concrete Frame Rating Section M (Frame 13)**

## Floor Beam Shear Section

### Section Capacity

Taken at face of column (North end of cap controls)

$A_{sh} = 0.62 \text{ in}^2$   
 $s = 12 \text{ in}$   
 $d = 66 \text{ in}$   
 $\alpha = 30 \text{ degrees}$   
 $V_c = 151.8 \text{ kips}$

Total Bar area per space (assumed double leg #5's)  
 Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)  
 $d$  used for shear  
 angle of shear reinforcement (30 degrees assumed)  
 Shear strength provided by concrete (AASHTO 8-49)

$V_s = 153.7 \text{ kips}$  (AASHTO Eq. 8-54)

$\phi V_n = 259.7 \text{ kips}$  Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

(Soil Load shear has 1.15 factor included)

Total Service Shear = **40.3** kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<b>78</b>	83.6	56.6	73.1	71.3	72.6	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.14	41.1 Tons	HS22.9
Operating	HS20	36 Tons	RF=1.91	68.7 Tons	HS38.1
	2F1	15 Tons	RF=2.82	42.2 Tons	
	3F1	23 Tons	RF=2.18	50.2 Tons	
	4F1	27 Tons	RF=2.24	60.4 Tons	
	5C1	40 Tons	RF=2.20	87.9 Tons	
	Ohio Legal %	220%			





### Column Section (Top of South Column controls)

h =	42	in	Column Depth
b =	21	in	Column Width
A <sub>s</sub> =	12.7	in <sup>2</sup>	Area of Tension Steel (10 -1 1/8" □ bars)(49/246 original plans)
A' <sub>s</sub> =	4	in <sup>2</sup>	Area of Compression Steel (4- 1" bars)
d =	36	in	Distance from compression face to centroid of tension steel
d' =	3	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	3	ksi	Concrete Strength
f <sub>y</sub> =	33	ksi	Steel Yield Stress
E <sub>s</sub> =	29000	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	0.003	in/in	Ultimate concrete strain
β <sub>1</sub> =	0.85		
d" =	15	in	Distance from centroid of gross section to centroid of tension steel

### Dead Loads plus Soil Loads (Moment taken top of column below chamfe (Soil Loads have 1.15 factor included)

Total Service Moment =	122.3	ft-kips	From Staad
Total Service Axial Force =	50.7	kips	From Staad

### Live Loads (Moment taken top of column below chamfer)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	174.2	186.7	126.4	163.3	159.1	162.0	ft-kips	
Max. LL+I Axial Force =	72.5	77.7	49.1	93.6	70.6	73.8	kips	

Maximum Moment and Axial load results from 3 lanes loaded..

### Section Capacity

#### Balanced Condition

a <sub>b</sub> =	22.19	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	26.10	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	33	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	900.9	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	1702.7	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

#### Pure Axial Compression Capacity

P <sub>o</sub> =	2757.6	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	1930.3	kips		



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Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	As-Built Concrete Frame Rating Section M (Frame 13)				

**Pure Bending Capacity** (Ignoring compression steel)

$a =$	7.826	in	$a = A_s * f_y / 0.85 * f_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	1120.6	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	1008.6	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **22.85** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a =$	19.42268167	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	1040.1	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	527.1	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	1190.2	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	27.10	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	223.2	234.6	172.4	269.1	219.2	226.1	kips
$M_u =$	537.0	564.2	433.4	513.4	504.3	510.6	ft-kips
$e =$	28.87	28.86	30.16	22.89	27.61	27.10	in
$\phi P_n =$	492.3	492.4	469.0	625.0	516.7	527.1	kips
$\phi M_n =$	1184.3	1184.3	1178.8	1192.4	1188.7	1190.2	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.53	91.0 Tons	HS50.6
Operating	HS20	36 Tons	RF=4.22	151.9 Tons	HS84.4
	2F1	15 Tons	RF=6.20	93.1 Tons	
	3F1	23 Tons	RF=4.59	105.6 Tons	
	4F1	27 Tons	RF=4.91	132.5 Tons	
	5C1	40 Tons	RF=4.80	192.2 Tons	
Ohio Legal %	460%				

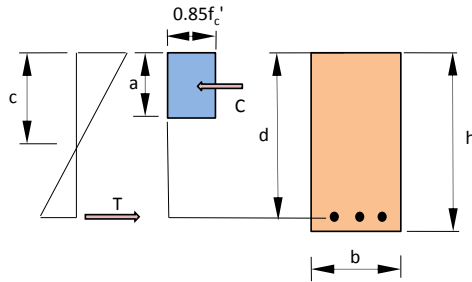
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.00	35.8 Tons	HS19.9
Operating	HS20	36 Tons	RF=1.66	59.8 Tons	HS33.2
	2F1	15 Tons	RF=2.45	36.8 Tons	
	3F1	23 Tons	RF=1.90	43.7 Tons	
	4F1	27 Tons	RF=1.95	52.7 Tons	
	5C1	40 Tons	RF=1.92	76.6 Tons	
Ohio Legal %	190%				

Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment  
Positive Moment



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 Checked by: **JMK** Date: **3/1/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Inspected Concrete Frame Rating Section M (Frame 13)**

### Floor Beam Postive Moment Section



b =	98.8	in
d =	48	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	12.7	in <sup>2</sup>
% Steel Loss =	0%	

(10-1 1/8" □)  
from 49/246 of  
original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	12.656	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	239.22	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	1.105	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1486.3	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

(Soil Load moment has been factored by 0.5)

Total Service Positive Moment = 277.2 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	41.6	44.6	30.2	39	38	38.7	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	54.1	58.0	39.3	50.7	49.4	50.3	kips
Reaction per Wheel (LL+I) =	27.0	29.0	19.6	25.4	24.7	25.2	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

#### From STAAD

Max. Positive LL+I Moment = 486.17 521.2 352.9 455.8 444.1 452.3 ft\*kips

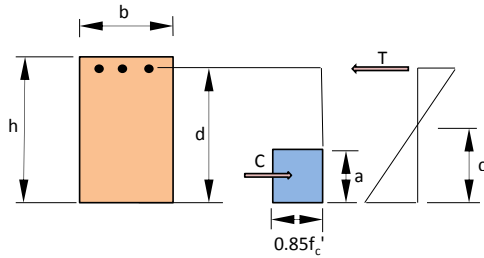
Maximum Positive Moment results from 2 lanes loaded.

#### Positive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.00	35.8 Tons	HS19.9
	Operating	HS20	36 Tons	RF=1.66	59.8 Tons
	2F1	15 Tons	RF=2.45	36.8 Tons	
	3F1	23 Tons	RF=1.90	43.7 Tons	
	4F1	27 Tons	RF=1.95	52.7 Tons	
	5C1	40 Tons	RF=1.92	76.6 Tons	
	Ohio Legal %		190%		

### Floor Beam Negative Moment Section

(North side of floorbeam controls)



b =	21	in
d =	66	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	9.35	in <sup>2</sup>
% Steel Loss =	0%	

(5-1 1/8" □,  
3-1" □) from  
49/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

A<sub>s</sub> = 9.350 in<sup>2</sup>

Area of reinforcing steel minus any loss noted

ρ<sub>b</sub> = 0.048

Balanced reinforcement ratio, AASHTO Eq. 8-18

0.75\*A<sub>sb</sub> = 49.50 in<sup>2</sup>

75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2

β<sub>1</sub> = 0.85

Depth of equivalent compressive stress block, AASHTO Eq. 8-17

a = 5.762 in

φM<sub>n</sub> = 1460.7 ft\*kips

Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load plus Soil Load Moment

Total Service Negative Moment = 76.2 ft\*kips From Staad

#### Live Load Moment

From STAAD					
HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
143.33	153.7	104.1	134.4	130.9	133.3

Max. Negative LL+I Moment = 143.33 ft\*kips

Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=4.08	147.0 Tons	HS81.7
	HS20	36 Tons	RF=6.82	245.4 Tons	HS136.3
Operating	2F1	15 Tons	RF=10.07	151.0 Tons	
	3F1	23 Tons	RF=7.79	179.3 Tons	
	4F1	27 Tons	RF=8.00	216.0 Tons	
	5C1	40 Tons	RF=7.86	314.2 Tons	
	Ohio Legal %			780%	

## Floor Beam Shear Section

### Section Capacity

Taken at face of column (North end of cap controls)

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 10" assumed)
$d =$	<input type="text" value="66"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="151.8"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="259.7"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

(Soil Load shear has 1.15 factor included)

Total Service Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="78"/>	83.6	56.6	73.1	71.3	72.6	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.14	41.1 Tons	HS22.9
Operating	HS20	36 Tons	RF=1.91	68.7 Tons	HS38.1
	2F1	15 Tons	RF=2.82	42.2 Tons	
	3F1	23 Tons	RF=2.18	50.2 Tons	
	4F1	27 Tons	RF=2.24	60.4 Tons	
	5C1	40 Tons	RF=2.20	87.9 Tons	
	Ohio Legal %	220%			

## Column Section

(South Column at top of column - spalled area)

$h =$	<input type="text" value="40"/>	in	Column Depth	<b>Reduced Section by 2" to account for spalling</b>
$b =$	<input type="text" value="21"/>	in	Column Width	
$A_s =$	<input type="text" value="12.7"/>	in <sup>2</sup>	Area of Tension Steel	(10 -1 1/8" □ bars)(49/246 original plans)
$A'_s =$	<input type="text" value="4"/>	in <sup>2</sup>	Area of Compression Steel	(4- 1" bars)
$d =$	<input type="text" value="37"/>	in	Distance from compression face to centroid of tension steel	
$d' =$	<input type="text" value="1"/>	in	Distance from compression face to centroid of compression steel	
$f_c =$	<input type="text" value="3"/>	ksi	Concrete Strength	
$f_y =$	<input type="text" value="33"/>	ksi	Steel Yield Stress	
$E_s =$	<input type="text" value="29000"/>	ksi	Modulus of elasticity of steel	
$\epsilon_u =$	<input type="text" value="0.003"/>	in/in	Ultimate concrete strain	
$\beta_1 =$	<input type="text" value="0.85"/>			
$d'' =$	<input type="text" value="17"/>	in	Distance from centroid of gross section to centroid of tension steel	

### Dead Loads plus Soil Loads

(Moment taken at spall location)

(Soil Load moment has 1.15 factor included)

Total Service Moment =	<input type="text" value="96.8"/>	ft-kips	From Staad
Total Service Axial Force =	<input type="text" value="52"/>	kips	From Staad

### Live Loads (Moment taken at spall location)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	<input type="text" value="151.3"/>		162.2	109.8	141.8	138.2	140.7	ft-kips
Max. LL+I Axial Force =	<input type="text" value="72.5"/>		77.7	49.1	93.6	70.6	73.8	kips

Maximum Moment and Axial load results from 3 lanes loaded..

### Section Capacity

#### Balanced Condition

$a_b =$	<input type="text" value="22.80"/>	in	$a_b = (87 / (87 + f_y)) * \beta_1 * d$	Depth of stress block for balanced conditions, AASHTO 8-34
$c_b =$	<input type="text" value="26.83"/>	in	$c_b = a_b / \beta_1$	Depth to neutral axis for balanced conditions
$f'_s =$	<input type="text" value="33"/>	ksi	$f'_s = 87 * (1 - (d'/d)) * ((87 + f_y) / 87)$	Stress in comp. steel at balanced condition ( $\leq f_y$ ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

$P_b =$	<input type="text" value="933.9"/>	kip	$P_b = .85 * f'_c * b * a_b + A'_s * f'_s - A_s * f_y$
$M_b =$	<input type="text" value="1677.7"/>	ft-kip	$M_b = 0.85 * f'_c * b * a_b * (d - d'' - a_b / 2) + A'_s * f'_s * (d - d'' - a_b / 2) + A_s * f_y * d''$

Any choice of  $c$  smaller than  $c_b$  will result in tension failure of the column, any choice greater than  $c_b$  will result in compression failure of the column.

#### Pure Axial Compression Capacity

$P_o =$	<input type="text" value="2650.5"/>	kips	$P_o = .85 * f'_c * (A_g - A_{st}) + A_{st} * f_y$	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
$\phi P_o =$	<input type="text" value="1855.4"/>	kips		

#### Pure Bending Capacity (Ignoring compression steel)

$a =$	<input type="text" value="7.826"/>	in	$a = A_s * f_y / (0.85 * f'_c * b)$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	<input type="text" value="1155.6"/>	ft-kips	$M_n = A_s * f_y * (d - a / 2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	<input type="text" value="1040.0"/>	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$    $\text{in}$

**Tension Failure**

$f_s = $ <input type="text" value="33.00"/> $\text{ksi}$	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s = $ <input type="text" value="33.00"/> $\text{ksi}$	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a = $ <input type="text" value="21.99797038"/> $\text{in}$	$a = \beta_1 * c$	Depth of concrete stress block
$C = $ <input type="text" value="1178.0"/> $\text{kip}$	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n = $ <input type="text" value="623.6"/> $\text{kips}$	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n = $ <input type="text" value="1180.4"/> $\text{ft-kips}$	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e = $ <input type="text" value="22.71"/> $\text{in}$	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	224.9	236.3	174.1	270.8	220.9	227.8	kips
$M_u =$	454.1	477.8	364.2	433.6	425.7	431.2	ft-kips
$e =$	24.23	24.27	25.10	19.22	23.13	22.71	in
$\phi P_n =$	586.98	586.08	567.25	704.86	613.35	623.62	kips
$\phi M_n =$	1185.0	1185.1	1186.3	1128.7	1182.0	1180.4	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=3.01	108.4 Tons	HS60.2
Operating	HS20	36 Tons	RF=5.02	180.9 Tons	HS100.5
	2F1	15 Tons	RF=7.43	111.4 Tons	
	3F1	23 Tons	RF=5.24	120.4 Tons	
	4F1	27 Tons	RF=5.88	158.8 Tons	
	5C1	40 Tons	RF=5.77	230.6 Tons	
Ohio Legal %	525%				

	Load	GVW	Rating Factor	Safe Load	HS Rating	
Inventory	HS20	36 Tons	RF=1.00	35.8 Tons	HS19.9	Positive Moment
Operating	HS20	36 Tons	RF=1.66	59.8 Tons	HS33.2	Positive Moment
	2F1	15 Tons	RF=2.45	36.8 Tons		Positive Moment
	3F1	23 Tons	RF=1.90	43.7 Tons		Positive Moment
	4F1	27 Tons	RF=1.95	52.7 Tons		Positive Moment
	5C1	40 Tons	RF=1.92	76.6 Tons		Positive Moment
Ohio Legal %	190%					



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**P402110046**Sheet No  
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Rev

Part Section M, Frame 23

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 23.std Date/Time 01-Mar-2012 14:56

## Job Information

	Engineer	Checked	Approved
Name:	M Johnson	J Kemnitz	
Date:	14-Feb-12	01-Mar-12	

Structure Type SPACE FRAME

Number of Nodes	4	Highest Node	4
Number of Elements	3	Highest Beam	3

Number of Basic Load Cases	8
Number of Combination Load Cases	2

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	DEAD LOAD
Primary	3	LIVE LOAD 1
Primary	4	LIVE LOAD 2
Primary	5	LIVE LOAD 3
Primary	6	LIVE LOAD 4
Primary	7	LIVE LOAD 5
Primary	8	LIVE LOAD 6
Primary	2	SOIL LOAD
Combination	9	DEAD AND SOIL
Combination	10	DL AND SOIL POS MOM

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	0.000	0.000
2	0.000	20.850	0.000
3	37.000	20.850	0.000
4	37.000	2.000	0.000

## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	2	20.850	2	0
2	2	3	37.000	1	0
3	4	3	18.850	3	0





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### Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE
2	Rect 42.00x21.00	882.000	32.4E+3	130E+3	89E+3	CONCRETE
3	Rect 48.00x21.00	1.01E+3	37E+3	194E+3	107E+3	CONCRETE

### Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

### Basic Load Cases

Number	Name
1	DEAD LOAD
3	LIVE LOAD 1
4	LIVE LOAD 2
5	LIVE LOAD 3
6	LIVE LOAD 4
7	LIVE LOAD 5
8	LIVE LOAD 6
2	SOIL LOAD

### Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	DEAD AND SOIL	1	DEAD LOAD	1.00
		2	SOIL LOAD	1.15
10	DL AND SOIL POS MOM	1	DEAD LOAD	1.00
		2	SOIL LOAD	0.50



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By M Johnson	Date 14-Feb-12	Chd J Kemnitz
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## Beam Force Detail

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			Shear			Torsion			Bending		
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	Mx (kip'in)	My (kip'in)	Mz (kip'in)	Mx (kip'in)	My (kip'in)	Mz (kip'in)
1	1:DEAD LOAD	0.000	71.034	-14.197	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.25E+3	
		2.085	69.114	-14.197	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-898.744	
		4.170	67.194	-14.197	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-543.538	
		6.255	65.274	-14.197	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-188.333	
		8.340	63.354	-14.197	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	166.873	
		10.425	61.434	-14.197	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	522.079	
		12.510	59.514	-14.197	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	877.284	
		14.595	57.594	-14.197	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.23E+3
		16.680	55.674	-14.197	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.59E+3
		18.765	53.755	-14.197	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.94E+3
		20.850	51.835	-14.197	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.3E+3	
	3:LIVE LOAD 1	0.000	85.500	-20.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.82E+3	
		2.085	85.500	-20.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.3E+3	
		4.170	85.500	-20.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-783.035	
		6.255	85.500	-20.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-265.611	
		8.340	85.500	-20.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	251.812	
		10.425	85.500	-20.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	769.236	
		12.510	85.500	-20.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.29E+3	
		14.595	85.500	-20.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.8E+3
		16.680	85.500	-20.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.32E+3
		18.765	85.500	-20.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.84E+3
		20.850	85.500	-20.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.36E+3	
	4:LIVE LOAD 2	0.000	58.128	-20.675	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.82E+3	
		2.085	58.128	-20.675	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.3E+3	
		4.170	58.128	-20.675	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-785.261	
		6.255	58.128	-20.675	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-267.966	
		8.340	58.128	-20.675	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	249.329	
		10.425	58.128	-20.675	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	766.625	
		12.510	58.128	-20.675	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.28E+3	
		14.595	58.128	-20.675	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.8E+3
		16.680	58.128	-20.675	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.32E+3
		18.765	58.128	-20.675	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.84E+3
		20.850	58.128	-20.675	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.35E+3	
	5:LIVE LOAD 3	0.000	71.789	-21.804	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.92E+3	
		2.085	71.789	-21.804	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.37E+3	
		4.170	71.789	-21.804	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-826.642	
		6.255	71.789	-21.804	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-281.104	
		8.340	71.789	-21.804	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	264.434	
		10.425	71.789	-21.804	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	809.972	
		12.510	71.789	-21.804	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.36E+3	
		14.595	71.789	-21.804	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.9E+3
		16.680	71.789	-21.804	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45E+3	



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By M Johnson Date 14-Feb-12 Chd J Kemnitz

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File Section M Frame 23.std Date/Time 01-Mar-2012 14:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		18.765	71.789	-21.804	0.000	0.000	0.000	0.000	0.000	2.99E+3	
		20.850	71.789	-21.804	0.000	0.000	0.000	0.000	0.000	3.54E+3	
	6:LIVE LOAD 4	0.000	77.673	-21.603	0.000	0.000	0.000	0.000	0.000	-1.9E+3	
		2.085	77.673	-21.603	0.000	0.000	0.000	0.000	0.000	-1.36E+3	
		4.170	77.673	-21.603	0.000	0.000	0.000	0.000	0.000	-816.352	
		6.255	77.673	-21.603	0.000	0.000	0.000	0.000	0.000	-275.846	
		8.340	77.673	-21.603	0.000	0.000	0.000	0.000	0.000	264.660	
		10.425	77.673	-21.603	0.000	0.000	0.000	0.000	0.000	805.165	
		12.510	77.673	-21.603	0.000	0.000	0.000	0.000	0.000	1.35E+3	
		14.595	77.673	-21.603	0.000	0.000	0.000	0.000	0.000	1.89E+3	
		16.680	77.673	-21.603	0.000	0.000	0.000	0.000	0.000	2.43E+3	
		18.765	77.673	-21.603	0.000	0.000	0.000	0.000	0.000	2.97E+3	
		20.850	77.673	-21.603	0.000	0.000	0.000	0.000	0.000	3.51E+3	
	7:LIVE LOAD 5	0.000	65.914	-21.591	0.000	0.000	0.000	0.000	0.000	-1.9E+3	
		2.085	65.914	-21.591	0.000	0.000	0.000	0.000	0.000	-1.36E+3	
		4.170	65.914	-21.591	0.000	0.000	0.000	0.000	0.000	-821.322	
		6.255	65.914	-21.591	0.000	0.000	0.000	0.000	0.000	-281.103	
		8.340	65.914	-21.591	0.000	0.000	0.000	0.000	0.000	259.117	
		10.425	65.914	-21.591	0.000	0.000	0.000	0.000	0.000	799.336	
		12.510	65.914	-21.591	0.000	0.000	0.000	0.000	0.000	1.34E+3	
		14.595	65.914	-21.591	0.000	0.000	0.000	0.000	0.000	1.88E+3	
		16.680	65.914	-21.591	0.000	0.000	0.000	0.000	0.000	2.42E+3	
		18.765	65.914	-21.591	0.000	0.000	0.000	0.000	0.000	2.96E+3	
		20.850	65.914	-21.591	0.000	0.000	0.000	0.000	0.000	3.5E+3	
	8:LIVE LOAD 6	0.000	53.510	-21.161	0.000	0.000	0.000	0.000	0.000	-1.86E+3	
		2.085	53.510	-21.161	0.000	0.000	0.000	0.000	0.000	-1.33E+3	
		4.170	53.510	-21.161	0.000	0.000	0.000	0.000	0.000	-801.361	
		6.255	53.510	-21.161	0.000	0.000	0.000	0.000	0.000	-271.922	
		8.340	53.510	-21.161	0.000	0.000	0.000	0.000	0.000	257.517	
		10.425	53.510	-21.161	0.000	0.000	0.000	0.000	0.000	786.956	
		12.510	53.510	-21.161	0.000	0.000	0.000	0.000	0.000	1.32E+3	
		14.595	53.510	-21.161	0.000	0.000	0.000	0.000	0.000	1.85E+3	
		16.680	53.510	-21.161	0.000	0.000	0.000	0.000	0.000	2.38E+3	
		18.765	53.510	-21.161	0.000	0.000	0.000	0.000	0.000	2.9E+3	
		20.850	53.510	-21.161	0.000	0.000	0.000	0.000	0.000	3.43E+3	
	2:SOIL LOAD	0.000	-3.158	77.756	0.000	0.000	0.000	0.000	0.000	4.05E+3	
		2.085	-3.158	61.882	0.000	0.000	0.000	0.000	0.000	2.33E+3	
		4.170	-3.158	46.344	0.000	0.000	0.000	0.000	0.000	987.134	
		6.255	-3.158	32.318	0.000	0.000	0.000	0.000	0.000	7.407	
		8.340	-3.158	20.109	0.000	0.000	0.000	0.000	0.000	-652.781	
		10.425	-3.158	9.719	0.000	0.000	0.000	0.000	0.000	-1.04E+3	
		12.510	-3.158	1.407	0.000	0.000	0.000	0.000	0.000	-1.16E+3	
		14.595	-3.158	-5.087	0.000	0.000	0.000	0.000	0.000	-1.11E+3	
		16.680	-3.158	-9.763	0.000	0.000	0.000	0.000	0.000	-915.944	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**5**

Rev

Part Section M, Frame 23

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 23.std Date/Time 01-Mar-2012 14:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		18.765	-3.158	-12.620	0.000	0.000	0.000	0.000	0.000	-633.765	
		20.850	-3.158	-13.659	0.000	0.000	0.000	0.000	0.000	-302.839	
	9:DEAD AND S	0.000	67.401	75.222	0.000	0.000	0.000	0.000	0.000	3.41E+3	
		2.085	65.481	56.968	0.000	0.000	0.000	0.000	0.000	1.78E+3	
		4.170	63.561	39.099	0.000	0.000	0.000	0.000	0.000	591.666	
		6.255	61.642	22.968	0.000	0.000	0.000	0.000	0.000	-179.815	
		8.340	59.722	8.928	0.000	0.000	0.000	0.000	0.000	-583.825	
		10.425	57.802	-3.020	0.000	0.000	0.000	0.000	0.000	-670.190	
		12.510	55.882	-12.579	0.000	0.000	0.000	0.000	0.000	-457.600	
		14.595	53.962	-20.047	0.000	0.000	0.000	0.000	0.000	-39.474	
		16.680	52.042	-25.424	0.000	0.000	0.000	0.000	0.000	534.360	
		18.765	50.122	-28.710	0.000	0.000	0.000	0.000	0.000	1.21E+3	
		20.850	48.202	-29.905	0.000	0.000	0.000	0.000	0.000	1.95E+3	
	10:DL AND SO	0.000	69.454	24.681	0.000	0.000	0.000	0.000	0.000	772.180	
		2.085	67.534	16.744	0.000	0.000	0.000	0.000	0.000	265.192	
		4.170	65.614	8.975	0.000	0.000	0.000	0.000	0.000	-49.971	
		6.255	63.695	1.962	0.000	0.000	0.000	0.000	0.000	-184.629	
		8.340	61.775	-4.142	0.000	0.000	0.000	0.000	0.000	-159.517	
		10.425	59.855	-9.338	0.000	0.000	0.000	0.000	0.000	3.701	
		12.510	57.935	-13.494	0.000	0.000	0.000	0.000	0.000	296.900	
		14.595	56.015	-16.741	0.000	0.000	0.000	0.000	0.000	679.462	
		16.680	54.095	-19.078	0.000	0.000	0.000	0.000	0.000	1.13E+3	
		18.765	52.175	-20.507	0.000	0.000	0.000	0.000	0.000	1.63E+3	
		20.850	50.255	-21.027	0.000	0.000	0.000	0.000	0.000	2.15E+3	
2	1:DEAD LOAD	0.000	14.197	47.135	0.000	0.000	0.000	0.000	0.000	2.3E+3	
		3.700	14.197	38.164	0.000	0.000	0.000	0.000	0.000	426.199	
		7.400	14.197	29.080	0.000	0.000	0.000	0.000	0.000	-1.06E+3	
		11.100	14.197	19.882	0.000	0.000	0.000	0.000	0.000	-2.14E+3	
		14.800	14.197	10.571	0.000	0.000	0.000	0.000	0.000	-2.83E+3	
		18.500	14.197	1.146	0.000	0.000	0.000	0.000	0.000	-3.12E+3	
		22.200	14.197	-10.459	0.000	0.000	0.000	0.000	0.000	-2.84E+3	
		25.900	14.197	-20.128	0.000	0.000	0.000	0.000	0.000	-2.15E+3	
		29.600	14.197	-29.911	0.000	0.000	0.000	0.000	0.000	-1.04E+3	
		33.300	14.197	-39.807	0.000	0.000	0.000	0.000	0.000	496.325	
		37.000	14.197	-49.816	0.000	0.000	0.000	0.000	0.000	2.46E+3	
	3:LIVE LOAD 1	0.000	20.680	85.500	0.000	0.000	0.000	0.000	0.000	3.36E+3	
		3.700	20.680	56.580	0.000	0.000	0.000	0.000	0.000	639.834	
		7.400	20.680	37.300	0.000	0.000	0.000	0.000	0.000	-1.69E+3	
		11.100	20.680	22.840	0.000	0.000	0.000	0.000	0.000	-3.29E+3	
		14.800	20.680	13.200	0.000	0.000	0.000	0.000	0.000	-4.19E+3	
		18.500	20.680	-10.900	0.000	0.000	0.000	0.000	0.000	-4.64E+3	
		22.200	20.680	-15.720	0.000	0.000	0.000	0.000	0.000	-4.11E+3	
		25.900	20.680	-35.000	0.000	0.000	0.000	0.000	0.000	-3.12E+3	
		29.600	20.680	-49.460	0.000	0.000	0.000	0.000	0.000	-1.42E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**6**

Rev

Part Section M, Frame 23

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 23.std Date/Time 01-Mar-2012 14:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	20.680	-59.100	0.000	0.000	0.000	0.000	0.000	944.734	
		37.000	20.680	-59.100	0.000	0.000	0.000	0.000	0.000	3.57E+3	
	4:LIVE LOAD 2	0.000	20.675	58.128	0.000	0.000	0.000	0.000	0.000	3.35E+3	
		3.700	20.675	58.128	0.000	0.000	0.000	0.000	0.000	772.222	
		7.400	20.675	48.488	0.000	0.000	0.000	0.000	0.000	-1.55E+3	
		11.100	20.675	34.028	0.000	0.000	0.000	0.000	0.000	-3.2E+3	
		14.800	20.675	14.748	0.000	0.000	0.000	0.000	0.000	-4.16E+3	
		18.500	20.675	9.928	0.000	0.000	0.000	0.000	0.000	-4.63E+3	
		22.200	20.675	-14.172	0.000	0.000	0.000	0.000	0.000	-4.15E+3	
		25.900	20.675	-23.812	0.000	0.000	0.000	0.000	0.000	-3.2E+3	
		29.600	20.675	-38.272	0.000	0.000	0.000	0.000	0.000	-1.56E+3	
		33.300	20.675	-57.552	0.000	0.000	0.000	0.000	0.000	812.625	
		37.000	20.675	-86.472	0.000	0.000	0.000	0.000	0.000	3.57E+3	
	5:LIVE LOAD 3	0.000	21.804	71.789	0.000	0.000	0.000	0.000	0.000	3.54E+3	
		3.700	21.804	66.969	0.000	0.000	0.000	0.000	0.000	504.479	
		7.400	21.804	47.689	0.000	0.000	0.000	0.000	0.000	-1.71E+3	
		11.100	21.804	33.229	0.000	0.000	0.000	0.000	0.000	-3.34E+3	
		14.800	21.804	23.589	0.000	0.000	0.000	0.000	0.000	-4.41E+3	
		18.500	21.804	-0.511	0.000	0.000	0.000	0.000	0.000	-4.59E+3	
		22.200	21.804	-24.611	0.000	0.000	0.000	0.000	0.000	-4.37E+3	
		25.900	21.804	-34.251	0.000	0.000	0.000	0.000	0.000	-3.24E+3	
		29.600	21.804	-48.711	0.000	0.000	0.000	0.000	0.000	-1.57E+3	
		33.300	21.804	-67.991	0.000	0.000	0.000	0.000	0.000	686.045	
		37.000	21.804	-72.811	0.000	0.000	0.000	0.000	0.000	3.76E+3	
	6:LIVE LOAD 4	0.000	21.603	77.673	0.000	0.000	0.000	0.000	0.000	3.51E+3	
		3.700	21.603	53.573	0.000	0.000	0.000	0.000	0.000	550.667	
		7.400	21.603	43.933	0.000	0.000	0.000	0.000	0.000	-1.68E+3	
		11.100	21.603	29.473	0.000	0.000	0.000	0.000	0.000	-3.31E+3	
		14.800	21.603	10.193	0.000	0.000	0.000	0.000	0.000	-4.29E+3	
		18.500	21.603	5.373	0.000	0.000	0.000	0.000	0.000	-4.63E+3	
		22.200	21.603	-18.727	0.000	0.000	0.000	0.000	0.000	-4.23E+3	
		25.900	21.603	-28.367	0.000	0.000	0.000	0.000	0.000	-3.19E+3	
		29.600	21.603	-42.827	0.000	0.000	0.000	0.000	0.000	-1.52E+3	
		33.300	21.603	-62.107	0.000	0.000	0.000	0.000	0.000	820.936	
		37.000	21.603	-66.927	0.000	0.000	0.000	0.000	0.000	3.73E+3	
	7:LIVE LOAD 5	0.000	21.591	65.914	0.000	0.000	0.000	0.000	0.000	3.5E+3	
		3.700	21.591	61.094	0.000	0.000	0.000	0.000	0.000	641.321	
		7.400	21.591	41.814	0.000	0.000	0.000	0.000	0.000	-1.66E+3	
		11.100	21.591	27.354	0.000	0.000	0.000	0.000	0.000	-3.28E+3	
		14.800	21.591	17.714	0.000	0.000	0.000	0.000	0.000	-4.27E+3	
		18.500	21.591	-6.386	0.000	0.000	0.000	0.000	0.000	-4.63E+3	
		22.200	21.591	-11.206	0.000	0.000	0.000	0.000	0.000	-4.25E+3	
		25.900	21.591	-30.486	0.000	0.000	0.000	0.000	0.000	-3.22E+3	
		29.600	21.591	-44.946	0.000	0.000	0.000	0.000	0.000	-1.55E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**7**

Rev

Part Section M, Frame 23

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 23.std Date/Time 01-Mar-2012 14:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	21.591	-54.586	0.000	0.000	0.000	0.000	0.000	730.915	
		37.000	21.591	-78.686	0.000	0.000	0.000	0.000	0.000	3.73E+3	
	8:LIVE LOAD 6	0.000	21.161	53.510	0.000	0.000	0.000	0.000	0.000	3.43E+3	
		3.700	21.161	53.510	0.000	0.000	0.000	0.000	0.000	1.06E+3	
		7.400	21.161	53.510	0.000	0.000	0.000	0.000	0.000	-1.32E+3	
		11.100	21.161	37.310	0.000	0.000	0.000	0.000	0.000	-3.34E+3	
		14.800	21.161	26.510	0.000	0.000	0.000	0.000	0.000	-4.68E+3	
		18.500	21.161	-0.490	0.000	0.000	0.000	0.000	0.000	-5.2E+3	
		22.200	21.161	-27.490	0.000	0.000	0.000	0.000	0.000	-4.63E+3	
		25.900	21.161	-38.290	0.000	0.000	0.000	0.000	0.000	-3.25E+3	
		29.600	21.161	-54.490	0.000	0.000	0.000	0.000	0.000	-1.19E+3	
		33.300	21.161	-54.490	0.000	0.000	0.000	0.000	0.000	1.23E+3	
		37.000	21.161	-54.490	0.000	0.000	0.000	0.000	0.000	3.65E+3	
	2:SOIL LOAD	0.000	13.659	-3.158	0.000	0.000	0.000	0.000	0.000	-302.839	
		3.700	13.659	-3.158	0.000	0.000	0.000	0.000	0.000	-162.601	
		7.400	13.659	-3.158	0.000	0.000	0.000	0.000	0.000	-22.364	
		11.100	13.659	-3.158	0.000	0.000	0.000	0.000	0.000	117.873	
		14.800	13.659	-3.158	0.000	0.000	0.000	0.000	0.000	258.110	
		18.500	13.659	-3.158	0.000	0.000	0.000	0.000	0.000	398.348	
		22.200	13.659	-3.158	0.000	0.000	0.000	0.000	0.000	538.585	
		25.900	13.659	-3.158	0.000	0.000	0.000	0.000	0.000	678.822	
		29.600	13.659	-3.158	0.000	0.000	0.000	0.000	0.000	819.060	
		33.300	13.659	-3.158	0.000	0.000	0.000	0.000	0.000	959.297	
		37.000	13.659	-3.158	0.000	0.000	0.000	0.000	0.000	1.1E+3	
	9:DEAD AND S	0.000	29.905	43.502	0.000	0.000	0.000	0.000	0.000	1.95E+3	
		3.700	29.905	34.532	0.000	0.000	0.000	0.000	0.000	239.207	
		7.400	29.905	25.448	0.000	0.000	0.000	0.000	0.000	-1.08E+3	
		11.100	29.905	16.250	0.000	0.000	0.000	0.000	0.000	-2.01E+3	
		14.800	29.905	6.938	0.000	0.000	0.000	0.000	0.000	-2.53E+3	
		18.500	29.905	-2.487	0.000	0.000	0.000	0.000	0.000	-2.66E+3	
		22.200	29.905	-14.092	0.000	0.000	0.000	0.000	0.000	-2.22E+3	
		25.900	29.905	-23.761	0.000	0.000	0.000	0.000	0.000	-1.37E+3	
		29.600	29.905	-33.543	0.000	0.000	0.000	0.000	0.000	-96.816	
		33.300	29.905	-43.439	0.000	0.000	0.000	0.000	0.000	1.6E+3	
		37.000	29.905	-53.449	0.000	0.000	0.000	0.000	0.000	3.73E+3	
	10:DL AND SO	0.000	21.027	45.555	0.000	0.000	0.000	0.000	0.000	2.15E+3	
		3.700	21.027	36.585	0.000	0.000	0.000	0.000	0.000	344.898	
		7.400	21.027	27.501	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		11.100	21.027	18.303	0.000	0.000	0.000	0.000	0.000	-2.08E+3	
		14.800	21.027	8.991	0.000	0.000	0.000	0.000	0.000	-2.7E+3	
		18.500	21.027	-0.434	0.000	0.000	0.000	0.000	0.000	-2.92E+3	
		22.200	21.027	-12.039	0.000	0.000	0.000	0.000	0.000	-2.57E+3	
		25.900	21.027	-21.707	0.000	0.000	0.000	0.000	0.000	-1.81E+3	
		29.600	21.027	-31.490	0.000	0.000	0.000	0.000	0.000	-629.205	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**8**

Rev

Part Section M, Frame 23

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 23.std Date/Time 01-Mar-2012 14:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	21.027	-41.386	0.000	0.000	0.000	0.000	0.000	975.974	
		37.000	21.027	-51.396	0.000	0.000	0.000	0.000	0.000	3.01E+3	
3	1:DEAD LOAD	0.000	74.353	14.197	0.000	0.000	0.000	0.000	0.000	750.461	
		1.885	72.370	14.197	0.000	0.000	0.000	0.000	0.000	429.328	
		3.770	70.386	14.197	0.000	0.000	0.000	0.000	0.000	108.195	
		5.655	68.402	14.197	0.000	0.000	0.000	0.000	0.000	-212.938	
		7.540	66.419	14.197	0.000	0.000	0.000	0.000	0.000	-534.072	
		9.425	64.435	14.197	0.000	0.000	0.000	0.000	0.000	-855.205	
		11.310	62.451	14.197	0.000	0.000	0.000	0.000	0.000	-1.18E+3	
		13.195	60.468	14.197	0.000	0.000	0.000	0.000	0.000	-1.5E+3	
		15.080	58.484	14.197	0.000	0.000	0.000	0.000	0.000	-1.82E+3	
		16.965	56.500	14.197	0.000	0.000	0.000	0.000	0.000	-2.14E+3	
		18.850	54.516	14.197	0.000	0.000	0.000	0.000	0.000	-2.46E+3	
	3:LIVE LOAD 1	0.000	59.100	20.680	0.000	0.000	0.000	0.000	0.000	1.11E+3	
		1.885	59.100	20.680	0.000	0.000	0.000	0.000	0.000	641.341	
		3.770	59.100	20.680	0.000	0.000	0.000	0.000	0.000	173.551	
		5.655	59.100	20.680	0.000	0.000	0.000	0.000	0.000	-294.240	
		7.540	59.100	20.680	0.000	0.000	0.000	0.000	0.000	-762.031	
		9.425	59.100	20.680	0.000	0.000	0.000	0.000	0.000	-1.23E+3	
		11.310	59.100	20.680	0.000	0.000	0.000	0.000	0.000	-1.7E+3	
		13.195	59.100	20.680	0.000	0.000	0.000	0.000	0.000	-2.17E+3	
		15.080	59.100	20.680	0.000	0.000	0.000	0.000	0.000	-2.63E+3	
		16.965	59.100	20.680	0.000	0.000	0.000	0.000	0.000	-3.1E+3	
		18.850	59.100	20.680	0.000	0.000	0.000	0.000	0.000	-3.57E+3	
	4:LIVE LOAD 2	0.000	86.472	20.675	0.000	0.000	0.000	0.000	0.000	1.1E+3	
		1.885	86.472	20.675	0.000	0.000	0.000	0.000	0.000	636.762	
		3.770	86.472	20.675	0.000	0.000	0.000	0.000	0.000	169.087	
		5.655	86.472	20.675	0.000	0.000	0.000	0.000	0.000	-298.588	
		7.540	86.472	20.675	0.000	0.000	0.000	0.000	0.000	-766.262	
		9.425	86.472	20.675	0.000	0.000	0.000	0.000	0.000	-1.23E+3	
		11.310	86.472	20.675	0.000	0.000	0.000	0.000	0.000	-1.7E+3	
		13.195	86.472	20.675	0.000	0.000	0.000	0.000	0.000	-2.17E+3	
		15.080	86.472	20.675	0.000	0.000	0.000	0.000	0.000	-2.64E+3	
		16.965	86.472	20.675	0.000	0.000	0.000	0.000	0.000	-3.1E+3	
		18.850	86.472	20.675	0.000	0.000	0.000	0.000	0.000	-3.57E+3	
	5:LIVE LOAD 3	0.000	72.811	21.804	0.000	0.000	0.000	0.000	0.000	1.17E+3	
		1.885	72.811	21.804	0.000	0.000	0.000	0.000	0.000	674.253	
		3.770	72.811	21.804	0.000	0.000	0.000	0.000	0.000	181.044	
		5.655	72.811	21.804	0.000	0.000	0.000	0.000	0.000	-312.164	
		7.540	72.811	21.804	0.000	0.000	0.000	0.000	0.000	-805.372	
		9.425	72.811	21.804	0.000	0.000	0.000	0.000	0.000	-1.3E+3	
		11.310	72.811	21.804	0.000	0.000	0.000	0.000	0.000	-1.79E+3	
		13.195	72.811	21.804	0.000	0.000	0.000	0.000	0.000	-2.28E+3	
		15.080	72.811	21.804	0.000	0.000	0.000	0.000	0.000	-2.78E+3	



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Rev

Part Section M, Frame 23

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 23.std Date/Time 01-Mar-2012 14:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		16.965	72.811	21.804	0.000	0.000	0.000	0.000	0.000	-3.27E+3	
		18.850	72.811	21.804	0.000	0.000	0.000	0.000	0.000	-3.76E+3	
	6:LIVE LOAD 4	0.000	66.927	21.603	0.000	0.000	0.000	0.000	0.000	1.16E+3	
		1.885	66.927	21.603	0.000	0.000	0.000	0.000	0.000	672.899	
		3.770	66.927	21.603	0.000	0.000	0.000	0.000	0.000	184.241	
		5.655	66.927	21.603	0.000	0.000	0.000	0.000	0.000	-304.418	
		7.540	66.927	21.603	0.000	0.000	0.000	0.000	0.000	-793.077	
		9.425	66.927	21.603	0.000	0.000	0.000	0.000	0.000	-1.28E+3	
		11.310	66.927	21.603	0.000	0.000	0.000	0.000	0.000	-1.77E+3	
		13.195	66.927	21.603	0.000	0.000	0.000	0.000	0.000	-2.26E+3	
		15.080	66.927	21.603	0.000	0.000	0.000	0.000	0.000	-2.75E+3	
		16.965	66.927	21.603	0.000	0.000	0.000	0.000	0.000	-3.24E+3	
		18.850	66.927	21.603	0.000	0.000	0.000	0.000	0.000	-3.73E+3	
	7:LIVE LOAD 5	0.000	78.686	21.591	0.000	0.000	0.000	0.000	0.000	1.15E+3	
		1.885	78.686	21.591	0.000	0.000	0.000	0.000	0.000	662.675	
		3.770	78.686	21.591	0.000	0.000	0.000	0.000	0.000	174.276	
		5.655	78.686	21.591	0.000	0.000	0.000	0.000	0.000	-314.124	
		7.540	78.686	21.591	0.000	0.000	0.000	0.000	0.000	-802.524	
		9.425	78.686	21.591	0.000	0.000	0.000	0.000	0.000	-1.29E+3	
		11.310	78.686	21.591	0.000	0.000	0.000	0.000	0.000	-1.78E+3	
		13.195	78.686	21.591	0.000	0.000	0.000	0.000	0.000	-2.27E+3	
		15.080	78.686	21.591	0.000	0.000	0.000	0.000	0.000	-2.76E+3	
		16.965	78.686	21.591	0.000	0.000	0.000	0.000	0.000	-3.24E+3	
		18.850	78.686	21.591	0.000	0.000	0.000	0.000	0.000	-3.73E+3	
	8:LIVE LOAD 6	0.000	54.490	21.161	0.000	0.000	0.000	0.000	0.000	1.13E+3	
		1.885	54.490	21.161	0.000	0.000	0.000	0.000	0.000	655.974	
		3.770	54.490	21.161	0.000	0.000	0.000	0.000	0.000	177.321	
		5.655	54.490	21.161	0.000	0.000	0.000	0.000	0.000	-301.333	
		7.540	54.490	21.161	0.000	0.000	0.000	0.000	0.000	-779.986	
		9.425	54.490	21.161	0.000	0.000	0.000	0.000	0.000	-1.26E+3	
		11.310	54.490	21.161	0.000	0.000	0.000	0.000	0.000	-1.74E+3	
		13.195	54.490	21.161	0.000	0.000	0.000	0.000	0.000	-2.22E+3	
		15.080	54.490	21.161	0.000	0.000	0.000	0.000	0.000	-2.69E+3	
		16.965	54.490	21.161	0.000	0.000	0.000	0.000	0.000	-3.17E+3	
		18.850	54.490	21.161	0.000	0.000	0.000	0.000	0.000	-3.65E+3	
	2:SOIL LOAD	0.000	3.158	13.659	0.000	0.000	0.000	0.000	0.000	1.99E+3	
		1.885	3.158	13.659	0.000	0.000	0.000	0.000	0.000	1.68E+3	
		3.770	3.158	13.659	0.000	0.000	0.000	0.000	0.000	1.37E+3	
		5.655	3.158	13.659	0.000	0.000	0.000	0.000	0.000	1.06E+3	
		7.540	3.158	13.659	0.000	0.000	0.000	0.000	0.000	754.312	
		9.425	3.158	13.659	0.000	0.000	0.000	0.000	0.000	445.338	
		11.310	3.158	13.659	0.000	0.000	0.000	0.000	0.000	136.363	
		13.195	3.158	13.659	0.000	0.000	0.000	0.000	0.000	-172.611	
		15.080	3.158	13.659	0.000	0.000	0.000	0.000	0.000	-481.585	





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By M Johnson Date 14-Feb-12 Chd J Kemnitz

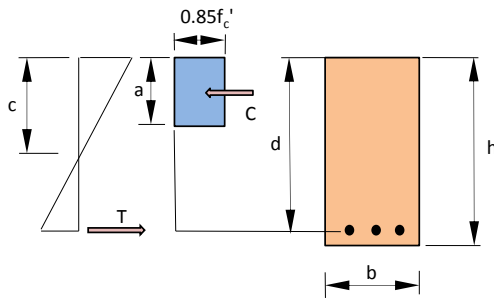
Client ODOT

File Section M Frame 23.std Date/Time 01-Mar-2012 14:56

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		16.965	3.158	13.659	0.000	0.000	0.000	0.000	0.000	-790.560	
		18.850	3.158	13.659	0.000	0.000	0.000	0.000	0.000	-1.1E+3	
	9:DEAD AND S	0.000	77.986	29.905	0.000	0.000	0.000	0.000	0.000	3.04E+3	
		1.885	76.002	29.905	0.000	0.000	0.000	0.000	0.000	2.36E+3	
		3.770	74.018	29.905	0.000	0.000	0.000	0.000	0.000	1.69E+3	
		5.655	72.035	29.905	0.000	0.000	0.000	0.000	0.000	1.01E+3	
		7.540	70.051	29.905	0.000	0.000	0.000	0.000	0.000	333.387	
		9.425	68.067	29.905	0.000	0.000	0.000	0.000	0.000	-343.066	
		11.310	66.084	29.905	0.000	0.000	0.000	0.000	0.000	-1.02E+3	
		13.195	64.100	29.905	0.000	0.000	0.000	0.000	0.000	-1.7E+3	
		15.080	62.116	29.905	0.000	0.000	0.000	0.000	0.000	-2.37E+3	
		16.965	60.132	29.905	0.000	0.000	0.000	0.000	0.000	-3.05E+3	
		18.850	58.149	29.905	0.000	0.000	0.000	0.000	0.000	-3.73E+3	
	10:DL AND SO	0.000	75.933	21.027	0.000	0.000	0.000	0.000	0.000	1.75E+3	
		1.885	73.949	21.027	0.000	0.000	0.000	0.000	0.000	1.27E+3	
		3.770	71.965	21.027	0.000	0.000	0.000	0.000	0.000	794.325	
		5.655	69.982	21.027	0.000	0.000	0.000	0.000	0.000	318.705	
		7.540	67.998	21.027	0.000	0.000	0.000	0.000	0.000	-156.915	
		9.425	66.014	21.027	0.000	0.000	0.000	0.000	0.000	-632.536	
		11.310	64.030	21.027	0.000	0.000	0.000	0.000	0.000	-1.11E+3	
		13.195	62.047	21.027	0.000	0.000	0.000	0.000	0.000	-1.58E+3	
		15.080	60.063	21.027	0.000	0.000	0.000	0.000	0.000	-2.06E+3	
		16.965	58.079	21.027	0.000	0.000	0.000	0.000	0.000	-2.54E+3	
		18.850	56.096	21.027	0.000	0.000	0.000	0.000	0.000	-3.01E+3	

### Floor Beam Postive Moment Section



b =	98.9	in
d =	48	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	12.7	in <sup>2</sup>
% Steel Loss =	0%	

10 - 1 1/8" □  
from 49/246 of  
original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	12.700	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	239.37	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	1.108	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1491.3	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load and Soil Load Moment

(Soil Force factored by 0.5)

Total Service Positive Moment = 243.0 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	41.6	44.6	30.2	39	38	38.9	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	54.1	58.0	39.3	50.7	49.4	50.6	kips
Reaction per Wheel (LL+I) =	27.0	29.0	19.6	25.4	24.7	25.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

		From STAAD					
Max. Positive LL+I Moment =	433.75	465.0	314.9	406.6	396.2	405.6	ft*kips

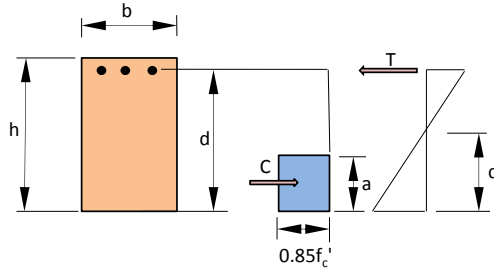
Maximum Positive Moment results from 2 lanes loaded.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.16	41.9 Tons	HS23.3
Operating	HS20	36 Tons	RF=1.94	70.0 Tons	HS38.9
	2F1	15 Tons	RF=2.87	43.1 Tons	
	3F1	23 Tons	RF=2.22	51.1 Tons	
	4F1	27 Tons	RF=2.28	61.6 Tons	
	5C1	40 Tons	RF=2.23	89.2 Tons	
	Ohio Legal %	220%			

### Floor Beam Negative Moment Section

(North side of floorbeam controls)



b =	21	in
d =	66	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	9.35	in <sup>2</sup>
% Steel Loss =	0%	

(5-1 1/8" □,  
3-1" □) from  
49/246 of  
original plans

#### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	9.350	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	49.50	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.85		
a =	5.762	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1460.7	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load and Soil Load Moment

(Moment taken at face of column)

(Soil moment increased by 1.15 factor)

Total Service Negative Moment = 100.0 ft\*kips From Staad

#### Live Load Moment

(Moment taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Negative LL+I Moment =	205.83	220.7	149.4	193.0	188.0	192.5	ft*kips

Maximum Negative Moment results from 3 lanes loaded.

#### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.78	100.0 Tons	HS55.6
Operating	HS20	36 Tons	RF=4.64	167.0 Tons	HS92.8
	2F1	15 Tons	RF=6.85	102.8 Tons	
	3F1	23 Tons	RF=5.30	122.0 Tons	
	4F1	27 Tons	RF=5.44	147.0 Tons	
	5C1	40 Tons	RF=5.32	212.7 Tons	
	Ohio Legal %	530%			



Made by: **MJJ** Date: **2/14/2012** Job No: **P402110046**  
 Checked by: **JKM** Date: **3/1/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Built Concrete Frame Rating Section M (Frame 23)**

## Floor Beam Shear Section

### Section Capacity

*Taken at face of column (North end of cap controls)*

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)
$d =$	<input type="text" value="66"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="151.8"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="259.7"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

*(Taken at face of column)*

*(Soil Force increased by 1.15 factor)*

Total Service Shear =  kips From Staad

### Live Load Shear

*(Live Load shear is taken at face of column)*

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="77.6"/>		83.2	56.3	72.8	70.9	72.6

*Maximum Shear results from 3 lanes loaded.*

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.15	41.5 Tons	HS23.1
Operating	HS20	36 Tons	RF=1.93	69.3 Tons	HS38.5
	2F1	15 Tons	RF=2.84	42.7 Tons	
	3F1	23 Tons	RF=2.20	50.6 Tons	
	4F1	27 Tons	RF=2.26	61.0 Tons	
	5C1	40 Tons	RF=2.21	88.3 Tons	
	Ohio Legal %	220%			



**Column Section** (Top of North Column controls)

h =	<b>42</b>	in	Column Depth
b =	<b>21</b>	in	Column Width
A <sub>s</sub> =	<b>8</b>	in <sup>2</sup>	Area of Tension Steel (10 -1 1/8" □ bars)(49/246 original plans)
A' <sub>s</sub> =	<b>6.35</b>	in <sup>2</sup>	Area of Compression Steel (5-1 1/8" bars)
d =	<b>38</b>	in	Distance from compression face to centroid of tension steel
d' =	<b>3</b>	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	<b>3</b>	ksi	Concrete Strength
f <sub>y</sub> =	<b>33</b>	ksi	Steel Yield Stress
E <sub>s</sub> =	<b>29000</b>	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	<b>0.003</b>	in/in	Ultimate concrete strain
β <sub>1</sub> =	<b>0.85</b>		
d" =	<b>17</b>	in	Distance from centroid of gross section to centroid of tension steel

(Soil Forces increased by 1.15 factor)

**Dead Loads plus soil loads** (Moment taken at top of column below chamfer)

Total Service Moment =	<b>54.7</b>	ft-kips	From Staad
Total Service Axial Force =	<b>50</b>	kips	From Staad

**Live Loads** (Moment taken at top of column below chamfer)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	<b>213.0</b>		228.4	154.6	199.7	194.6	199.2	ft-kips
Max. LL+I Axial Force =	<b>71.8</b>		77.0	48.6	92.7	70.0	73.5	kips

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	<b>23.42</b>	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	<b>27.55</b>	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	<b>33</b>	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	<b>1199.6</b>	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	<b>1659.3</b>	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	<b>2686.1</b>	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	<b>1880.2</b>	kips		



Made by:	MJJ	Date:	2/14/2012	Job No:	P402110046
Checked by:	JKM	Date:	3/1/2012	Page:	
Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	As-Built Concrete Frame Rating Section M (Frame 23)				

**Pure Bending Capacity** (Ignoring compression steel)

$a =$	4.930	in	$a = A_s * f_y / 0.85 * f'_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	781.8	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	703.6	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **16.53** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d - c) / c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c - d') / c, f_y)$	Stress in compression steel
$a =$	14.04899243	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	752.3	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	488.5	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	1095.2	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	26.90	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	220.8	232.0	170.5	266.2	216.8	224.5	kips
$M_u =$	533.3	566.6	406.6	504.4	493.3	503.3	ft-kips
$e =$	28.98	29.30	28.62	22.74	27.30	26.90	in
$\phi P_n =$	441.0	434.3	448.8	605.8	478.9	488.5	kips
$\phi M_n =$	1065.1	1060.5	1070.4	1147.8	1089.5	1095.2	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.00	71.9 Tons	HS39.9
Operating	HS20	36 Tons	RF=3.33	120.0 Tons	HS66.7
	2F1	15 Tons	RF=4.97	74.6 Tons	
	3F1	23 Tons	RF=4.15	95.4 Tons	
	4F1	27 Tons	RF=4.03	108.7 Tons	
	5C1	40 Tons	RF=3.96	158.2 Tons	
Ohio Legal %	395%				

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.15	41.5 Tons	HS23.1
Operating	HS20	36 Tons	RF=1.93	69.3 Tons	HS38.9
	2F1	15 Tons	RF=2.84	42.7 Tons	
	3F1	23 Tons	RF=2.20	50.6 Tons	
	4F1	27 Tons	RF=2.26	61.0 Tons	
	5C1	40 Tons	RF=2.21	88.3 Tons	
Ohio Legal %	220%				

Shear in Beam  
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Client ODOT

File Section M Frame 33.std Date/Time 01-Mar-2012 18:51

## Job Information

	Engineer	Checked	Approved
<b>Name:</b>	M Johnson	J Kemnitz	
<b>Date:</b>	14-Feb-12	03-Mar-12	

**Structure Type** SPACE FRAME

Number of Nodes	4	Highest Node	4
Number of Elements	3	Highest Beam	3

Number of Basic Load Cases	8
Number of Combination Load Cases	2

*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	DEAD LOAD
Primary	3	LIVE LOAD 1
Primary	4	LIVE LOAD 2
Primary	5	LIVE LOAD 3
Primary	6	LIVE LOAD 4
Primary	7	LIVE LOAD 5
Primary	8	LIVE LOAD 6
Primary	2	SOIL LOAD
Combination	9	DEAD AND SOIL
Combination	10	DL AND SOIL POS MOM

## Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0.000	0.500	0.000
2	0.000	23.200	0.000
3	37.000	23.200	0.000
4	37.000	0.000	0.000

## Beams

Beam	Node A	Node B	Length (ft)	Property	$\beta$ (degrees)
1	1	2	22.700	2	0
2	2	3	37.000	1	0
3	4	3	23.200	3	0



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## Section Properties

Prop	Section	Area (in <sup>2</sup> )	I <sub>yy</sub> (in <sup>4</sup> )	I <sub>zz</sub> (in <sup>4</sup> )	J (in <sup>4</sup> )	Material
1	Rect 54.00x21.00	1.13E+3	41.7E+3	276E+3	126E+3	CONCRETE
2	Rect 42.00x21.00	882.000	32.4E+3	130E+3	89E+3	CONCRETE
3	Rect 48.00x21.00	1.01E+3	37E+3	194E+3	107E+3	CONCRETE

## Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

## Basic Load Cases

Number	Name
1	DEAD LOAD
3	LIVE LOAD 1
4	LIVE LOAD 2
5	LIVE LOAD 3
6	LIVE LOAD 4
7	LIVE LOAD 5
8	LIVE LOAD 6
2	SOIL LOAD

## Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
9	DEAD AND SOIL	1	DEAD LOAD	1.00
		2	SOIL LOAD	1.15
10	DL AND SOIL POS MOM	1	DEAD LOAD	1.00
		2	SOIL LOAD	0.50





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## Beam Force Detail

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			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
1	1:DEAD LOAD	0.000	75.789	-12.851	0.000	0.000	0.000	0.000	0.000	-1.2E+3	
		2.270	73.699	-12.851	0.000	0.000	0.000	0.000	0.000	-848.199	
		4.540	71.608	-12.851	0.000	0.000	0.000	0.000	0.000	-498.144	
		6.810	69.518	-12.851	0.000	0.000	0.000	0.000	0.000	-148.088	
		9.080	67.428	-12.851	0.000	0.000	0.000	0.000	0.000	201.967	
		11.350	65.338	-12.851	0.000	0.000	0.000	0.000	0.000	552.023	
		13.620	63.247	-12.851	0.000	0.000	0.000	0.000	0.000	902.078	
		15.890	61.157	-12.851	0.000	0.000	0.000	0.000	0.000	1.25E+3	
		18.160	59.067	-12.851	0.000	0.000	0.000	0.000	0.000	1.6E+3	
		20.430	56.977	-12.851	0.000	0.000	0.000	0.000	0.000	1.95E+3	
		22.700	54.886	-12.851	0.000	0.000	0.000	0.000	2.3E+3		
	3:LIVE LOAD 1	0.000	79.549	-16.498	0.000	0.000	0.000	0.000	0.000	-1.53E+3	
		2.270	79.549	-16.498	0.000	0.000	0.000	0.000	0.000	-1.09E+3	
		4.540	79.549	-16.498	0.000	0.000	0.000	0.000	0.000	-635.929	
		6.810	79.549	-16.498	0.000	0.000	0.000	0.000	0.000	-186.527	
		9.080	79.549	-16.498	0.000	0.000	0.000	0.000	0.000	262.874	
		11.350	79.549	-16.498	0.000	0.000	0.000	0.000	0.000	712.276	
		13.620	79.549	-16.498	0.000	0.000	0.000	0.000	0.000	1.16E+3	
		15.890	79.549	-16.498	0.000	0.000	0.000	0.000	0.000	1.61E+3	
		18.160	79.549	-16.498	0.000	0.000	0.000	0.000	0.000	2.06E+3	
		20.430	79.549	-16.498	0.000	0.000	0.000	0.000	0.000	2.51E+3	
		22.700	79.549	-16.498	0.000	0.000	0.000	0.000	2.96E+3		
	4:LIVE LOAD 2	0.000	54.006	-16.498	0.000	0.000	0.000	0.000	0.000	-1.54E+3	
		2.270	54.006	-16.498	0.000	0.000	0.000	0.000	0.000	-1.09E+3	
		4.540	54.006	-16.498	0.000	0.000	0.000	0.000	0.000	-636.361	
		6.810	54.006	-16.498	0.000	0.000	0.000	0.000	0.000	-186.967	
		9.080	54.006	-16.498	0.000	0.000	0.000	0.000	0.000	262.427	
		11.350	54.006	-16.498	0.000	0.000	0.000	0.000	0.000	711.821	
		13.620	54.006	-16.498	0.000	0.000	0.000	0.000	0.000	1.16E+3	
		15.890	54.006	-16.498	0.000	0.000	0.000	0.000	0.000	1.61E+3	
		18.160	54.006	-16.498	0.000	0.000	0.000	0.000	0.000	2.06E+3	
		20.430	54.006	-16.498	0.000	0.000	0.000	0.000	0.000	2.51E+3	
		22.700	54.006	-16.498	0.000	0.000	0.000	0.000	2.96E+3		
	5:LIVE LOAD 3	0.000	66.739	-17.396	0.000	0.000	0.000	0.000	0.000	-1.62E+3	
		2.270	66.739	-17.396	0.000	0.000	0.000	0.000	0.000	-1.14E+3	
		4.540	66.739	-17.396	0.000	0.000	0.000	0.000	0.000	-670.671	
		6.810	66.739	-17.396	0.000	0.000	0.000	0.000	0.000	-196.804	
		9.080	66.739	-17.396	0.000	0.000	0.000	0.000	0.000	277.063	
		11.350	66.739	-17.396	0.000	0.000	0.000	0.000	0.000	750.930	
		13.620	66.739	-17.396	0.000	0.000	0.000	0.000	0.000	1.22E+3	
15.890	66.739	-17.396	0.000	0.000	0.000	0.000	0.000	1.7E+3			
		18.160	66.739	-17.396	0.000	0.000	0.000	0.000	2.17E+3		



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### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		20.430	66.739	-17.396	0.000	0.000	0.000	0.000	0.000	2.65E+3	
		22.700	66.739	-17.396	0.000	0.000	0.000	0.000	0.000	3.12E+3	
	6:LIVE LOAD 4	0.000	72.231	-17.232	0.000	0.000	0.000	0.000	0.000	-1.6E+3	
		2.270	72.231	-17.232	0.000	0.000	0.000	0.000	0.000	-1.13E+3	
		4.540	72.231	-17.232	0.000	0.000	0.000	0.000	0.000	-662.240	
		6.810	72.231	-17.232	0.000	0.000	0.000	0.000	0.000	-192.831	
		9.080	72.231	-17.232	0.000	0.000	0.000	0.000	0.000	276.578	
		11.350	72.231	-17.232	0.000	0.000	0.000	0.000	0.000	745.987	
		13.620	72.231	-17.232	0.000	0.000	0.000	0.000	0.000	1.22E+3	
		15.890	72.231	-17.232	0.000	0.000	0.000	0.000	0.000	1.68E+3	
		18.160	72.231	-17.232	0.000	0.000	0.000	0.000	0.000	2.15E+3	
		20.430	72.231	-17.232	0.000	0.000	0.000	0.000	0.000	2.62E+3	
		22.700	72.231	-17.232	0.000	0.000	0.000	0.000	0.000	3.09E+3	
	7:LIVE LOAD 5	0.000	61.261	-17.230	0.000	0.000	0.000	0.000	0.000	-1.61E+3	
		2.270	61.261	-17.230	0.000	0.000	0.000	0.000	0.000	-1.14E+3	
		4.540	61.261	-17.230	0.000	0.000	0.000	0.000	0.000	-666.418	
		6.810	61.261	-17.230	0.000	0.000	0.000	0.000	0.000	-197.082	
		9.080	61.261	-17.230	0.000	0.000	0.000	0.000	0.000	272.254	
		11.350	61.261	-17.230	0.000	0.000	0.000	0.000	0.000	741.590	
		13.620	61.261	-17.230	0.000	0.000	0.000	0.000	0.000	1.21E+3	
		15.890	61.261	-17.230	0.000	0.000	0.000	0.000	0.000	1.68E+3	
		18.160	61.261	-17.230	0.000	0.000	0.000	0.000	0.000	2.15E+3	
		20.430	61.261	-17.230	0.000	0.000	0.000	0.000	0.000	2.62E+3	
		22.700	61.261	-17.230	0.000	0.000	0.000	0.000	0.000	3.09E+3	
	8:LIVE LOAD 6	0.000	49.270	-16.742	0.000	0.000	0.000	0.000	0.000	-1.56E+3	
		2.270	49.270	-16.742	0.000	0.000	0.000	0.000	0.000	-1.1E+3	
		4.540	49.270	-16.742	0.000	0.000	0.000	0.000	0.000	-645.022	
		6.810	49.270	-16.742	0.000	0.000	0.000	0.000	0.000	-188.956	
		9.080	49.270	-16.742	0.000	0.000	0.000	0.000	0.000	267.109	
		11.350	49.270	-16.742	0.000	0.000	0.000	0.000	0.000	723.174	
		13.620	49.270	-16.742	0.000	0.000	0.000	0.000	0.000	1.18E+3	
		15.890	49.270	-16.742	0.000	0.000	0.000	0.000	0.000	1.64E+3	
		18.160	49.270	-16.742	0.000	0.000	0.000	0.000	0.000	2.09E+3	
		20.430	49.270	-16.742	0.000	0.000	0.000	0.000	0.000	2.55E+3	
		22.700	49.270	-16.742	0.000	0.000	0.000	0.000	0.000	3E+3	
	2:SOIL LOAD	0.000	-4.488	86.896	0.000	0.000	0.000	0.000	0.000	5.15E+3	
		2.270	-4.488	69.955	0.000	0.000	0.000	0.000	0.000	3.03E+3	
		4.540	-4.488	53.268	0.000	0.000	0.000	0.000	0.000	1.37E+3	
		6.810	-4.488	37.645	0.000	0.000	0.000	0.000	0.000	136.453	
		9.080	-4.488	24.027	0.000	0.000	0.000	0.000	0.000	-708.783	
		11.350	-4.488	12.438	0.000	0.000	0.000	0.000	0.000	-1.22E+3	
		13.620	-4.488	3.166	0.000	0.000	0.000	0.000	0.000	-1.41E+3	
		15.890	-4.488	-4.078	0.000	0.000	0.000	0.000	0.000	-1.39E+3	
		18.160	-4.488	-9.293	0.000	0.000	0.000	0.000	0.000	-1.2E+3	



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### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		20.430	-4.488	-12.480	0.000	0.000	0.000	0.000	0.000	-903.199	
		22.700	-4.488	-13.639	0.000	0.000	0.000	0.000	0.000	-544.826	
	9:DEAD AND S	0.000	70.627	87.080	0.000	0.000	0.000	0.000	0.000	4.72E+3	
		2.270	68.537	67.598	0.000	0.000	0.000	0.000	0.000	2.64E+3	
		4.540	66.447	48.408	0.000	0.000	0.000	0.000	0.000	1.08E+3	
		6.810	64.357	30.441	0.000	0.000	0.000	0.000	0.000	8.833	
		9.080	62.266	14.780	0.000	0.000	0.000	0.000	0.000	-613.133	
		11.350	60.176	1.452	0.000	0.000	0.000	0.000	0.000	-849.351	
		13.620	58.086	-9.210	0.000	0.000	0.000	0.000	0.000	-722.515	
		15.890	55.996	-17.540	0.000	0.000	0.000	0.000	0.000	-346.077	
		18.160	53.905	-23.538	0.000	0.000	0.000	0.000	0.000	219.454	
		20.430	51.815	-27.203	0.000	0.000	0.000	0.000	0.000	913.566	
		22.700	49.725	-28.536	0.000	0.000	0.000	0.000	0.000	1.68E+3	
	10:DL AND SO	0.000	73.545	30.597	0.000	0.000	0.000	0.000	0.000	1.37E+3	
		2.270	71.454	22.127	0.000	0.000	0.000	0.000	0.000	669.027	
		4.540	69.364	13.783	0.000	0.000	0.000	0.000	0.000	186.690	
		6.810	67.274	5.972	0.000	0.000	0.000	0.000	0.000	-79.861	
		9.080	65.184	-0.837	0.000	0.000	0.000	0.000	0.000	-152.424	
		11.350	63.093	-6.632	0.000	0.000	0.000	0.000	0.000	-57.270	
		13.620	61.003	-11.268	0.000	0.000	0.000	0.000	0.000	195.734	
		15.890	58.913	-14.890	0.000	0.000	0.000	0.000	0.000	557.260	
		18.160	56.823	-17.497	0.000	0.000	0.000	0.000	0.000	1E+3	
		20.430	54.733	-19.091	0.000	0.000	0.000	0.000	0.000	1.5E+3	
		22.700	52.642	-19.670	0.000	0.000	0.000	0.000	0.000	2.03E+3	
2	1:DEAD LOAD	0.000	12.851	50.186	0.000	0.000	0.000	0.000	0.000	2.3E+3	
		3.700	12.851	40.432	0.000	0.000	0.000	0.000	0.000	314.394	
		7.400	12.851	30.610	0.000	0.000	0.000	0.000	0.000	-1.25E+3	
		11.100	12.851	20.720	0.000	0.000	0.000	0.000	0.000	-2.39E+3	
		14.800	12.851	10.763	0.000	0.000	0.000	0.000	0.000	-3.1E+3	
		18.500	12.851	0.738	0.000	0.000	0.000	0.000	0.000	-3.38E+3	
		22.200	12.851	-11.414	0.000	0.000	0.000	0.000	0.000	-3.08E+3	
		25.900	12.851	-21.584	0.000	0.000	0.000	0.000	0.000	-2.33E+3	
		29.600	12.851	-31.822	0.000	0.000	0.000	0.000	0.000	-1.15E+3	
		33.300	12.851	-42.127	0.000	0.000	0.000	0.000	0.000	483.586	
		37.000	12.851	-52.500	0.000	0.000	0.000	0.000	0.000	2.56E+3	
	3:LIVE LOAD 1	0.000	16.498	79.549	0.000	0.000	0.000	0.000	0.000	2.96E+3	
		3.700	16.498	52.549	0.000	0.000	0.000	0.000	0.000	435.298	
		7.400	16.498	34.549	0.000	0.000	0.000	0.000	0.000	-1.73E+3	
		11.100	16.498	21.049	0.000	0.000	0.000	0.000	0.000	-3.21E+3	
		14.800	16.498	12.049	0.000	0.000	0.000	0.000	0.000	-4.04E+3	
		18.500	16.498	-10.451	0.000	0.000	0.000	0.000	0.000	-4.44E+3	
		22.200	16.498	-14.951	0.000	0.000	0.000	0.000	0.000	-3.94E+3	
		25.900	16.498	-32.951	0.000	0.000	0.000	0.000	0.000	-3E+3	
		29.600	16.498	-46.451	0.000	0.000	0.000	0.000	0.000	-1.4E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**6**

Rev

Part Section M, Frame 33

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 33.std Date/Time 01-Mar-2012 18:51

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	16.498	-55.451	0.000	0.000	0.000	0.000	0.000	817.430	
		37.000	16.498	-55.451	0.000	0.000	0.000	0.000	0.000	3.28E+3	
	4:LIVE LOAD 2	0.000	16.498	54.006	0.000	0.000	0.000	0.000	0.000	2.96E+3	
		3.700	16.498	54.006	0.000	0.000	0.000	0.000	0.000	560.914	
		7.400	16.498	45.006	0.000	0.000	0.000	0.000	0.000	-1.59E+3	
		11.100	16.498	31.506	0.000	0.000	0.000	0.000	0.000	-3.13E+3	
		14.800	16.498	13.506	0.000	0.000	0.000	0.000	0.000	-4E+3	
		18.500	16.498	9.006	0.000	0.000	0.000	0.000	0.000	-4.44E+3	
		22.200	16.498	-13.494	0.000	0.000	0.000	0.000	0.000	-3.98E+3	
		25.900	16.498	-22.494	0.000	0.000	0.000	0.000	0.000	-3.08E+3	
		29.600	16.498	-35.994	0.000	0.000	0.000	0.000	0.000	-1.54E+3	
		33.300	16.498	-53.994	0.000	0.000	0.000	0.000	0.000	691.895	
		37.000	16.498	-80.994	0.000	0.000	0.000	0.000	0.000	3.28E+3	
	5:LIVE LOAD 3	0.000	17.396	66.739	0.000	0.000	0.000	0.000	0.000	3.12E+3	
		3.700	17.396	62.239	0.000	0.000	0.000	0.000	0.000	301.053	
		7.400	17.396	44.239	0.000	0.000	0.000	0.000	0.000	-1.75E+3	
		11.100	17.396	30.739	0.000	0.000	0.000	0.000	0.000	-3.26E+3	
		14.800	17.396	21.739	0.000	0.000	0.000	0.000	0.000	-4.25E+3	
		18.500	17.396	-0.761	0.000	0.000	0.000	0.000	0.000	-4.41E+3	
		22.200	17.396	-23.261	0.000	0.000	0.000	0.000	0.000	-4.18E+3	
		25.900	17.396	-32.261	0.000	0.000	0.000	0.000	0.000	-3.12E+3	
		29.600	17.396	-45.761	0.000	0.000	0.000	0.000	0.000	-1.55E+3	
		33.300	17.396	-63.761	0.000	0.000	0.000	0.000	0.000	571.361	
		37.000	17.396	-68.261	0.000	0.000	0.000	0.000	0.000	3.46E+3	
	6:LIVE LOAD 4	0.000	17.232	72.231	0.000	0.000	0.000	0.000	0.000	3.09E+3	
		3.700	17.232	49.731	0.000	0.000	0.000	0.000	0.000	344.987	
		7.400	17.232	40.731	0.000	0.000	0.000	0.000	0.000	-1.73E+3	
		11.100	17.232	27.231	0.000	0.000	0.000	0.000	0.000	-3.23E+3	
		14.800	17.232	9.231	0.000	0.000	0.000	0.000	0.000	-4.14E+3	
		18.500	17.232	4.731	0.000	0.000	0.000	0.000	0.000	-4.44E+3	
		22.200	17.232	-17.769	0.000	0.000	0.000	0.000	0.000	-4.05E+3	
		25.900	17.232	-26.769	0.000	0.000	0.000	0.000	0.000	-3.08E+3	
		29.600	17.232	-40.269	0.000	0.000	0.000	0.000	0.000	-1.5E+3	
		33.300	17.232	-58.269	0.000	0.000	0.000	0.000	0.000	698.626	
		37.000	17.232	-62.769	0.000	0.000	0.000	0.000	0.000	3.42E+3	
	7:LIVE LOAD 5	0.000	17.230	61.261	0.000	0.000	0.000	0.000	0.000	3.09E+3	
		3.700	17.230	56.761	0.000	0.000	0.000	0.000	0.000	431.261	
		7.400	17.230	38.761	0.000	0.000	0.000	0.000	0.000	-1.7E+3	
		11.100	17.230	25.261	0.000	0.000	0.000	0.000	0.000	-3.21E+3	
		14.800	17.230	16.261	0.000	0.000	0.000	0.000	0.000	-4.12E+3	
		18.500	17.230	-6.239	0.000	0.000	0.000	0.000	0.000	-4.44E+3	
		22.200	17.230	-10.739	0.000	0.000	0.000	0.000	0.000	-4.07E+3	
		25.900	17.230	-28.739	0.000	0.000	0.000	0.000	0.000	-3.1E+3	
		29.600	17.230	-42.239	0.000	0.000	0.000	0.000	0.000	-1.53E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
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Rev

Part Section M, Frame 33

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 33.std Date/Time 01-Mar-2012 18:51

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	17.230	-51.239	0.000	0.000	0.000	0.000	0.000	613.179	
		37.000	17.230	-73.739	0.000	0.000	0.000	0.000	0.000	3.43E+3	
	8:LIVE LOAD 6	0.000	16.742	49.270	0.000	0.000	0.000	0.000	0.000	3E+3	
		3.700	16.742	49.270	0.000	0.000	0.000	0.000	0.000	815.908	
		7.400	16.742	49.270	0.000	0.000	0.000	0.000	0.000	-1.37E+3	
		11.100	16.742	34.270	0.000	0.000	0.000	0.000	0.000	-3.23E+3	
		14.800	16.742	24.270	0.000	0.000	0.000	0.000	0.000	-4.46E+3	
		18.500	16.742	-0.730	0.000	0.000	0.000	0.000	0.000	-4.93E+3	
		22.200	16.742	-25.730	0.000	0.000	0.000	0.000	0.000	-4.39E+3	
		25.900	16.742	-35.730	0.000	0.000	0.000	0.000	0.000	-3.1E+3	
		29.600	16.742	-50.730	0.000	0.000	0.000	0.000	0.000	-1.18E+3	
		33.300	16.742	-50.730	0.000	0.000	0.000	0.000	0.000	1.08E+3	
		37.000	16.742	-50.730	0.000	0.000	0.000	0.000	0.000	3.33E+3	
	2:SOIL LOAD	0.000	13.639	-4.488	0.000	0.000	0.000	0.000	0.000	-544.826	
		3.700	13.639	-4.488	0.000	0.000	0.000	0.000	0.000	-345.548	
		7.400	13.639	-4.488	0.000	0.000	0.000	0.000	0.000	-146.269	
		11.100	13.639	-4.488	0.000	0.000	0.000	0.000	0.000	53.010	
		14.800	13.639	-4.488	0.000	0.000	0.000	0.000	0.000	252.289	
		18.500	13.639	-4.488	0.000	0.000	0.000	0.000	0.000	451.568	
		22.200	13.639	-4.488	0.000	0.000	0.000	0.000	0.000	650.846	
		25.900	13.639	-4.488	0.000	0.000	0.000	0.000	0.000	850.125	
		29.600	13.639	-4.488	0.000	0.000	0.000	0.000	0.000	1.05E+3	
		33.300	13.639	-4.488	0.000	0.000	0.000	0.000	0.000	1.25E+3	
		37.000	13.639	-4.488	0.000	0.000	0.000	0.000	0.000	1.45E+3	
	9:DEAD AND S	0.000	28.536	45.025	0.000	0.000	0.000	0.000	0.000	1.68E+3	
		3.700	28.536	35.270	0.000	0.000	0.000	0.000	0.000	-82.986	
		7.400	28.536	25.448	0.000	0.000	0.000	0.000	0.000	-1.42E+3	
		11.100	28.536	15.559	0.000	0.000	0.000	0.000	0.000	-2.33E+3	
		14.800	28.536	5.601	0.000	0.000	0.000	0.000	0.000	-2.81E+3	
		18.500	28.536	-4.424	0.000	0.000	0.000	0.000	0.000	-2.86E+3	
		22.200	28.536	-16.576	0.000	0.000	0.000	0.000	0.000	-2.33E+3	
		25.900	28.536	-26.746	0.000	0.000	0.000	0.000	0.000	-1.35E+3	
		29.600	28.536	-36.983	0.000	0.000	0.000	0.000	0.000	61.723	
		33.300	28.536	-47.288	0.000	0.000	0.000	0.000	0.000	1.92E+3	
		37.000	28.536	-57.661	0.000	0.000	0.000	0.000	0.000	4.22E+3	
	10:DL AND SO	0.000	19.670	47.942	0.000	0.000	0.000	0.000	0.000	2.03E+3	
		3.700	19.670	38.188	0.000	0.000	0.000	0.000	0.000	141.620	
		7.400	19.670	28.366	0.000	0.000	0.000	0.000	0.000	-1.32E+3	
		11.100	19.670	18.476	0.000	0.000	0.000	0.000	0.000	-2.36E+3	
		14.800	19.670	8.519	0.000	0.000	0.000	0.000	0.000	-2.98E+3	
		18.500	19.670	-1.506	0.000	0.000	0.000	0.000	0.000	-3.16E+3	
		22.200	19.670	-13.659	0.000	0.000	0.000	0.000	0.000	-2.75E+3	
		25.900	19.670	-23.828	0.000	0.000	0.000	0.000	0.000	-1.91E+3	
		29.600	19.670	-34.066	0.000	0.000	0.000	0.000	0.000	-620.390	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
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Rev

Part Section M, Frame 33

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 33.std Date/Time 01-Mar-2012 18:51

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		33.300	19.670	-44.371	0.000	0.000	0.000	0.000	0.000	1.11E+3	
		37.000	19.670	-54.744	0.000	0.000	0.000	0.000	0.000	3.28E+3	
3	1:DEAD LOAD	0.000	81.614	12.851	0.000	0.000	0.000	0.000	0.000	1.02E+3	
		2.320	79.173	12.851	0.000	0.000	0.000	0.000	0.000	661.420	
		4.640	76.731	12.851	0.000	0.000	0.000	0.000	0.000	303.655	
		6.960	74.290	12.851	0.000	0.000	0.000	0.000	0.000	-54.111	
		9.280	71.848	12.851	0.000	0.000	0.000	0.000	0.000	-411.877	
		11.600	69.407	12.851	0.000	0.000	0.000	0.000	0.000	-769.643	
		13.920	66.966	12.851	0.000	0.000	0.000	0.000	0.000	-1.13E+3	
		16.240	64.524	12.851	0.000	0.000	0.000	0.000	0.000	-1.49E+3	
		18.560	62.083	12.851	0.000	0.000	0.000	0.000	0.000	-1.84E+3	
		20.880	59.641	12.851	0.000	0.000	0.000	0.000	0.000	-2.2E+3	
		23.200	57.200	12.851	0.000	0.000	0.000	0.000	0.000	-2.56E+3	
	3:LIVE LOAD 1	0.000	55.451	16.498	0.000	0.000	0.000	0.000	0.000	1.31E+3	
		2.320	55.451	16.498	0.000	0.000	0.000	0.000	0.000	854.260	
		4.640	55.451	16.498	0.000	0.000	0.000	0.000	0.000	394.960	
		6.960	55.451	16.498	0.000	0.000	0.000	0.000	0.000	-64.340	
		9.280	55.451	16.498	0.000	0.000	0.000	0.000	0.000	-523.641	
		11.600	55.451	16.498	0.000	0.000	0.000	0.000	0.000	-982.941	
		13.920	55.451	16.498	0.000	0.000	0.000	0.000	0.000	-1.44E+3	
		16.240	55.451	16.498	0.000	0.000	0.000	0.000	0.000	-1.9E+3	
		18.560	55.451	16.498	0.000	0.000	0.000	0.000	0.000	-2.36E+3	
		20.880	55.451	16.498	0.000	0.000	0.000	0.000	0.000	-2.82E+3	
		23.200	55.451	16.498	0.000	0.000	0.000	0.000	0.000	-3.28E+3	
	4:LIVE LOAD 2	0.000	80.994	16.498	0.000	0.000	0.000	0.000	0.000	1.31E+3	
		2.320	80.994	16.498	0.000	0.000	0.000	0.000	0.000	853.614	
		4.640	80.994	16.498	0.000	0.000	0.000	0.000	0.000	394.321	
		6.960	80.994	16.498	0.000	0.000	0.000	0.000	0.000	-64.971	
		9.280	80.994	16.498	0.000	0.000	0.000	0.000	0.000	-524.264	
		11.600	80.994	16.498	0.000	0.000	0.000	0.000	0.000	-983.557	
		13.920	80.994	16.498	0.000	0.000	0.000	0.000	0.000	-1.44E+3	
		16.240	80.994	16.498	0.000	0.000	0.000	0.000	0.000	-1.9E+3	
		18.560	80.994	16.498	0.000	0.000	0.000	0.000	0.000	-2.36E+3	
		20.880	80.994	16.498	0.000	0.000	0.000	0.000	0.000	-2.82E+3	
		23.200	80.994	16.498	0.000	0.000	0.000	0.000	0.000	-3.28E+3	
	5:LIVE LOAD 3	0.000	68.261	17.396	0.000	0.000	0.000	0.000	0.000	1.38E+3	
		2.320	68.261	17.396	0.000	0.000	0.000	0.000	0.000	900.592	
		4.640	68.261	17.396	0.000	0.000	0.000	0.000	0.000	416.288	
		6.960	68.261	17.396	0.000	0.000	0.000	0.000	0.000	-68.017	
		9.280	68.261	17.396	0.000	0.000	0.000	0.000	0.000	-552.321	
		11.600	68.261	17.396	0.000	0.000	0.000	0.000	0.000	-1.04E+3	
		13.920	68.261	17.396	0.000	0.000	0.000	0.000	0.000	-1.52E+3	
		16.240	68.261	17.396	0.000	0.000	0.000	0.000	0.000	-2.01E+3	
		18.560	68.261	17.396	0.000	0.000	0.000	0.000	0.000	-2.49E+3	



Software licensed to TranSystems

Job No  
**P402110046**

Sheet No  
**9**

Rev

Part Section M, Frame 33

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

File Section M Frame 33.std Date/Time 01-Mar-2012 18:51

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		20.880	68.261	17.396	0.000	0.000	0.000	0.000	0.000	-2.97E+3	
		23.200	68.261	17.396	0.000	0.000	0.000	0.000	0.000	-3.46E+3	
	6:LIVE LOAD 4	0.000	62.769	17.232	0.000	0.000	0.000	0.000	0.000	1.37E+3	
		2.320	62.769	17.232	0.000	0.000	0.000	0.000	0.000	895.151	
		4.640	62.769	17.232	0.000	0.000	0.000	0.000	0.000	415.402	
		6.960	62.769	17.232	0.000	0.000	0.000	0.000	0.000	-64.346	
		9.280	62.769	17.232	0.000	0.000	0.000	0.000	0.000	-544.094	
		11.600	62.769	17.232	0.000	0.000	0.000	0.000	0.000	-1.02E+3	
		13.920	62.769	17.232	0.000	0.000	0.000	0.000	0.000	-1.5E+3	
		16.240	62.769	17.232	0.000	0.000	0.000	0.000	0.000	-1.98E+3	
		18.560	62.769	17.232	0.000	0.000	0.000	0.000	0.000	-2.46E+3	
		20.880	62.769	17.232	0.000	0.000	0.000	0.000	0.000	-2.94E+3	
		23.200	62.769	17.232	0.000	0.000	0.000	0.000	0.000	-3.42E+3	
	7:LIVE LOAD 5	0.000	73.739	17.230	0.000	0.000	0.000	0.000	0.000	1.37E+3	
		2.320	73.739	17.230	0.000	0.000	0.000	0.000	0.000	888.894	
		4.640	73.739	17.230	0.000	0.000	0.000	0.000	0.000	409.220	
		6.960	73.739	17.230	0.000	0.000	0.000	0.000	0.000	-70.454	
		9.280	73.739	17.230	0.000	0.000	0.000	0.000	0.000	-550.127	
		11.600	73.739	17.230	0.000	0.000	0.000	0.000	0.000	-1.03E+3	
		13.920	73.739	17.230	0.000	0.000	0.000	0.000	0.000	-1.51E+3	
		16.240	73.739	17.230	0.000	0.000	0.000	0.000	0.000	-1.99E+3	
		18.560	73.739	17.230	0.000	0.000	0.000	0.000	0.000	-2.47E+3	
		20.880	73.739	17.230	0.000	0.000	0.000	0.000	0.000	-2.95E+3	
		23.200	73.739	17.230	0.000	0.000	0.000	0.000	0.000	-3.43E+3	
	8:LIVE LOAD 6	0.000	50.730	16.742	0.000	0.000	0.000	0.000	0.000	1.33E+3	
		2.320	50.730	16.742	0.000	0.000	0.000	0.000	0.000	867.408	
		4.640	50.730	16.742	0.000	0.000	0.000	0.000	0.000	401.297	
		6.960	50.730	16.742	0.000	0.000	0.000	0.000	0.000	-64.813	
		9.280	50.730	16.742	0.000	0.000	0.000	0.000	0.000	-530.924	
		11.600	50.730	16.742	0.000	0.000	0.000	0.000	0.000	-997.034	
		13.920	50.730	16.742	0.000	0.000	0.000	0.000	0.000	-1.46E+3	
		16.240	50.730	16.742	0.000	0.000	0.000	0.000	0.000	-1.93E+3	
		18.560	50.730	16.742	0.000	0.000	0.000	0.000	0.000	-2.4E+3	
		20.880	50.730	16.742	0.000	0.000	0.000	0.000	0.000	-2.86E+3	
		23.200	50.730	16.742	0.000	0.000	0.000	0.000	0.000	-3.33E+3	
	2:SOIL LOAD	0.000	4.488	13.639	0.000	0.000	0.000	0.000	0.000	2.35E+3	
		2.320	4.488	13.639	0.000	0.000	0.000	0.000	0.000	1.97E+3	
		4.640	4.488	13.639	0.000	0.000	0.000	0.000	0.000	1.59E+3	
		6.960	4.488	13.639	0.000	0.000	0.000	0.000	0.000	1.21E+3	
		9.280	4.488	13.639	0.000	0.000	0.000	0.000	0.000	830.307	
		11.600	4.488	13.639	0.000	0.000	0.000	0.000	0.000	450.596	
		13.920	4.488	13.639	0.000	0.000	0.000	0.000	0.000	70.884	
		16.240	4.488	13.639	0.000	0.000	0.000	0.000	0.000	-308.827	
		18.560	4.488	13.639	0.000	0.000	0.000	0.000	0.000	-688.538	



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Job No  
**P402110046**

Sheet No  
**10**

Rev

Part Section M, Frame 33

Job Title Main Avenue Rating

Ref

By M Johnson Date 14-Feb-12 Chd J Kemnitz

Client ODOT

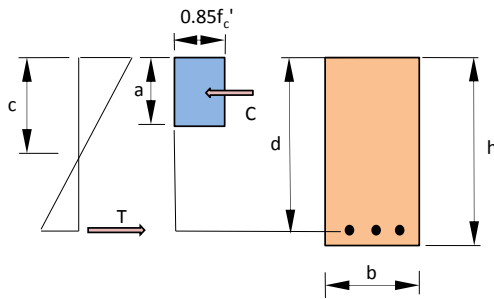
File Section M Frame 33.std Date/Time 01-Mar-2012 18:51

### Beam Force Detail Cont...

Beam	L/C	d (ft)	Axial			Shear			Torsion	Bending	
			Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip'in)	My (kip'in)	Mz (kip'in)			
		20.880	4.488	13.639	0.000	0.000	0.000	0.000	0.000	-1.07E+3	
		23.200	4.488	13.639	0.000	0.000	0.000	0.000	0.000	-1.45E+3	
	9:DEAD AND S	0.000	86.776	28.536	0.000	0.000	0.000	0.000	0.000	3.72E+3	
		2.320	84.334	28.536	0.000	0.000	0.000	0.000	0.000	2.93E+3	
		4.640	81.893	28.536	0.000	0.000	0.000	0.000	0.000	2.13E+3	
		6.960	79.451	28.536	0.000	0.000	0.000	0.000	0.000	1.34E+3	
		9.280	77.010	28.536	0.000	0.000	0.000	0.000	0.000	542.976	
		11.600	74.568	28.536	0.000	0.000	0.000	0.000	0.000	-251.458	
		13.920	72.127	28.536	0.000	0.000	0.000	0.000	0.000	-1.05E+3	
		16.240	69.686	28.536	0.000	0.000	0.000	0.000	0.000	-1.84E+3	
		18.560	67.244	28.536	0.000	0.000	0.000	0.000	0.000	-2.63E+3	
		20.880	64.803	28.536	0.000	0.000	0.000	0.000	0.000	-3.43E+3	
		23.200	62.361	28.536	0.000	0.000	0.000	0.000	0.000	-4.22E+3	
	10:DL AND SO	0.000	83.858	19.670	0.000	0.000	0.000	0.000	0.000	2.19E+3	
		2.320	81.417	19.670	0.000	0.000	0.000	0.000	0.000	1.65E+3	
		4.640	78.975	19.670	0.000	0.000	0.000	0.000	0.000	1.1E+3	
		6.960	76.534	19.670	0.000	0.000	0.000	0.000	0.000	550.898	
		9.280	74.093	19.670	0.000	0.000	0.000	0.000	0.000	3.276	
		11.600	71.651	19.670	0.000	0.000	0.000	0.000	0.000	-544.346	
		13.920	69.210	19.670	0.000	0.000	0.000	0.000	0.000	-1.09E+3	
		16.240	66.768	19.670	0.000	0.000	0.000	0.000	0.000	-1.64E+3	
		18.560	64.327	19.670	0.000	0.000	0.000	0.000	0.000	-2.19E+3	
		20.880	61.885	19.670	0.000	0.000	0.000	0.000	0.000	-2.73E+3	
		23.200	59.444	19.670	0.000	0.000	0.000	0.000	0.000	-3.28E+3	



### Floor Beam Postive Moment Section



b =	99.0	in
d =	48	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	14.15	in <sup>2</sup>
% Steel Loss =	0%	

(5-1 1/4" □ & 5-1 1/8" □)  
from 49/246 of original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	14.150	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	239.60	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	1.233	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1659.4	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load and Soil Load Moment

(Soil Force factored by 0.5)

Total Service Positive Moment = 263.1 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	38.5	41.6	27.7	35.8	34.3	35.8	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	50.1	54.1	36.0	46.5	44.6	46.5	kips
Reaction per Wheel (LL+I) =	25.0	27.0	18.0	23.3	22.3	23.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

From STAAD							
Max. Positive LL+I Moment =	411.17	444.3	295.8	382.3	366.3	382.3	ft*kips

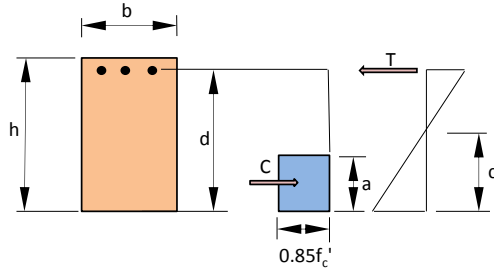
Maximum Positive Moment results from 2 lanes loaded.

#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.37	49.2 Tons	HS27.3
Operating	HS20	36 Tons	RF=2.28	82.1 Tons	HS45.6
	2F1	15 Tons	RF=3.43	51.4 Tons	
	3F1	23 Tons	RF=2.65	61.0 Tons	
	4F1	27 Tons	RF=2.77	74.7 Tons	
	5C1	40 Tons	RF=2.65	106.0 Tons	
	Ohio Legal %	265%			

### Floor Beam Negative Moment Section

(North side of floorbeam controls)



b =	21	in
d =	66	in
f <sub>c</sub> ' =	3	ksi
f <sub>y</sub> =	33	ksi
φ =	0.9	
Area of Steel =	9.35	in <sup>2</sup>
% Steel Loss =	0%	

5-1 1/8" □ &  
3-1" □ from  
49/246 of  
original plans

### Section Capacity

b = Frame width for negative moment

A <sub>s</sub> =	9.350	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.048		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	49.50	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.85		
a =	5.762	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1460.7	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

### Dead Load and Soil Load Moment

(Moment taken at face of column)

(Soil Force increased by 1.15 factor)

Total Service Negative Moment = **75.1** ft\*kips From Staad

### Live Load Moment

(Moment taken at face of column)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. Negative LL+I Moment =	<b>176.33</b>	190.5	126.9	164.0	157.1	164.0	ft*kips	

Maximum Negative Moment results from 3 lanes loaded.

### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=3.30	118.7 Tons	HS65.9
Operating	HS20	36 Tons	RF=5.50	198.1 Tons	HS110.1
	2F1	15 Tons	RF=8.26	124.0 Tons	
	3F1	23 Tons	RF=6.39	147.1 Tons	
	4F1	27 Tons	RF=6.67	180.2 Tons	
	5C1	40 Tons	RF=6.39	255.8 Tons	
	Ohio Legal %	640%			



Made by: MJJ Date: 2/16/2012 Job No: P402110046  
 Checked by: JKM Date: 3/1/2012 Page:  
 Project: CUY-2-14.41 (Main Avenue Bridge)  
 Subject: As-Built Concrete Frame Rating Section M (Frame 33)

## Floor Beam Shear Section

### Section Capacity

Taken at face of column (North end of cap controls)

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)
$d =$	<input type="text" value="66"/>	in	$d$ used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="151.8"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	(AASHTO Eq. 8-54)
$\phi V_n =$	<input type="text" value="259.7"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

(Soil Force increased by 1.15 factor)

Total Service Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="72.2"/>		78.0	51.9	67.1	64.3	67.1

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.22	43.9 Tons	HS24.4
Operating	HS20	36 Tons	RF=2.03	73.2 Tons	HS40.7
	2F1	15 Tons	RF=3.05	45.8 Tons	
	3F1	23 Tons	RF=2.36	54.4 Tons	
	4F1	27 Tons	RF=2.47	66.6 Tons	
	5C1	40 Tons	RF=2.36	94.5 Tons	
	Ohio Legal %	235%			



**Column Section** (Top of South Column controls)

h =	<b>48</b>	in	Column Depth
b =	<b>21</b>	in	Column Width
A <sub>s</sub> =	<b>12.7</b>	in <sup>2</sup>	Area of Tension Steel (10 -1 1/8" □ bars)(49/246 original plans)
A' <sub>s</sub> =	<b>4</b>	in <sup>2</sup>	Area of Compression Steel (4-1" bars)
d =	<b>42</b>	in	Distance from compression face to centroid of tension steel
d' =	<b>3</b>	in	Distance from compression face to centroid of compression steel
f <sub>c</sub> =	<b>3</b>	ksi	Concrete Strength
f <sub>y</sub> =	<b>33</b>	ksi	Steel Yield Stress
E <sub>s</sub> =	<b>29000</b>	ksi	Modulus of elasticity of steel
ε <sub>u</sub> =	<b>0.003</b>	in/in	Ultimate concrete strain
β <sub>1</sub> =	<b>0.85</b>		
d" =	<b>18</b>	in	Distance from centroid of gross section to centroid of tension steel

(Soil Forces increased by 1.15 factor)

**Dead Loads plus soil loads** (Moment taken at top of column below chamfer)

Total Service Moment =	<b>216.4</b>	ft-kips	From Staad
Total Service Axial Force =	<b>65</b>	kips	From Staad

**Live Loads** (Moment taken at top of column below chamfer)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	<b>205.5</b>		222.0	147.9	191.1	183.1	191.1	ft-kips
Max. LL+I Axial Force =	<b>68.3</b>		73.8	45.5	88.3	65.4	71.3	kips

Maximum Moment and Axial load results from 3 lanes loaded..

**Section Capacity**

**Balanced Condition**

a <sub>b</sub> =	<b>25.88</b>	in	a <sub>b</sub> = (87 / (87+f <sub>y</sub> ))*β <sub>1</sub> *d	Depth of stress block for balanced conditions, AASHTO 8-34
c <sub>b</sub> =	<b>30.45</b>	in	c <sub>b</sub> = a <sub>b</sub> /β <sub>1</sub>	Depth to neutral axis for balanced conditions
f <sub>s</sub> =	<b>33</b>	ksi	f <sub>s</sub> = 87*(1-(d'/d))*((87+f <sub>y</sub> )/87)	Stress in comp. steel at balanced condition (<= f <sub>y</sub> ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

P <sub>b</sub> =	<b>1098.9</b>	kip	P <sub>b</sub> = .85*f <sub>c</sub> *b*a <sub>b</sub> +A' <sub>s</sub> *f <sub>s</sub> -A <sub>s</sub> *f <sub>y</sub>
M <sub>b</sub> =	<b>2136.9</b>	ft-kip	M <sub>b</sub> = 0.85*f <sub>c</sub> *b*a <sub>b</sub> *(d-d"-a <sub>b</sub> /2)+A' <sub>s</sub> *f <sub>s</sub> *(d-d'-d")+A <sub>s</sub> *f <sub>y</sub> *d"

Any choice of c smaller than c<sub>b</sub> will result in tension failure of the column, any choice greater than c<sub>b</sub> will result in compression failure of the column.

**Pure Axial Compression Capacity**

P <sub>o</sub> =	<b>3078.9</b>	kips	P <sub>o</sub> = .85*f <sub>c</sub> *(A <sub>g</sub> -A <sub>st</sub> )+A <sub>st</sub> *f <sub>y</sub>	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
φP <sub>o</sub> =	<b>2155.2</b>	kips		



Made by:	MJJ	Date:	2/16/2012	Job No:	P402110046
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Project:	CUY-2-14.41 (Main Avenue Bridge)				
Subject:	As-Built Concrete Frame Rating Section M (Frame 33)				

**Pure Bending Capacity** (Ignoring compression steel)

$a =$	7.826	in	$a = A_s * f_y / 0.85 * f'_c * b$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	1330.2	ft-kips	$M_n = A_s * f_y * (d - a/2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	1197.2	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c =$  **22.03** in **Tension Failure**

$f_s =$	33.00	ksi	$f_s = \max(\epsilon_u * E_s * (d - c) / c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s =$	33.00	ksi	$f'_s = \max(\epsilon_u * E_s * (c - d') / c, f_y)$	Stress in compression steel
$a =$	18.72820713	in	$a = \beta_1 * c$	Depth of concrete stress block
$C =$	1002.9	kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n =$	501.1	kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n =$	1458.0	ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e =$	34.92	in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	232.7	244.6	183.2	276.1	226.5	239.2	kips
$M_u =$	727.3	763.2	602.2	696.0	678.6	696.0	ft-kips
$e =$	37.50	37.43	39.45	30.26	35.95	34.92	in
$\phi P_n =$	460.2	461.2	432.8	590.3	484.0	501.1	kips
$\phi M_n =$	1438.2	1438.7	1422.8	1488.3	1450.2	1458.0	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

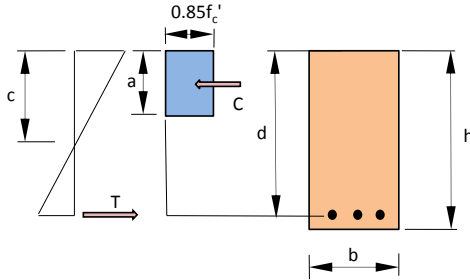
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.35	84.7 Tons	HS47.0
Operating	HS20	36 Tons	RF=3.93	141.4 Tons	HS78.5
	2F1	15 Tons	RF=5.89	88.4 Tons	
	3F1	23 Tons	RF=4.41	101.4 Tons	
	4F1	27 Tons	RF=4.70	126.8 Tons	
	5C1	40 Tons	RF=4.49	179.8 Tons	
Ohio Legal %	440%				

	Load	GVW	Rating Factor	Safe Load	HS Rating	
Inventory	HS20	36 Tons	RF=1.22	43.9 Tons	HS24.4	Shear in Beam
Operating	HS20	36 Tons	RF=2.03	73.2 Tons	HS45.6	Shear in Beam
	2F1	15 Tons	RF=3.05	45.8 Tons		Shear in Beam
	3F1	23 Tons	RF=2.36	54.4 Tons		Shear in Beam
	4F1	27 Tons	RF=2.47	66.6 Tons		Shear in Beam
	5C1	40 Tons	RF=2.36	94.5 Tons		Shear in Beam
Ohio Legal %	235%					



Made by: **MJJ** Date: **2/16/2012** Job No: **P402110046**  
 Checked by: **JKM** Date: **3/1/2012** Page:  
 Project: **CUY-2-14.41 (Main Avenue Bridge)**  
 Subject: **As-Inspected Concrete Frame Rating Section M (Frame 33)**

### Floor Beam Postive Moment Section



b =	99.0	in
d =	48	in
f'c =	4.5	ksi
fy =	33	ksi
φ =	0.9	
Area of Steel =	14.15	in <sup>2</sup>
% Steel Loss =	10%	

(5-1 1/4" □ &  
5-1 1/8" □)  
from 49/246 of  
original plans

#### Section Capacity

b = Tributary Slab Width for Positive Moment

A <sub>s</sub> =	12.735	in <sup>2</sup>	Area of reinforcing steel minus any loss noted
ρ <sub>b</sub> =	0.067		Balanced reinforcement ratio, AASHTO Eq. 8-18
0.75*A <sub>sb</sub> =	239.60	in <sup>2</sup>	75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2
β <sub>1</sub> =	0.8		
a =	1.110	in	Depth of equivalent compressive stress block, AASHTO Eq. 8-17
φM <sub>n</sub> =	1495.4	ft*kips	Design Moment Strength, AASHTO Eq. 8-16

#### Dead Load and Soil Load Moment

(Soil Force factored by 0.5)

Total Service Positive Moment = 263.1 ft\*kips From Staad

#### Live Load Moment

Reaction per lane is from Consys output

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Reaction per Lane (LL) =	38.5	41.6	27.7	35.8	34.3	35.8	kips
Impact % =	30%	30%	30%	30%	30%	30%	
Reaction per Lane (LL+I) =	50.1	54.1	36.0	46.5	44.6	46.5	kips
Reaction per Wheel (LL+I) =	25.0	27.0	18.0	23.3	22.3	23.3	kips

Reactions per Wheel (LL+I) are used for Staad Frame Analysis. The reactions are service reactions. HS20 Lane Load assumes 26k concentrated Force is used.

		From STAAD					
Max. Positive LL+I Moment =	411.17	444.3	295.8	382.3	366.3	382.3	ft*kips

Maximum Positive Moment results from 2 lanes loaded with one wheel line at center of frame.

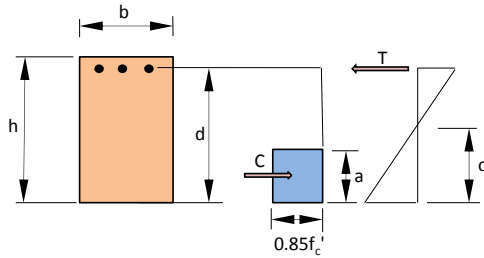
#### Postive Moment Rating

Positive Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.20	43.1 Tons	HS23.9
	Operating	HS20	36 Tons	RF=2.00	71.9 Tons
	2F1	15 Tons	RF=3.00	45.0 Tons	
	3F1	23 Tons	RF=2.32	53.4 Tons	
	4F1	27 Tons	RF=2.42	65.4 Tons	
	5C1	40 Tons	RF=2.32	92.8 Tons	
	Ohio Legal %		230%		

### Floor Beam Negative Moment Section

(Check north side of floorbeam)

Deduct 2" from d due to spall noted



$b =$	21	in
$d =$	64	in
$f'_c =$	3	ksi
$f_y =$	33	ksi
$\phi =$	0.9	
Area of Steel =	9.35	in <sup>2</sup>
% Steel Loss =	0%	

5-1 1/8" □ &  
3-1" □ from  
49/246 of  
original plans

### Section Capacity

$b =$  Frame width for negative moment

$A_s =$   in<sup>2</sup>

Area of reinforcing steel minus any loss noted

$\rho_b =$    
 $0.75 \cdot A_{sb} =$   in<sup>2</sup>

Balanced reinforcement ratio, AASHTO Eq. 8-18

75% of steel required for balanced conditions, limiting amount of steel per Manual for Bridge Evaluation, Section 6B.6.3.2

$\beta_1 =$    
 $a =$   in

Depth of equivalent compressive stress block, AASHTO Eq. 8-17

$\phi M_n =$   ft\*kips

Design Moment Strength, AASHTO Eq. 8-16

### Dead Load plus Soil Load Moment

(Moment taken at end of cap)

(Soil Force increased by 1.15 factor)

Total Service Negative Moment =  ft\*kips From Staad

### Live Load Moment

(Moment taken at end of cap)

Max. Negative LL+I Moment =  ft\*kips

Maximum Negative Moment results from 3 lanes loaded.

#### From STAAD

HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
176.33	190.5	126.9	164.0	157.1	164.0

### Negative Moment Rating

Negative Moment Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=3.18	114.7 Tons	HS63.7
	HS20	36 Tons	RF=5.32	191.4 Tons	HS106.3
Operating	2F1	15 Tons	RF=7.98	119.8 Tons	
	3F1	23 Tons	RF=6.18	142.1 Tons	
	4F1	27 Tons	RF=6.45	174.1 Tons	
	5C1	40 Tons	RF=6.18	247.1 Tons	
	Ohio Legal %	620%			

## Floor Beam Shear Section

(Assumed 2" spalled from d dimension)

### Section Capacity

Taken at face of column

$A_{sh} =$	<input type="text" value="0.62"/>	in <sup>2</sup>	Total Bar area per space (assumed double leg #5's)
$s =$	<input type="text" value="12"/>	in	Bar spacing (Shear reinforcing is fanning out at this location, 12" assumed)
$d =$	<input type="text" value="64"/>	in	d used for shear
$\alpha =$	<input type="text" value="30"/>	degrees	angle of shear reinforcement (30 degrees assumed)
$V_c =$	<input type="text" value="147.2"/>	kips	Shear strength provided by concrete (AASHTO 8-49)
$V_s =$	<input type="text" value="153.7"/>	kips	(AASHTO Eq. 8-53)
$\phi V_n =$	<input type="text" value="255.8"/>	kips	Shear Capacity of Section

### Dead Load plus Soil Load Shear

(Taken at face of column)

Total Service Shear =  kips From Staad

### Live Load Shear

(Live Load shear is taken at face of column)

		From STAAD					
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1
Max. Service LL+I Shear =	<input type="text" value="72.2"/>	78.0	51.9	67.1	64.3	67.1	kips

Maximum Shear results from 3 lanes loaded.

### Shear Rating

Shear Load Rating:					
	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=1.20	43.0 Tons	HS23.9
Operating	HS20	36 Tons	RF=2.00	71.8 Tons	HS39.9
	2F1	15 Tons	RF=3.00	45.0 Tons	
	3F1	23 Tons	RF=2.32	53.3 Tons	
	4F1	27 Tons	RF=2.42	65.3 Tons	
	5C1	40 Tons	RF=2.32	92.7 Tons	
	Ohio Legal %			230%	



## Column Section

(Check Top of north Column, just under chamfer)

$h =$	<input type="text" value="42"/>	in	Column Depth
$b =$	<input type="text" value="19"/>	in	Column Width <b>(Deducted 2" for delamination)</b>
$A_s =$	<input type="text" value="8"/>	in <sup>2</sup>	Area of Tension Steel (10-1 1/8" bars)
$A'_s =$	<input type="text" value="6.35"/>	in <sup>2</sup>	Area of Compression Steel (4- 1" bars)
$d =$	<input type="text" value="37"/>	in	Distance from compression face to centroid of tension steel
$d' =$	<input type="text" value="3"/>	in	Distance from compression face to centroid of compression steel
$f_c =$	<input type="text" value="3"/>	ksi	Concrete Strength
$f_y =$	<input type="text" value="33"/>	ksi	Steel Yield Stress
$E_s =$	<input type="text" value="29000"/>	ksi	Modulus of elasticity of steel
$\epsilon_u =$	<input type="text" value="0.003"/>	in/in	Ultimate concrete strain
$\beta_1 =$	<input type="text" value="0.85"/>		
$d'' =$	<input type="text" value="16"/>	in	Distance from centroid of gross section to centroid of tension steel

### Dead Loads

(Moment taken at spall location)

Total Service Dead Load Moment =	<input type="text" value="36.7"/>	ft-kips	From Staad
Total Service Dead Load Axial Force =	<input type="text" value="53"/>	kips	From Staad

### Live Loads (Moment taken at spall location)

		From STAAD						
		HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
Max. LL+I Moment =	<input type="text" value="194.8"/>		210.4	140.1	181.1	173.5	181.1	ft-kips
Max. LL+I Axial Force =	<input type="text" value="66.7"/>		72.1	44.4	86.2	63.9	69.6	kips

Maximum Moment and Axial load results from 3 lanes loaded..

## Section Capacity

### Balanced Condition

$a_b =$	<input type="text" value="22.80"/>	in	$a_b = (87 / (87 + f_y)) * \beta_1 * d$	Depth of stress block for balanced conditions, AASHTO 8-34
$c_b =$	<input type="text" value="26.83"/>	in	$c_b = a_b / \beta_1$	Depth to neutral axis for balanced conditions
$f'_s =$	<input type="text" value="33"/>	ksi	$f'_s = 87 * (1 - (d'/d)) * ((87 + f_y) / 87)$	Stress in comp. steel at balanced condition ( $\leq f_y$ ) (8-35)

Nominal axial load and moment at balanced condition, (AASHTO Eq. 8-32 and 8-33)

$P_b =$	<input type="text" value="1050.3"/>	kip	$P_b = .85 * f'_c * b * a_b + A'_s * f'_s - A_s * f_y$
$M_b =$	<input type="text" value="1550.0"/>	ft-kip	$M_b = 0.85 * f'_c * b * a_b * (d - d'' - a_b / 2) + A'_s * f'_s * (d - d'' - a_b) + A_s * f_y * d''$

Any choice of  $c$  smaller than  $c_b$  will result in tension failure of the column, any choice greater than  $c_b$  will result in compression failure of the column.

### Pure Axial Compression Capacity

$P_o =$	<input type="text" value="2471.9"/>	kips	$P_o = .85 * f'_c * (A_g - A_{st}) + A_{st} * f_y$	Design Axial Load at zero Eccentricity (AASHTO Eq. 8-31)
$\phi P_o =$	<input type="text" value="1730.3"/>	kips		

### Pure Bending Capacity (Ignoring compression steel)

$a =$	<input type="text" value="5.449"/>	in	$a = A_s * f_y / (0.85 * f'_c * b)$	Depth of equivalent stress block (AASHTO Eq. 8-17)
$M_n =$	<input type="text" value="754.1"/>	ft-kips	$M_n = A_s * f_y * (d - a / 2)$	Nominal Moment Strength (AASHTO Eq. 8-15)
$\phi M_n =$	<input type="text" value="678.7"/>	ft-kips		

**Moment Interaction Diagram Construction**

Moment Interaction Diagram is constructed by calculating Axial Load and Moment for a series of neutral axis distances, from  $c = 0$  (pure bending) to  $c = \text{infinity}$  (pure compression).

Calculate  $P_n$  and  $M_n$  for chosen  $c$

$c = 19.76$  in

**Tension Failure**

$f_s = 33.00$ ksi	$f_s = \max(\epsilon_u * E_s * (d-c)/c, f_y)$	Stress in tension steel, limited to $f_y$ (- indicates tension)
$f'_s = 33.00$ ksi	$f'_s = \max(\epsilon_u * E_s * (c-d')/c, f_y)$	Stress in compression steel
$a = 16.79433286$ in	$a = \beta_1 * c$	Depth of concrete stress block
$C = 813.7$ kip	$C = .85 * f'_c * a * b$	Resultant concrete compressive resultant
$\phi P_n = 531.5$ kips	$P_n = C + A'_s * f'_s - A_s * f_s$	
$\phi M_n = 1064.6$ ft-kips	$M_n = C * (h/2 - a/2) + A'_s * f'_s * (h/2 - d') + A_s * f_s * (d - h/2)$	
$e = 24.04$ in	$e = M_n / P_n$	Equivalent eccentricity

	HS20 Lane	HS20 Truck	Ohio 2F1	Ohio 3F1	Ohio 4F1	Ohio 5C1	
$P_u =$	213.6	225.3	165.3	256.0	207.6	220.0	kips
$M_u =$	470.3	504.3	351.7	440.6	424.2	440.6	ft-kips
$e =$	26.42	26.86	25.54	20.66	24.52	24.04	in
$\phi P_n =$	472.26	462.11	493.10	631.66	518.70	531.46	kips
$\phi M_n =$	1039.6	1034.4	1049.4	1087.4	1059.9	1064.6	ft-kips

$\phi P_n$  and  $\phi M_n$  capacities are calculated by iterating the "c" value until the calculated eccentricities "e" match.

	Load	GVW	Rating Factor	Safe Load	HS Rating
Inventory	HS20	36 Tons	RF=2.16	77.8 Tons	HS43.2
	Operating	HS20	36 Tons	RF=3.61	129.9 Tons
Operating	2F1	15 Tons	RF=5.50	82.5 Tons	
	3F1	23 Tons	RF=4.42	101.6 Tons	
	4F1	27 Tons	RF=4.49	121.2 Tons	
	5C1	40 Tons	RF=4.32	172.8 Tons	
	Ohio Legal %	430%			

	Load	GVW	Rating Factor	Safe Load	HS Rating	
Inventory	HS20	36 Tons	RF=1.20	43.0 Tons	HS23.9	Shear in Beam
	Operating	HS20	36 Tons	RF=2.00	71.8 Tons	HS39.9
Operating	2F1	15 Tons	RF=3.00	45.0 Tons		Shear in Beam
	3F1	23 Tons	RF=2.32	53.3 Tons		Shear in Beam
	4F1	27 Tons	RF=2.42	65.3 Tons		Shear in Beam
	5C1	40 Tons	RF=2.32	92.7 Tons		Shear in Beam
	Ohio Legal %	230%				

West Approach - Deck Rating  
SECTIONS B, D, J, M

Material Properties:

lightweight concrete  $f'_c = 4500 \text{ psi}$       Reinforcement  $f'_s = 24 \text{ ksi}$   
 $\gamma = 113 \text{ pcf}$        $f_y = 60 \text{ ksi}$   
 Latex concrete  $\gamma = 150 \text{ pcf}$

Deck Geometry:

10" slab (lightweight concrete), continuous over floor beams  
 1/4" wearing surface (latex concrete)

AB plus  
p181/991

Longitudinal Reinforcing: Top + Bottom #6's @ 8"      Top Cover: 4 1/4" (to w.s.)      Btm Cover = 1"  
 Transverse Reinforcing: Top + Bottom #5's @ 12"      Top Cover: 3 5/8" (to w.s.)      Btm Cover = 1 3/4"

Typ. Long. Spa.  
 B+J'  $\rightarrow 10'13/4"$  c/c       $S = 10'4 1/4" - 1'9" = 8.6'$       AASHTO 3.24.1  
 D+M  $\rightarrow 10'4 1/4"$  c/c       $\uparrow$  FB width

Typ. Transverse Span  
 All  $\rightarrow 18'9"$  clear span

$\frac{18.75'}{8.6'} = 2.2$        $\leftarrow$  Since transverse span is more than 2 times transverse span  
 assume deck acts as one way slab in longitudinal direction

For B'

$S \approx 10'13/4" - 1'9" = 8.40'$

For J'

$\Rightarrow$  B' + J' will have the same rating

3 spans @ end have larger spa.

$\frac{9'7 1/2" + 10'8 3/8"}{2} = 10.16'$        $\frac{10.16' + 10'8 3/8"}{2} = 10.43'$

$S = 10.43' - 1.75' = 8.68'$

Typ.  $S \approx 8.40'$  (same as B')       $\leftarrow$  This will govern because live load moments are higher @ this location  
 DL does not increase enough to make other spans lower

For D

2 span types

$9'11 1/8" \rightarrow 10'4 3/16"$       Avg of larger = 10.24'

$10'0 1/16" \rightarrow 10'3 3/8"$       Avg of larger = 10.23'

$\Rightarrow$  Use 10.24'

$S = 10.24' - 1'9" = 8.49'$

For M

$\Rightarrow$  D+M will have the same rating

highest moments occur @ typical spaced panels

$9'11 3/8" \rightarrow 10'4 1/4"$       Avg of larger = 10.25'

$S = 10.25' - 1'9" = 8.5'$       Page 512A of 512


 Made By: CTG  
 Checked By: MJJ

 Date: 5/2/2012  
 Date: 5/3/2012

 Job No.: p402110046

CUY-2-1441 Main Ave

## Deck Rating - West Approach Section B' & J'

### Input

Lightweight Concrete:	Latex Concrete:	Steel Reinforcement:
$f'_c = 4.50$ ksi	Weight = 0.150 kcf	$f'_s = 24.00$ ksi
Weight = 0.113 kcf	Thickness = 1.25 in	$f_y = 60.00$ ksi
Thickness = 10.00 in		

Longitudinal Effective Span Length: 8.40 ft AASHTO 3.24.1

	Bar Size	Spacing	Clear cover*
Top Longitudinal Reinforcing:	6	8.00 in	3.00 in
Bottom Longitudinal Reinforcing:	6	8.00 in	1.00 in

\*neglect wearing surface

### Capacity (for unit width)

$\beta_1 =$	0.825	AASHTO 8.16.2.7
Reinforcement Ratio $\rho_b =$	0.031	AASHTO 8.16.3.1.1
$0.75^* \rho_b =$	0.023	

#### Negative Moment Capacity:

AASHTO 8.16.3.2

$A_s =$	0.66	in <sup>2</sup>	
$d_t =$	6.63	in	
Actual Top Reinf. Ratio $\rho =$	0.008	<	0.023 <b>Reinforcing Controls</b>
$a =$	0.863	in	
$\Phi M_n =$	<b>18.39</b>	<b>k-ft</b>	

#### Positive Moment Capacity:

AASHTO 8.16.3.2

$A_s =$	0.66	in <sup>2</sup>	
$d_t =$	8.63	in	
Actual Top Reinf. Ratio $\rho =$	0.006	<	0.023 <b>Reinforcing Controls</b>
$a =$	0.863	in	
$\Phi M_n =$	<b>24.33</b>	<b>k-ft</b>	

### Dead Load (for unit width)

Deck:	0.094	k/ft
Wearing Surface:	0.016	k/ft
Total Dead Load:	0.11	k/ft

<b>Negative Dead Load Moment</b>	<b>0.83</b>	<b>k-ft</b>
<b>Positive Dead Load Moment:</b>	<b>0.6</b>	<b>k-ft</b>



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CUY-2-1441 Main Ave

## Deck Rating - West Approach Section B' & J'

### Live Load (for unit width)

Distribution Width E : 4.5 ft AASHTO 3.24.3.2  
 Impact = 1.3

Input Moments from CONSYS output\*\*

Load Case	Positive Moment	Negative Moment
HS20	55.64 k-ft	42.29 k-ft
2F1	32.65 k-ft	26.43 k-ft
3F1	33.85 k-ft	36.20 k-ft
4F1	30.10 k-ft	31.44 k-ft
5C1	33.85 k-ft	36.20 k-ft

\*\*distribution width and lane output correction accounted for in rating factor calculation

### RATING FACTORS

	M <sup>+</sup> Rating Factor	M <sup>-</sup> Rating Factor
HS20 Inventory	1.35	1.31
HS20 Operating	2.25	2.18
2F1 Operating	3.84	3.49
3F1 Operating	3.7	2.55
4F1 Operating	4.17	2.93
5C1 Operating	3.7	2.55


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CUY-2-1441 Main Ave

## Deck Rating - West Approach Section D & M

### Input

Lightweight Concrete:	Latex Concrete:	Steel Reinforcement:
$f'_c =$ 4.50 ksi	Weight = 0.150 kcf	$f'_s =$ 24.00 ksi
Weight = 0.113 kcf	Thickness = 1.25 in	$f_y =$ 60.00 ksi
Thickness = 10.00 in		

Longitudinal Effective Span Length: 8.50 ft AASHTO 3.24.1

	Bar Size	Spacing	Clear cover*
Top Longitudinal Reinforcing:	6	8.00 in	3.00 in
Bottom Longitudinal Reinforcing:	6	8.00 in	1.00 in

\*neglect wearing surface

### Capacity (for unit width)

$\beta_1 =$	0.825	AASHTO 8.16.2.7
Reinforcement Ratio $\rho_b =$	0.031	AASHTO 8.16.3.1.1
$0.75 \cdot \rho_b =$	0.023	

#### Negative Moment Capacity:

AASHTO 8.16.3.2

$A_s =$	0.66	in <sup>2</sup>	
$d_t =$	6.63	in	
Actual Top Reinf. Ratio $\rho =$	0.008	<	0.023 <b>Reinforcing Controls</b>
$a =$	0.863	in	
<b><math>\Phi M_n =</math></b>	<b>18.39</b>	<b>k-ft</b>	

#### Positive Moment Capacity:

AASHTO 8.16.3.2

$A_s =$	0.66	in <sup>2</sup>	
$d_t =$	8.63	in	
Actual Top Reinf. Ratio $\rho =$	0.006	<	0.023 <b>Reinforcing Controls</b>
$a =$	0.863	in	
<b><math>\Phi M_n =</math></b>	<b>24.33</b>	<b>k-ft</b>	

### Dead Load (for unit width)

Deck:	0.094	k/ft
Wearing Surface:	0.016	k/ft
Total Dead Load:	0.11	k/ft

<b>Negative Dead Load Moment</b>	<b>0.85</b>	<b>k-ft</b>
<b>Positive Dead Load Moment:</b>	<b>0.61</b>	<b>k-ft</b>



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CUY-2-1441 Main Ave

## Deck Rating - West Approach Section D & M

### Live Load (for unit width)

Distribution Width E : 4.51 ft AASHTO 3.24.3.2  
 Impact = 1.3

Input Moments from CONSYS output\*\*

Load Case	Positive Moment	Negative Moment
HS20	55.62 k-ft	42.52 k-ft
2F1	32.63 k-ft	26.57 k-ft
3F1	33.05 k-ft	36.39 k-ft
4F1	30.10 k-ft	31.50 k-ft
5C1	33.83 k-ft	36.39 k-ft

\*\*distribution width and lane output correction accounted for in rating factor calculation

### RATING FACTORS

	M <sup>+</sup> Rating Factor	M <sup>-</sup> Rating Factor
HS20 Inventory	1.35	1.3
HS20 Operating	2.26	2.17
2F1 Operating	3.85	3.47
3F1 Operating	3.8	2.54
4F1 Operating	4.17	2.93
5C1 Operating	3.71	2.54